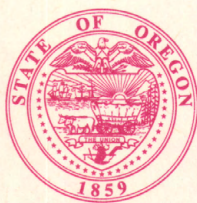
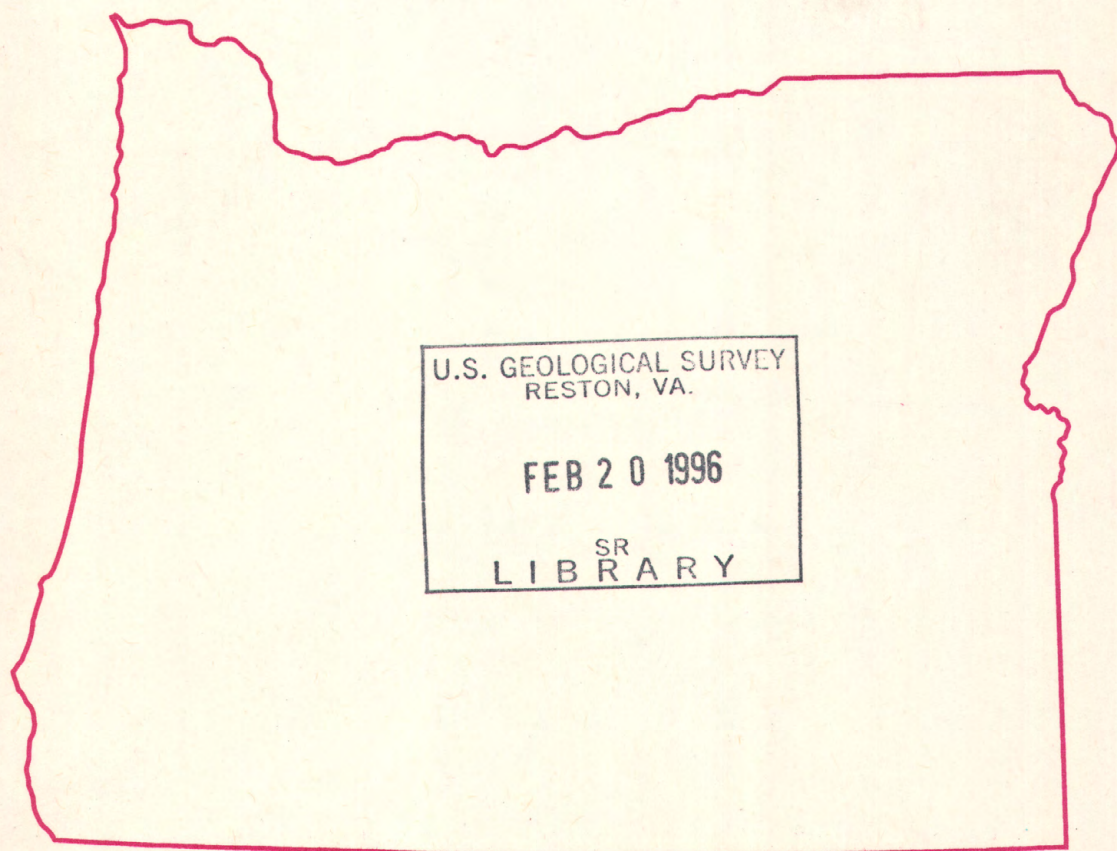


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# Water Resources Data Oregon Water Year 1994



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT OR-94-1  
Prepared in cooperation with other agencies



## CALENDAR FOR WATER YEAR 1994

1993

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1994

JANUARY							FEBRUARY							MARCH						
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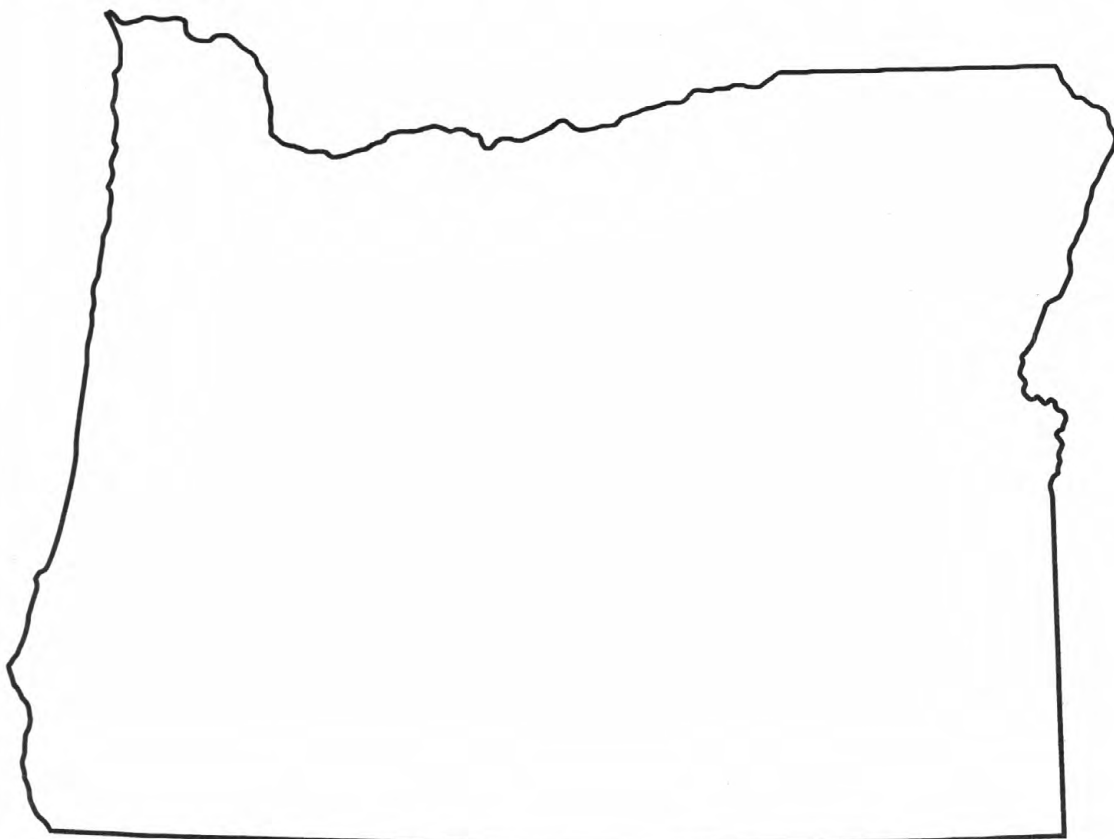
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# Water Resources Data Oregon Water Year 1994

by L.E. Hubbard, T.A. Herrett, R.L. Kraus, G.P. Ruppert, and  
M.L. Courts



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT OR-94-1  
Prepared in cooperation with other agencies



U.S. DEPARTMENT OF THE INTERIOR

BRUCE BABBITT, Secretary

U.S. GEOLOGICAL SURVEY

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Portland, Oregon 97216

1995



## PREFACE

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

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 other agencies under the general supervision of Dennis D. Lynch, District Chief, and T. John Conomos, Regional Hydrologist, Western Region.



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SURFACE-WATER STATIONS, IN DOWNSTREAM ORDER, FOR WHICH      VII  
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NOTE.--Data for chemical quality of precipitation and miscellaneous sites are published in separate sections of the data report. See references at the end of this list of page numbers for these sections.

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

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XIV

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GROUND-WATER LEVELS

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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 Oregon have been discontinued. Daily streamflow or stage records were collected and published for the period of record, expressed in water years, shown for each station. Discontinued project stations with less than 3 years of record have not been included. Information regarding these stations may be obtained from the District Office at the address given on the back side of the title page of this report.

[Letters after station name designate type of data collected: (d) discharge, (g) gage height, (e) elevation]

Station name	Station number	Drainage area (mi <sup>2</sup> )	Period of record
WARNER LAKES BASIN			
Twentymile Creek near Adel (d)	10366000	194	1910-16;1918-19;1921-22; 1941-44;1945-91
Deep Creek above Dismal Creek, near Warner Lake (d)	10366500	13.0	1918-19
Dismal Creek above Big Valley, near Warner Lake (d)	10367000	12.5	1913
Dismal Creek near Warner Lake (d)	10367500	14.0	1919
Deep Creek below Dismal Creek, near Warner Lake (d)	10368000	27	1913;1918-19
Deep Creek at Big Valley, near Lakeview (d)	10368500	76	1912-15
Camas Creek near Plush (d)	10369000	32.0	1912
Mud Creek near Plush (d)	10369500	18.0	1912;1915;1928-30
Camas Creek near Lakeview (d)	10370000	63.0	1913-15;1951-73
Crane Creek near Lakeview (d)	10370500	7.00	1914
Drake Creek near Adel (d)	10371000	67.0	1915;1923;1951-64;1966-73
Deep Creek above Adel (d)	10371500	249	1923;1930-91
Givan Canal near Adel (d)	10373000	--	1915
Deep Creek at Adel (d)	10374500	274	1910-16;1918-19;1921-22
Mud Creek Ditch at Adel (d)	10375000	--	1915
Fish Creek near Plush (d)	10376500	38.0	1914
Honey Creek at Chalstrand's ranch, near Plush (d)	10377000	56.0	1911
Snyder Creek near Plush (d)	10377500	--	1911
Twelvemile Creek near Plush (d)	10378000	37.0	1911
Honey Creek near Plush (d)	10378500	170	1911-14;1915;1921;1922; 1930-91
ABERT LAKE BASIN			
Chewaucan River at damsite, near Paisley (d)	10382500	158	1913-16
Chewaucan River near Buck Mountain, near Paisley (d)	10382550	157	1983-86
Chewaucan River below Coffeepot Creek, near Paisley (d)	10382600	216	1983-86
Conn Ditch near Paisley (d)	10383500	--	1915-20
Chewaucan River near Paisley (d)	10384000	275	1912-21;1924-91
Chewaucan River at Paisley (d)	10384100	278	1905-07;1909-12
Smalls Canal at Paisley (d)	10384500	--	1914-21
Jones-Innis-ZX Ditch near Paisley (d)	10385500	--	1915-20
Chewaucan River at narrows, near Paisley (d)	10386000	380	1914-21
Chewaucan River at Hotchkiss Ford, near Paisley (d)	10386500	430	1914-20
Crooked Creek near Valley Falls (d)	10387000	--	1912-13
Ana River plus Summer Lake Canal, near Summer Lake (d)	10388001	--	1930-39;1940-42;1951-91
SUMMER LAKE BASIN			
West Fork Silver Creek near Silver Lake (d)	10389000	27	1919-23;1925-32
Silver Creek plus Silver Lake Ir Canal, near Silver Lake (d)	10390001	180	1905-07;1909-27;1928; 1929-91
Bridge Creek near Silver Lake (d)	10390500	30	1922-23
Buck Creek above Timothy Creek, near Silver Lake (d)	10390800	250	1922-23
Buck Creek near Silver Lake (d)	10391000	290	1905-06;1909-10;1919-21
Duncan Creek near Silver Lake (d)	10392000	58	1922-23
Silvies River near Burns (d)	10393500	934	1903-06;1909-12;1913-17; 1918-20;1921-22;1923-91
MALHEUR AND HARNEY LAKES BASIN			
Silvies River near Silvies (d)	10392500	510	1904;1909-11;1916; 1921-23
Emigrant Creek near Burns (d)	10393000	240	1921
Poison Creek near Burns (d)	10394000	81	1921
Prater Creek near Burns (d)	10394500	20	1921-23
East Fork Silvies River near Lawen (d)	10395000	--	1916;1973-77
West Fork Silvies River near Lawen (d)	10395500	--	1916-17;1919;1922; 1973-77
Flood Bypass Silvies River near Burns (d)	10395505	--	1976



## DISCONTINUED SURFACE-WATER DISCHARGE OR STAGE-ONLY STATIONS

Station name	Station number	Drainage area (mi <sup>2</sup> )	Period of record
MALHEUR AND HARNEY LAKES BASIN-Continued			
Rock Creek near Burns (d)	10395600	--	1976
Mud Creek near Diamond (d)	10396500	30	1911-16;1930
Bridge Creek near Frenchglen (d)	10397000	30.0	1911-16;1930;1938-70
Krumbo Creek near Diamond (d)	10397500	37	1911;1930
Donner und Blitzen River near Narrows (d)	10398500	420	1915-20
Kiger Creek near Diamond (d)	10399000	75	1911-13;1916-21;1930; 1941
Cucamonga Creek near Diamond (d)	10399500	15	1916;1930
McCoy Creek near Diamond (d)	10400000	45	1910-11;1914;1916-21; 1930;1941
Riddle Creek near Smith (d)	10405000	60	1911
Riddle Creek near Diamond (d)	10401000	120	1917-21
Donner Und Blitzen River near Voltage (d)	10401500	760	1938-46;1973-77
Malheur Lake near Voltage (e)	10401800	2,150	1976-80;1983-89
Malheur Lake on west side Cole Island dike, at Voltage (e)	10401810	--	1983-84
Malheur Lake at break in Cole Island dike, near Voltage (e)	10401830	2,150	1972-79
Malheur Lake Outlet at Narrows (d)	10402000	2,150	1916;1973-77
Mud Lake Outlet near Narrows (d)	10402500	2,160	1916-18;1921-22
Silver Creek near Riley (d)	10403000	228	1952-80
Silver Creek above Suintex (d)	10403500	260	1904-06;1909-12;1914-23; 1925-26
Chickahominy Creek near Suintex (d)	10404000	90	1917;1922
Rock Quarry Creek near Suintex (d)	10404500	--	1921;1922
Silver Creek below Suintex (d)	10405000	550	1912-13;1921-23
Silver Creek near Narrows (d)	10406000	630	1917;1919-23
ALVORD LAKE BASIN			
Trout Creek near Denio, NV (d)	10406500	88	1911-12;1922-23;1925-31; 1932-91
CATLOW VALLEY BASIN			
Home Creek near Beckley (Narrows) (d)	10406300	38	1911-12;1915-17;1930
ALVORD LAKE BASIN			
Little Cottonwood Creek near Denio, NV (d)	10407000	8	1911-12
GOOSE LAKE (CLOSED BASIN)			
Dog Creek near Lakeview (d)	11338000	27	1912-13
North Drews Canal near Lakeview (d)	11339000	--	1976-81
Drews Creek near Lakeview (d)	11339500	212	1909-81
Cottonwood Creek near Lakeview (d)	11340500	32.9	1909-19;1924-81
Thomas Creek near Lakeview (d)	11341000	30	1912-17;1919;1927-31
LOST RIVER BASIN			
Miller Creek at Gerber Reservoir, near Lorella (d)	11483500	220	1905-08;1925-50
Miller Creek near Lorella (d)	11484000	270	1909-20
Lost River above Olene (d)	11484500	1,410	1915-17
Lost River at Olene (d)	11485000	1,590	1904;1907-12
Lost River Diversion Canal near Olene (d)	11486000	--	1961-68
Lost River at Wilson Bridge, near Olene (d)	11487000	1,620	1912-20
Lost River near Merrill (d)	11487500	1,670	1904-07
Lost River at Merrill (d)	11488000	1,680	1916
KLAMATH RIVER BASIN			
Williamson River below Sheep Creek, near Lenz (d)	11491400	205	1974-91
Williamson River near Silver Lake (d)	11491500	220	1917-18;1920-21
Miller Creek near Crescent (d)	11492000	23.7	1912;1914
Sand Creek near Fort Klamath (d)	11492500	35	1917-22
Scott Creek near Fort Klamath (d)	11493000	10	1917-20
Williamson River above Spring Creek, near Klamath Agency (d)	11494000	1,330	1912-13;1918-25
Williamson River at Chiloquin (d)	11494500	1,400	1911-16;1917
South Fork Sprague River near Bly (d)	11495500	110	1925-26
North Fork Sprague River near Bly (d)	11496500	45	1917-18;1925-26
Fivemile Creek near Bly (d)	11497000	40	1917-20
Sprague River near Beatty (d)	11497500	513	1912-26;1953-91
Sycan River near Silver Lake (d)	11498000	100	1918-20
Sycan River at Sycan Marsh, near Silver Lake (d)	11498100	220	1905
Long Creek near Silver Lake (d)	11498500	40	1918-24;1927-29

## DISCONTINUED SURFACE-WATER DISCHARGE OR STAGE-ONLY STATIONS

Station name	Station number	Drainage area (mi <sup>2</sup> )	Period of record
KLAMATH RIVER BASIN-Continued			
Sycan River near Beatty (d)	11499000	540	1912-25
Sycan River below Snake Creek, near Beatty (d)	11499100	568	1974-91
Sprague River near Yainax (d)	11500000	1,270	1904
Sprague River at Chiloquin (d)	11502000	1,600	1911-19;1923;1925
Anna Creek near Fort Klamath (d)	11503500	40	1923-27
Wood River at Fort Klamath (d)	11504000	90.0	1911-36
Wood River near Fort Klamath (d)	11504100	87.7	1965-67
Crooked Creek near Fort Klamath (d)	11504200	5.68	1965-67
Fourmile Creek near Odessa (d)	11505500	10.6	1912-17
Fourmile Creek near Rocky Point (d)	11505600	105	1965-67
Varney Creek near Rocky Point (d)	11505700	7.43	1965-67
"A" Canal at Klamath Falls (d)	11507200	--	1911-50;1961-81
Keno Canal at Klamath Falls (d)	11507400	--	1967-83
Diversion from Klamath River to Lost River, near Olene (d)	11508500	--	1931-68
Spencer Creek near Keno (d)	11510000	90	1929-32
Klamath River at Spencer Bridge, near Keno (d)	11510500	4,050	1914-31
Howard Prairie Lake Outlet near Pinehurst (d)	11512920	--	1961-65
Keene Creek near Ashland (d)	11514500	12.1	1917-22;1949-65
Green Springs Powerplant Diversion near Ashland (d)	11516100	--	1961-65
OWYHEE RIVER BASIN			
Crooked Creek near Rome (d)	13181500	1,700	1950
Owyhee River above Owyhee Reservoir (d)	13182000	10,400	1929-51
Owyhee River at Owyhee (d)	13184000	11,300	1890-96;1904-16; 1920-29;1980-86
MALHEUR RIVER BASIN			
Malheur River at Jone's Ranch, near Drewsey (d)	13213500	530	1914
Warm Springs Reservoir near Riverside (e)	13214500	1,100	1920-91
South Fork Malheur River at Riverside (d)	13215500	630	1910-14;1919-20; 1927-29;1938
Malheur River at Riverside (d)	13216000	1,750	1909-15
North Fork Malheur River at Foley's Ranch, near Beulah (d)	13218000	470	1909-12;1914
North Fork Malheur River at Juntura (d)	13218500	530	1919-22;1926-32;1935-40
Malheur River near Namorf (d)	13219000	2,590	1913-23;1926-31
Malheur River near Westfall (d)	13219500	2,970	1904-05
Malheur River at Little Valley, near Hope (d)	13220000	3,010	1949-79
Malheur River near Hope (d)	13220500	3,030	1919-49
Malheur River near Little Valley (d)	13221500	3,030	1914
Malheur River at McLaughlin Bridge, near Vale (d)	13223500	3,060	1905-06
Bully Creek near Westfall (d)	13225500	160	1912-13;1923
Cottonwood Creek near Westfall (d)	13226000	82	1922-23
Bully Creek at Warm Springs, near Vale (d)	13226500	539	1903-07;1910-17; 1922-23;1964-86
Bully Creek near Vale (d)	13227000	570	1934-62
Bully Creek at Vale (d)	13227500	620	1904
Malheur River at Vale (d)	13228000	3,880	1890-91;1895-97; 1903-14;1919
Willow Creek near Malheur (d)	13229500	250	1912-15;1921-29
Willow Creek below reservoir, near Malheur (d)	13230500	290	1905-06;1911;1921-29
Cow Creek near Brogan (d)	13231000	75	1912-14
Willow Creek near Brogan (d)	13231500	420	1912-14
Willow Creek at Cole's Ranch, near Brogan (d)	13232000	455	1904-06
Pole Creek near Brogan (d)	13232500	14	1912
Pole Creek below Black Creek feed canal, near Brogan (d)	13233000	14	1913
Malheur River below Nevada Dam, near Vale (d)	13233300	3,880	1926-34;1951-54
Malheur River at Halliday Bridge, near Ontario (d)	13233500	4,620	1905
Malheur River near Ontario (d)	13234000	4,680	1904
BURNT RIVER BASIN			
North Fork Burnt River near Whitney (d)	13269300	110	1965-80
North Fork Burnt River at Audrey (d)	13269500	139	1915-16
Middle Fork Burnt River near Audrey (d)	13270000	9.54	1915-16
South Fork Burnt River near Unity (d)	13270500	30.9	1915-16
South Fork Burnt River above Barney Creek, near Unity (d)	13270800	38.5	1963-81
South Fork Burnt River at Hardman Ranch, near Unity (d)	13271000	44.4	1916-20;1938-41
Fleetwood Ditch near Unity (d)	13271500	--	1918-20

## DISCONTINUED SURFACE-WATER DISCHARGE OR STAGE-ONLY STATIONS

Station name	Station number	Drainage area (mi <sup>2</sup> )	Period of record
BURNT RIVER BASIN-Continued			
Sawmill Creek near Unity (d)	13272000	--	1915
Burnt River at Bridgeport (d)	13274000	600	1915-16;1931-36
Burnt River near Bridgeport (d)	13274200	650	1957-80
Burnt River near Durkee (d)	13274500	700	1931-38
Burnt River at Huntington (d)	13275000	1,093	1929-32;1957-59;1962-80
POWDER RIVER BASIN			
Powder River near Baker (d)	13275500	219	1904-14;1929-68
Old Settlers Slough at Baker (d)	13276000	--	1913-14
Baldock Slough at Baker (d)	13276500	--	1913-14
Pine Creek near Baker (d)	13277500	8.8	1913-14;1929-30
Goodrich Creek near Baker (d)	13278000	3.1	1913
Mill Creek near Baker (d)	13279000	3.9	1913-14;1929-30
Marble Creek near Baker (d)	13279500	3.9	1913-14;1929-30
Salmon Creek near Baker (d)	13280000	4.4	1913-14;1929
Willow Creek near Haines (d)	13280500	2.4	1913
Powder River at Haines (d)	13281000	539	1914
Powder River near Haines (d)	13281500	572	1947-53
North Powder River near North Powder (d)	13282000	47.7	1912
Anthony Fork near North Powder (d)	13282500	37	1912
North Powder River at North Powder (d)	13283000	129	1912-14
Wolf Creek at Bauer's Ranch, near North Powder (d)	13283500	30	1913-14
Wolf Creek near North Powder (d)	13284000	32.9	1947-53
Powder River near North Powder (d)	13284500	860	1913-16;1920-25
Big Creek near Medical Springs (d)	13286000	35.5	1913-14
Goose Creek near Keating (d)	13286500	41.9	1913-14
Eagle Creek above West Fork, near Baker (d)	13287000	18	1911
West Fork Eagle Creek near Baker (d)	13287500	15	1911
Eagle Creek near Baker (d)	13288000	42	1909-10
Eagle Creek near Newbridge (d)	13288500	170	1910-11;1914
Daly Creek near Richland (d)	13289000	40.5	1913
Powder River near Robinette (d)	13289500	1,660	1929-57
IMNAHA RIVER BASIN			
Imnaha River above Gumbo Creek (d)	13291000	99.6	1945-53
Big Sheep Creek near Joseph (d)	13291500	12.5	1920
GRANDE RONDE RIVER BASIN			
Meadow Creek near Starkey (d)	13318000	140	1932-35
Meadow Creek below Smith Creek, near Starkey (d)	13318050	33.2	1978-79
Meadow Creek above Bear Creek, near Starkey (d)	13318060	48.2	1978-79
Grande Ronde River near Hilgard (d)	13318500	505	1938-56
Grande Ronde River at Hilgard (d)	13318800	555	1967-81
Grande Ronde River at La Grande (d)	13319000	678	1904-15;1918-23;1926-89
Little Creek near Union (d)	13321000	30.4	1918
Ladd Creek near Hot Lake (d)	13321500	40	1918
Mill Creek near Cove (d)	13322000	11.6	1918;1920-21
Mill Creek near Summerville (d)	13322500	--	1914-15
Grande Ronde River near Elgin (d)	13323500	1,250	1956-81
Indian Creek near Imbler (d)	13323600	22.0	1938-50
Grande Ronde River at Elgin (d)	13324000	1,400	1903-12;1918-19
Wallowa Falls powerplant tailrace near Joseph (d)	13324500	--	1925-52;1967-83
East Fork Wallowa River near Joseph (d)	13325000	10.3	1925-52;1967-82
Wallowa River above Wallowa Lake, near Joseph (d)	13325500	43.0	1924-33;1937-38;1940-41
Wallowa Lake near Joseph (g)	13326000	50.8	1904-06;1912-15;1926-91
Joseph powerplant tailrace at Joseph (d)	13326500	--	1951-56
Wallowa River at Joseph (d)	13327500	50.9	1904-07;1908-14;1915;1927-91
Hurricane Creek near Joseph (d)	13329500	29.6	1915;1924-78
Wallowa River at Wallowa (d)	13329900	--	1976-77
Lostine River near Lostine (d)	13330000	70.9	1912-14;1915;1925-91
Bear Creek near Wallowa (d)	13330500	68.0	1915;1924-85
Wallowa River near Wallowa (d)	13331000	520	1904-07
Wallowa River at Minam (d)	13332000	880	1904-14
Grande Ronde River at Rondowa (d)	13332500	2,550	1927-91
Joseph Creek at Chico (d)	13333500	280	1931-33



## DISCONTINUED SURFACE-WATER DISCHARGE OR STAGE-ONLY STATIONS

Station name	Station number	Drainage area (mi <sup>2</sup> )	Period of record
WALLA WALLA RIVER BASIN			
South Fork Walla Walla River near Milton-Freewater (d)	14010000	63.0	1903;1906-17;1931-91
South Fork Walla Walla River blw PP&L plant, near Milton (d)	14010500	80.0	1904-06;1931-45
North Fork Walla Walla River near Milton-Freewater (d)	14010800	34.4	1970-91
North Fork Walla Walla River near Milton (d)	14011000	43.8	1930-69
Walla Walla River near Milton (d)	14011500	130	1905-06;1918-29
Walla Walla River at Milton (d)	14012000	155	1903-05
Walla Walla River below Freewater (d)	14012500	160	1941-48
COLUMBIA RIVER MAIN STEM			
Columbia River at McNary Dam, near Umatilla (d)	14019200	214,000	1951-81
UMATILLA RIVER BASIN			
North Fork Umatilla River near Gibbon (d)	14019500	31	1912-15;1940-43
Umatilla River at Gibbon (d)	14020500	310	1896-99;1900-01;1902-12
Umatilla River near Cayuse (d)	14020700	384	1969-75
Umatilla River at Pendleton (d)	14021000	637	1891-92;1904-05;1935-89
Umatilla River above McKay Creek, near Pendleton (d)	14022000	700	1921-34
McKay Creek near Pilot Rock (d)	14022500	180	1921;1927-89
MdKay Reservoir near Pendleton (g)	14023000	186	1927-92
McKay Creek near Pendleton (d)	14023500	186	1919-23;1925-91
McKay Creek at mouth, near Pendleton (d)	14024000	190	1903-04;1922-24
East Birch Creek near Pilot Rock (d)	14024200	69.7	1968-73
Birch Creek near Pilot Rock (d)	14024500	240	1920-26
Birch Creek at Rieth (d)	14025000	291	1921-23;1927-76
Umatilla River near Yoakum (d)	14025500	1,260	1915-36
Umatilla River at Yoakum (d)	14026000	1,280	1903-91
Butter Creek near Pine City (d)	14032000	291	1928-88
WILLOW CREEK BASIN			
Rhea Creek near Heppner (d)	14034800	120	1960-91
Willow Creek near Morgan (d)	14035000	630	1921;1929-31
Willow Creek above Eightmile Canyon, near Arlington (d)	14035500	680	1905
Willow Creek near Arlington (d)	14036000	850	1906;1961-79
JOHN DAY RIVER BASIN			
Strawberry Creek above Slide Creek, near Prairie City (d)	14037500	7.00	1931-91
Strawberry Creek near Prairie City (d)	14038000	15	1916-17;1925-30
John Day River at Prairie City (d)	14038500	231	1916-17;1925-68
John Day River near Dayville (d)	14039000	960	1909-14;1920-21;1925-26
South Fork John Day River near Dayville (d)	14039500	590	1952-56
South Fork John Day at Dayville (d)	14040000	600	1909-14;1920-21;1925-26
John Day River at Picture Gorge, near Dayville (d)	14040500	1,680	1986-91
Mountain Creek near Mitchell (d)	14040600	20.0	1986-89
Desolation Creek near Dale (d)	14041000	108	1915-17;1949-58
North Fork John Day River near Dale (d)	14041500	525	1930-58
Camas Creek near Lehman (d)	14042000	60.7	1951-70
Camas Creek near Ukiah (d)	14042500	121	1914-17;1920-24;1932-91
Cable Creek near Ukiah (d)	14043000	39	1914-17;1919-24;1932-37;1939
Snipe Creek near Ukiah (d)	14043560	37.0	1968-73
Fox Creek at gorge, near Fox (d)	14044500	90.2	1931-58
Cottonwood Creek near Monument (d)	14045000	210	1926-31
Cottonwood Creek at Monument (d)	14045500	232	1925
John Day River at Clarno (d)	14047000	5,940	1914-15;1920-21
Lone Rock Creek near Lonerock (d)	14047380	69	1966-74;1976-91
Rock Creek above Whyte Park near Condon (d)	14047390	297	1976-89
Rock Creek at Rock Creek (d)	14047500	500	1905;1911
DESCHUTES RIVER BASIN			
Deschutes River above Snow Creek, near La Pine (d)	14049000	109	1922-25
Snow Creek above Crane Prairie, near La Pine (d)	14049500	23.0	1922-25
Deschutes River below Snow Creek, near La Pine (d)	14050000	32	1938-91
Cultus River above Cultus Creek, near La Pine (d)	14050500	16.5	1923-25;1938-91
Cultus Creek abv Crane Prairie Reservoir, nr La Pine(d)	14051000	33.2	1924;1938-91
Cultus River below Cultus Creek, near La Pine (d)	14051500	52.8	1922
Deer Creek above Crane Prairie Reservoir, near La Pine (d)	14052000	21.5	1924;1938-91
Quinn River near La Pine (d)	14052500	--	1922-25;1938-91

## DISCONTINUED SURFACE-WATER DISCHARGE OR STAGE-ONLY STATIONS

Station name	Station number	Drainage area (mi <sup>2</sup> )	Period of record
DESCHUTES RIVER BASIN--Continued			
Charlton Creek above Crane Prairie Reservoir, near La Pine (d)	14053000	15.6	1923-24;1938-79
Crane Prairie Reservoir near La Pine (e)	14053500	254	1923-91
Deschutes River blw Crane Prairie Reservoir, nr La Pine (d)	14054000	254	1907-08;1912-17;1922-91
Brown Creek near La Pine (d)	14054500	21.0	1922-25;1938-91
Deschutes River above Davis Creek, near La Pine (d)	14055000	290	1925-32
Odell Creek near Crescent (d)	14055500	39.0	1912-14;1924;1933-76
Deschutes River below Wickiup Reservoir, near La Pine (d)	14056500	483	1938-91
Deschutes River at Pringle Falls, near La Pine (d)	14057000	507	1916-17;1922-60
Fall River near La Pine (d)	14057500	45.1	1938-91
Deschutes River near La Pine (d)	14058000	600	1910-17;1920;1922
Deschutes River near Lava (d)	14058500	659	1905-07;1909-12
Little Deschutes River at Crescent (d)	14059000	109	1905-08;1911-14
Crescent Lake near Crescent (e)	14059500	60.7	1922-91
Crescent Creek at Crescent lake, near Crescent (d)	14060000	60.7	1911;1912-15;1927;1928-91
Crescent Creek below Cold Creek, near Crescent (d)	14060500	77.0	1922-26;1931-32
Big Marsh Creek at Hoey Ranch, near Crescent (d)	14061000	51.5	1912-14;1924;1928-58
Crescent Creek near Crescent (d)	14061500	137	1912-14
Little Deschutes R above Walker Basin intake, nr La Pine (d)	14062000	307	1914-17;1919-26;1931-22
Little Deschutes River at Allen's Ranch, near La Pine (d)	14063500	1,020	1905-12;1913-15;1931-32 1943-44
Deschutes River at Benham Falls, near Bend (d)	14064500	1,759	1906-14;1921;1924-91
Deschutes River above Lava Island, near Bend (d)	14065000	1,790	1915-16;1943-50
Arnold Canal near Bend (d)	14065500	--	1913-90
Deschutes River below Lava Island, near Bend (d)	14066000	1,829	1926-65
Central Oregon Canal above Pilot Butte Canal (d)	14066500	--	1933-90
Deschutes County Mncpl Improvement Dist Canal at Bend (d)	14068500	--	1923-90
North Unit Main Canal near Bend (d)	14069000	--	1946-90
North Canal near Bend (d)	14069500	--	1913-90
Swalley Canal near Bend (d)	14070000	--	1913-90
Deschutes River below Bend (d)	14070500	1,899	1915-91
Bridge Creek near Bend (d)	14070700	6.58	1981-85
Tumalo Creek near Tumalo (d)	14071500	30.9	1906-14
Tumalo Creek near Bend (d)	14073000	47.3	1913-21;1922;1923-87
Deschutes River at Tumalo (d)	14074000	1,983	1910-12;1914-15
Deschutes River at Cline Falls, near Redmond (d)	14074500	2,080	1910-13;1928-46
Snow Creek near Sisters (d)	14074900	1.65	1986-91
South Fork Beaver Creek near Paulina (d)	14077000	95	1944-53
North Fork Beaver Creek near Paulina (d)	14077500	64.4	1942-54
Beaver Creek near Paulina (d)	14078000	450	1943-75
North Fork Crooked River above Deep Creek (d)	14078500	159	1942-54
North Fork Crooked River below Deep Creek (d)	14079000	264	1947-53
Crooked River near Post (d)	14079500	2,160	1909-11;1940-62;1969-73
Crooked River above Prineville Reservoir, near Post (d)	14079800	2,400	1961-68
Bear Creek at Rickman Ranch, near Roberts (d)	14080000	44	1920-23
Bear Creek near Prineville (d)	14080250	205	1976-81
Prineville Reservoir near Prineville (e)	14080400	2,700	1961-91
Crooked River near Prineville (d)	14080500	2,700	1909-14;1941-91
Crooked River at Prineville (d)	14081500	2,820	1914
Marks Creek near Prineville (d)	14082500	61.0	1916
Ochoco Creek above Mill Creek, near Prineville (d)	14083000	200	1918-22;1924-33
Mill Creek near Prineville (d)	14083500	78.8	1916-18;1920-22;1924-33
Ochoco Creek at Elliott Ranch, near Prineville (d)	14085000	300	1909-10;1915-17
Ochoco Creek at Prineville (d)	14085500	358	1912;1914-15
McKay Creek near Prineville (d)	14086000	76.6	1925-32
McKay Creek above Old Dry Creek, near Prineville (d)	14086500	86.2	1918-19;1920
McKay Creek below Old Dry Creek, near Prineville (d)	14087000	103	1915
Crooked River near Terrebonne (d)	14087300	4,240	1968-73
Crooked River near Culver (d)	14087500	4,330	1918-63
Lake Creek near Sisters (d)	14088000	22.2	1912-13;1915-91
Metolius River at Allingham ranger station, near Sisters (d)	14088500	81.5	SS1911-13;1915-17
First Creek near Sisters (d)	14089000	12.2	1915-17;1924-28
Jack Creek near Sisters (d)	14089500	16.0	1915-16
Canyon Creek near Sisters (d)	14090000	32.5	1915-16
Whitewater River near Grandview (d)	14090500	30.6	1911-13
Metolius River at Riggs Ranch, near Sisters (d)	14092000	347	1909-12
Seekseequa Creek near Warm Springs (d)	14092150	47.3	1987-93
Shitike Creek at Warm Springs (d)	14093000	105	911-16;1923-28;1973-74
Deschutes River at Mecca (d)	14093500	7,940	1911-27

## DISCONTINUED SURFACE-WATER DISCHARGE OR STAGE-ONLY STATIONS

Station name	Station number	Drainage area (mi <sup>2</sup> )	Period of record
DESCHUTES RIVER BASIN--Continued			
Trout Creek near Antelope (d)	14094000	220	1915-17
Trout Creek near Gateway (d)	14094500	--	1915-16
Hay Creek near Hay Creek (d)	14095000	78	1915-16
Mill Creek at outlet of Olallie Lake (d)	14096000	5.6	1915-16
Mill Creek near Warm Springs (d)	14096500	28.8	1915
Warm Springs River near Warm Springs (d)	14097000	517	1911-19
White River near Government Camp (d)	14097200	40.7	1970-1980
Clear Creek below Clear Lake, near Govt Camp (d)	14097400	8.32	1969-73
Clear Creek near Government Camp (d)	14097500	9.94	1941-41;1947-53
Clear Creek above intake, near Wapinitia (d)	14098000	17.7	1918-21;1934-35
Clear Creek Ditch near Government Camp (d)	14098100	--	1969-73
Clear Creek near Pine Grove (d)	14098600	38.3	1968-73
Gate Creek at Purcell Ranch, near Wamic (d)	14099500	23.9	1921-23
Gate Creek near Wamic (d)	14100000	28.3	1918
White River near Tygh Valley (d)	14100500	221	1911-18
White River below Tygh Valley (d)	14101500	417	1918-90
Deschutes River at Sherars Bridge (d)	14102000	10,200	1923-32
FIFTEENMILE CREEK BASIN			
Fifteenmile Creek near Dufur (d)	14104000	19.6	1918-19
Fifteenmile Creek near Wrentham (d)	14104500	171	1947-53
Eightmile Creek near Boyd (d)	14105000	56	1947-53
Fivemile Creek near The Dalles (d)	14105500	32.4	1926;1928;1930-31;1949-50
MILL CREEK BASIN			
South Fork Mill Creek near The Dalles (d)	14105850	28.0	1961-75
MOSIER CREEK BASIN			
Mosier Creek near Mosier (d)	14113200	41.5	1964-81
HOOD RIVER BASIN			
Dog River near Parkdale (d)	14113400	4.50	1961-71
East Fork Hood River above intake, near Mount Hood (d)	14113500	77.2	1915-22
East Fork Hood River near Mount Hood (d)	14115000	78.8	1913-14
East Fork Hood River near Dee (d)	14115500	108	1917
Hood River at Dee (d)	14116000	155	1913-17
Green Point Creek near Dee (d)	14116500	10.0	1919-21
North Fork Green Point Creek near Dee (d)	14117500	7.6	1919;1921
Green Point below North Fork, near Dee (d)	14118000	20.0	1950-54
West Fork Hood River near Dee (d)	14118500	95.6	1914-16;1932-91
Hood River at Winans (d)	14119000	259	1906-07;1910-12;1913
Hood River near Hood River (d)	14121000	329	1913-64
COLUMBIA RIVER MAIN STEM			
Columbia River at Bonneville Dam (g)	14128860	239,900	1981-87
Columbia River at Warrendale (g)	14128910	240,000	1972-87
SANDY RIVER BASIN			
Lost Creek near Brightwood (d)	14130000	11.2	1913-18
Little Zigzag River at Twin Bridges, near Rhododendron (d)	14131000	3.70	1926-36
Zigzag River near Rhododendron (d)	14131400	14.8	1981-93
Zigzag River at Rhododendron (d)	14131500	31.0	1920-21;1926-30
Sandy River above Salmon River, at Brightwood (d)	14133500	117	1910-14;1926-31
Salmon River near Government Camp (d)	14134000	8.00	1910-12;1926-91
Salmon River below Linney Creek (d)	14134500	54.0	1928-50
Salmon River at Welches (d)	14135000	100	1913-14;1920-21;1925-36
Salmon River above Boulder Creek, near Brightwood (d)	14135500	106	1936-52
Bull Run River below Lake Ben Morrow (d)	14139500	74.0	1930-54
Little Sandy River near Marmot (d)	14140500	17.9	1913-19
WILLAMETTE RIVER BASIN			
Hills Creek above Hills Creek Reservoir, near Oakridge (d)	14144900	52.7	1959-81
Hills Creek near Oakridge (d)	14145000	59.0	1935-43
Salt Creek near Oakridge (d)	14146000	113	1913-14;1934-51
Gray Creek near Oakridge (d)	14146700	5.06	1979-86
Waldo Lake Outlet near Oakridge (d)	14147000	30.5	1937-53;1970-82;1984
Fall Creek above Winberry Creek, near Lowell (d)	14150500	127	1936-43
Winberry Creek near Lowell (d)	14150800	43.9	1964-81



## DISCONTINUED SURFACE-WATER DISCHARGE OR STAGE-ONLY STATIONS

Station name	Station number	Drainage area (mi <sup>2</sup> )	Period of record
WILLAMETTE RIVER BASIN--Continued			
Little Fall Creek near Fall Creek (d)	14151500	52.5	1936-48
Coast Fork Willamette River at London (d)	14152500	72.1	1936-87
Mosby Creek near Cottage Grove (d)	14156000	85.0	1936-46
Mosby Creek at Mouth, near Cottage Grove (d)	14156500	95.3	1947-68;1970-81
Coast Fork Willamette River at Saginaw (d)	14157000	529	1924-26;1928-51
Willamette River at Springfield (d)	14158000	2,030	1912-13;1920-57
McKenzie River near Belknap Springs (d)	14158700	146	1958-62
Budworm Creek near Belknap Springs (d)	14158930	3.00	1979-83;1984-86
McKenzie River above Boulder Creek, near Belknap Springs (d)	14158955	--	1983
Horse Creek near McKenzie Bridge (d)	14159100	149	1963-69
South Fork McKenzie River above Cougar Lake, nr Rainbow (d)	14159200	160	1958-87
Blue River above Quentin Creek (d)	14161000	11.5	1948-55
Blue River near Blue River (d)	14162000	75.0	1936-64
Gate Creek at Vida (d)	14163000	47.6	1952-57;1967-90
McKenzie River near Springfield (d)	14164000	1,066	1906-15
McKenzie River near Coburg (d)	14165500	1,337	1945-72
Coyote Creek near Crow (d)	14167000	95.1	1941-87
Amazon Creek at Eugene (d)	14169300	3.35	1963-75
Amazon Creek near Eugene (d)	14169500	21.3	1955-68;1980-82
Rock Creek near Philomath (d)	14170500	14.6	1946-52;1975-79
Marys River near Philomath (d)	14171000	159	1941-85
Muddy Creek near Corvallis (d)	14171500	107	1964-68
Calapooia River at Holley (d)	14172000	105	1936-90
Calapooia River at Albany (d)	14173500	372	1941-81
Breitenbush River above French Creek, near Detroit (d)	14179000	106	1933-87
Middle Santiam River near Cascadia (d)	14185800	104	1963-81
Packers Gulch near Cascadia (d)	14185880	7.45	1984-86;1988
Middle Santiam River near Foster (d)	14186000	271	1932-47
Middle Santiam River at Mouth, near Foster (d)	14186500	287	1951-66
South Santiam River at Foster (d)	14186700	493	1967-73
Wiley Creek at Foster (d)	14187100	62.3	1974-88
Crabtree Creek near Crabtree (d)	14188700	111	1964-70
Thomas Creek near Scio (d)	14188800	109	1963-87
Luckiamute River near Hoskins (d)	14189500	34.3	1935-78
Luckiamute River at Pedee (d)	14190000	115	1940-70
Little Luckiamute River at Falls City (d)	14190100	22.7	1965-71
Rickreall Creek near Dallas (d)	14190700	27.4	1957-78
Mill Creek at Penitentiary Annex, near Salem (d)	14191500	104	1940-56
Mill Creek at Salem (d)	14192000	110	1940-78
Willamina Creek near Willamina (d)	14193000	64.7	1934-91
Mill Creek near Willamina (d)	14193300	27.4	1958-73
South Yamhill River near Whiteson (d)	14194000	502	1940-91
North Yamhill River near Fairdale (d)	14194300	9.03	1959-66;1968-91
Haskins Creek near McMinnville (d)	14195000	6.48	1928-51
North Yamhill River near Pike (d)	14196500	47.8	1940-51
North Yamhill River at Pike (d)	14197000	66.8	1948-73
Willamette River at Wilsonville (d)	14198000	8,400	1948-73
Mollala River above Pine Creek, near Wilhoit (d)	14198500	97.0	1936-93
Molalla River near Molalla (d)	14199000	201	1906-09;1947-51
Molalla River near Canby (d)	14200000	323	1929-59;1964-78
Silver Creek at Silverton (d)	14200300	47.9	1964-68;1971-79
Pudding River near Mount Angel (d)	14201000	204	1940-66
Butte Creek at Monitor (d)	14201500	58.7	1936;1941-52;1967-85
Tualatin River near Gaston (d)	14202500	48.5	1941-56;1973-76;1979-84
Scoggins Creek above Henry Hagg Lake, near Gaston (d)	14202850	15.9	1973-76
Sain Creek near Gaston (d)	14202920	10.3	1973-76
Scoggin Creek near Gaston (d)	14203000	43.3	1941-74
Gales Creek near Gales Creek (d)	14204000	33.2	1936-45;1964-70
Gales Creek near Forest Grove (d)	14204500	66.1	1941-56;1971-81
East Fork Dairy Creek at Mountindale (d)	14205500	43.0	1941-51
Dairy Creek near Cornelius (d)	14205800	147	1974-76
McKay Creek near North Plains (d)	14206000	27.6	1941-43;1949-56
McKay Creek near Hillsboro (d)	14206180	61.0	1973-76
Tualatin River at Farmington (d)	14206500	568	1940-58;1973-76
Oswego Canal near Lake Oswego (d)	14207000	--	1929-91
Clackamas River at Big Bottom (d)	14208000	136	1920-70
Collawash River near Breitenbush (d)	14208300	142	1966-68
Oak Grove Fork at Timothy Meadows (d)	14208500	54.0	1913-14;1916-29

## DISCONTINUED SURFACE-WATER DISCHARGE OR STAGE-ONLY STATIONS

Station name	Station number	Drainage area (mi <sup>2</sup> )	Period of record
WILLAMETTE RIVER BASIN--Continued			
Roaring River near Estacada (d)	14209600	42.4	1966-68
Clackamas River near Clackamas (d)	14211000	930	1963-83;1986;1988-89
COLUMBIA RIVER MAIN STEM			
Columbia River at Columbia City (g)	14222880	254,000	1971-81
Columbia River at Longview, WA (g)	14245300	256,700	1984-90
Bear Creek near Svensen (d)	14248700	3.33	1966-75
Youngs River near Astoria (d)	14251500	40.1	1928-58
NESTUCCA RIVER BASIN			
Trask River near Tillamook (d)	14302500	145	1932-55;1962-72
Nestucca River near McMinnville (d)	14303000	12.0	1929-44
Nestucca River near Beaver (d)	14303600	180	1965-91
SILETZ RIVER BASIN			
Sunshine Creek near Valsetz (d)	14304350	6.70	1973-91
Big Rock Creek near Valsetz (d)	14304850	6.90	1986-89
YAQUINA RIVER BASIN			
Yaquina River near Chitwood (d)	14306030	71.0	1973-91
Mill Creek near Toledo (d)	14306036	4.18	1961-73
ALSEA RIVER BASIN			
North Fork Beaver Creek near Seal Rock (d)	14306040	10.0	1966-67
North Fork Alsea River at Alsea (d)	14306100	63.0	1958-89
South Fork Alsea River near Alsea (d)	14306200	49.5	1961-63
Fall Creek near Alsea (d)	14306300	29.4	1961-63
Five Rivers near Fisher (d)	14306400	114	1961-63;1968-90
Drift Creek near Salado (d)	14306600	20.5	1959-63;1966-70
Needle Branch near Salado (d)	14306700	.27	1959-73
Flynn Creek near Salado (d)	14306800	.78	1959-73
Deer Creek near Salado (d)	14306810	1.17	1959-73
BIG CREEK BASIN			
Big Creek near Roosevelt Beach (d)	14306900	11.9	1973-91
SIUSLAW RIVER BASIN			
Siuslaw River above Wildcat Creek, at Austa (d)	14307000	267	1932-40
Lake Creek at Triangle Lake (d)	14307500	52.5	1932-55
Lake Creek near Deadwood (d)	14307580	174	1968-89
North Fork Siuslaw River near Minerva (d)	14307645	41.2	1968-85
UMPQUA RIVER BASIN			
Jackson Creek near Tiller (d)	14307700	152	1956-86
South Umpqua River at Days Creek (d)	14308600	641	1975-90
Days Creek at Days Creek (d)	14308700	55.3	1956-72
South Myrtle Creek near Myrtle Creek (d)	14310700	43.9	1956-72
North Myrtle Creek near Myrtle Creek (d)	14311000	54.2	1956-86
Olalla Creek near Tenmile (d)	14311200	61.3	1957-73
Tenmile Creek at Tenmile (d)	14311300	29.6	1968-73
Deer Creek near Roseburg (d)	14312200	53.2	1956-73
Silent Creek near Diamond Lake (d)	14312400	8.24	1972-77
Lake Creek near Diamond Lake (d)	14312500	54.9	1923-29;1930;1931-53 1972-84
North Umpqua River at Toketee Falls (d)	14315500	339	1926-45;1947-48
North Umpqua River above Rock Creek, near Glide (d)	14317500	886	1925-45
Rock Creek near Glide (d)	14317600	97.4	1958-73
Little River at Peel (d)	14318000	177	1955-89
North Umpqua River near Glide (d)	14318500	1,210	1916-18;1928-38
Sutherlin Creek at Sutherlin (d)	14319200	16.4	1956-67
Calapooya Creek at Nonpareil (d)	14319900	88.6	1977-88
Elk Creek near Drain (d)	14322000	104	1956-73;1978-79
Umpqua River near Scottsburg (d)	14322900	4,095	1967-69
Smith River near Gardiner (d)	14323100	206	1966-73
Tenmile Creek near Lakeside (d0)	14323200	87.0	1958-76
COOS RIVER BASIN			
West Fork Millicoma River near Allegany (d)	14324500	46.9	1955-81

## DISCONTINUED SURFACE-WATER DISCHARGE OR STAGE-ONLY STATIONS

Station name	Station number	Drainage area (mi <sup>2</sup> )	Period of record
COQUILLE RIVER BASIN			
South Fork Coquille River above Panther Creek, nr Illahe (d)	14324600	31.2	1957-70
South Fork Coquille River near Illahe (d)	14324700	40.6	1957-74
South Fork Coquille River near Powers (d)	14324900	93.2	1957-70
Middle Fork Coquille River near Myrtle Point (d)	14326500	305	1931-46
North Fork Coquille River near Fairview (d)	14326800	73.9	1964-81
North Fork Coquille River near Myrtle Point (d)	14327000	282	1929-46;1964-68
SIXES RIVER BASIN			
Sixes River at Sixes (d)	14327150	116	1968-70
Elk River near Sixes (d)	14327300	86.1	1968-70
ROGUE RIVER BASIN			
Rogue River above Bybee Creek, near Union Creek (d)	14327500	156	1930-52
Mill Creek near Prospect (d)	14329500	32.0	1926-35
South Fork Rogue River above Imnaha Creek, near Prospect (d)	14330500	52.0	1932-49
Imnaha Creek near Prospect (d)	14331000	26.0	1932-49
Middle Fork Rogue River near Prospect (d)	14333000	56.5	1926-55
Red Blanket Creek near Prospect (d)	14333500	45.5	1926-32;1934-81
South Fork Rogue River south of Prospect (d)	14334700	246	1969-92
Rogue River below South Fork Rogue River, near Prospect (d)	14335000	650	1929-65
Rogue River at McLeod (d)	14335075	697	1978-81
South Fk Big Butte Creek, abv Willow Cr, nr Butte Falls (d)	14335200	67.6	1986-91
South Fork Big Butte Creek near Butte Falls (d)	14335500	138	1911;1915;1918-22;1925-91
South Fork Little Butte Collect Canal near Pinehurst (d)	14339400	--	1961-65
South Fork Little Butte Creek at Big Elk Ranger Station (d)	14339500	16.6	1927-50
Dead Indian Collect Canal near Pinehurst (d)	14340400	--	1961-65
South Fork Little Butte Creek near Lakecreek (d)	14341500	138	1922-57;1961-82
North Fork Little Butte Creek at Fish Lake, nr Lakecreek (d)	14342500	20.8	1915;1917-89
North Fork Little Butte Creek near Lakecreek (d)	14343000	43.8	1912-13;1917;1923-27;1929-64;1966-85
N F Little Butte Creek abv Intake Canal, near Lakecreek (d)	14344500	60.4	1918-19;1922-50
Little Butte Creek above Eagle Point (d)	14347000	269	1917-26;1929
Little Butte Creek below Eagle Point (d)	14348000	293	1908-16;1924-26;1946-50
Emigrant Creek near Ashland (d)	14350000	64.3	1920-86
West Fork Ashland Creek near Ashland (d)	14353000	10.5	1925-33;1975-82
East Fork Ashland Creek near Ashland (d)	14353500	8.14	1925-33;1975-82
Evans Creek near Bybee Springs, near Rogue River (d)	14359500	116	1925-27;1951-53
Middle Fork Applegate River near Copper (d)	14361590	50.7	1980-87
Elliott Creek near Copper (d)	14361600	51.8	1978-87
Carberry Creek near Copper (d)	14361700	68.9	1978-87
Applegate River near Ruch (d)	14363000	302	1912-14;1926-53
Powell Creek near Williams (d)	14368500	8.17	1947-58
Slate Creek at Wonder (d)	14370000	31.4	1944-57
Grave Creek at Pease Bridge, near Placer (d)	14371500	22.1	1941-89
Grave Creek near Placer (d)	14372000	45.6	1914;1941-50
East Fork Illinois River near Takilma (d)	14372500	42.3	1926;1927-32;1941-91
Althouse Creek near Holland (d)	14373500	24.3	1947-53
Sucker Creek near Holland (d)	14375000	76.2	1942-65
Sucker Creek below Little Grayback Creek, near Holland (d)	14375100	83.9	1966-91
Elk Creek near O'Brien (d)	14375400	26.6	1986-91
West Fork Illinois River below Rock Creek, near O'Brien (d)	14375500	42.4	1955-85
West Fork Illinois River near O'Brien (d)	14376500	49.7	1947-54
Illinois River at Kerby (d)	14377000	364	1926-61
Deer Creek near Dryden (d)	14377500	22.0	1942-56
Illinois River near Selma (d)	14378000	665	1957-68
Illinois River near Agness (d)	14378200	988	1961-81



## DISCONTINUED SURFACE-WATER QUALITY STATIONS

The following continuous-record water-quality stations in Oregon have been discontinued. Continuous water-quality data were collected and published for the period of record shown for each station. For each station entry, a period of record, expressed in water years, is provided for each type of record listed. Discontinued project stations with less than 3 years of record have not been included. Information regarding these stations may be obtained from the District Office at the address given on the back side of the title page.

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

tb (turbidity), sed (sediment)]

Station name	Station number	Drainage area (mi <sup>2</sup> )	Type of record	Period of record
MALHEUR AND HARNEY LAKES BASIN				
Donner und Blitzen River near Frenchglen	10396000	200	t, sc	1976-81
OWYHEE RIVER BASIN				
Owyhee River near Rome	13181000	8,000	t	1973-77
Owyhee River at Owyhee	13184000	11,300	t, sc	1980-82
Bully Creek near Vale	13227000	570	t, sed	1959-62
POWDER RIVER BASIN				
Powder River at Baker	13277000	351	sed	1961
Powder River near Richland	13286700	1,310	t	1960-61
Eagle Creek above Smith Creek near New Bridge	13288200	156	t	1960-61
GRANDE RONDE RIVER BASIN				
Imnaha River at Imnaha	13292000	622	t	1966-68;1977
Meadow Creek below Smith Creek near Starkey	13318050	33.2	t	1978-79
Meadow Creek above Bear Creek near Starkey	13318060	48.2	t	1978-79
Grande Ronde River at La Grande	13319000	678	t	1960-61
Wallowa River at Wallowa	13329900	--	t	1977
Lostine River near Lostine	13330000	70.9	t	1958
Lostine River at Lostine	13330200	--	t	1976-77
Minam River at Minam	13331500	240	t	1966-85
Grande Ronde River at Rondowa	13332500	2,555	t	1960-61
WALLA WALLA RIVER BASIN				
South Fork Walla Walla River near Milton-Freewater	14010000	63	t	1960-61
COLUMBIA RIVER MAIN STEM				
Columbia River at McNary Dam	14019200	214,000	t	1962
			sed	1966
Columbia River at Umatilla	14019250	214,000	t	1975-79
UMATILLA RIVER BASIN				
Umatilla River above Meacham Creek near Gibbon	14020000	131	t	1960-80
Umatilla River near Umatilla	14033500	2,290	t	1963-69
WILLOW CREEK RIVER BASIN				
Willow Creek at Heppner	14034500	96.8	t	1963-68; 1972-73
			sed	1963-68
Willow Creek near Arlington	14036000	850	t	1963-68
			sed	1963-70
JOHN DAY RIVER BASIN				
South Fork John Day River near Dayville	14039500	590	t	1952-56
Desolation Creek near Dale	14041000	108	t	1958
Middle Fork John Day River at Ritter	14044000	515	t	1967-68
North Fork John Day River at Monument	14046000	2,520	t	1967-68
John Day River at McDonald Ferry	14048000	7,580	t	1967-68 1976-81
			sc	1976-81
			sed	1963-70
Columbia River at Biggs Junction	14048330	226,400	t	1975-76

## DISCONTINUED SURFACE-WATER QUALITY STATIONS

Station name	Station number	Drainage area (mi <sup>2</sup> )	Type of record	Period of record
DESCHUTES RIVER BASIN				
Deschutes River at Benham Falls	14064500	1,759	t	1968-80
Deschutes River near Culver	14076500	2,705	t	1955-57;1959-74
Crooked River at Post	14079500	2,160	t, sed	1960-62
Bear Creek in Prineville	14080250	205	t	1976
			sed	1976-80
Crooked River near Prineville	14080500	2,700	t, sed	1959
Crooked River below Opal Springs, near Culver	14087400	4,300	t	1964-74
Crooked River near Culver	14087500	4,330	t	1955-63
Metolius River near Grandview	14091500	316	t	1955-74
Deschutes River near Madras	14092500	7,820	t	1953-56
				1958;1972-88
White River below Tygh Valley	14101500	417	t, sed	1982
			tb	1982-83
Deschutes River at Moody	14103000	10,500	t	1955-58;1962-81
COLUMBIA RIVER MAIN STEM				
Columbia River at The Dalles	14105700	237,000	t	1956-70;1974-76
			sc	1965-85
Columbia River at Warrendale	14128910	240,000	t, sc	1976-92
Columbia River at Vancouver	14144700	241,000	t	1968-70;1973-79
			sed	1964-69
WILLAMETTE RIVER BASIN				
Middle Fork Willamette River near Oakridge	14144800	258	t	1957-87
Hills Creek above Hills Creek Reservoir, near Oakridge	14144900	52.7	t	1959-81
Middle Fork Willamette River below North Fork, near Oakridge	14148000	924	t	1951-87
Fall Creek near Lowell	14150300	118	t	1964-87
Winberry Creek near Lowell	14150800	43.9	t	1964-81
Middle Fork Willamette River at Jasper	14152000	1,340	t	1954-87
Coast Fork Willamette River at London	14152500	72.1	t	1961-65;1968-87
Coast Fork Willamette River near Goshen	14157500	642	t	1962-75
McKenzie River below Trail Bridge Dam, near Belknap Springs	14158850	184	t, sc	1977-85
McKenzie River at McKenzie Bridge	14159000	348	t, sc	1977-85
Horse Creek near McKenzie Bridge	14159100	149	t	1963-69;1984
South Fork McKenzie River above Cougar Lake, near Rainbow	14159200	160	t	1958-87
Blue River below Tidbits Creek, near Blue River	14161100	45.8	t	1964-87
Lookout Creek near Blue River	14161500	24.1	t	1952-55;1964-81
Blue River near Blue River	14162000	75	t	1962-64
McKenzie River at Finn Rock	14162400	--	t	1984
McKenzie River near Vida	14162500	930	t	1962-85
			sc	1977-85
Gate Creek at Vida	14163000	47.6	t	1984
McKenzie River at Leaburg Dam	14163100	--	t	1984
McKenzie River near Springfield	14164000	1,066	t	1984
Walterville Canal near Walterville	14164200	--	t	1984
McKenzie River above Hayden Bridge, at Springfield	14164900	--	t	1984
Mohawk River near Springfield	14165000	177	t	1964-69;1984
McKenzie River near Coburg	14165500	1,337	t	1964-75;1984
Willamette River at Harrisburg	14166000	3,420	t	1962-87
			sc, do	1970-76
			ph	1970-75
Willamette River above Calapooia River at Albany	14171750	4,460	t	1964-87
North Santiam River below Boulder Creek, near Detroit	14178000	216	t	1952-87
Breitenbush River above French Creek, near Detroit	14179000	108	t	1951;1954-87
North Santiam River at Fisherman's Bend, near Mill City	14181800	--	t	1986
Little North Santiam River near Mehama	14182500	112	t	1986
North Santiam River at Mehama	14183000	655	t	1986
North Santiam River near Jefferson	14184100	736	t	1985-86
South Santiam River below Cascadia	14185000	174	t	1963-63;1967;
				1970-87
Middle Santiam River near Cascadia	14185800	104	t	1964-79;1981-82

## DISCONTINUED SURFACE-WATER QUALITY STATIONS

Station name	Station number	Drainage area (mi <sup>2</sup> )	Type of record	Period of record
WILLAMETTE RIVER BASIN--Continued				
Quartzville Creek near Cascadia	14185900	99.2	t	1964-87
Middle Santiam River at mouth, near Foster	14186500	287	t	1954-64;1966
South Santiam River at Foster	14186700	493	t	1968;1970-73; 1985
South Santiam River at Waterloo	14187500	640	t	1964-87
Crabtree Creek near Scio	14188750	--	t	1985
Thomas Creek near Scio	14188800	109	t	1963-75
Thomas Creek near Crabtree	14188850	--	t	1986
South Santiam River below Thomas Creek, near Jefferson	14188900	--	t	1986
Santiam River at Jefferson	14189000	1,790	t	1964-65;1967-87
Luckiamute River at Pedee	14190000	115	t	1965-70
Willamette River at Salem	14191000	7,280	t	1964-87
			sc	1952-60;1965-72 1976-84
Willamina Creek near Willamina	14193000	64.7	t	1964-68
South Yamhill River near Whiteson	14194000	502	t	1964-68
North Yamhill River at Pike	14197000	66.8	t	1964-69
Molalla River above Pine Creek, near Wilhoit	14198500	97	t	1964-69
Molalla River near Canby	14200000	323	t	1964-69
Silver Creek at Silverton	14200300	47.9	t	1964-68
Tualatin River near Gaston	14202500	48.5	t	1979-84
Tualatin River near Dilley	14203500	125	t	1964-68
Gales Creek near Gales Creek	14204000	33.2	t	1964-69
Tualatin River at West Linn	14207500	706	t	1964-68;1976-81
			sc	1976-81
Willamette River at Oregon City	14207700	10,000	t	1963-67
Clackamas River near Clackamas	14211000	930	t	1964-76
Willamette River at Portland	14211720	11,100	t, sc	1976-81
Willamette River above St. Johns Bridge, at Portland	14211805	11,450	t	1972-75
COLUMBIA RIVER MAIN STEM				
Columbia River at Columbia City	14222880	254,000	t	1971
Columbia River near Columbia City	14222890	253,900	t	1969-72
Columbia River at Kalama	14222910	254,000	t	1969-79
Columbia River at Prescott	14223780	254,200	t	1968-69
Columbia River at Rainier	14245295	256,700	t	1972-79
Columbia River at Longview, WA	14245300	256,700	t	1968-72
Columbia River at Beaver Army Terminal, near Quincy	14246900	256,900	t	1968-70
Columbia River at Wauna	14247295	256,900	t	1972-76
Columbia River at Bradwood	14247400	257,100	t	1977-81
Columbia River at Altoona, WA	14248600	258,000	t	1972-79
Bear Creek near Svenson	14248700	3.33	t	1966-75
PACIFIC SLOPE BASINS IN OREGON				
NEHALEM RIVER BASIN				
Nehalem River near Foss	14301000	667	t	1975-81
			sc	1981
NESTUCCA RIVER BASIN				
Trask River near Tillamook	14302500	145	t	1962-71
Nestucca River near Beaver	14303600	180	t	1965-87
SILETZ RIVER BASIN				
Big Rock Creek near Valsetz	14304850	6.90	t	1979-85
Siletz River at Siletz	14305500	202	t	1979-85
YAQUINA RIVER BASIN				
Yaquina River near Chitwood	14306030	71	sed	1973-74
ALSEA RIVER BASIN				
North Fork Beaver Creek near Seal Rock	14306040	10	t	1966-67
North Fork Alsea River at Alsea	14306100	63	t	1958-66
South Fork Alsea River near Alsea	14306200	49.5	t	1958-63
Fall Creek near Alsea	14306300	29.4	t	1959
Five Rivers near Fisher	14306400	114	t	1959



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WATER RESOURCES DATA FOR OREGON, 1994  
DISCONTINUED SURFACE-WATER QUALITY STATIONS

Station name	Station number	Drainage area (mi <sup>2</sup> )	Type of record	Period of record
ALSEA RIVER BASIN--Continued				
Alsea River near Tidewater	14306500	334	t, sc sed	1980-81 1973-74
Drift Creek near Salado	14306600	20.5	t	1959-63;1969-70
Needle branch near Salado	14306700	0.27	t, sed	1959-73
Flynn Creek near Salado	14306800	0.78	t, sed	1959-73
Deer Creek near Salado	14306810	1.17	t, sed	1959-73
SIUSLAW RIVER BASIN				
Siuslaw River near Mapleton	14307620	588	t sc sed	1968-75;1978-81 1978-81 1968-75
UMPQUA RIVER BASIN				
South Umpqua River at Days Creek	14308600	641	t tb sc, ph, do	1971-82;1991-92 1973-82 1991-92
North Umpqua River at Winchester	14319500	1,344	t	1971-91
Umpqua River near Elkton	14321000	3,683	t	1971-92
COOS RIVER BASIN				
West Fork Millicoma River near Allegany	14324500	46.9	t	1973-76
COQUILLE RIVER BASIN				
South Fork Coquille River near Illahe	14324700	40.6	t	1971-74
Rock Creek near Illahe	14324800	--	t	1958
South Fork Coquille River near Powers	14324900	93.2	t	1957-70
SIXES RIVER BASIN				
Sixes River at Sixes	14327150	116	t sed	1968 1968-70
ROGUE RIVER BASIN				
South Fork Rogue River south of Prospect	14334700	246	t sed	1969-92 1977-81
Rogue River at Grants Pass	14361500	2,459	t	1956-58;1974-87
Middle Fork Applegate River near Copper	14361590	50.7	t	1980-87
Elliott Creek near Copper	14361600	51.8	t sed	1978-87 1978-80
Carberry Creek near Copper	14361700	68.9	t sed	1978-87 1981
Rogue River near Merlin	14370400	3,268	t	1975-87
Rogue River at Marial	14372250	3,812	t	1975-87
Rogue River near Agness	14372300	3,939	t	1961-87
Illinois River near Selma	14378000	665	t	1962-68

# WATER RESOURCES DATA FOR OREGON, 1994

## INTRODUCTION

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

This report includes records on both surface and ground water in the State. Specifically, it contains: (1) Discharge records for 201 stream-gaging stations, stage only records for 4 gaging stations, 45 partial-record or miscellaneous streamflow stations, and 1 crest-stage, partial-record streamflow station; (2) stage and content records for 32 lakes and reservoirs; (3) water-quality records for 47 streamflow-gaging stations and 8 ungaged streamsites; (4) water-quality for 2 precipitation stations; and (5) water-level records for 2 observation wells.

This series of annual reports for Oregon began with the 1961 water year with a report that contained only data relating to the quantities of surface water. For the 1964 water year, a similar report was introduced that contained only data relating to water quality. Beginning with the 1975 water year, the report format was changed to present, in one or two volumes, data on quantities of surface water, quality of surface and ground water, and ground-water levels. In 1981, the annual report was divided into two volumes: Volume 1 described the activities for Eastern Oregon, while Volume 2 described the activities for Western Oregon. Beginning with the 1985 water year, presentation of ground-water levels in this report was discontinued. In 1991, the annual report returned to a single volume report.

Prior to introduction of this series and for several water years concurrent with it, water-resources data for Oregon were published in U.S. Geological Survey Water-Supply Papers. Data on stream discharge and stage and on lake or reservoir contents and stage, through September 1960, were published annually under the title "Surface-Water Supply of the United States, Parts 10, 11, 13, and 14." For the 1961 through 1970 water years, the data were published in two 5-year reports. Data on chemical quality, temperature, and suspended sediment for the 1941 through 1970 water years were published annually under the title "Quality of Surface Waters of the United States," and water levels for the 1935 through 1974 water years were published under the title "Ground-Water Levels in the United States." These Water-Supply Papers may be consulted in the libraries of the principal cities of the United States, 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 OR-94-1." 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, are reproduced on a single CD-ROM disc.

Additional information, including current prices, for ordering specific reports may be obtained from the District Chief at the address given on back of title page or by telephone (503) 251-3201. 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 and organizations of the State of Oregon have had cooperative agreements for the systematic collection of surface-water records since 1905. Organizations that supplied data are acknowledged in station descriptions. Organizations that assisted in collecting data through cooperative agreements with the Survey are:

State of Oregon Water Resources Department, Martha O. Pagel, Director.  
 State of Oregon Department of Fish and Wildlife, Rudolph A. Rosen, Acting Director.  
 State of Oregon Department of Environmental Quality, Langdon Marsh, Director.  
 Coos Bay-North Bend Water Board, P. A. Matson, General Manager.  
 Eugene Water and Electric Board, R. L. Berggren, General Manager.  
 Coos County, Board of Commissioners, Jack L. Beebe, Chair.  
 Douglas County, Natural Resources Division of Public Works, Frank M. Nielsen, Division Manager  
 City of Albany, Steve Bryant, City Manager.  
 City of Ashland, Department of Public Works, S. M. Hall, Director.  
 City of Gresham, Department of Environmental Services, Gregory E. DiLoreto, City Engineer.  
 City of McMinnville, J. L. Harshman, General Manager.  
 City of Portland, Bureau of Environmental Services, Noam Stampfer, Director.  
 City of Portland, Bureau of Water Works, Michael F. Rosenberger, Administrator.  
 The Confederated Tribes of the Umatilla Indian Reservation, E. H. Patawa, Chair, Board of Trustees.  
 The Confederated Tribes of the Warm Springs Indian Reservation, Zane Jackson, Chair of Tribal Council.

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

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

## SUMMARY OF HYDROLOGIC CONDITIONS

Surface Water

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

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

Eastern Oregon has more complex hydrologic patterns than western Oregon. Precipitation is less than 10 inches per year in the semiarid regions, such as parts of the north-central area, the closed basin in south-central Oregon, and southeastern



Oregon. The northeastern part of the state receives as much as 80 inches of precipitation per year, much of it occurring as snowfall. On large streams, flooding can result from winter rains and (or) seasonal snowmelt; in smaller drainage basins, flooding can result from winter rains, seasonal snowmelt, and convection storms.

#### Surface-water Conditions

"Scarce winter snow, low streamflows and lack of precipitation" were the opening remarks on July 13, 1994 as then Oregon's Governor Barbara Roberts signed the drought declaration for Crook County. By the end of the water year, 10 counties were included in the State's drought declaration. Dry conditions in water year 1994 bring the total to 8 of the past 10 years with below average streamflows in Oregon.

Throughout Oregon many new record high temperatures were set in the spring and summer. Water shortages were noted in practically all basins across the state. Snowpacks during the winter were reported to be below to much below average for the entire state. Snowpacks near Mt. Hood in north-central Oregon were 80 percent of average and were the highest in the state. The snowpacks reached their maximum during March and then began a downward decline as lack of spring snow and warm temperatures began an early snowmelt. By April 1st snowpacks of less than 50 percent were common in the state. Precipitation in Oregon during the water year was much below average almost everywhere. By the end of the water year precipitation ranged from a low of 56 percent in the Upper Deschutes and Crooked River basins of Central Oregon to a high of 80 percent in the John Day basin of northeastern Oregon. The preceding information was taken from reports of the Natural Resources Conservation Service and National Weather Service.

Streamflows in the state were generally 50 percent of average. Worse conditions existed in central and southeastern basins in the state. Flows in the Owyhee basin were only 18 percent of average. Basins in the upper reaches of the Deschutes River reported flows which were only 41 percent of average. As a result most storage reservoirs were empty by the end of the water year with little or no carry over storage for the next water year.

No significant flooding was reported during the year. Peak streamflows recorded during the year for selected gages are shown in Table 1.

Table 1.--Comparison of peak discharge for the 1994 water year with peak discharge for the period of record at long-term stations

Station number	Station name	Drainage area (mi <sup>2</sup> )	Peak discharge 1994 water year		Exceedance probability	Peak discharge period of record	
			Date	ft <sup>3</sup> /s		Date	ft <sup>3</sup> /s
10396000	Donner und Blitzen near Frenchglen	a200	Mar. 1	674	0.83	Apr. 26, 1978	4,270
11502500	Williamson River below Sprague River near Chiloquin	a3,000	Mar. 4	868	>.95	Dec. 26, 1964	16,100
13181000	Owyhee River near Romea	8,000	Mar. 3	1,360	>.95	Mar. 18, 1993	55,700
13214000	Malheur River near Drewsey	a910	Feb. 27	356	>.95	Dec. 23, 1964	12,000
13331500	Minam River at Minam	240	May 12	2,370	.80	June 16, 1974	6,260
14048000	John Day River at McDonald Ferry	a7,580	May 22	8,530	.77	Dec. 24, 1964	42,800
14137000	Sandy River near Marmot	262	Jan. 2	7,790	.88	Dec. 22, 1964	61,400
14178000	North Santiam River below Boulder Creek near Detroit	216	Jan. 3	3,040	>.95	Dec. 22, 1964	26,700
14301000	Nehalem River near Foss	667	Dec. 10	14,400	>.95	Jan. 9, 1990	53,400
14321000	Umpqua River near Elkton	3,683	Dec. 9	20,000	>.95	Dec. 23, 1964	265,000
14325000	South Fork Coquille River at Powers	169	Dec. 11	7,970	.90	Dec. 22, 1964	48,900

a Approximately.

> More than indicated value

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

## SPECIAL NETWORKS AND PROGRAMS

Hydrologic Bench-Mark Network is a network of 53 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 284 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 objectives of NASQAN are (1) 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 such that the data may be used for, (2) description of the areal variability of water quality in the Nation's rivers through analysis of data from this and other programs, (3) detection of changes or trends with time in the pattern of occurrence of water-quality characteristics, and (4) providing a nationally consistent data base useful for water-quality assessment and hydrologic research.

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

The National Water-Quality Assessment (NAWQA) Program of the U.S. Geological Survey is a long-term program with goals to describe the status and trends of water-quality conditions for a large, diverse, and geographically distributed part of the Nation's ground- and surface-water resources, and to identify, describe, and explain the major natural and human factors that affect these observed conditions and trends.

Assessment activities have begun in about two-thirds of the study units and ultimately will be conducted in 60 study units (major watersheds and aquifer systems) that represent a wide range of environmental settings nationwide and that account for a large percentage of the Nation's water use. A wide array of chemical constituents will be measured in ground water, surface water, streambed sediments, and fish tissues. The coordinated application of comparative hydrologic studies at a wide range of spatial and temporal scales will provide information for decision making by water-resources managers and a foundation for aggregation and comparison of findings to address water-quality issues of regional and national interest.

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

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

## EXPLANATION OF THE RECORDS

The surface-water records published in this report are for the 1994 water year that began October 1, 1993, and ended September 30, 1994. A calendar of the water year is provided on the inside of the front cover. The records contain streamflow data, stage and content data for lakes and reservoirs, and water-quality data for surface water. The following sections of the introductory text are presented to provide users with a more

detailed explanation of how the hydrologic data published in this report were collected, analyzed, computed, and arranged for presentation.

#### Station Identification Numbers

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

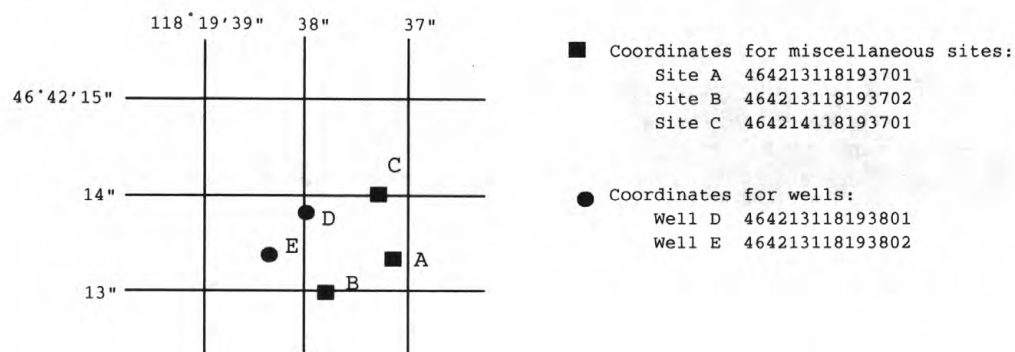
#### Downstream Order System

Since October 1, 1950, the order of listing hydrologic-station records in Survey reports is in a downstream direction along the main stream. All stations on a tributary entering upstream from a mainstream station are listed before that station. A station on a tributary that enters between two mainstream stations is listed between them. A similar order is followed in listing stations on first rank, second rank, and other ranks of tributaries. The rank of any tributary with respect to the stream to which it is immediately tributary is indicated by an 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 14105700, which appears just to the left of the station name, includes the two-digit Part number "14" plus the six-digit downstream-order number "105700." The Part number designates the major river basin; for example, part "14" refers to the Pacific slope basins in Oregon and lower Columbia River basin.

#### Latitude-Longitude System

The identification numbers for wells and miscellaneous surface-water sites are assigned according to the grid system of latitude and longitude (figure 1, page 6). 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.



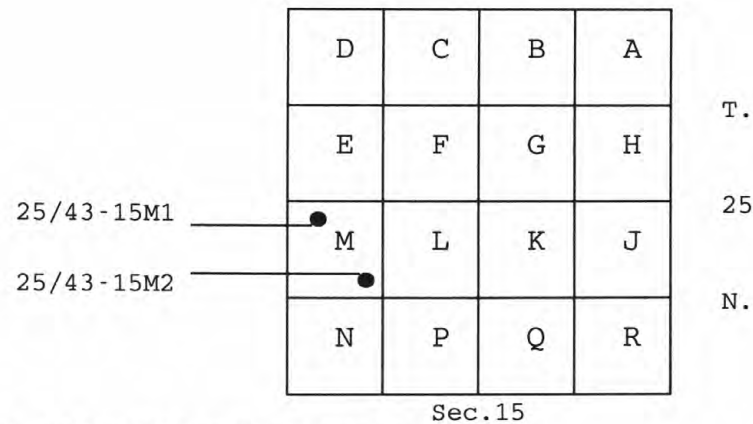
**Figure 1.** System for numbering wells and miscellaneous sites (latitude and longitude).

#### Local Identifier Well-Numbering System

In addition to the latitude-longitude based site identification number, wells in the State of Oregon 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. 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, page 7. 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.



R. 43 E.



**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.

#### Data Collection and Computation

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

Continuous records of stage are obtained with analog recorders that trace continuous graphs of stage or with digital recorders that punch stage values on paper tapes at selected time intervals. Measurements of discharge are made with current meters using methods adapted by the Geological Survey that are described in standard textbooks, in Water-Supply Paper 2175, and in U.S. Geological Survey Techniques of Water-Resources Investigations (TWRI), Book 3, Chapter A6. These methods are described in standard textbooks, Water-Supply Paper 2175, and the U.S. Geological Survey Techniques of Water-Resources Investigations (TWRI's), Book 3, Chapter A1 through A19 and Book 8, Chapters A2 and B2. The methods are consistent with the American Society for Testing and Materials

(ASTM) standards and generally follow the standards of the International Organization for Standards (ISO).

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 gaging stations, acoustic velocity meter (AVM) systems are used to compute discharge. The AVM system measures the stream's velocity at one or more paths in the cross section. Coefficients are developed to relate this path velocity to the mean velocity in the cross section. Because the AVM sensors are fixed in position, the adjustment coefficients generally vary with stage. Cross-sectional area curves are developed to relate stage, recorded as noted above, to cross section area. Discharge is computed by multiplying path velocity by the appropriate stage related coefficient and area.

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

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

## Data Presentation

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 discharges 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, daily, and instantaneous 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 further 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, locations, and datums of previous gages are given under this heading.

REMARKS.--All periods of estimated daily-discharge record will either be identified by date in this paragraph of the station description for water-discharge stations or flagged in the daily-discharge table. (See next section, "Identifying Estimated Daily



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

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

AVERAGE DISCHARGE.--The discharge value given is the arithmetic 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 graphic or digital recorder, a crest-stage gage, or by direct observation of a nonrecording gage. If the maximum stage did not occur on the same day as the maximum discharge or content, it is given separately. Similarly, the minimum is the instantaneous minimum discharge, unless otherwise qualified, and was determined and is reported in the same manner as the maximum.

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

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

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

Although rare, occasionally the records of a discontinued gaging station may need revision. Because, for these stations, there would be no current or, possibly, future station manuscript published to document the revision in a "Revised Records" entry, users of data for these stations who obtained the record from previously published data reports may wish to contact the Oregon office (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 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 for the month; and 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 computerized data for 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 10 percent of the time for the designated period.

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

90 PERCENT EXCEEDS.--The discharge that is exceeded 90 percent of the time 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 ft<sup>3</sup>/s; the nearest tenth between 1.0 and 10 ft<sup>3</sup>/s; whole numbers between 10 and 1,000 ft<sup>3</sup>/s; and 3 significant figures for more than 1,000 ft<sup>3</sup>/s. The number of significant figures used is based solely on the magnitude of the discharge value. The same rounding rules apply to discharges listed for partial-record stations and miscellaneous sites.

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

#### Other Records Available

Monthly records for several ungaged sites are given in a separate section following the gaged sites. The accuracy of records for ungaged sites is generally lower than that for gaged sites, depending on the precision of the computation method and the accuracy of data used in the computations. For most gaging stations, unpublished, detailed information, on file in the Oregon office, includes discharge measurements, gage-height records, and rating tables. Many gaging-station records in Oregon through 1987 have been analyzed to determine several statistical summaries: (1) The number of days in each year that the daily discharge was between selected limits (duration tables); (2) the lowest mean discharge for selected numbers of consecutive days in each year; and (3) the highest mean discharge for selected numbers of consecutive days in each year.

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

#### Records of Surface-Water Quality

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



### Classification of Records

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

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

### Arrangement of Records

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

### On-site Measurements and Sample Collection

In obtaining water-quality data, it is important that the data obtained represent the in situ quality of the water. To assure this, certain measurements, such as water temperature, pH, and dissolved oxygen, need to be made onsite when the samples are taken. To assure that measurements made in the laboratory also represent the in situ water, carefully prescribed procedures need to be followed in collecting the samples, treating the samples to prevent changes in quality pending analysis, and shipping the samples to the laboratory. Procedures for onsite measurements and for collecting, treating, and shipping samples are detailed in the TWRI Book 1, Chapter D2; Book 3, Chapter C2; Book 5, Chapter A1, A3, and A4. These references are listed in the PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS section of this report. These methods are consistent with ASTM standards and generally follow ISO standards. Also, detailed information on collecting, treating, and shipping samples may be obtained from the Geological Survey Oregon office.

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

Chemical-quality data published in this report are considered to be the most representative values available for the stations listed. The values reported represent water-quality conditions at the time of sampling as much as possible, consistent with available sampling techniques and methods of analysis. In the rare case where an apparent inconsistency exists between a reported pH value and the relative abundance of carbon



dioxide species (carbonate and bicarbonate), the inconsistency is the result of a slight uptake of carbon dioxide from the air by the sample between measurement of pH in the field and determination of carbonate and bicarbonate in the laboratory.

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

#### Water Temperature

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

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

#### Sediment

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

During periods of rapidly changing flow or rapidly changing suspended-sediment concentration, samples may have been collected more frequently (twice daily or, in some instances, hourly). The published sediment discharges for days of rapidly changing flow or concentration were computed by the subdivided-day method (time discharge weighted average). Therefore, for those days when the published sediment discharge value differs from the value computed as the product of discharge times mean concentration times 0.0027, the reader can assume that the sediment discharge for that day was computed by the subdivided-day method. For periods when no samples were collected, daily discharges of suspended sediment were estimated on the basis of water discharge, sediment concentrations observed immediately before and after the periods, and suspended-sediment loads for other periods of similar discharge. Methods used in the computation of sediment records are described in the TWRI Book 3, Chapters C1 and C3. These methods are consistent with ASTM standards and generally follow ISO standards.

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

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

#### Laboratory Measurements

Sediment samples, samples for biochemical-oxygen demand (BOD), samples for identification of biological populations, samples for indicator bacteria, and daily samples for specific conductance are analyzed locally. All other samples are analyzed in the Geological Survey laboratory in Arvada, Colorado. Methods used to analyze sediment samples and to compute sediment records are described in the TWRI Book 1, Chapter D2; Book 3, Chapter C2; and Book 5, Chapters A1, A3, A4, and A5. These methods are consistent

with ASTM standards and generally follow ISO standards.

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

## 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 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, are 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 within 24 hours when incubated at 44.5°C plus or minus 0.2°C on M-FC medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Fecal streptococcal bacteria are bacteria found also in the intestine of warmblooded animals. Their presence in water is considered to verify fecal pollution. They are characterized as gram-positive, cocci bacteria which are



capable of growth in brain-heart infusion broth. In the laboratory they are defined as all the organisms which produce red or pink colonies within 48 hours at 35°C plus or minus 1.0°C on KF-streptococcus medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Base flow. See Base runoff.

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

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

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

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

Ash mass is the mass or amount of residue present after the residue from the dry mass determination has been ashed in a muffle 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 ( $\text{g/m}^3$ ), and periphyton and benthic organisms in grams per square meter ( $\text{g/m}^2$ ).

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 ( $\text{ft}^3/\text{s}$ ) is the rate of discharge representing a volume of 1 cubic foot passing a given point during 1 second and is equivalent to 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- $\mu\text{m}$  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 ( $\text{CaCO}_3$ ).

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 analyzed.

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

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

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

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

National Trends Network (NTN) is a 150-station network for sampling atmospheric deposition in the United States. The purpose of the network is to determine the



variability, both in location and in time, of the composition of atmospheric deposition, which includes snow, rain, dust particles, aerosols, and gases. The core from which the NTN was built was the already-existing deposition-monitoring network of the National Atmospheric Deposition Program (NADP).

NTU (Nephelometric Turbidity Unit) is a method of quantitative analysis in which the concentration or particle size of suspended matter in a liquid is determined by measurement of light absorption.

Organism is any living entity.

Organism count/area refers to the number of organisms collected and enumerated in a sample and adjusted to the number per unit area habitat, usually square meter (m<sup>2</sup>), 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 ( $1 \times 10^{-12}$ ) of the amount of radioactivity represented by a curie (Ci). A curie is the amount of radioactivity that yields  $3.7 \times 10^{10}$  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 [ $\text{mg O}_2/(\text{m}^2 \cdot \text{time})$ ] for periphyton and macrophytes and [ $\text{mg O}_2/(\text{m}^3 \cdot \text{time})$ ] for phytoplankton are units for expressing primary productivity. They define production and respiration rates as estimated from changes in the measured dissolved-oxygen concentration. The oxygen light and dark bottle method is preferred if the rate of primary production is sufficient for accurate measurements to be made within 24 hours. Unit time may be either the hour or day, depending on the incubation period.

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

Recoverable from bottom material is the amount of a given constituent that is in

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

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

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

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<sup>3</sup>/s) x 0.0027.

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

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

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

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

7 consecutive days (the 7-day low flow).

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

Solute is any substance that is dissolved in water.

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

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

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

Substrate is the physical surface upon which an organism lives.

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

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

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

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

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

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



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

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

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

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

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



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

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

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

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

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

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

WATER RESOURCES DATA FOR OREGON 1994  
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, Branch of Information Services, Box 25286, Federal Center, Denver, Colorado 80225 (authorized agent of the Superintendent of Documents, Government Printing Office). Prepayment is required. Remittance should be sent by check or money order payable to the U.S. Geological Survey. Prices are not included because they are subject to change. Current prices can be obtained by writing to the above address. When ordering or inquiring about prices for any of these publications, please give the title, book number, chapter number, and "U.S. Geological Survey Techniques of Water-Resources Investigations."

1-D1. Water temperature--influential factors, field measurement, and data presentation, by H. H. Stevens, Jr., J. F. Ficke, and G. F. Smoot: USGS--TWRI Book 1, Chapter D1. 1975. 65 pages.

1-D2. Guidelines for collection and field analysis of ground-water samples for selected unstable constituents, by W. W. Wood: USGS--TWRI Book 1, Chapter D2. 1976. 24 pages.

2-D1. Application of surface geophysics to ground-water investigations, by A. A. R. Zohdy, G. P. Eaton, and D. R. Mabey: USGS--TWRI Book 2, Chapter D1. 1974. 116 pages.

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. MacCary: 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.

3-A5. Measurement of peak discharge at dams by indirect methods, by Harry Hulsing: USGS--TWRI Book 3, Chapter A5. 1967. 29 pages.

3-A6. General procedure for gaging streams, by R. W. Carter and Jacob Davidian: USGS--TWRI Book 3, Chapter A6. 1968. 13 pages.

3-A7. Stage measurement at gaging stations, by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A7. 1968. 28 pages.

3-A8. Discharge measurements at gaging stations, by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A8. 1969. 65 pages.

3-A9. Measurement of time of travel 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 the 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, Revised, by J. F. Wilson, Jr., E. D. Cobb, and F. A. Kilpatrick: USGS--TWRI Book 3, Chapter A12. 1986. 34 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. Rathbun, Nobuhiro Yotsukura, G. W. Parker, and L. L. DeLong: USGS--TWRI Book 3, Chapter A18. 1989. 52 pages.

3-A19. Levels at streamflow gaging stations, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A19. 1990. 31 pages.

3-A20. Simulation of soluble waste transport and buildup in surface waters using tracers, by F. A. Kilpatrick: USGS--TWRI Book 3, Chapter A20. 1993. 38 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. 190 pages.

3-C1. Fluvial sediment concepts, by H. P. Guy: USGS--TWRI Book 3, Chapter C1. 1970. 55 pages.

3-C2. Field methods for measurement of fluvial sediment, by H. P. Guy and V. W. Norman: USGS--TWRI Book 3, Chapter C2. 1970. 59 pages.

3-C3. Computation of fluvial-sediment discharge, by George Porterfield: USGS--TWRI Book 3, Chapter C3. 1972. 66 pages.

4-A1. Some statistical tools in hydrology, by H. C. Riggs: USGS--TWRI Book 4, Chapter A1. 1968. 39 pages.

4-A2. Frequency curves, by H. C. Riggs: USGS--TWRI Book 4, Chapter A2. 1968. 15 pages.

4-B1. Low-flow investigations, by H. C. Riggs: USGS--TWRI Book 4, Chapter B1. 1972. 18 pages.

4-B2. Storage analyses for water supply, by H. C. Riggs and C. H. Hardison: USGS--TWRI Book 4, Chapter B2. 1973. 20 pages.

4-B3. Regional analyses of streamflow characteristics, by H. C. Riggs: USGS--TWRI Book 4, Chapter B3. 1973. 15 pages.

4-D1. Computation of rate and volume of stream depletion by wells, by C. T. Jenkins: USGS--TWRI Book 4, Chapter D1. 1970. 17 pages.

5-A1. Methods for determination of inorganic substances in water and fluvial sediments, by M.J. Fishman and L. C. Friedman, editors: 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. Greenson, 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-flow 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.

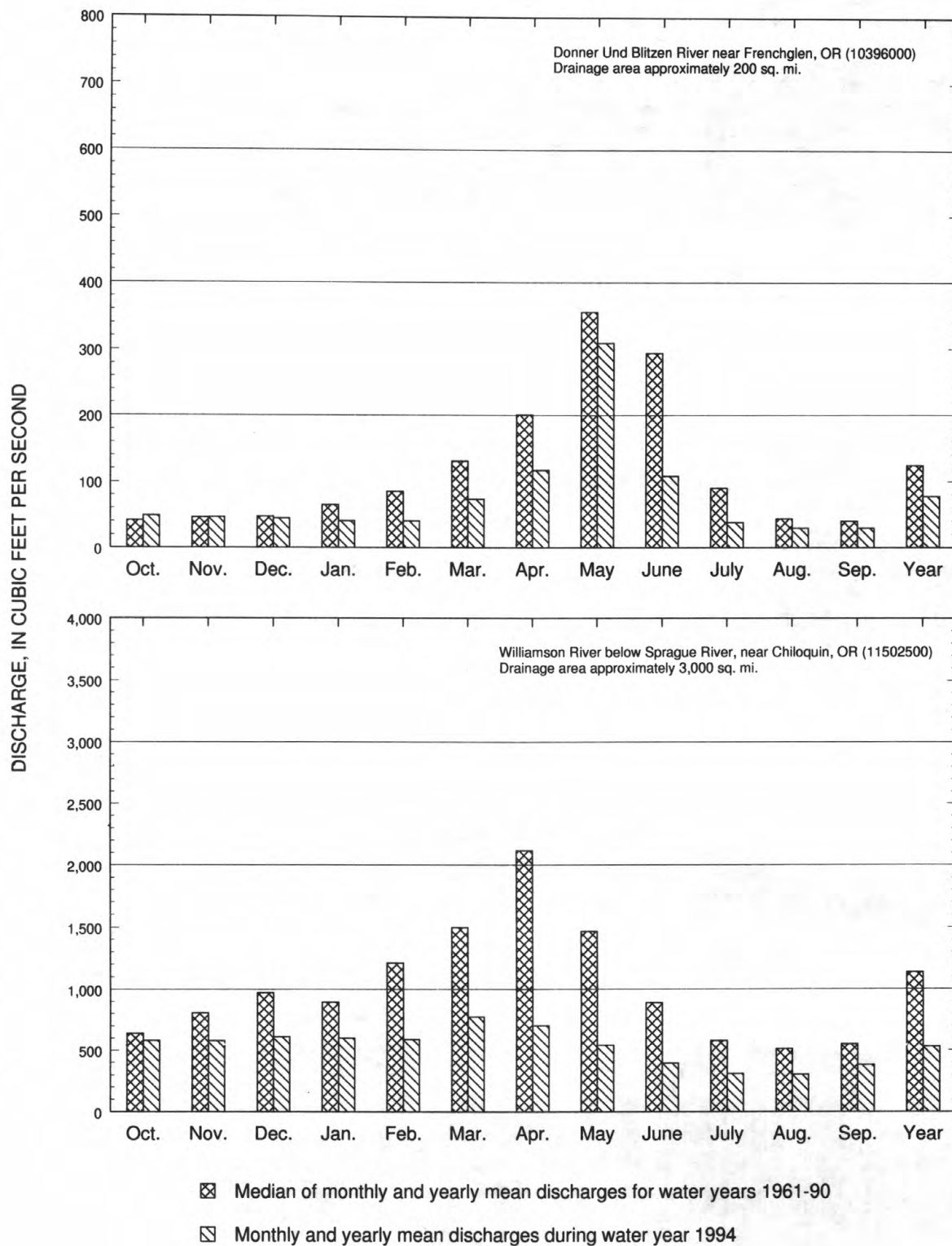
7-C2. Computer model of two-dimensional solute transport and dispersion in ground water, by L. F. Konikow and J. D. Bredehoeft: USGS--TWRI Book 7, Chapter C2. 1978. 90 pages.

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.

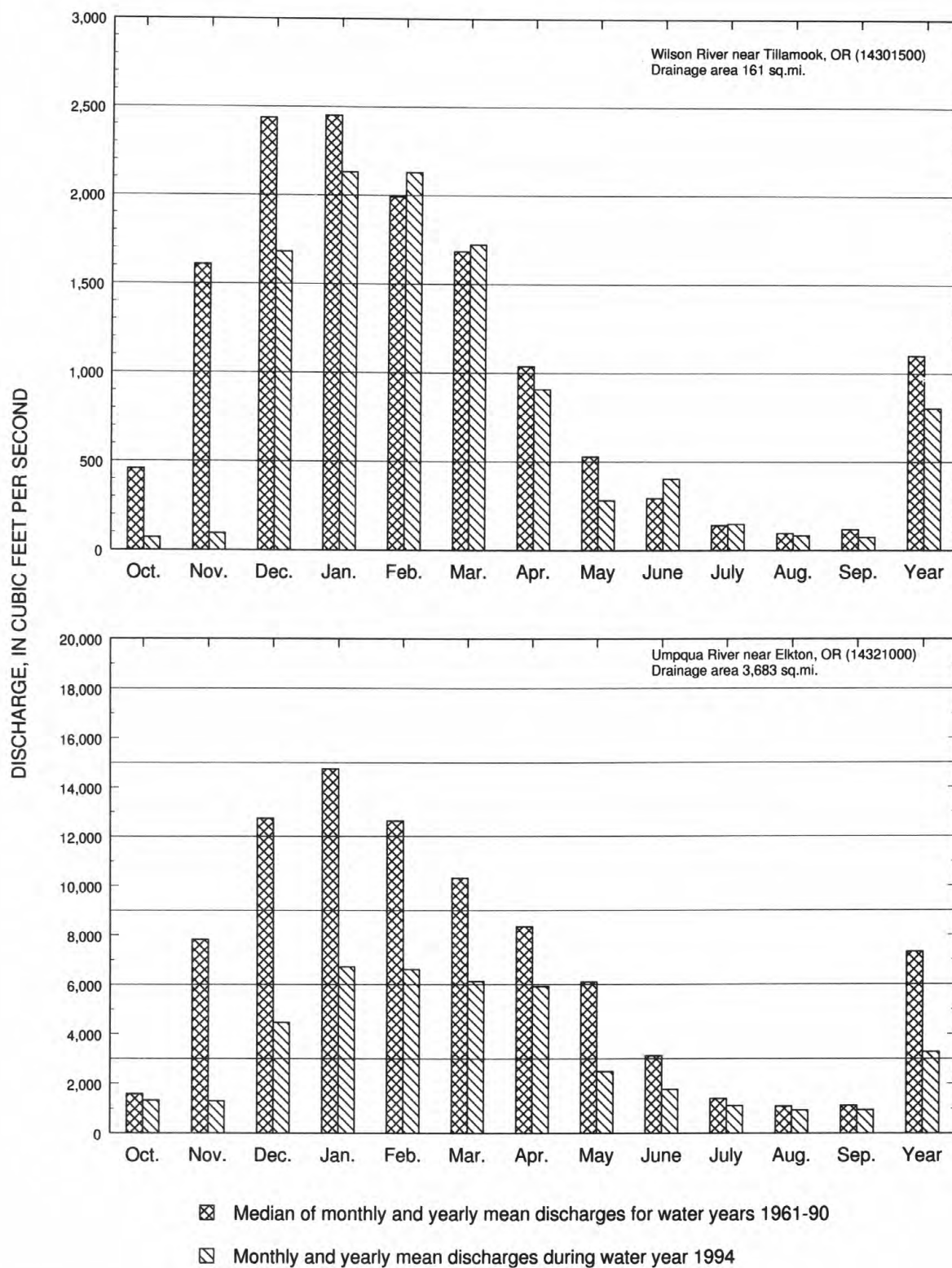
8-A1. Methods of measuring water levels in deep wells, by M. S. Garber and F. C. Koopman: USGS--TWRI Book 8, Chapter A1. 1968. 23 pages.

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 3.** Discharge during 1994 water year compared with median discharge for period 1961-90 for two representative gaging stations in Eastern Oregon.



**Figure 4.** Discharge during 1994 water year compared with median discharge for period 1961-90 for two representative gaging stations in Western Oregon.

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## 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 acceptance range (non-ideal colony count)
ND	Materials specifically analyzed for but not detected

## Dissolved Trace-Element Concentrations

NOTE.--Traditionally, dissolved trace-element concentrations have been reported at the microgram per liter (ug/L) level. Recent evidence, mostly from large rivers, indicates that actual dissolved-phase concentrations for a number of trace elements are within the range of 10's to 100's of nanograms per liter (ug/L). Data above the ug/L level should be viewed with caution. Such data may actually represent elevated environmental concentrations from natural or human causes; however, these data could reflect contamination introduced during sampling, processing, or analysis. To confidently produce dissolved trace-element data with insignificant contamination, the U.S. Geological Survey began using new trace-element protocols at some stations in water year 1994. Full implementation of the protocols will take place during the 1995 water year.

## Change in National Trends Network procedures

NOTE.--Sample handling procedures at all National Trends Network stations were changed substantially on January 11, 1994, in order to reduce contamination from the sample shipping container. The data for samples before and after that date are different and not directly comparable. A tabular summary of the differences based on a special intercomparison study, is available from the NADP/NTN Coordination Office, Colorado State University, Fort Collins, CO 80523 (Telephone: 303-491-5643).

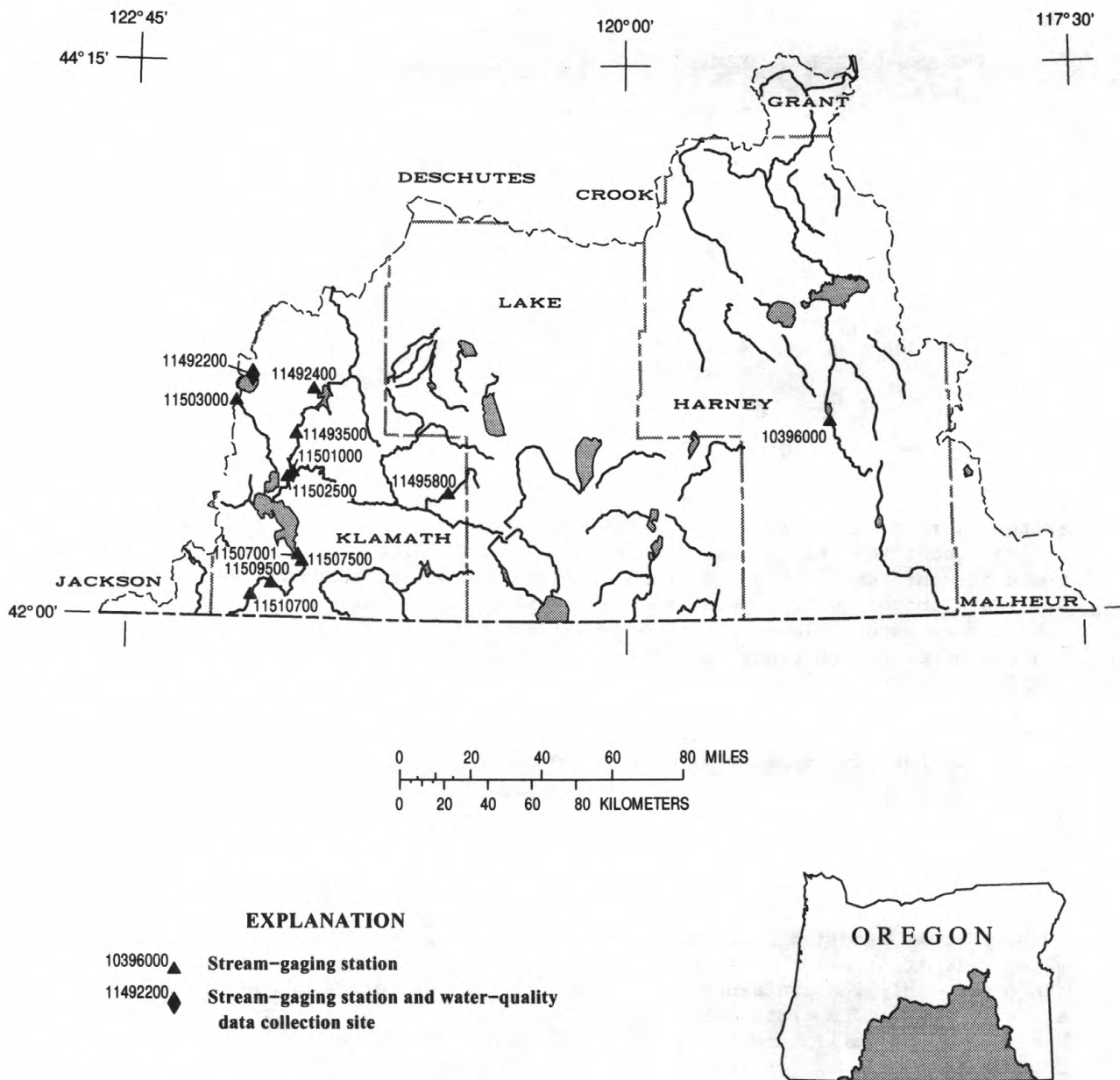


Figure 5. Location of surface-water and water-quality stations in The Great Basin and the Klamath River Basin.

## THE GREAT BASIN

## MALHEUR AND HARNEY LAKES BASIN

10396000 DONNER UND BLITZEN RIVER NEAR FRENCHGLEN, OR

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

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

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

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

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

REMARKS.--No estimated daily discharges. Records good. No regulation or diversion upstream from station. Periodic water-quality records for the period March 1975 to September 1986 and continuous water-quality records for the period October 1975 to September 1981 have been collected at this location. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--64 years (water years 1912-13, 1915-16, 1918-21, 1939-94), 125 ft<sup>3</sup>/s, 90,560 acre-ft/yr.

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

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

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 1	1945	*674	*3.77	May 9	2130	668	3.76

Minimum discharge, 14 ft<sup>3</sup>/s Nov. 25, result of freezeup.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	46	46	47	46	34	210	76	129	249	51	31	29
2	46	44	47	44	37	250	79	129	196	50	32	30
3	46	47	44	44	37	149	88	131	190	49	31	30
4	46	45	43	42	39	102	85	151	174	47	31	30
5	46	41	39	43	40	84	80	193	159	46	30	30
6	48	43	44	40	44	58	83	321	145	47	30	29
7	50	45	44	36	46	53	79	514	129	45	30	28
8	51	46	43	45	38	51	75	498	114	44	29	28
9	49	48	44	42	39	47	84	524	110	42	30	29
10	49	46	43	40	43	51	88	526	117	41	29	29
11	49	44	44	41	36	53	83	515	125	40	29	30
12	51	44	42	39	31	48	88	493	135	38	29	31
13	49	39	43	41	45	50	104	438	132	38	29	31
14	48	41	45	41	40	58	98	348	109	37	29	31
15	50	52	44	41	39	65	100	312	97	36	28	30
16	58	48	42	38	38	66	117	247	91	36	29	30
17	57	44	41	40	39	62	126	260	82	35	29	29
18	53	43	33	40	39	62	143	296	82	35	29	29
19	51	35	27	41	37	58	160	378	81	34	29	29
20	50	45	33	40	38	53	170	404	79	34	29	29
21	50	50	46	45	38	55	183	272	79	33	29	29
22	49	48	53	41	37	55	173	224	75	33	29	29
23	48	42	57	41	38	50	161	202	70	34	29	28
24	48	29	58	41	38	52	161	223	67	33	29	28
25	48	28	57	40	41	52	150	256	65	34	29	28
26	47	42	55	40	46	51	153	284	62	33	29	28
27	47	57	52	39	52	53	145	315	59	32	29	28
28	47	77	40	39	71	57	130	273	56	32	30	28
29	48	78	42	34	---	64	123	228	55	32	29	29
30	47	56	42	44	---	72	131	259	53	32	29	31
31	46	---	45	26	---	84	---	251	---	31	29	---
TOTAL	1518	1393	1379	1254	1140	2275	3516	9594	3237	1184	912	877
MEAN	49.0	46.4	44.5	40.5	40.7	73.4	117	309	108	38.2	29.4	29.2
MAX	58	78	58	46	71	250	183	526	249	51	32	31
MIN	46	28	27	26	31	47	75	129	53	31	28	28
AC-FT	3010	2760	2740	2490	2260	4510	6970	19030	6420	2350	1810	1740

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1911 - 1994, BY WATER YEAR (WY)

	43.7	47.9	55.1	63.6	90.4	151	222	372	285	96.8	47.5	42.1
MEAN	43.7	47.9	55.1	63.6	90.4	151	222	372	285	96.8	47.5	42.1
MAX	86.4	94.3	181	239	310	500	666	812	802	320	113	87.3
(WY)	1985	1985	1965	1971	1921	1993	1952	1984	1917	1984	1984	1984
MIN	24.2	25.3	25.2	25.0	27.8	40.5	61.2	105	44.7	28.9	21.1	22.2
(WY)	1993	1962	1960	1916	1964	1977	1968	1992	1992	1968	1992	1992

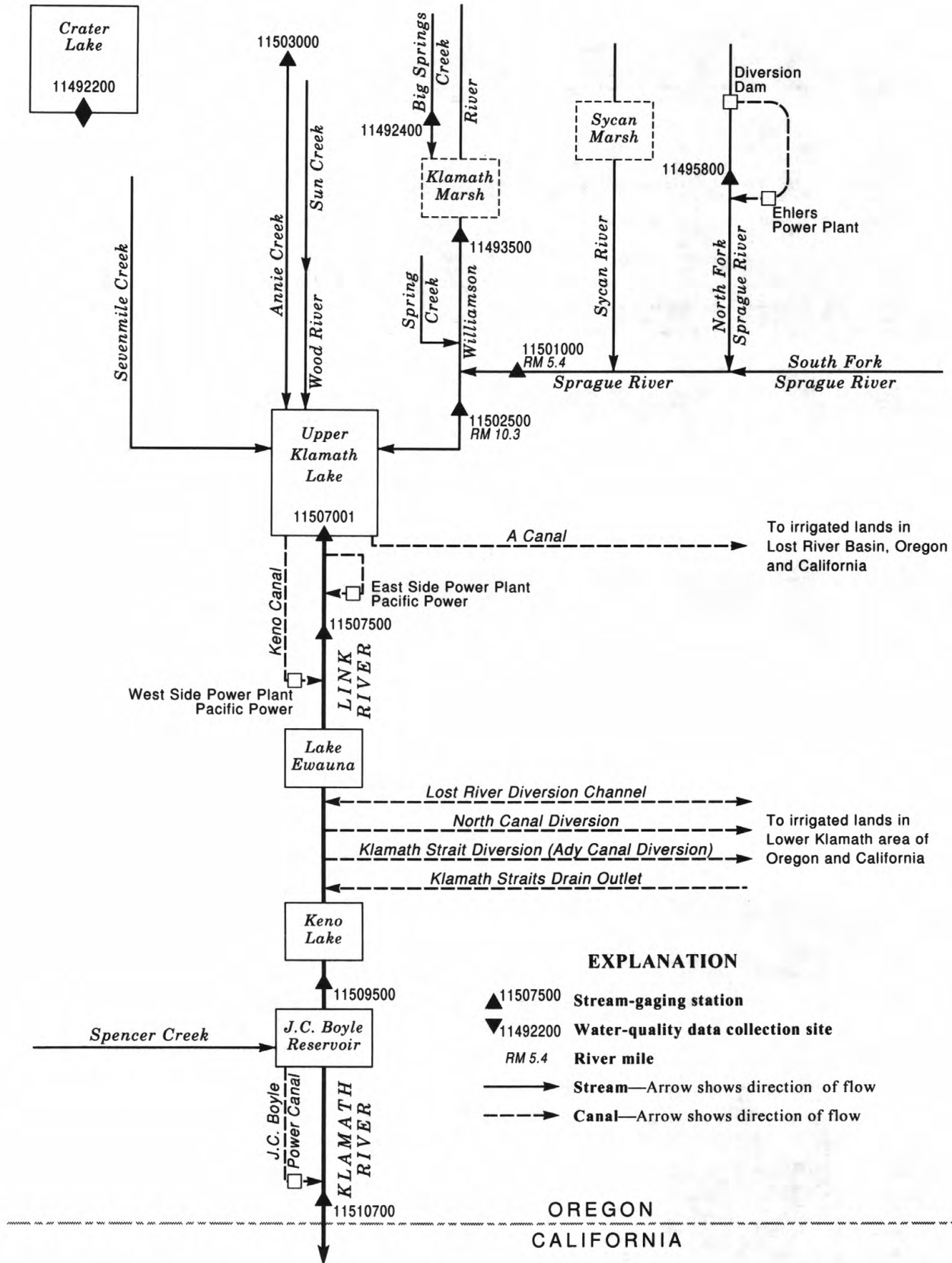
## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1911 - 1994

ANNUAL TOTAL	67392	28279	125
ANNUAL MEAN	185	77.5	273
HIGHEST ANNUAL MEAN			49.1
LOWEST ANNUAL MEAN			2700
HIGHEST DAILY MEAN	2700	Mar 17	May 10
LOWEST DAILY MEAN	18	Feb 26	Jan 31
ANNUAL SEVEN-DAY MINIMUM	29	Feb 24	Sep 22
ANNUAL RUNOFF (AC-FT)	133700	56090	90640
10 PERCENT EXCEEDS	466	165	323
50 PERCENT EXCEEDS	62	46	57
90 PERCENT EXCEEDS	37	29	32



**Figure 6.** Schematic diagram showing gaging stations and major diversions in the Klamath Basin in Oregon.



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

DRAINAGE AREA.--26.2 mi<sup>2</sup>, of which 20.5 mi<sup>2</sup> is lake area at elevation 6,176 ft.

## WATER - ELEVATION RECORDS

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

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

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

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

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

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 6,169.17 ft Oct. 1; minimum, not determined, occurred during period of no record Sept. 19-30.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6169.16	6168.76	6168.49	6168.55	6168.67	6168.73	6168.59	6168.51	6168.42	6168.22	6167.74	6167.07
2	6169.15	6168.75	6168.46	6168.63	6168.66	6168.72	6168.59	6168.50	6168.42	6168.21	6167.73	6167.05
3	6169.14	6168.73	6168.46	6168.62	6168.64	6168.73	6168.58	6168.49	6168.41	6168.19	6167.72	6167.03
4	6169.13	6168.70	6168.48	6168.68	6168.63	6168.73	6168.55	6168.51	6168.40	6168.17	6167.70	6167.01
5	6169.13	6168.68	6168.46	6168.77	6168.62	6168.72	6168.55	6168.52	6168.44	6168.16	6167.67	6167.00
6	6169.12	6168.67	6168.44	6168.74	6168.62	6168.70	6168.62	6168.52	6168.47	6168.15	6167.64	6166.99
7	6169.10	6168.65	6168.54	6168.74	6168.62	6168.69	6168.62	6168.52	6168.46	6168.13	6167.62	6166.96
8	6169.05	6168.64	6168.75	6168.77	6168.60	6168.68	6168.63	6168.52	6168.45	6168.12	6167.58	6166.94
9	6169.04	6168.61	6168.73	6168.80	6168.61	6168.67	6168.66	6168.51	6168.44	6168.10	6167.56	6166.90
10	6169.03	6168.58	6168.67	6168.79	6168.65	6168.66	6168.65	6168.51	6168.44	6168.10	6167.54	6166.87
11	6169.04	6168.57	6168.73	6168.80	6168.63	6168.65	6168.64	6168.51	6168.43	6168.08	6167.52	6166.86
12	6169.02	6168.54	6168.72	6168.79	6168.62	6168.64	6168.63	6168.50	6168.42	6168.06	6167.51	6166.84
13	6169.01	6168.52	6168.70	6168.77	6168.62	6168.63	6168.63	6168.49	6168.43	6168.04	6167.49	6166.82
14	6169.01	6168.48	6168.73	6168.77	6168.59	6168.61	6168.60	6168.48	6168.42	6168.03	6167.46	6166.80
15	6169.06	6168.47	6168.71	6168.75	6168.56	6168.60	6168.59	6168.50	6168.40	6168.02	6167.44	6166.78
16	6169.04	6168.44	6168.70	6168.73	6168.51	6168.62	6168.58	6168.50	6168.39	6168.00	6167.42	6166.77
17	6169.03	6168.43	6168.68	6168.72	6168.62	6168.58	6168.57	6168.48	6168.38	6167.99	6167.40	6166.76
18	6169.01	6168.40	6168.66	6168.72	6168.62	6168.62	6168.57	6168.47	6168.37	6167.97	6167.37	6166.75
19	6169.00	6168.39	6168.65	6168.70	6168.61	6168.60	6168.57	6168.47	6168.35	6167.96	6167.35	--
20	6168.99	6168.37	6168.64	6168.69	6168.64	6168.59	6168.56	6168.46	6168.35	6167.95	6167.33	--
21	6168.97	6168.36	6168.63	6168.70	6168.67	6168.63	6168.55	6168.48	6168.34	6167.93	6167.31	--
22	6168.96	6168.42	6168.62	6168.73	6168.66	6168.65	6168.55	6168.47	6168.33	6167.92	6167.29	--
23	6168.94	6168.39	6168.59	6168.75	6168.69	6168.64	6168.54	6168.47	6168.32	6167.91	6167.27	--
24	6168.92	6168.36	6168.57	6168.80	6168.70	6168.65	6168.53	6168.46	6168.30	6167.88	6167.24	--
25	6168.90	6168.34	6168.57	6168.79	6168.70	6168.64	6168.56	6168.46	6168.29	6167.87	6167.22	--
26	6168.87	6168.33	6168.55	6168.78	6168.72	6168.63	6168.56	6168.46	6168.28	6167.85	6167.20	--
27	6168.86	6168.32	6168.54	6168.76	6168.75	6168.61	6168.54	6168.45	6168.26	6167.83	6167.16	--
28	6168.85	6168.31	6168.52	6168.73	6168.74	6168.60	6168.53	6168.45	6168.25	6167.83	6167.15	--
29	6168.82	6168.38	6168.51	6168.73	--	6168.59	6168.53	6168.43	6168.25	6167.81	6167.13	--
30	6168.82	6168.38	6168.52	6168.70	--	6168.62	6168.52	6168.42	6168.23	6167.79	6167.11	--
31	6168.79	--	6168.52	6168.68	--	6168.60	--	6168.43	--	6167.77	6167.09	--
MAX	6169.16	6168.76	6168.75	6168.80	6168.75	6168.73	6168.66	6168.52	6168.47	6168.22	6167.74	--
MIN	6168.79	6168.31	6168.44	6168.55	6168.51	6168.58	6168.52	6168.42	6168.23	6167.77	6167.09	--
CAL YR 1993    MAX 6170.45    MIN 6168.23												

11492200 CRATER LAKE NEAR CRATER LAKE, OR--Continued

## WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD. - -

WATER TEMPERATURE: October 1963 to current year.

INSTRUMENTATION.--Temperature recorder from October 1963 to current year. Elevation of probe is approximately 6,157 ft above sea level.

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

EXTREMES FOR PERIOD OF DAILY RECORD. - -

WATER TEMPERATURE: Maximum, 18.5°C Aug. 9, 10, 1978, several days in July and August, 1994; minimum recorded, 0.5°C on several days in 1969, but may have been as low or lower during period of missing record Oct. 29, 1985 to July 1, 1986.

EXTREMES FOR CURRENT YEAR. - -

WATER TEMPERATURE: Maximum, 18.5°C several days in July and August; minimum recorded (more than 20 percent missing record), 6.0°C Nov. 26-28.

## WATER-QUALITY DATA

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	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 AD- SORP- TION PERATIO	SODIUM AD- SORP- TION RATIO
OCT 1993												
20...	1330	112	7.6	10.5	0.2	677	27	6.6	2.6	11	45	0.9
JUN 1994												
30...	1130	112	7.9	13.0	0.2	--	27	6.7	2.5	11	45	0.9
SEP												
06...	1600	113	7.9	14.5	0.4	--	27	6.5	2.5	10	43	0.8

DATE	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)	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)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
OCT 1993												
20...	1.4	29	36	0	10	9.0	0.1	17	78	76	0.11	<0.01
JUN 1994												
30...	1.8	29	35	0	9.8	9.2	0.1	17	84	75	0.11	0.02
SEP												
06...	1.6	30	37	0	11	9.8	<0.1	17	77	77	0.10	0.02

DATE	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA+ ORGANIC 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)	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)
OCT 1993											
20...	<0.01	0.2	<0.05	0.02	<0.01	0.01	<10	6	<3	<3	42
JUN 1994											
30...	<0.01	<0.2	<0.05	<0.01	<0.01	<0.01	<10	6	<3	5	44
SEP											
06...	<0.01	<0.2	<0.05	<0.01	<0.01	<0.01	10	6	<3	<3	47

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)	URANIUM NATURAL DIS- SOLVED (UG/L AS U)	URANIUM NATURAL 2 SIGMA WATER, DISS., (UG/L)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	GROSS ALPHA, DIS- SOLVED (UG/L AS U-NAT)	ALPHA, COUNT, 2 SIGMA WAT DIS AS NAT U (UG/L)
OCT 1993											
20...	1	<10	<1	<1	<1	57	0.01	<1	<6	<0.6	0.39
JUN 1994											
30...	<1	<10	<1	<1	<1	54	--	--	<6	--	--
SEP											
06...	<1	<10	<1	<1	<1	58	--	--	<6	--	--

[illegible]



## KLAMATH RIVER BASIN

11492200 CRATER LAKE NEAR CRATER LAKE, OR--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

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



KLAMATH RIVER BASIN

43

11492400 BIG SPRINGS CREEK BELOW LENZ RANCH, NEAR LENZ, OR

LOCATION.--Lat 42°55'26", long 121°44'21", in SE 1/4 SW 1/4 sec.35, T.30 S., R.8 E., Klamath County, Hydrologic Unit 18010201, on right bank 1.8 mi upstream from Klamath Marsh, 2.7 mi southeast of Lenz Ranch, and 4.1 mi east of Lenz.

DRAINAGE AREA.--Indeterminate, normal flow is from Big Springs and other springs or wells in area.

PERIOD OF RECORD.--May 1992 to current year.

GAGE.--Water-stage recorder and parshall flume. Elevation of gage is 4,516 ft above sea level, from topographic map.

REMARKS.--Records fair.

AVERAGE DISCHARGE.--2 years, 4.36 ft<sup>3</sup>/s, 3,160 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 95 ft<sup>3</sup>/s Mar. 20, 1993; minimum discharge, no flow many days most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 33 ft<sup>3</sup>/s Jan. 5, gage height, 2.29 ft; minimum discharge, no flow many days June to September.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.57	1.9	3.2	3.6	4.0	14	4.5	2.9	2.2	.00	.00	.00
2	.91	1.9	3.3	3.8	4.1	15	4.4	2.6	1.8	.00	.00	.00
3	1.2	1.9	2.7	5.0	4.2	8.5	4.2	2.6	1.6	.00	.00	.00
4	1.1	1.9	2.6	14	4.2	6.1	3.8	2.8	1.4	.00	.00	.00
5	.77	1.9	2.4	18	4.2	4.9	3.6	3.2	1.4	.00	.00	.00
6	1.1	1.8	2.4	6.3	4.2	4.5	3.8	3.2	1.2	.00	.00	.00
7	1.4	1.8	2.8	4.9	4.3	4.5	3.8	2.9	1.0	.00	.00	.00
8	1.3	1.8	6.5	4.6	4.2	4.1	3.9	2.8	.76	.00	.00	.00
9	1.5	1.8	6.0	4.2	4.2	4.0	3.8	2.7	.40	.00	.00	.00
10	1.7	1.8	8.7	3.9	4.2	3.8	3.5	2.6	.18	.00	.00	.00
11	1.8	1.8	14	3.7	3.9	3.7	3.4	2.5	.07	.00	.00	.00
12	1.7	1.7	9.3	3.5	4.0	3.6	3.2	2.5	.02	.00	.00	.00
13	1.6	1.6	6.9	3.3	4.0	3.6	2.9	2.5	.01	.00	.00	.00
14	1.8	1.5	5.9	3.3	3.9	3.6	2.8	2.5	.01	.00	.00	.00
15	2.0	1.6	5.0	3.3	3.9	3.8	2.7	2.5	.01	.00	.00	.00
16	2.1	1.6	4.5	3.3	4.0	3.6	2.7	2.7	.01	.00	.00	.00
17	1.9	1.5	4.1	3.3	4.4	3.5	2.5	2.7	.00	.00	.00	.00
18	1.7	1.5	3.9	3.3	4.8	3.5	2.4	2.6	.00	.00	.00	.00
19	1.7	1.5	3.9	3.3	4.5	3.6	2.3	2.7	.00	.00	.00	.00
20	2.0	1.5	3.8	3.3	4.6	3.5	2.3	2.6	.00	.00	.00	.00
21	2.0	1.5	3.8	3.3	4.4	3.5	2.2	2.9	.00	.00	.00	.00
22	1.8	1.5	3.9	3.4	4.3	3.2	2.1	3.5	.00	.00	.00	.00
23	1.8	1.8	4.1	6.9	3.9	3.4	2.2	3.3	.00	.00	.00	.00
24	1.8	1.9	4.1	10	4.1	3.2	2.6	3.0	.00	.00	.00	.00
25	1.8	2.3	4.0	6.1	6.6	3.1	3.0	2.9	.00	.00	.00	.00
26	1.7	2.5	4.0	4.7	11	3.0	3.3	2.7	.00	.00	.00	.00
27	1.8	2.5	4.0	4.2	13	2.9	3.0	2.7	.00	.00	.00	.00
28	1.9	3.1	4.0	4.1	11	3.1	2.8	2.6	.00	.00	.00	.00
29	1.8	3.5	4.0	4.0	---	3.1	2.8	2.6	.00	.00	.00	.00
30	1.8	2.9	3.9	4.0	---	4.0	3.3	2.5	.00	.00	.00	.00
31	1.9	---	3.7	4.0	---	4.8	---	2.4	---	.00	.00	---
TOTAL	49.95	57.8	145.4	156.6	142.1	142.7	93.8	85.2	12.07	0.00	0.00	0.00
MEAN	1.61	1.93	4.69	5.05	5.07	4.60	3.13	2.75	.40	.000	.000	.000
MAX	2.1	3.5	14	18	13	15	4.5	3.5	2.2	.00	.00	.00
MIN	.57	1.5	2.4	3.3	3.9	2.9	2.1	2.4	.00	.00	.00	.00
AC-FT	99	115	288	311	282	283	186	169	24	.00	.00	.00

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1992 - 1994, BY WATER YEAR (WY)

	1992	1993	1994	1993	1994	1993	1994	1993	1994	1993	1994	1993	1994
MEAN	1.38	2.32	2.49	2.53	2.54	17.6	15.7	3.65	2.32	.82	.53	.63	
MAX	1.61	2.72	4.69	5.05	5.07	30.7	28.2	4.55	3.75	1.45	1.47	1.52	
(WY)	1994	1993	1994	1994	1994	1993	1993	1993	1993	1992	1993	1993	
MIN	1.14	1.93	.29	.000	.000	4.60	3.13	2.75	.40	.000	.000	.000	
(WY)	1993	1994	1993	1993	1993	1994	1994	1994	1994	1994	1994	1994	

SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1992 - 1994

ANNUAL TOTAL	2426.90	885.62		
ANNUAL MEAN	6.65	2.43		
HIGHEST ANNUAL MEAN			4.36	
LOWEST ANNUAL MEAN			6.30	1993
HIGHEST DAILY MEAN	95	Mar 20	2.43	1994
LOWEST DAILY MEAN	.00	Jan 1	.00	Mar 20 1993
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 1	.00	Dec 5 1992
ANNUAL RUNOFF (AC-FT)	4810		3160	
10 PERCENT EXCEEDS	11		4.8	
50 PERCENT EXCEEDS	1.8		1.8	
90 PERCENT EXCEEDS	.00		.00	

## KLAMATH RIVER BASIN

11493500 WILLIAMSON RIVER NEAR KLAMATH AGENCY, OR

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

DRAINAGE AREA.--1,290 mi<sup>2</sup>, approximately.

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

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

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

REMARKS.--Records good. Flow affected by natural storage in Klamath Marsh. Small diversions upstream from station for irrigation in vicinity of marsh.

AVERAGE DISCHARGE.--40 years (water years 1955-94), 187 ft<sup>3</sup>/s, 135,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 1,590 ft<sup>3</sup>/s Mar. 13, 1910, gage height, 3.7 ft, site and datum then in use, from rating curve extended above 800 ft<sup>3</sup>/s; maximum gage height, 5.75 ft Mar. 3, 1958; no flow at times most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 102 ft<sup>3</sup>/s Mar. 24, gage height, 3.64 ft; no flow Oct. 1 to Mar. 5, May 28 to Sept. 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	74	23	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	72	22	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	69	21	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	65	21	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.04	59	24	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	2.4	56	26	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	11	56	21	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	24	55	19	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	34	55	17	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	46	56	16	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	56	53	15	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	63	48	13	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	69	46	12	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	75	48	10	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	76	44	7.0	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	77	41	9.2	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	84	40	8.6	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	85	37	8.9	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	93	36	6.9	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	86	33	5.8	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	84	31	5.0	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	88	29	4.5	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	91	29	3.4	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	95	25	2.2	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	94	27	.99	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	91	29	.39	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	86	29	.10	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	81	27	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	.00	77	24	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	.00	74	25	.00	.00	.00	.00	.00
31	.00	.00	.00	.00	.00	74	.00	.00	.00	.00	.00	.00
TOTAL	0.00	0.00	0.00	0.00	0.00	1816.44	1318	322.98	0.00	0.00	0.00	0.00
MEAN	.000	.000	.000	.000	.000	58.6	43.9	10.4	.000	.000	.000	.000
MAX	.00	.00	.00	.00	.00	95	74	26	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	24	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	3600	2610	641	.00	.00	.00	.00

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1955 - 1994, BY WATER YEAR (WY)

	MEAN	43.0	121	222	227	301	440	448	260	123	45.4	15.1	12.1
MAX	255	391	580	730	799	1039	1081	952	531	332	146	95.8	
(WY)	1958	1957	1956	1956	1965	1986	1956	1956	1956	1958	1958	1958	
MIN	.000	.000	.000	.000	.000	58.6	22.3	7.35	.000	.000	.000	.000	
(WY)	1962	1965	1991	1992	1993	1994	1992	1992	1992	1981	1961	1960	

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1955 - 1994
ANNUAL TOTAL	31715.42	3457.42	
ANNUAL MEAN	86.9	9.47	
HIGHEST ANNUAL MEAN			187
LOWEST ANNUAL MEAN			468
HIGHEST DAILY MEAN	774	Apr 4	7.84
LOWEST DAILY MEAN	.00	Jan 1	1250
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 1	.00
ANNUAL RUNOFF (AC-FT)	62910	6860	135800
10 PERCENT EXCEEDS	370	45	487
50 PERCENT EXCEEDS	.00	.00	110
90 PERCENT EXCEEDS	.00	.00	.00

KLAMATH RIVER BASIN

45

11495800 NORTH FORK SPRAGUE RIVER AT POWERPLANT, NEAR BLY, OR

LOCATION.--Lat 42°30'06", long 120°59'13", in SW 1/4 SE 1/4 sec.30, T.35 S., R.15 E., Klamath County, Hydrologic Unit 18010202, at powerplant 0.1 mi upstream from Yaden Creek, and 7.6 mi northeast of Bly.

DRAINAGE AREA.--77.7 mi<sup>2</sup>.

PERIOD OF RECORD.--May 1993 to current year.

GAGE.--Water-stage record. Elevation of gage is 4,750 ft above sea level, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are fair. All records given herein do not include flow diverted through powerplant.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 640 ft<sup>3</sup>/s May 12, 1993, gage height, 7.00 ft; minimum discharge, 12 ft<sup>3</sup>/s Dec. 10, 1993.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 123 ft<sup>3</sup>/s April, 15, May 5, gage height, 5.16 ft; minimum discharge, 12 ft<sup>3</sup>/s Dec. 10.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	33	37	40	38	35	39	42	36	36	39	33	30
2	37	37	40	36	34	40	41	34	31	39	33	31
3	37	38	39	38	34	43	43	35	32	39	33	31
4	37	37	40	40	35	46	37	56	30	38	32	30
5	41	37	38	40	35	46	38	85	30	38	32	30
6	44	37	38	39	35	45	33	101	34	38	32	30
7	40	38	39	37	36	46	28	96	32	38	32	30
8	39	37	40	37	35	43	28	94	31	37	32	29
9	39	39	36	32	35	29	27	75	31	37	32	30
10	40	40	37	21	36	31	26	45	30	37	32	30
11	42	40	37	16	35	30	29	40	30	36	32	32
12	40	39	41	19	36	30	45	60	31	36	32	32
13	39	37	40	22	35	33	50	33	31	35	32	30
14	40	e34	39	24	35	33	54	30	31	35	31	30
15	51	e33	39	31	35	35	69	43	33	35	31	30
16	53	e32	39	36	36	36	78	48	40	35	31	30
17	45	e34	37	36	36	35	89	37	41	35	31	29
18	42	39	36	36	35	35	83	40	40	36	31	30
19	40	35	37	36	35	33	87	31	39	35	31	30
20	40	e35	38	36	36	33	83	53	38	34	31	29
21	39	36	39	36	36	34	76	31	37	34	31	29
22	39	e32	37	37	35	33	69	31	44	34	31	29
23	39	e20	37	38	35	32	62	20	43	36	31	29
24	38	32	38	38	36	33	62	21	42	35	31	29
25	38	35	38	36	36	33	59	22	42	34	31	29
26	38	e36	38	36	37	33	55	24	42	34	30	29
27	38	e38	38	36	38	35	55	21	42	33	30	29
28	38	e39	36	36	38	39	44	25	41	33	30	31
29	38	42	37	36	---	44	40	30	40	33	31	33
30	38	41	38	36	---	52	45	31	40	33	31	32
31	38	---	38	35	---	50	---	32	---	33	30	---
TOTAL	1240	1086	1184	1050	995	1159	1577	1360	1084	1104	973	902
MEAN	40.0	36.2	38.2	33.9	35.5	37.4	52.6	43.9	36.1	35.6	31.4	30.1
MAX	53	42	41	40	38	52	89	101	44	39	33	33
MIN	33	20	36	16	34	29	26	20	30	33	30	29
AC-FT	2460	2150	2350	2080	1970	2300	3130	2700	2150	2190	1930	1790

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1994 - 1994, BY WATER YEAR (WY)

	40.0	36.2	38.2	33.9	35.5	37.4	52.6	43.9	36.1	35.6	31.4	30.1
MEAN	40.0	36.2	38.2	33.9	35.5	37.4	52.6	43.9	36.1	35.6	31.4	30.1
MAX	40.0	36.2	38.2	33.9	35.5	37.4	52.6	43.9	36.1	35.6	31.4	30.1
(WY)	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994
MIN	40.0	36.2	38.2	33.9	35.5	37.4	52.6	43.9	36.1	35.6	31.4	30.1
(WY)	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994

SUMMARY STATISTICS

FOR 1994 WATER YEAR

ANNUAL TOTAL	13714
ANNUAL MEAN	37.6
HIGHEST DAILY MEAN	101
LOWEST DAILY MEAN	16
ANNUAL SEVEN-DAY MINIMUM	23
ANNUAL RUNOFF (AC-FT)	27200
10 PERCENT EXCEEDS	44
50 PERCENT EXCEEDS	36
90 PERCENT EXCEEDS	30

e Estimated

## KLAMATH RIVER BASIN

11501000 SPRAGUE RIVER NEAR CHILOQUIN, OR

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

DRAINAGE AREA.--1,580 mi<sup>2</sup>, approximately.

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

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

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

REMARKS.--Records good except for estimated daily discharges, which are fair. Minor regulation from irrigation diversions upstream from station.

AVERAGE DISCHARGE.--73 years (water years 1922-94), 571 ft<sup>3</sup>/s, 413,500 acre-ft/yr.

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 583 ft<sup>3</sup>/s Mar. 4, gage height, 2.18 ft; minimum discharge, 55 ft<sup>3</sup>/s July 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	210	300	349	306	288	439	363	352	211	95	89	89
2	216	296	336	308	282	475	381	334	250	88	88	77
3	228	294	331	314	277	530	364	348	259	83	85	81
4	238	292	314	322	285	577	364	352	238	79	83	95
5	259	287	308	327	291	557	380	363	217	78	73	88
6	274	291	315	330	289	561	395	379	220	90	81	89
7	279	294	311	324	283	536	385	363	223	104	89	93
8	283	294	341	316	288	480	380	363	233	108	92	98
9	306	293	392	309	288	443	380	333	245	103	91	106
10	308	290	448	313	295	427	369	303	234	96	101	106
11	294	290	436	313	296	412	370	294	233	96	116	122
12	284	297	387	309	298	402	362	285	213	91	104	128
13	285	299	369	310	291	388	357	290	206	87	96	149
14	298	297	359	308	276	378	360	286	201	80	104	167
15	311	292	346	304	295	372	368	280	178	82	107	158
16	311	282	346	303	303	370	367	262	178	80	95	151
17	316	283	336	304	309	366	369	272	174	90	83	153
18	336	285	320	298	316	374	370	336	183	85	67	161
19	342	294	e270	293	325	370	381	346	184	63	60	152
20	322	301	e265	296	317	363	364	342	178	66	58	143
21	307	284	e260	296	305	348	374	357	177	68	67	145
22	301	e300	e255	299	301	334	345	391	152	62	73	135
23	298	e295	e260	315	306	340	341	394	134	61	70	123
24	298	e215	e275	326	306	334	356	353	122	63	81	127
25	307	e190	e280	327	309	326	361	306	106	108	89	138
26	304	e255	e290	321	322	324	366	248	107	106	92	140
27	303	e290	e285	312	335	320	385	227	110	98	100	137
28	302	e315	e275	301	373	316	373	239	113	87	103	138
29	298	e325	e285	292	--	319	360	223	100	80	95	143
30	298	327	e270	296	--	331	369	208	97	79	88	165
31	301	--	297	296	--	343	--	198	--	81	93	--
TOTAL	9017	8647	9911	9588	8449	12455	11059	9627	5476	2637	2713	3797
MEAN	291	288	320	309	302	402	369	311	183	85.1	87.5	127
MAX	342	327	448	330	373	577	395	394	259	108	116	167
MIN	210	190	255	292	276	316	341	198	97	61	58	77
AC-FT	17890	17150	19660	19020	16760	24700	21940	19100	10860	5230	5380	7530

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1921 - 1994, BY WATER YEAR (WY)

	MEAN	295	344	467	501	652	917	1255	1119	601	277	219	236
MAX	848	789	2853	1961	2764	2904	4250	3211	1762	560	405	374	
(WY)	1963	1974	1965	1965	1982	1972	1956	1956	1983	1983	1956	1956	
MIN	183	219	215	196	223	286	263	119	93.8	85.1	76.9	125	
(WY)	1934	1933	1933	1937	1933	1992	1977	1992	1992	1994	1992	1992	

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1921 - 1994
ANNUAL TOTAL	292566	93376	
ANNUAL MEAN	802	256	571
HIGHEST ANNUAL MEAN			1395
LOWEST ANNUAL MEAN			199
HIGHEST DAILY MEAN	5470	Mar 22	14500
LOWEST DAILY MEAN	141	Aug 10	50
ANNUAL SEVEN-DAY MINIMUM	158	Aug 7	65
ANNUAL RUNOFF (AC-FT)	580300	185200	413500
10 PERCENT EXCEEDS	1970	370	1270
50 PERCENT EXCEEDS	320	293	343
90 PERCENT EXCEEDS	200	89	200

e Estimated



KLAMATH RIVER BASIN

47

11502500 WILLIAMSON RIVER BELOW SPRAGUE RIVER, NEAR CHILOQUIN, OR

LOCATION.--Lat 42°33'54", long 121°52'42", in NE 1/4 SE 1/4 sec.4, T.35 S., R.7 E., Klamath County, Hydrologic Unit 18010202, on right bank 0.8 mi downstream from Sprague River and 1.2 mi southwest of Chiloquin, and at mile 10.3.

DRAINAGE AREA.--3,000 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--June 1917 to current year. Monthly discharge only for October 1922 to August 1923 published in WSP 1315-B.

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

GAGE.--Water-stage recorder. Datum of gage is 4,148.50 ft above sea level. September 1, 1923 to July 12, 1991 at site 0.6 mi upstream at datum 7.05 ft higher. Prior to Sept. 1, 1923, at different datum.

REMARKS.--Records excellent except for estimated daily discharges, which are good. Some regulation by diversion dams and logpond operations on Sprague River. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--76 years (water years 1918-22, 1924-94), 1,036 ft<sup>3</sup>/s, 750,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,100 ft<sup>3</sup>/s Dec. 26, 1964, gage height, 10.56 ft, at site and datum then in use; minimum discharge, 285 ft<sup>3</sup>/s Aug. 6, 8, 9, 1994.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 868 ft<sup>3</sup>/s Mar. 4, gage height, 4.08 ft; minimum discharge, 285 ft<sup>3</sup>/s Aug. 6, 8, 9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	514	590	646	605	579	704	760	618	404	334	298	330
2	516	587	632	606	576	741	774	596	438	329	301	318
3	524	587	618	602	569	797	762	604	455	321	298	317
4	534	586	608	613	575	852	754	612	441	321	300	326
5	549	583	599	619	580	847	762	623	426	319	300	325
6	567	585	604	615	581	846	774	634	430	313	288	321
7	570	587	608	613	577	835	765	622	427	323	293	331
8	571	586	655	608	578	805	760	609	432	332	292	329
9	587	585	673	601	578	790	763	587	441	330	289	337
10	595	584	733	601	587	784	741	551	433	322	293	341
11	587	583	733	601	582	782	748	537	432	321	312	356
12	576	587	676	598	583	782	728	551	423	315	308	373
13	575	588	653	600	582	779	709	530	416	309	301	391
14	585	587	646	598	572	779	704	518	414	302	305	421
15	608	583	627	598	582	779	709	513	395	302	312	422
16	604	580	e610	594	592	778	706	497	387	304	306	419
17	602	578	e600	592	599	772	706	493	384	303	300	425
18	614	578	e590	590	601	782	702	539	394	312	296	435
19	620	585	e560	586	605	781	702	549	399	302	291	429
20	612	588	e550	587	602	779	668	541	394	303	290	412
21	598	574	e540	588	594	765	661	554	392	306	293	411
22	592	e570	e540	593	587	756	622	579	368	301	296	406
23	588	e570	e560	605	591	762	608	587	353	300	300	388
24	588	e500	e570	615	594	764	617	554	340	297	302	390
25	594	e470	e580	612	594	755	633	522	343	311	310	397
26	594	e550	e590	607	606	748	641	470	334	321	313	406
27	592	594	590	600	616	737	655	441	342	313	323	406
28	592	614	592	590	639	724	646	448	345	305	335	413
29	590	624	595	584	--	720	630	435	335	296	329	429
30	589	619	597	585	--	734	629	419	333	294	327	442
31	592	--	593	586	--	738	--	409	--	294	331	--
TOTAL	18019	17382	18968	18592	16501	23997	21039	16742	11850	9655	9432	11446
MEAN	581	579	612	600	589	774	701	540	395	311	304	382
MAX	620	624	733	619	639	852	774	634	455	334	335	442
MIN	514	470	540	584	569	704	608	409	333	294	288	317
AC-FT	35740	34480	37620	36880	32730	47600	41730	33210	23500	19150	18710	22700

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1918 - 1994, BY WATER YEAR (WY)

	656	763	945	974	1203	1593	1970	1639	997	610	541	565
MEAN	656	763	945	974	1203	1593	1970	1639	997	610	541	565
MAX	1237	1345	3682	3075	3846	4256	5488	4376	2658	1278	934	871
(WY)	1963	1974	1965	1958	1958	1972	1956	1953	1958	1958	1958	1958
MIN	488	556	545	524	547	619	583	391	338	311	304	382
(WY)	1993	1993	1993	1937	1933	1992	1992	1992	1992	1994	1994	1994

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1918 - 1994
ANNUAL TOTAL	415931	193623	
ANNUAL MEAN	1140	530	1036
HIGHEST ANNUAL MEAN			2187
LOWEST ANNUAL MEAN			483
HIGHEST DAILY MEAN	5870	852	16000
LOWEST DAILY MEAN	418	288	288
ANNUAL SEVEN-DAY MINIMUM	436	294	294
ANNUAL RUNOFF (AC-FT)	825000	384100	750700
10 PERCENT EXCEEDS	2540	739	1940
50 PERCENT EXCEEDS	592	583	743
90 PERCENT EXCEEDS	486	309	508

e Estimated

## KLAMATH RIVER BASIN

11503000 ANNIE SPRING NEAR CRATER LAKE, OR

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

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

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

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

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

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

AVERAGE DISCHARGE.--17 years, 2.76 ft<sup>3</sup>/s, 2,000 acre-ft/yr, adjusted for diversion.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18 ft<sup>3</sup>/s July 6, 1984, gage height, 1.56 ft; minimum daily discharge, 0.28 ft<sup>3</sup>/s Mar. 2-5, 1993.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4.3 ft<sup>3</sup>/s June 7, gage height, 1.13 ft; minimum daily discharge, 0.92 ft<sup>3</sup>/s Apr. 15.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.6	2.1	1.7	1.3	1.6	1.2	.93	1.4	4.0	2.4	1.5	1.5
2	2.6	2.0	1.7	1.3	1.5	1.2	.93	1.4	4.0	2.3	1.4	1.5
3	2.6	2.0	1.7	1.3	1.4	1.2	.93	1.4	4.1	2.3	1.4	1.5
4	2.5	2.0	1.7	1.3	1.4	1.2	.93	1.4	4.1	2.3	1.3	1.5
5	2.5	2.0	1.6	1.3	1.4	1.1	.93	1.4	4.0	2.3	1.3	1.5
6	2.5	2.0	1.6	1.3	1.4	1.1	.96	1.4	4.0	2.3	1.3	1.5
7	2.6	1.9	1.5	1.3	1.4	1.1	.97	1.6	4.2	2.2	1.4	1.5
8	2.5	1.9	1.5	1.3	1.3	1.1	.97	1.8	4.2	2.2	1.5	1.5
9	2.5	1.9	1.5	1.3	1.3	1.1	.96	2.1	4.1	2.2	1.5	1.5
10	2.4	2.0	1.6	1.4	1.3	1.1	.98	2.7	4.0	2.1	1.4	1.5
11	2.4	1.9	1.5	1.4	1.3	1.1	.97	3.0	4.0	2.1	1.4	1.5
12	2.5	1.9	1.5	1.4	1.3	1.1	.97	3.5	3.9	2.0	1.4	1.4
13	2.5	1.9	1.5	1.4	1.3	1.1	.93	3.7	3.8	1.9	1.3	1.5
14	2.5	1.9	1.5	1.4	1.3	1.0	.93	3.9	3.8	1.9	1.2	1.5
15	2.5	1.9	1.5	1.4	1.3	1.0	.92	3.9	3.8	1.8	1.2	1.4
16	2.5	1.9	1.5	1.4	1.3	1.0	.93	3.9	3.8	1.8	1.2	1.4
17	2.5	1.8	1.4	1.4	1.3	1.0	.95	4.0	3.7	1.8	1.3	1.5
18	2.5	1.8	1.3	1.4	1.3	1.0	.98	4.0	3.7	1.8	1.5	1.4
19	2.4	1.7	1.4	1.4	1.3	.98	1.0	3.9	3.6	1.7	1.6	1.4
20	2.4	1.8	1.4	1.4	1.3	.97	1.1	3.9	3.6	1.7	1.6	1.4
21	2.4	1.8	1.3	1.5	1.2	.97	1.1	3.8	3.5	1.7	1.6	1.4
22	2.4	1.8	1.3	1.5	1.2	.97	1.3	3.8	3.4	1.7	1.7	1.4
23	2.4	1.7	1.4	1.5	1.2	.97	1.4	3.7	3.3	1.7	1.6	1.4
24	2.4	1.7	1.4	1.5	1.2	.97	1.5	3.7	3.2	1.7	1.6	1.4
25	2.3	1.7	1.3	1.5	1.2	.97	1.6	3.7	3.0	1.6	1.6	1.3
26	2.2	1.7	1.3	1.5	1.2	.97	1.6	3.7	2.8	1.6	1.6	1.3
27	2.2	1.7	1.3	1.5	1.2	.97	1.6	3.9	2.6	1.6	1.6	1.4
28	2.1	1.7	1.3	1.5	1.2	.97	1.6	3.9	2.6	1.6	1.5	1.4
29	2.1	1.7	1.3	1.5	---	.97	1.5	4.0	2.5	1.6	1.5	1.3
30	2.1	1.7	1.3	1.5	---	.97	1.5	4.0	2.4	1.5	1.5	1.3
31	2.0	---	1.3	1.6	---	.95	---	4.0	---	1.5	1.5	---
TOTAL	74.6	55.5	45.1	43.7	36.6	32.30	33.87	96.5	107.7	58.9	45.0	43.0
MEAN	2.41	1.85	1.45	1.41	1.31	1.04	1.13	3.11	3.59	1.90	1.45	1.43
MAX	2.6	2.1	1.7	1.6	1.6	1.2	1.6	4.0	4.2	2.4	1.7	1.5
MIN	2.0	1.7	1.3	1.3	1.2	.95	.92	1.4	2.4	1.5	1.2	1.3
AC-FT	148	110	89	87	73	64	67	191	214	117	89	85
MEAN†	2.45	1.87	1.47	1.42	1.32	1.06	1.15	3.14	3.65	1.99	1.56	1.51
AC-FT†	150.67	111.46	90.38	87.54	73.28	65.41	68.42	192.93	217.01	122.29	95.66	90.12

CAL YR 1993 TOTAL 1187.64 MEAN 3.25 MAX 11 MIN .28 AC-FT 2360 MEAN† 3.30 AC-FT† 2388.47  
WTR YR 1994 TOTAL 672.77 MEAN 1.84 MAX 4.2 MIN .92 AC-FT 1330 MEAN† 1.89 AC-FT† 1365.16

† Adjusted for diversion by pumping.

KLAMATH RIVER BASIN

49

11507001 UPPER KLAMATH LAKE NEAR KLAMATH FALLS, OR

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

DRAINAGE AREA.--3,810 mi<sup>2</sup>, approximately, including 26.2 mi<sup>2</sup> in closed basin of Crater Lake.

PERIOD OF RECORD.--May 1904 to September 1922 (gage heights only), October 1922 to current year. Monthend contents only October 1923 to September 1927, published in WSP 1315-B.

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

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

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

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

EXTREMES FOR CURRENT YEAR.--Maximum daily elevation, 4,142.29 ft Apr. 12-15; minimum daily, 4,136.83 ft Sept. 28.

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

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

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4139.48	4139.62	4139.67	4139.95	4140.63	4141.37	4142.19	4142.12	4141.95	4140.79	4139.01	4137.49
2	4139.48	4139.58	4139.69	4139.97	4140.66	4141.40	4142.21	4142.11	4141.95	4140.73	4138.98	4137.43
3	4139.47	4139.60	4139.72	4139.98	4140.69	4141.44	4142.22	4142.09	4141.90	4140.67	4138.92	4137.38
4	4139.44	4139.57	4139.73	4140.01	4140.74	4141.49	4142.22	4142.11	4141.85	4140.63	4138.88	4137.33
5	4139.43	4139.59	4139.73	4140.02	4140.77	4141.58	4142.20	4142.15	4141.84	4140.56	4138.84	4137.30
6	4139.43	4139.58	4139.71	4140.06	4140.82	4141.60	4142.21	4142.18	4141.85	4140.48	4138.79	4137.26
7	4139.43	4139.58	4139.69	4140.07	4140.86	4141.60	4142.21	4142.16	4141.82	4140.47	4138.76	4137.21
8	4139.41	4139.58	4139.79	4140.08	4140.88	4141.63	4142.20	4142.16	4141.78	4140.41	4138.70	4137.17
9	4139.40	4139.56	4139.82	4140.10	4140.88	4141.66	4142.26	4142.18	4141.78	4140.33	4138.55	4137.15
10	4139.39	4139.61	4139.76	4140.11	4140.92	4141.69	4142.27	4142.18	4141.79	4140.26	4138.50	4137.10
11	4139.42	4139.66	4139.86	4140.12	4140.90	4141.72	4142.27	4142.19	4141.75	4140.20	4138.47	4137.07
12	4139.42	4139.63	4139.90	4140.13	4140.91	4141.73	4142.29	4142.18	4141.65	4140.13	4138.41	4137.07
13	4139.43	4139.62	4139.89	4140.13	4140.90	4141.76	4142.29	4142.17	4141.62	4140.06	4138.36	4137.03
14	4139.44	4139.58	4139.94	4140.14	4140.95	4141.78	4142.29	4142.15	4141.60	4140.01	4138.33	4136.98
15	4139.47	4139.56	4139.95	4140.15	4140.96	4141.80	4142.29	4142.10	4141.60	4139.92	4138.30	4136.97
16	4139.50	4139.57	4139.96	4140.17	4140.83	4141.84	4142.26	4142.12	4141.52	4139.85	4138.26	4136.97
17	4139.51	4139.60	4139.96	4140.18	4140.96	4141.86	4142.27	4142.12	4141.49	4139.78	4138.23	4136.96
18	4139.52	4139.64	4139.96	4140.21	4141.04	4141.90	4142.26	4142.13	4141.43	4139.71	4138.15	4136.96
19	4139.53	4139.64	4139.95	4140.24	4141.04	4141.94	4142.26	4142.13	4141.39	4139.66	4138.09	4136.95
20	4139.53	4139.64	4139.94	4140.27	4141.08	4141.91	4142.24	4142.11	4141.35	4139.62	4138.03	4136.96
21	4139.54	4139.63	4139.94	4140.29	4141.13	4141.98	4142.24	4142.14	4141.31	4139.58	4137.99	4136.96
22	4139.56	4139.62	4139.94	4140.30	4141.14	4141.98	4142.21	4142.16	4141.22	4139.52	4137.91	4136.93
23	4139.57	4139.60	4139.94	4140.29	4141.16	4141.94	4142.17	4142.16	4141.21	4139.47	4137.87	4136.90
24	4139.58	4139.57	4139.93	4140.33	4141.20	4142.03	4142.15	4142.17	4141.16	4139.42	4137.83	4136.87
25	4139.60	4139.55	4139.93	4140.40	4141.24	4142.08	4142.12	4142.17	4141.12	4139.38	4137.78	4136.86
26	4139.62	4139.56	4139.92	4140.44	4141.26	4142.08	4142.17	4142.17	4141.06	4139.31	4137.72	4136.86
27	4139.57	4139.57	4139.92	4140.50	4141.31	4142.08	4142.17	4142.12	4140.99	4139.26	4137.67	4136.85
28	4139.58	4139.56	4139.92	4140.52	4141.34	4142.10	4142.13	4142.08	4140.93	4139.21	4137.66	4136.83
29	4139.60	4139.62	4139.92	4140.53	---	4142.12	4142.13	4142.06	4140.88	4139.16	4137.62	4136.85
30	4139.58	4139.64	4139.93	4140.57	---	4142.16	4142.13	4142.06	4140.86	4139.10	4137.60	4136.84
31	4139.60	---	4139.93	4140.60	---	4142.16	---	4141.99	---	4139.06	4137.56	---
MEAN	4139.50	4139.60	4139.87	4140.22	4140.97	4141.82	4142.22	4142.13	4141.49	4139.89	4138.25	4137.05
MAX	4139.62	4139.66	4139.96	4140.60	4141.34	4142.16	4142.29	4142.19	4141.95	4140.79	4139.01	4137.49
MIN	4139.39	4139.55	4139.67	4139.95	4140.63	4141.37	4142.12	4141.99	4140.86	4139.06	4137.56	4136.83
(†)	237500	235400	258400	306500	363100	429300	426800	411900	320500	196500	96000	50900
(‡)	+11800	-2100	+23000	+48100	+56600	+66200	-2500	-14900	-91400	-124000	-100500	-45100
CAL YR 1993	MEAN 4141.04	MAX 4143.38	MIN 4139.30	AC-FT†	+45000							
WTR YR 1994	MEAN 4140.25	MAX 4142.29	MIN 4136.83	AC-FT‡	-174800							

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

‡ Change in contents, in acre-feet.

## KLAMATH RIVER BASIN

## 11507500 LINK RIVER AT KLAMATH FALLS, OR

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

DRAINAGE AREA.--3,810 mi<sup>2</sup>, approximately, including 26.2 mi<sup>2</sup> in closed basin of Crater Lake.

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

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

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

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

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

EXTREMES FOR CURRENT YEAR.-- Maximum discharge, 1,340 ft<sup>3</sup>/s June 16; minimum, 122 ft<sup>3</sup>/s Oct. 5, Aug. 24, result of regulation from Upper Klamath Lake, minimum daily, 186 ft<sup>3</sup>/s Mar. 10.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	900	779	677	667	202	204	666	356	872	1050	532	1110
2	701	775	625	677	202	205	732	358	577	1110	834	1180
3	696	771	698	844	202	199	777	358	543	1080	819	1080
4	679	765	803	931	202	196	776	363	509	970	587	1070
5	728	766	842	713	202	197	776	375	509	868	580	1030
6	763	810	876	814	202	194	949	289	730	819	705	941
7	766	868	888	825	202	191	927	203	1020	926	816	957
8	748	860	834	945	202	192	872	200	1030	1090	826	959
9	720	856	759	944	294	207	738	198	1040	1090	863	956
10	719	855	792	942	316	186	736	197	1040	1090	890	945
11	721	855	884	943	315	193	656	207	873	1090	929	957
12	524	857	996	922	279	193	614	200	913	1070	926	969
13	402	843	1020	731	215	193	774	238	1120	1050	916	842
14	787	841	1020	697	200	194	988	368	850	1050	816	689
15	734	826	1020	719	199	194	992	309	1140	1040	801	691
16	737	717	1020	692	194	196	901	222	1170	934	910	690
17	737	527	975	479	195	196	1040	192	1100	792	1040	690
18	735	452	841	365	198	197	1020	191	863	815	1030	690
19	702	582	817	412	197	246	948	190	980	699	1030	662
20	681	745	904	463	199	334	868	189	1070	678	1000	643
21	682	802	1020	467	196	387	630	190	1120	855	916	676
22	683	790	1020	456	191	388	694	189	1120	864	863	869
23	685	915	1020	426	190	382	892	189	1120	862	818	866
24	684	978	1010	429	194	386	873	300	1060	833	937	861
25	875	976	1020	297	202	393	563	638	1050	844	944	812
26	940	942	1010	210	202	372	527	603	1120	892	1090	776
27	935	893	963	204	202	335	486	723	1080	886	1200	778
28	935	788	888	202	202	303	386	866	876	934	1200	824
29	875	677	933	202	--	412	352	933	819	722	1130	752
30	831	674	932	202	--	601	353	887	946	582	1020	622
31	803	--	872	202	--	614	--	995	--	507	1060	--
TOTAL	23108	23785	27979	18022	5996	8680	22506	11716	28260	28092	28028	25587
MEAN	745	793	903	581	214	280	750	378	942	906	904	853
MAX	940	978	1020	945	316	614	1040	995	1170	1110	1200	1180
MIN	402	452	625	202	190	186	352	189	509	507	532	622
AC-FT	45830	47180	55500	35750	11890	17220	44640	23240	56050	55720	55590	50750

CAL YR 1993 TOTAL 509955 MEAN 1397 MAX 6730 MIN 112 AC-FT 1011000  
WTR YR 1994 TOTAL 251759 MEAN 690 MAX 1200 MIN 186 AC-FT 499400



## 51

LOCATION.--Lat 42°08'00", long 121°57'40", in NW 1/4 SE 1/4 sec.35, T.39 S., R.7 E., Klamath County, Hydrologic Unit 18010206, on left bank 1.7 mi northwest of Keno and 4.5 mi upstream from Spencer Creek, and at mile 231.9.

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

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

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

AVERAGE DISCHARGE.--74 years, 1,631 ft<sup>3</sup>/s, 1,181,000 acre-ft/yr.

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

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,270 ft<sup>3</sup>/s Oct. 4, gage height, 5.72 ft; minimum discharge, 196 ft<sup>3</sup>/s Mar. 28; minimum daily, 242 ft<sup>3</sup>/s Mar. 29.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1150	1150	1060	989	417	376	251	269	397	291	335	669
2	1140	1150	1060	985	417	370	253	266	250	292	328	663
3	1120	1160	1050	1050	410	324	253	263	252	297	333	579
4	1140	1160	1050	1130	409	287	253	260	254	292	331	506
5	1140	1150	1050	1130	408	283	252	262	347	299	330	517
6	1100	1150	1050	1130	378	280	252	263	601	325	328	542
7	1100	1150	1060	1130	354	293	255	283	606	335	329	584
8	1110	1150	1060	1130	289	343	257	379	607	335	330	586
9	1110	1160	1060	1130	265	443	255	661	606	342	332	580
10	1130	1160	1070	1130	268	501	252	814	604	345	333	543
11	1160	1160	1070	1130	270	481	254	802	604	350	334	527
12	889	1120	1070	1140	272	431	251	658	602	350	328	593
13	726	1060	1050	1080	332	315	250	326	410	328	329	674
14	1160	1060	1000	1030	389	262	367	264	256	312	332	670
15	1160	1020	1010	1030	389	255	524	263	256	312	327	669
16	1160	935	961	1030	388	259	521	266	358	321	305	667
17	1160	934	883	727	387	265	522	267	610	321	262	667
18	1160	929	882	588	387	292	528	266	608	320	263	668
19	1140	927	879	586	544	261	531	266	607	318	266	694
20	1130	926	924	587	576	254	529	287	611	312	272	679
21	1130	929	984	589	571	255	357	323	596	309	271	674
22	1120	1000	981	590	565	256	254	351	570	320	286	675
23	1120	1190	981	589	519	257	254	527	453	322	328	679
24	1130	1130	982	590	429	256	257	567	450	322	331	685
25	1150	1060	983	507	353	254	262	530	456	324	327	682
26	1150	1060	985	329	387	251	264	532	471	326	371	673
27	1150	1060	987	310	382	248	267	530	440	321	477	662
28	1160	1060	986	355	380	243	269	533	305	321	473	664
29	1160	1060	984	416	---	242	269	537	298	320	518	672
30	1160	1060	986	423	---	243	270	538	292	333	624	609
31	1160	---	987	421	---	246	---	536	---	338	638	---
TOTAL	34675	32220	31125	24981	11135	9326	9533	12889	13777	9953	10971	18952
MEAN	1119	1074	1004	806	398	301	318	416	459	321	354	632
MAX	1160	1190	1070	1140	576	501	531	814	611	350	638	694
MIN	726	926	879	310	265	242	250	260	250	291	262	506
AC-FT	68780	63910	61740	49550	22090	18500	18910	25570	27330	19740	21760	37590

MEAN	1426	1680	1919	1951	2096	2518	2274	1704	1163	859	964	1192
MAX	3055	4673	5732	7702	7564	8197	6594	5258	7075	4177	2513	2214
(WY)	1957	1985	1984	1965	1956	1972	1956	1956	1904	1904	1904	1943
MIN	564	290	391	542	254	215	166	109	97.6	114	146	246
(WY)	1982	1935	1935	1935	1992	1992	1931	1931	1931	1931	1992	1992

ANNUAL TOTAL	572555		219537						
ANNUAL MEAN	1569		601			1631			
HIGHEST ANNUAL MEAN						3582			1956
LOWEST ANNUAL MEAN						340			1992
HIGHEST DAILY MEAN	8580	Mar 25	1190	Nov 23		9780	Mar 5	1972	
LOWEST DAILY MEAN	243	Jul 9	242	Mar 29		60	May 19	1934	
ANNUAL SEVEN-DAY MINIMUM	258	Feb 9	246	Mar 26		78	Jun 4	1931	
ANNUAL RUNOFF (AC-FT)	1136000		435500			1181000			
10 PERCENT EXCEEDS	4980		1130			3150			
50 PERCENT EXCEEDS	1010		519			1270			
90 PERCENT EXCEEDS	451		261			407			

## KLAMATH RIVER BASIN

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

LOCATION.--Lat 42°05'05", long 122°04'20", in SE 1/4 SE 1/4 sec.14, T.40 S., R.6 E., Klamath County, Hydrologic Unit 18010206, on right bank 0.7 mi downstream from John C. Boyle powerplant, 8 mi downstream from Spencer Creek, and 8.5 mi southwest of Keno, and at mile 219.7.

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

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

REVISED RECORDS.--WDR OR-87-1: 1967.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 3,274.82 ft above sea level (levels by Pacific Power & Light Co.).

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

AVERAGE DISCHARGE.--35 years, 1,773 ft<sup>3</sup>/s, 1,285,000 acre-ft/yr.

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,890 ft<sup>3</sup>/s Oct. 20, gage height, 5.76 ft; minimum discharge, 301 ft<sup>3</sup>/s Jan. 16, Apr. 28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1440	1320	1430	1240	1000	678	583	504	563	497	605	747
2	1410	1420	1350	1350	320	583	359	454	531	490	480	814
3	1400	1440	1330	1280	958	582	658	457	518	512	533	712
4	1420	1500	1230	1500	320	630	316	469	536	499	493	770
5	1390	1380	1230	1340	904	586	536	500	547	493	479	768
6	1380	1380	1370	1380	320	317	559	546	835	526	526	717
7	1400	1470	1460	1480	534	719	549	536	849	496	486	721
8	1310	1340	1450	1320	533	317	577	747	763	497	473	806
9	1400	1440	1250	1340	531	902	340	882	762	508	584	753
10	1400	1410	1310	1440	512	316	616	964	791	490	564	720
11	1360	1470	1330	1400	510	781	319	924	807	510	504	714
12	990	1380	1340	1320	518	783	607	826	626	510	542	901
13	1240	1230	1320	1350	319	829	539	566	574	560	563	803
14	1410	1250	1340	1430	688	601	531	479	459	594	520	861
15	1490	1330	1230	1210	590	318	710	475	495	584	520	901
16	1320	1220	1200	1110	588	587	702	480	670	539	480	896
17	1520	1340	1130	874	645	316	723	533	792	542	561	905
18	1470	1210	1110	863	643	785	710	512	797	542	512	856
19	1420	1150	1020	809	722	317	873	493	787	499	486	810
20	1390	1130	1220	815	639	689	652	490	799	544	464	842
21	1180	1130	1280	834	915	317	764	493	801	516	488	858
22	1520	1140	1320	777	777	635	321	486	748	485	315	844
23	1230	1420	1560	770	782	316	590	748	676	492	493	903
24	1430	1540	1550	817	778	701	600	762	641	497	530	859
25	1420	1290	1530	731	622	316	539	752	566	523	538	886
26	1450	1290	1510	639	633	595	309	754	707	498	628	861
27	1480	1280	1490	318	320	315	311	749	687	540	723	860
28	1360	1270	1460	860	691	533	306	754	526	533	721	786
29	1480	1400	1240	319	---	313	397	750	556	494	761	861
30	1480	1340	1300	764	---	680	521	753	504	483	817	721
31	1500	---	1220	532	---	361	---	577	---	528	720	---
TOTAL	43090	39910	41110	32212	17312	16718	16117	19415	19913	16021	17109	24456
MEAN	1390	1330	1326	1039	618	539	537	626	664	517	552	815
MAX	1520	1540	1560	1500	1000	902	873	964	849	594	817	905
MIN	990	1130	1020	318	319	313	306	454	459	483	315	712
AC-FT	85470	79160	81540	63890	34340	33160	31970	38510	39500	31780	33940	48510

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 1994, BY WATER YEAR (WY)

MEAN	1584	1988	2415	2390	2398	2892	2387	1607	879	660	889	1217
MAX	3157	4506	5733	7905	7780	8755	5645	3935	2327	1424	1198	1898
(WY)	1985	1985	1984	1965	1965	1972	1974	1971	1983	1959	1959	1959
MIN	786	735	796	771	489	450	537	418	391	349	349	457
(WY)	1982	1992	1992	1993	1992	1992	1994	1992	1992	1992	1992	1992

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1959 - 1994
ANNUAL TOTAL	675445	303383	
ANNUAL MEAN	1851	831	1773
HIGHEST ANNUAL MEAN			3024
LOWEST ANNUAL MEAN			564
HIGHEST DAILY MEAN	9120	1560	10800
LOWEST DAILY MEAN	316	306	306
ANNUAL SEVEN-DAY MINIMUM	455	400	338
ANNUAL RUNOFF (AC-FT)	1340000	601800	1285000
10 PERCENT EXCEEDS	5250	1410	3200
50 PERCENT EXCEEDS	1260	747	1300
90 PERCENT EXCEEDS	702	477	597

## KLAMATH RIVER BASIN

53

## 11516530 KLAMATH RIVER BELOW IRON GATE DAM, CA

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

DRAINAGE AREA.--4,630 mi<sup>2</sup>, approximately (not including Lost River, Butte Creek, or Lower Klamath Lake basins).

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

GAGE.--Water-stage recorder. Datum of gage is 2,162.44 ft above sea level (levels by Pacific Corp., formerly Pacific Power and Light Co.).

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

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 29,400 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 13.63 ft, from rating curve extended above 15,000 ft<sup>3</sup>/s, on basis of slope-area measurement of peak flow; minimum daily discharge, 389 ft<sup>3</sup>/s Aug. 25-28, 1992.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,150 ft<sup>3</sup>/s Nov. 1, gage height, 4.39 ft; minimum daily discharge, 541 ft<sup>3</sup>/s May 7.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1370	1780	1390	1380	684	861	568	572	578	570	576	901
2	1380	1420	1390	1380	692	861	568	570	575	569	576	903
3	1370	1400	1390	1380	714	842	565	571	574	570	576	900
4	1370	1390	1390	1380	773	791	564	573	573	567	577	898
5	1370	1400	1390	1380	775	759	566	567	604	570	575	900
6	1380	1400	1390	1380	775	758	569	565	1180	572	576	893
7	1380	1410	1390	1380	764	737	568	541	1180	572	578	899
8	1380	1410	1390	1380	740	707	569	555	1030	572	578	896
9	1360	1410	1380	1380	702	707	569	1140	834	574	577	900
10	1370	1410	1380	1380	615	707	568	1190	630	575	577	905
11	1370	1400	1390	1380	576	669	568	1080	566	575	579	905
12	1360	1420	1390	1380	575	572	574	881	573	577	580	904
13	1360	1420	1390	1380	575	572	574	796	558	575	581	909
14	1370	1400	1390	1380	588	572	572	756	563	572	580	909
15	1370	1460	1390	1380	616	572	572	759	566	572	581	906
16	1380	1390	1390	1380	633	573	573	702	804	572	582	905
17	1380	1400	1390	1380	679	572	573	567	1180	571	578	905
18	1370	1400	1390	1310	703	572	576	562	1160	570	576	904
19	1370	1400	1390	956	756	572	576	569	947	567	576	904
20	1370	1400	1390	873	786	573	576	575	760	569	577	903
21	1370	1390	1390	873	787	573	576	587	586	574	577	905
22	1370	1390	1390	890	808	574	576	623	564	577	580	908
23	1380	1390	1390	901	849	575	576	1180	564	578	579	911
24	1380	1390	1380	906	851	576	576	1190	568	580	577	912
25	1380	1390	1380	881	851	574	576	1070	568	579	576	916
26	1370	1390	1380	700	851	574	575	857	569	577	758	917
27	1380	1390	1380	598	858	572	574	654	569	579	904	914
28	1380	1390	1380	612	861	572	571	571	566	578	905	912
29	1380	1390	1380	646	---	570	571	572	564	576	905	916
30	1390	1390	1380	647	---	567	572	571	567	576	904	918
31	1420	---	1380	677	---	568	---	574	---	578	900	---
TOTAL	42630	42420	42990	34930	20437	19844	17151	22540	21120	17783	19721	27178
MEAN	1375	1414	1387	1127	730	640	572	727	704	574	636	906
MAX	1420	1780	1390	1380	861	861	576	1190	1180	580	905	918
MIN	1360	1390	1380	598	575	567	564	541	558	567	575	893
AC-FT	84560	84140	85270	69280	40540	39360	34020	44710	41890	35270	39120	53910

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1695	2202	2829	2842	2923	3535	2951	1974	1035	750	965	1301
MAX	3353	5254	6735	9489	9150	10780	6922	4973	2591	1429	1208	2052
(WY)	1985	1985	1984	1965	1965	1972	1971	1971	1983	1982	1965	1965
MIN	852	873	889	888	525	511	572	512	506	428	398	538
(WY)	1982	1992	1992	1992	1992	1992	1994	1992	1992	1992	1992	1992

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1961 - 1994

ANNUAL TOTAL	746935	328744	
ANNUAL MEAN	2046	901	
HIGHEST ANNUAL MEAN			2080
LOWEST ANNUAL MEAN			3657
HIGHEST DAILY MEAN	10800	Mar 24	25000
LOWEST DAILY MEAN	672	Jul 29	389
ANNUAL SEVEN-DAY MINIMUM	673	Jul 24	390
INSTANTANEOUS PEAK FLOW		2150	29400
INSTANTANEOUS PEAK STAGE		4.39	13.63
INSTANTANEOUS LOW FLOW			389
ANNUAL RUNOFF (AC-FT)	1482000	652100	1507000
10 PERCENT EXCEEDS	5690	1390	3950
50 PERCENT EXCEEDS	1370	775	1400
90 PERCENT EXCEEDS	779	569	729

## COLUMBIA RIVER MAIN STEM

12472800 COLUMBIA RIVER BELOW PRIEST RAPIDS DAM, WA

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

DRAINAGE AREA. -- 96,000 mi<sup>2</sup>, approximately.

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

REVISED RECORDS.--WSP 1933: Drainage area. 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. 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. Water temperatures March 1980 to April 1993. Temperature records for site "at Vernita Bridge, near Priest Rapids Dam" (station 12472900) for period July 1974 to September 1980 are equivalent.

AVERAGE DISCHARGE.--77 years, 118,600 ft<sup>3</sup>/s, 85,926,000 acre-ft/yr.

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

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 233,000 ft<sup>3</sup>/s May 3, elevation, 413.59 ft; minimum discharge, 36,100 ft<sup>3</sup>/s Oct. 24, Nov. 21, elevation, 396.34 ft; minimum daily discharge, 40,700 ft<sup>3</sup>/s Aug. 21.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	79600	74000	88000	52200	131000	84800	84100	130000	151000	142000	72700	66200
2	52100	90800	78300	51900	142000	78700	78800	105000	156000	109000	95900	54800
3	44900	93400	70900	54800	138000	64600	81800	134000	155000	92600	96400	41600
4	65100	90400	60000	74900	144000	65400	116000	137000	145000	102000	89200	42200
5	71200	84200	70800	79200	140000	64200	103000	138000	136000	119000	95800	57200
6	83800	86800	98900	77300	128000	64400	103000	129000	157000	118000	73000	84100
7	75400	71500	88400	81100	137000	96200	101000	111000	156000	120000	66900	77600
8	63900	75300	92200	71900	140000	83900	94700	107000	156000	128000	82300	69300
9	63800	90500	87800	60700	117000	89400	55200	119000	153000	119000	80400	60100
10	53600	90600	72700	81000	115000	85900	61200	118000	166000	90000	83800	50600
11	68100	81400	66100	82300	122000	85100	93100	122000	169000	114000	86600	42100
12	60800	88400	67100	71800	105000	64300	95800	127000	176000	128000	91900	58400
13	74700	73800	90200	72300	101000	67800	97800	115000	179000	122000	77600	50000
14	76100	68700	89600	83000	117000	63200	80200	94700	180000	108000	58700	45000
15	58300	74900	92000	69900	104000	89900	71700	103000	150000	122000	92500	59300
16	59300	80300	102000	60000	96400	99600	62000	111000	147000	90800	93800	71900
17	46800	84600	115000	92300	100000	99100	72600	115000	134000	72600	89700	49600
18	67100	94200	98000	116000	107000	94600	99700	117000	139000	101000	90500	47900
19	74700	84300	85900	99100	80000	101000	95700	112000	126000	112000	75400	67100
20	79100	78900	107000	98100	77600	91000	81200	118000	142000	114000	64900	79900
21	84000	53700	115000	97900	96900	109000	97600	119000	155000	122000	40700	74100
22	84700	90600	119000	73000	112000	115000	88200	92100	151000	111000	67000	71100
23	61900	123000	97500	64200	111000	120000	66800	129000	164000	94600	66600	49200
24	52300	137000	86200	83900	116000	108000	60700	153000	164000	74800	77600	54500
25	67000	125000	61700	101000	110000	87800	86200	147000	147000	95800	78000	41600
26	90400	120000	72100	107000	89900	82500	92400	137000	131000	119000	74300	73900
27	89600	93300	86300	107000	80000	66900	111000	133000	126000	110000	70600	78200
28	84000	85100	91300	106000	95200	90200	123000	118000	136000	102000	58300	68500
29	88700	101000	88300	109000	---	93900	128000	118000	140000	109000	62300	59500
30	87500	95500	88800	104000	---	98500	118000	116000	156000	80700	76300	56100
31	68000	---	67400	124000	---	101000	---	139000	---	68300	81300	---
TOTAL	2176500	2681200	2694500	2606800	3153000	2705900	2700500	3763800	4543000	3311200	2411000	1801600
MEAN	70210	89370	86920	84090	112600	87290	90020	121400	151400	106800	77770	60050
MAX	90400	137000	119000	124000	144000	120000	128000	153000	180000	142000	96400	84100
MIN	44900	53700	60000	51900	77600	63200	55200	92100	126000	68300	40700	41600
AC-FT	4317000	5318000	5345000	5171000	6254000	5367000	5356000	7465000	9011000	6568000	4782000	3573000
CAL YR 1993	TOTAL 33270200		MEAN 91150	MAX 201000		MIN 41000	AC-FT 65990000					
WTR YR 1994	TOTAL 34549000		MEAN 94650	MAX 180000		MIN 40700	AC-FT 68530000					



OWYHEE RIVER BASIN

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13177985 JORDAN CREEK AT DE LAMAR MINE NEAR JORDAN VALLEY, OR

LOCATION.--Lat 43°01'27", long 116°51'15", in NW 1/4 NW 1/4 sec.6, T.5 S., R.4 W., Owyhee County, Hydrologic Unit 17050108, on left bank, 0.2 mi below road crossing to De Lamar Mine, and 10.5 mi northeast of Jordan Valley.

PERIOD OF RECORD.--October 1993 to September 1994.

GAGE.--Water-stage recorder. Elevation of gage is 5,280 ft above sea level, from topographic map.

REMARKS.--Records fair except for estimated daily discharges, which are poor.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e.90	1.8	e2.5	e3.4	1.4	e14	43	63	23	1.3	.00	.00
2	e.90	1.8	e2.4	e3.4	e1.4	e15	48	61	19	1.2	.00	.00
3	e.90	1.8	e1.9	e3.4	e1.5	e22	52	62	17	1.3	.00	.00
4	e1.0	1.6	e2.0	e3.6	e2.8	e20	44	70	15	1.2	.00	.00
5	e1.0	e1.5	e2.0	e3.1	e3.0	e19	35	79	14	1.2	.00	.00
6	1.0	e1.4	e2.0	e2.8	e2.9	e18	35	86	13	1.4	.00	.00
7	1.6	e1.5	e2.1	e3.2	e2.9	e17	33	84	13	1.3	.00	.00
8	1.8	e2.0	e2.1	e3.2	e2.8	e17	30	71	12	1.1	.00	.00
9	1.5	e1.6	e2.0	e3.1	e2.7	e16	33	70	10	.86	.00	.00
10	1.3	e1.5	e1.9	e3.1	e2.7	e16	32	72	9.5	.74	.00	.00
11	1.3	e1.5	e1.6	e3.1	e2.6	e15	35	71	8.7	.63	.00	.00
12	1.3	e1.5	e1.4	e3.3	e2.5	14	44	70	8.3	.57	.00	.00
13	1.3	e1.5	e1.7	e3.3	e2.7	18	50	67	7.7	.54	.00	.00
14	1.3	e1.5	e1.8	e3.2	e2.8	25	45	58	7.6	.51	.00	.00
15	1.8	e2.0	1.8	e3.1	e3.1	31	52	52	7.5	.45	.00	.00
16	2.5	e1.9	1.6	e3.0	e3.2	30	73	49	7.3	.40	.00	.00
17	2.8	e1.6	1.6	e2.9	e3.1	28	97	49	6.7	.37	.00	.00
18	2.0	e1.4	e.90	e2.8	e3.1	26	111	41	6.1	.38	.00	.00
19	1.8	e1.9	e1.0	e2.9	e3.1	23	118	38	5.6	.30	.00	.00
20	1.6	e2.9	e1.2	e3.0	e3.1	21	120	34	4.9	.26	.00	.00
21	1.6	e1.8	e1.3	e3.1	e3.1	18	107	31	4.5	.17	.00	.00
22	1.6	e.80	e1.8	e3.3	e4.0	18	102	29	3.9	.06	.00	.00
23	1.4	e.50	e2.0	e3.2	e6.0	16	91	27	3.3	.00	.00	.00
24	1.3	e1.0	e2.1	e3.2	e8.5	16	83	27	3.0	.00	.00	.00
25	1.3	e1.3	e2.2	e3.1	e12	15	80	26	2.6	.00	.00	.00
26	1.3	e1.9	e2.9	e3.1	e12	17	70	27	2.4	.00	.00	.00
27	1.3	e2.5	e3.4	e3.0	13	20	64	27	2.3	.00	.00	.00
28	1.5	e2.8	e3.1	e2.7	14	28	60	25	2.0	.00	.00	.00
29	1.6	e2.8	e3.2	e2.0	---	36	62	23	1.9	.00	.00	.00
30	1.6	e2.6	e3.4	e1.0	---	40	66	21	1.6	.00	.00	.00
31	1.7	---	e3.6	e1.2	---	43	---	21	---	.00	.00	---
TOTAL	45.80	52.20	64.50	91.8	126.0	672	1915	1531	243.4	16.24	0.00	0.00
MEAN	1.48	1.74	2.08	2.96	4.50	21.7	63.8	49.4	8.11	.52	.000	.000
MAX	2.8	2.9	3.6	3.6	14	43	120	86	23	1.4	.00	.00
MIN	.90	.50	.90	1.0	1.4	14	30	21	1.6	.00	.00	.00
AC-FT	91	104	128	182	250	1330	3800	3040	483	32	.00	.00

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1994 - 1994, BY WATER YEAR (WY)

	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994
MEAN	1.48	1.74	2.08	2.96	4.50	21.7	63.8	49.4	8.11	.52	.000	.000
MAX	1.48	1.74	2.08	2.96	4.50	21.7	63.8	49.4	8.11	.52	.000	.000
(WY)	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994
MIN	1.48	1.74	2.08	2.96	4.50	21.7	63.8	49.4	8.11	.52	.000	.000
(WY)	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994

SUMMARY STATISTICS

FOR 1994 WATER YEAR

ANNUAL TOTAL	4757.94
ANNUAL MEAN	13.0
HIGHEST DAILY MEAN	120 Apr 20
LOWEST DAILY MEAN	a.00 Jul 23
ANNUAL SEVEN-DAY MINIMUM	a.00 Jul 23
INSTANTANEOUS PEAK FLOW	151 Apr 19
INSTANTANEOUS PEAK STAGE	1.52 Apr 19
ANNUAL RUNOFF (AC-FT)	9440
10 PERCENT EXCEEDS	46
50 PERCENT EXCEEDS	2.5
90 PERCENT EXCEEDS	.00

e Estimated

a No flow July 23 to Sept. 30.



Figure 7. Location of surface-water stations in the Owyhee and Malheur River Basins.

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

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

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

REMARKS.--No estimated daily discharges. Records good. Flow regulated by Antelope Reservoir, capacity, 70,000 acre-ft, increased in 1970, and Wild Horse Reservoir, capacity, 32,690 acre-ft, and numerous small reservoirs. Diversions upstream from station for irrigation. Continuous water-quality records for the period October 1972 to June 1977 have been collected at this location.

AVERAGE DISCHARGE.--45 years, 954 ft<sup>3</sup>/s, 691,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 55,700 ft<sup>3</sup>/s Mar. 18, 1993, gage height, 20.11 ft; minimum, 42 ft<sup>3</sup>/s Aug. 12, 1954, July 28, Aug. 5, 1961, July 31, 1968.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,360 ft<sup>3</sup>/s Mar. 3, gage height, 3.66 ft; minimum discharge, 49 ft<sup>3</sup>/s Sept. 4.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	148	162	165	150	145	768	283	361	166	82	68	57
2	187	162	168	151	140	767	274	361	180	81	70	54
3	182	162	169	152	141	1020	268	325	178	80	73	52
4	190	163	172	152	128	1120	254	325	169	78	72	50
5	170	164	170	156	132	1010	245	346	165	76	68	55
6	171	160	167	157	132	878	236	318	153	74	67	54
7	158	159	173	156	145	870	242	291	158	73	66	53
8	150	158	172	151	159	696	246	289	166	78	66	54
9	141	156	169	167	157	580	248	296	159	83	67	56
10	133	158	172	158	152	515	250	361	147	79	65	61
11	135	159	172	161	167	495	284	403	124	77	61	65
12	149	163	178	164	157	522	274	373	117	72	61	67
13	152	160	182	162	141	542	280	343	117	69	60	67
14	176	166	171	164	147	593	283	316	109	71	60	66
15	182	160	200	162	145	628	272	286	109	70	63	69
16	175	145	188	163	146	766	255	265	110	69	65	71
17	172	161	187	160	149	786	246	268	109	70	64	74
18	172	155	183	157	158	654	234	255	107	68	60	76
19	172	156	183	160	167	584	229	249	101	65	60	78
20	173	153	158	157	163	557	216	324	99	63	59	78
21	175	137	157	153	172	495	206	339	99	61	61	80
22	177	160	140	151	190	435	202	337	104	63	59	83
23	175	149	116	157	181	372	199	302	102	63	60	85
24	174	159	132	160	172	332	208	285	95	69	59	90
25	171	149	137	160	176	314	205	286	91	64	55	93
26	169	123	138	166	177	296	197	274	88	67	53	90
27	167	118	143	171	227	278	192	246	82	69	53	92
28	166	141	149	172	433	264	200	218	83	65	53	97
29	163	144	156	168	---	256	226	185	94	65	52	108
30	162	157	154	160	---	258	324	172	90	67	55	109
31	161	---	152	169	---	272	---	164	---	69	54	---
TOTAL	5148	4619	5073	4947	4699	17923	7278	9163	3671	2200	1909	2184
MEAN	166	154	164	160	168	578	243	296	122	71.0	61.6	72.8
MAX	190	166	200	172	433	1120	324	403	180	83	73	109
MIN	133	118	116	150	128	256	192	164	82	61	52	50
AC - FT	10210	9160	10060	9810	9320	35550	14440	18170	7280	4360	3790	4330

MEAN	164	219	399	649	1225	2483	2976	1920	898	259	154	138
MAX	442	593	2898	4461	8820	9404	16960	10470	4870	1035	452	361
(WY)	1976	1971	1965	1971	1986	1972	1952	1984	1984	1984	1984	1984
MIN	85.3	107	104	114	129	233	144	86.5	89.6	61.2	56.0	62.5
(WY)	1955	1955	1955	1955	1955	1977	1992	1992	1992	1968	1992	1955

ANNUAL TOTAL	522119		68814						
ANNUAL MEAN	1430		189			954			
HIGHEST ANNUAL MEAN						3400			1984
LOWEST ANNUAL MEAN						162			1992
HIGHEST DAILY MEAN	46900	Mar 18	1120	Mar 4	46900		Mar 18		1993
LOWEST DAILY MEAN	103	Sep 16	50	Sep 4	44		Aug 1		1968
ANNUAL SEVEN-DAY MINIMUM	107	Sep 13	53	Sep 2	47		Jul 26		1968
INSTANTANEOUS PEAK FLOW			1360	Mar 3	55700		Mar 18		1993
INSTANTANEOUS PEAK STAGE			3.66	Mar 3	20.11		Mar 18		1993
INSTANTANEOUS LOW FLOW			49	Sep 4	42		Aug 12		1954
ANNUAL RUNOFF (AC-FT)	1036000		136500		691100				
10 PERCENT EXCEEDS	3180		324		2510				
50 PERCENT EXCEEDS	183		159		232				
90 PERCENT EXCEEDS	133		65		106				

## OWYHEE RIVER BASIN

13182500 LAKE OWYHEE NEAR NYSSA, OR

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

DRAINAGE AREA.--11,160 mi<sup>2</sup>, approximately.

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

GAGE.--Water-stage recorder. Datum of gage is sea level (levels by Bureau of Reclamation). Prior to Oct. 1, 1965, nonrecording gage at same site and datum. U.S. Bureau of Reclamation satellite telemeter at station.

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

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

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 1,140,000 acre-ft Apr. 15, 1952, elevation, 2,671.50 ft, furnished by Owyhee Irrigation District; minimum contents observed since full capacity was attained on May 7, 1936, 397,700 acre-ft Aug. 25, 1992, elevation, 2,588.56 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 906,500 acre-ft Mar. 28, elevation, 2,651.69 ft; minimum contents, 465,900 acre-ft Sept. 30, elevation, 2,599.94 ft.

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

2,590	405,700	2,630	696,800
2,600	466,300	2,640	787,300
2,610	535,400	2,650	888,300
2,620	611,900	2,660	999,700

ELEVATION (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2643.39	2641.12	2642.70	---	2646.21	2647.97	2651.57	2646.81	2641.07	2631.91	2620.22	2608.23
2	2643.22	2641.15	2642.73	---	2646.27	2648.16	2651.47	2646.73	2640.84	2631.54	2619.83	2607.92
3	2643.02	2641.22	2642.80	---	2646.30	2648.35	2651.40	2646.48	2640.65	2631.20	2619.49	2607.67
4	2642.87	2641.24	2642.83	---	2646.37	2648.55	2651.30	2646.30	2640.43	2630.81	2619.11	2607.21
5	2642.71	2641.28	2642.87	---	2646.41	2648.81	2651.17	2646.15	2640.22	2630.45	2618.71	2606.85
6	2642.54	2641.33	2642.93	---	2646.44	2649.03	2651.01	2645.90	2639.93	2630.11	2618.30	2606.56
7	2642.36	2641.38	2642.98	---	2646.51	2649.21	2650.92	2645.83	2639.66	2629.74	2617.91	2606.22
8	2642.22	2641.43	2643.07	---	2646.62	2649.39	2650.82	2645.54	2639.39	2629.38	2617.51	2605.91
9	2642.06	2641.47	2643.13	---	2646.64	2649.54	2650.67	2645.40	2639.14	2629.02	2617.10	2605.58
10	2641.87	2641.55	2643.19	---	2646.74	2649.68	2650.55	2645.15	2638.88	2628.64	2616.72	2605.30
11	2641.75	2641.58	2643.26	---	2646.80	2649.80	2650.42	2644.97	2638.56	2628.28	2616.29	2604.96
12	2641.60	2641.63	2643.34	---	2646.84	2649.94	2650.30	2644.73	2638.29	2627.92	2615.91	2604.67
13	2641.46	2641.66	2643.36	2645.14	2646.93	2650.04	2650.16	2644.50	2638.00	2627.70	2615.52	2604.37
14	2641.35	2641.75	2643.42	2645.18	2646.95	2650.16	2650.02	2644.24	2637.66	2627.19	2615.17	2604.12
15	2641.22	2641.80	2643.50	2645.25	2647.00	2650.29	2649.88	2644.03	2637.35	2626.80	2614.71	2603.84
16	2641.12	2641.85	2643.55	2645.31	2647.05	2650.45	2649.73	2643.81	2637.02	2626.46	2614.32	2603.58
17	2641.04	2641.89	2643.60	2645.35	2647.15	2650.61	2649.62	2643.60	2636.78	2626.09	2613.94	2603.32
18	2640.92	2641.94	2643.67	2645.42	2647.20	2650.74	2649.40	2643.39	2636.41	2625.74	2613.60	2603.08
19	2640.80	2641.98	2643.75	2645.46	2647.24	2650.88	2649.22	2643.21	2636.12	2625.37	2613.16	2602.74
20	2640.68	2642.04	2643.80	2645.53	2647.29	2651.05	2649.05	2643.04	2635.77	2624.99	2612.76	2602.51
21	2640.58	2642.09	2643.86	2645.57	2647.40	2651.14	2648.81	2642.86	2635.47	2624.61	2612.34	2602.24
22	2640.55	2642.18	2643.94	2645.61	2647.45	2651.24	2648.62	2642.77	2635.13	2624.24	2612.00	2601.94
23	2640.63	2642.19	2643.97	2645.69	2647.47	2651.33	2648.37	2642.65	2634.76	2623.78	2611.57	2601.73
24	2640.67	2642.24	2643.99	2645.80	2647.53	2651.42	2648.14	2642.49	2634.47	2623.38	2611.18	2601.49
25	2640.75	2642.26	2644.03	2645.82	2647.60	2651.51	2648.00	2642.31	2634.10	2623.02	2610.83	2601.15
26	2640.81	2642.32	2644.10	2645.85	2647.66	2651.55	2647.74	2642.12	2633.70	2622.64	2610.44	2601.06
27	2640.85	2642.37	---	2645.93	2647.76	2651.66	2647.54	2642.02	2633.35	2622.23	2610.07	2600.65
28	2640.89	2642.41	---	2645.99	2647.81	2651.65	2647.34	2641.82	2633.01	2621.88	2609.65	2600.31
29	2640.94	2642.49	---	2646.03	---	2651.65	2647.18	2641.58	2632.64	2621.47	2609.33	2600.28
30	2640.97	2642.61	---	2646.10	---	2651.63	2646.96	2641.44	2632.29	2621.05	2608.94	2599.94
31	2641.06	---	---	2646.16	---	2651.61	---	2641.23	---	2620.67	2608.59	---
MAX	2643.39	2642.61	---	---	2647.81	2651.66	2651.57	2646.81	2641.07	2631.91	2620.22	2608.23
MIN	2640.55	2641.12	---	---	2646.21	2647.97	2646.96	2641.23	2632.29	2620.67	2608.59	2599.94
(+)	797600	812700	830400	848400	865400	905600	856600	799200	716000	617400	525200	465900
(+)	-24800	+15100	+17700	+18000	+17000	+40200	-49000	-57400	-83200	-98600	-92200	-59300

CAL YR 1993 AC-FT+ +386200  
WTR YR 1994 AC-FT+ -356500

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



OWYHEE RIVER BASIN

59

13183000 OWYHEE RIVER BELOW OWYHEE DAM, OR

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

DRAINAGE AREA.--11,160 mi<sup>2</sup>, approximately.

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

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

GAGE.--Water-stage recorder. Datum of gage is 2,343.67 ft above sea level (levels by Bureau of Reclamation).

REMARKS.--Records good. Flow regulated since October 1932 by Lake Owyhee (station 13182500), and by many smaller reservoirs. Diversion of up to 457,000 acre-ft from Lake Owyhee during the year for irrigation of lands downstream from station and outside the basin. Many smaller diversions upstream from Lake Owyhee for irrigation upstream from station. Computation of monthly and annual adjusted flows discontinued in 1991.

AVERAGE DISCHARGE.--62 years (water years 1933-94), 417 ft<sup>3</sup>/s, 302,100 acre-ft/yr, not adjusted for storage or diversion.

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 274 ft<sup>3</sup>/s July 9, gage height, 2.30 ft; minimum discharge, 5.2 ft<sup>3</sup>/s Oct. 26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	211	20	19	e19	12	26	155	194	194	223	208	194
2	211	20	20	e19	12	21	180	194	194	223	208	194
3	211	20	20	e19	11	19	190	194	194	223	208	193
4	211	20	19	e20	11	18	190	194	194	223	207	193
5	207	20	19	e20	11	18	189	194	194	223	207	192
6	211	20	19	e20	11	18	189	194	194	219	207	192
7	211	20	19	e20	11	18	188	195	194	222	206	192
8	211	20	19	e20	11	19	189	195	194	219	206	192
9	211	20	18	e20	11	19	190	194	195	222	206	192
10	211	20	18	e20	11	20	189	186	195	215	201	192
11	211	20	18	e20	11	19	189	195	196	209	206	192
12	211	20	19	e20	11	18	190	195	197	215	206	192
13	211	20	19	19	10	18	190	194	197	215	206	190
14	225	20	19	20	11	17	190	188	197	215	206	190
15	211	19	19	19	13	17	190	182	197	208	206	190
16	211	19	18	19	14	17	190	194	197	213	206	190
17	211	19	18	19	14	16	190	194	197	213	206	190
18	211	19	18	19	14	16	190	182	198	215	205	190
19	213	19	18	18	14	15	190	193	199	213	204	190
20	213	19	18	18	15	15	190	193	199	211	204	190
21	213	19	18	18	15	14	192	192	201	209	204	190
22	132	19	18	17	14	14	192	193	201	211	204	191
23	7.5	19	18	17	15	14	192	194	214	210	204	192
24	6.5	19	18	18	15	14	192	193	223	210	198	192
25	6.5	19	18	17	15	14	193	193	211	209	195	192
26	5.7	19	18	18	15	14	193	194	223	208	195	192
27	16	19	18	18	15	15	194	188	223	208	194	191
28	21	19	e18	17	23	77	194	194	223	208	194	190
29	21	18	e19	18	---	117	194	194	217	208	194	190
30	20	17	e19	19	---	113	195	194	223	208	194	190
31	20	---	e19	17	---	125	---	194	---	208	194	---
TOTAL	4703.2	581	575	582	366	895	5679	5967	6075	6636	6289	5740
MEAN	152	19.4	18.5	18.8	13.1	28.9	189	192	202	214	203	191
MAX	225	20	20	20	23	125	195	195	223	223	208	194
MIN	5.7	17	18	17	10	14	155	182	194	208	194	190
AC-FT	9330	1150	1140	1150	726	1780	11260	11840	12050	13160	12470	11390

CAL YR 1993 TOTAL 168422.9 MEAN 461 MAX 4630 MIN 1.0 AC-FT 334100  
WTR YR 1994 TOTAL 44088.2 MEAN 121 MAX 225 MIN 5.7 AC-FT 87450

e Estimated

## SNAKE RIVER BASIN

13213100 SNAKE RIVER AT NYSSA, OR

LOCATION.--Lat 45°52'34", long 116°58'53", in NW 1/4 SW 1/4 NE 1/4 sec.7, T.6 N., R.5 W., Canyon County, Hydrologic Unit 17050115, on right bank, 300 upstream from U.S. Highway 20-26 bridge at Nyssa, 2.3 mi downstream from Boise River and at mile 385.2.

DRAINAGE AREA.--58,700 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--November 1974 to September 1986, February 1989 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,170 ft above sea level, from topographic map. Prior to 1989, station located on left bank, in Oregon.

REMARKS.--Records fair. Station equipment includes satellite telemetry. Flow regulated by many reservoirs upstream from station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9770	10400	10900	11300	10600	11500	9100	9600	10000	6900	7320	7470
2	9630	10300	11300	11300	8930	12300	8680	10400	9900	7070	8160	7360
3	10100	10100	11100	11200	9180	12100	8770	10500	9750	7500	8070	7350
4	10300	10300	11000	11000	9640	11600	8870	10500	9660	7540	7810	7310
5	10300	10200	10700	10900	9970	11200	9020	10100	9870	7630	7630	7500
6	10400	10800	11300	11100	9960	10800	9790	9140	10200	7780	7700	7420
7	10400	10800	11200	11300	9690	11100	11100	e10000	9070	e8200	7550	7320
8	10300	10700	11100	11300	9750	10900	9150	e10600	8590	e8200	7440	7070
9	10300	11000	11200	11400	9880	10900	9550	e10900	8520	e8000	7580	7840
10	10700	10800	10500	11500	10300	11100	8750	e10000	8380	e8400	7230	7710
11	10700	10900	10800	11500	10400	11500	9710	e10600	8230	e7800	7190	7260
12	11100	10500	12200	11400	10500	11400	11300	e10300	8160	e7800	6490	7430
13	11200	10400	11200	11100	10500	11400	11500	e10100	8020	e7600	6490	7370
14	10900	10500	10900	11100	10400	11400	11300	e10600	7560	e7500	7500	7390
15	10800	10500	12000	11200	10400	11700	9710	e10300	7560	e7550	6540	8050
16	11700	10500	10700	11000	9750	11300	9360	e10000	7460	e7600	6950	7800
17	11100	10600	11500	11100	10300	11500	9130	e10500	7280	7470	7200	7900
18	11000	10500	11700	11300	10400	10800	8550	e11100	7480	7630	7020	7920
19	10900	10600	e10900	11100	10600	10600	8160	e10600	7150	8940	6840	7920
20	10800	e10500	11400	11100	10600	9710	8700	e11100	6860	9120	6730	7840
21	10500	e10600	10800	11000	11100	11000	8850	e10600	7880	7240	6880	7730
22	10900	e10700	10500	11000	10800	10200	e8400	e10400	7210	6820	7150	7790
23	11300	e10800	11100	11000	10400	9350	e8000	e11300	6690	7080	7030	7990
24	13900	e10900	11100	11100	10600	10200	e7800	e11800	6730	7940	6840	7760
25	11300	e11200	11600	11100	11500	11600	e9000	10900	6560	7300	7190	7590
26	10900	e11100	12300	11200	10800	10100	e9200	9120	6180	6540	7110	7840
27	10900	e11000	10600	11100	10500	9760	e10100	8890	6320	7150	7340	8420
28	10300	e10900	9970	11100	10900	9400	e11000	9910	e6480	8210	7390	7950
29	10600	e10800	11000	11000	---	e9200	e11300	9090	e6650	7440	7430	8430
30	10700	11300	11300	11100	---	e9200	10400	8920	6670	7800	7370	8510
31	10700	---	11200	10900	---	9230	---	10500	---	7800	7390	---
TOTAL	334400	320200	345070	345800	288350	334050	284250	318370	237070	237550	224560	231240
MEAN	10790	10670	11130	11150	10300	10780	9475	10270	7902	7663	7244	7708
MAX	13900	11300	12300	11500	11500	12300	11500	11800	10200	9120	8160	8510
MIN	9630	10100	9970	10900	8930	9200	7800	8890	6180	6540	6490	7070
AC-FT	663300	635100	684400	685900	571900	662600	563800	631500	470200	471200	445400	458700

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 1994, BY WATER YEAR (WY)

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
MEAN	12560	13370	13670	14420	14870	17140	20880	19570	15350	8505	8504	10500								
MAX	21360	24660	24320	30290	26690	40010	43970	49060	41100	16480	11630	13650								
(WY)	1985	1985	1984	1984	1986	1986	1984	1984	1984	1983	1984	1984								
MIN	8102	8924	8902	8908	8562	8018	6033	5367	5223	5546	5075	6664								
(WY)	1993	1993	1993	1993	1992	1991	1992	1992	1992	1992	1992	1992								

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1975 - 1994

ANNUAL TOTAL	4059030	3500910	
ANNUAL MEAN	11120	9592	14000
HIGHEST ANNUAL MEAN			26260
LOWEST ANNUAL MEAN			7365
HIGHEST DAILY MEAN	25000	Jun 11	57400
LOWEST DAILY MEAN	7070	Jul 2	4240
ANNUAL SEVEN-DAY MINIMUM	7480	Jun 30	4520
INSTANTANEOUS PEAK FLOW			57900
INSTANTANEOUS PEAK STAGE			13.34
INSTANTANEOUS LOW FLOW			a4110
ANNUAL RUNOFF (AC-FT)	8051000	6944000	10140000
10 PERCENT EXCEEDS	15000	11300	26100
50 PERCENT EXCEEDS	10500	10300	10900
90 PERCENT EXCEEDS	8300	7270	7100

e Estimated

a Gage height, 4.32 ft.

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

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

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

AVERAGE DISCHARGE.--68 years (water years 1927-94), 187 ft<sup>3</sup>/s, 135,500 acre-ft/yr.

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

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

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 27	0645	*356	*4.25				

Minimum discharge, 0.84 ft<sup>3</sup>/s several days during August and September.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	68	69	70	63	171	208	60	48	6.3	1.2	1.0
2	25	66	73	72	57	183	227	57	47	6.0	1.2	.98
3	26	65	73	74	63	166	253	50	43	5.2	1.2	.95
4	26	66	76	91	67	167	237	43	39	5.0	1.2	.95
5	27	65	72	97	70	169	189	37	35	5.4	1.2	1.0
6	40	60	66	88	70	139	177	41	33	10	1.1	1.0
7	35	57	66	73	72	125	186	40	33	12	1.2	.97
8	37	56	78	71	71	122	168	39	33	15	1.1	.96
9	38	55	94	72	73	120	168	43	34	14	1.5	.95
10	50	62	87	75	73	124	179	56	30	13	1.5	.84
11	48	67	84	76	73	130	147	67	27	14	1.0	.94
12	58	70	82	75	75	131	142	73	24	6.5	1.1	1.2
13	57	67	76	77	72	132	137	71	19	4.0	1.2	1.3
14	54	56	73	82	78	142	133	67	9.5	3.8	1.4	1.7
15	64	53	75	83	81	155	129	65	25	3.8	1.2	2.0
16	72	59	70	78	80	186	126	55	31	3.5	.95	2.5
17	92	68	69	76	85	181	125	59	27	2.5	.95	1.8
18	84	69	70	71	116	165	128	61	23	2.2	1.0	3.7
19	79	59	57	69	92	156	136	80	20	2.0	.97	3.4
20	73	47	51	69	82	140	139	99	19	1.7	.84	2.3
21	70	46	49	66	80	130	132	104	16	1.5	.84	2.7
22	73	63	51	68	77	120	125	128	14	1.5	1.0	2.3
23	70	63	50	78	82	105	121	113	9.7	1.6	1.0	1.9
24	68	60	58	79	100	98	122	94	9.0	1.6	.92	2.0
25	68	43	59	80	222	97	129	71	10	1.7	.89	2.0
26	66	38	59	77	177	104	121	51	8.2	1.5	.91	2.6
27	67	38	62	71	261	113	101	48	9.5	1.3	.94	5.2
28	68	45	63	65	215	132	80	50	8.6	1.2	.92	6.5
29	68	52	64	60	---	157	72	46	7.8	1.2	.91	8.0
30	68	63	64	70	---	197	63	44	7.0	1.2	.95	5.0
31	67	---	66	67	---	213	---	45	---	1.2	.95	---
TOTAL	1761	1746	2106	2320	2727	4470	4400	1957	699.3	151.4	33.24	68.64
MEAN	56.8	58.2	67.9	74.8	97.4	144	147	63.1	23.3	4.88	1.07	2.29
MAX	92	70	94	97	261	213	253	128	48	15	1.5	8.0
MIN	23	38	49	60	57	97	63	37	7.0	1.2	.84	.84
AC-FT	3490	3460	4180	4600	5410	8870	8730	3880	1390	300	66	13.4

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1927 - 1994. BY WATER YEAR (WY)

MEAN	42.0	69.3	101	140	254	471	645	344	136	29.0	10.0	14.4
MAX	103	178	739	817	1124	1472	2290	1136	501	158	60.2	68.6
(WY)	1985	1971	1965	1970	1982	1993	1952	1958	1984	1982	1976	1984
MIN	5.32	5.11	8.95	20.0	20.0	55.0	44.1	17.5	7.96	1.87	.000	.000
(WY)	1933	1933	1933	1933	1933	1977	1934	1934	1934	1934	1934	1934

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1927 - 1994
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ANNUAL TOTAL	128799.8			22439.58					
ANNUAL MEAN	353			61.5				187	
HIGHEST ANNUAL MEAN								474	1984
LOWEST ANNUAL MEAN								34.3	1934
HIGHEST DAILY MEAN	4510	Mar	25	261	Feb	27	6910		Dec 23 1964
LOWEST DAILY MEAN	5.4	Aug	8	.84	Aug	20	.00		Jul 27 1934
ANNUAL SEVEN-DAY MINIMUM	8.0	Aug	5	.91	Aug	20	.00		Jul 27 1934
ANNUAL RUNOFF (AC-FT)	255500			44510			135600		
10 PERCENT EXCEEDS	1020			132			498		
50 PERCENT EXCEEDS	69			62			67		
90 PERCENT EXCEEDS	22			1.2			6.0		

## MALHEUR RIVER BASIN

13215000 MALHEUR RIVER BELOW WARMSPRINGS RESERVOIR, NEAR RIVERSIDE, OR

LOCATION.--Lat 43d34'29", long 118°12'31", on line between NW 1/4 SW 1/4 and SW 1/4 NW 1/4 sec.17, T.23 S., R.37 E., Malheur County, Hydrologic Unit 17050116, on left bank 0.9 mi downstream from Warm Springs Dam, 3.0 mi upstream from South Fork, 4.0 mi northwest of Riverside, and at mile 113.

DRAINAGE AREA.--1,100 mi<sup>2</sup>, approximately.

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

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

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

REMARKS.--Records good except for flows below 100 ft<sup>3</sup>/s, and estimated daily discharges, which are poor. Flow completely regulated since November 1919 by Warm Springs Reservoir (station 13214500). Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--75 years (water years 1920-94), 188 ft<sup>3</sup>/s, 136,200 acre-ft/yr.

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 657 ft<sup>3</sup>/s July 23, gage height, 5.46 ft; minimum daily discharge 0.02 ft<sup>3</sup>/s Nov. 25-27, Mar. 14-16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	191	e.30	e.04	e.10	e.10	e.06	104	371	261	495	578	.14
2	183	e.20	e.06	e.10	e.10	e.06	104	350	259	496	566	.12
3	181	e.10	e.06	e.10	e.10	e.06	104	362	258	494	553	.11
4	172	e.10	e.06	e.10	e.10	e.06	104	375	275	495	546	.13
5	167	e.10	e.08	e.10	e.10	e.06	152	413	284	496	545	.16
6	164	e.08	e.08	e.10	e.10	e.04	176	431	306	497	545	.18
7	160	e.08	e.10	e.10	e.10	e.04	176	428	316	500	538	.23
8	157	e.08	e.10	e.10	e.10	e.04	176	428	315	496	535	.25
9	157	e.08	e.12	e.10	e.10	e.04	174	409	329	496	541	.25
10	157	e.08	e.10	e.10	e.10	e.04	174	415	347	504	551	.33
11	157	e.08	e.10	e.10	e.10	e.04	174	429	368	514	544	.36
12	138	e.08	e.08	e.10	e.10	e.04	208	451	371	521	557	.38
13	127	e.08	e.08	e.10	e.10	e.04	224	458	370	529	558	.37
14	121	e.08	e.08	e.10	e.10	e.02	264	457	370	538	540	.39
15	87	e.08	e.08	e.10	e.10	e.02	266	367	370	540	516	.39
16	68	e.08	e.08	e.10	e.10	.02	277	368	363	555	508	.34
17	67	e.08	e.06	e.10	e.10	.03	288	457	359	562	515	.17
18	67	e.08	e.06	e.10	e.08	.06	369	426	359	569	444	.26
19	56	e.08	e.06	e.10	e.08	.09	430	398	358	614	499	.22
20	49	e.08	e.04	e.10	e.08	.10	453	354	381	621	400	.22
21	49	e.06	e.04	e.10	e.08	.11	474	336	405	623	263	.16
22	44	e.06	e.04	e.10	e.08	.12	475	333	418	624	121	.09
23	40	e.04	e.06	e.10	e.08	.14	484	312	429	638	48	.09
24	40	e.04	e.06	e.10	e.08	.15	487	281	432	636	19	.40
25	40	e.02	e.06	e.10	e.08	.17	469	269	439	628	8.3	.68
26	e15	e.02	e.08	e.10	e.06	.19	451	276	440	628	3.1	.79
27	e.80	e.02	e.08	e.10	e.06	.20	446	247	448	623	1.2	.97
28	e.70	e.04	e.08	e.10	e.06	.20	442	249	451	601	.39	1.0
29	e.60	e.04	e.08	e.10	---	.22	412	261	450	603	.16	1.4
30	e.50	e.04	e.08	e.10	---	.23	380	261	478	600	.12	2.1
31	e.40	---	e.10	e.10	---	137	---	261	---	591	.16	---
TOTAL	2857.00	2.38	2.28	3.10	2.52	139.69	8917	11233	11009	17327	11043.43	12.68
MEAN	92.2	.079	.074	.10	.090	4.51	297	362	367	559	356	.42
MAX	191	.30	.12	.10	.10	1.37	487	458	478	638	578	2.1
MIN	.40	.02	.04	.10	.06	.02	104	247	258	494	.12	.09
AC-FT	5670	4.7	4.5	6.1	5.0	277	17690	22280	21840	34370	21900	25

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1920 - 1994, BY WATER YEAR (WY)

	34.4	.86	7.89	16.6	34.9	80.8	319	435	341	430	351	197
MEAN	34.4	.86	7.89	16.6	34.9	80.8	319	435	341	430	351	197
MAX	138	19.8	323	452	763	1440	1603	1162	557	677	575	394
(WY)	1953	1920	1984	1971	1983	1984	1958	1953	1945	1946	1928	
MIN	.000	.000	.000	.000	.000	.000	.000	31.4	92.0	30.3	.041	.000
(WY)	1934	1933	1933	1933	1933	1933	1935	1942	1992	1988	1988	

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1920 - 1994

ANNUAL TOTAL	86485.80	62549.08	188
ANNUAL MEAN	237	171	566
HIGHEST ANNUAL MEAN			46.8
LOWEST ANNUAL MEAN			3030
HIGHEST DAILY MEAN	1590	Apr 12	638
LOWEST DAILY MEAN	.00	Jan 1	.02
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 1	.03
ANNUAL RUNOFF (AC-FT)	171500	124100	136300
10 PERCENT EXCEEDS	529	514	497
50 PERCENT EXCEEDS	110	.70	3.0
90 PERCENT EXCEEDS	.00	.06	.00

e Estimated



## 63

e Estimated

## MALHEUR RIVER BASIN

## 13217000 BEULAH RESERVOIR AT BEULAH, OR

LOCATION.--Lat 43d54'41", long 118°9'25", in SW 1/4 SE 1/4 sec.15, T.19 S., R.37 E., Malheur County, Hydrologic Unit 17050116, on top of dam near right end of dam on North Fork Malheur River, 0.2 mi northwest of Beulah, and at mile 15.0.

DRAINAGE AREA.--440 mi<sup>2</sup>, approximately.

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

REVISED RECORDS.--WSP 1397: Drainage area.

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

REMARKS.--Reservoir is formed by earthfill, rock-faced dam. Storage began December 1935. Capacity, 59,920 acre-ft between gage heights 3,263.21 ft, bottom of outlet tunnel, and 3,340.0 ft, top of spillway gates; with gates open the capacity is 32,220 acre-ft. No dead storage. Storage below 3,268 ft unusable due to restriction at the trashrack structure. Water is used for irrigation of lands below Juntura, on Vale project, Bureau of Reclamation. U.S. Bureau of Reclamation satellite telemeter at station.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 62,770 acre-ft May 3, 1941, gage height, 3,341.50 ft; no contents Sept. 17 to Oct. 13, 1950, Aug. 28 to Oct. 4, 1955, Aug. 13 to Oct. 1, 1961, Sept. 21 to Oct. 5, 1968, Aug. 31 to Oct. 3, 1977, Aug. 25 to Sept. 30, 1994.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 44,580 acre-ft Apr. 11, gage height, 3,331.28 ft; no contents Aug. 25 to Sept. 30.

REVISIONS.--Figures of gage heights at 24:00 hours for the period October 1-20, 1992 published in WDR OR-93-1 are in error and should not be used.

CORRECTIONS.--The minimum contents for water year 1993 is 19 acre-ft (interpolated), October 1, 1992; the previously published figure was not the minimum.

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

3,263	0	3,290	3,750	3,320	28,250
3,265	3	3,295	6,090	3,325	35,025
3,270	70	3,300	8,980	3,330	42,530
3,275	310	3,305	12,520	3,335	50,820
3,280	925	3,310	16,950	3,340	59,925
3,285	2,020	3,315	22,220	3,341	61,840

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3315.84	3316.21	3318.81	3321.83	3324.60	3327.28	3330.82	3328.56	3322.78	3310.32	3293.88	---
2	3315.77	3316.31	3318.93	3321.94	3324.67	3327.42	3330.93	3328.45	3322.57	3309.70	3293.26	---
3	3315.69	3316.41	3319.06	3322.05	3324.73	3327.57	3330.97	3328.34	3322.33	3309.05	3292.72	---
4	3315.62	3316.50	3319.16	3322.18	3324.79	3327.72	3331.07	3328.23	3322.07	3308.41	3292.22	---
5	3315.54	3316.60	3319.27	3322.29	3324.88	3327.86	3331.13	3328.18	3321.77	3307.73	3291.74	---
6	3315.50	3316.68	3319.36	3322.38	3324.95	3328.00	3331.17	3328.12	3321.50	---	3291.27	---
7	3315.46	3316.76	3319.49	3322.46	3325.05	3328.10	3331.21	3328.02	3321.18	---	3290.79	---
8	3315.43	3316.84	3319.63	3322.55	3325.13	3328.22	3331.21	3327.94	3320.89	---	3290.30	---
9	3315.40	3316.91	3319.75	3322.67	3325.22	3328.32	3331.23	3327.76	3320.58	---	3289.94	---
10	3315.35	3317.03	3319.87	3322.76	3325.31	3328.42	3331.25	3327.54	3320.26	---	3289.62	---
11	3315.33	3317.13	3320.02	3322.87	3325.43	3328.54	3331.25	3327.28	3319.91	---	3289.28	---
12	3315.32	3317.24	3320.07	3322.97	3325.48	3328.66	3331.19	3327.02	3319.56	---	3289.02	---
13	3315.31	3317.32	3320.15	3323.07	3325.58	3328.78	3331.12	3326.73	3319.14	---	3288.81	---
14	3315.33	3317.38	3320.25	3323.15	3325.69	3328.91	3331.02	3326.42	3318.73	3302.88	3288.60	---
15	3315.35	3317.46	3320.38	3323.25	3325.76	3329.01	3330.89	3326.06	3318.38	3302.35	3288.37	---
16	3315.38	3317.56	3320.45	3323.34	3325.84	3329.11	3330.73	3325.75	3318.02	3301.81	3288.15	---
17	3315.45	3317.67	3320.55	3323.44	3325.95	3329.26	3330.59	3325.46	3317.63	3301.25	3287.91	---
18	3315.48	3317.76	3320.64	3323.51	3326.06	3329.33	3330.43	3325.26	3317.22	3300.72	3287.67	---
19	3315.50	3317.84	3320.70	3323.59	3326.12	3329.46	3330.28	3325.07	3316.82	3300.23	3287.42	---
20	3315.50	3317.90	3320.72	3323.64	3326.18	3329.55	3330.13	3324.88	3316.36	3299.75	3287.14	---
21	3315.52	3317.96	3320.78	3323.73	3326.27	3329.67	3329.93	3324.72	3315.86	3299.27	3286.18	---
22	3315.55	3318.07	3320.87	3323.80	3326.35	3329.73	3329.74	3324.59	3315.34	3298.79	3283.58	---
23	3315.56	3318.16	3320.93	3323.90	3326.44	3329.84	3329.55	3324.42	3314.79	3298.32	3279.76	---
24	3315.58	3318.19	3321.01	3324.00	3326.58	3329.91	3329.41	3324.24	3314.27	3297.89	3274.06	---
25	3315.58	3318.21	3321.09	3324.10	3326.69	3330.01	3329.28	3324.06	3313.73	3297.49	---	---
26	3315.62	3318.24	3321.17	3324.19	3326.86	3330.12	3329.13	3323.85	3313.18	3297.02	---	---
27	3315.71	3318.28	3321.28	3324.27	3327.02	3330.23	3329.01	3323.70	3312.63	3296.55	---	---
28	3315.83	3318.38	3321.38	3324.36	3327.14	3330.35	3328.89	3323.54	3312.07	3296.05	---	---
29	3315.92	3318.52	3321.46	3324.42	---	3330.43	3328.79	3323.37	3311.50	3295.51	---	---
30	3316.01	3318.65	3321.58	3324.48	---	3330.54	3328.66	3323.19	3310.93	3294.97	---	---
31	3316.12	---	3321.70	3324.56	---	3330.65	---	3322.97	---	3294.42	---	---
MAX	3316.12	3318.65	3321.70	3324.56	3327.14	3330.65	3331.25	3328.56	3322.78	---	---	---
MIN	3315.31	3316.21	3318.81	3321.83	3324.60	3327.28	3328.66	3322.97	3310.93	---	---	---
(†)	23520	26570	30470	34400	38170	43560	40460	32180	17880	5795	0	0
(‡)	+250	+3050	+3900	+3930	+3770	+5390	-3100	-8280	-14300	-12085	-5795	0

CAL YR 1993 AC-FT† +23307

WTR YR 1994 AC-FT† -23270

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

‡ Change in contents, in acre-ft.

## MALHEUR RIVER BASIN

65

13217500 NORTH FORK MALHEUR RIVER AT BEULAH, OR

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

DRAINAGE AREA.--440 mi<sup>2</sup>, approximately.

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

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

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

REMARKS.--No estimated daily discharges. Records good except those below 20 ft<sup>3</sup>/s, which are poor. Flow regulated since 1935 by Beulah Reservoir (station 13217000). Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--59 years (water years 1936-94), 143 ft<sup>3</sup>/s, 103,600 acre-ft/yr.

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 462 ft<sup>3</sup>/s Aug. 22, gage height, 3.62 ft; minimum daily discharge, no flow Dec. 6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	96	1.9	.13	.15	.34	.82	3.1	180	208	334	158	36
2	98	1.8	.10	.13	.36	.90	22	172	208	336	157	37
3	95	1.8	.05	.09	.36	.96	46	163	223	331	146	39
4	88	1.7	.06	.10	.36	.91	39	150	230	328	124	39
5	88	1.6	.01	.09	.36	.85	54	140	228	324	117	39
6	77	1.5	.00	.08	.37	.91	72	137	227	316	115	38
7	68	1.4	.08	.05	.41	.90	75	165	246	293	113	39
8	68	1.3	.17	.07	.45	.89	76	180	258	271	109	38
9	67	1.1	.14	.09	.47	.92	84	242	261	264	87	38
10	66	.91	.15	.08	.47	1.1	84	294	260	261	77	41
11	65	.70	.19	.07	.47	1.2	102	302	257	246	77	40
12	57	.56	.19	.07	.47	1.2	125	301	254	233	59	43
13	51	.43	.20	.11	.49	1.3	153	319	275	224	51	40
14	51	.31	.21	.15	.52	1.4	165	328	287	219	52	41
15	48	.19	.23	.15	.52	1.5	205	328	277	218	52	39
16	45	.11	.21	.16	.54	1.6	222	309	272	215	51	37
17	45	.05	.23	.12	.58	1.7	221	284	282	213	56	41
18	45	.02	.23	.07	.60	1.7	223	253	286	195	58	37
19	45	.05	.21	.07	.59	1.8	244	241	284	181	58	35
20	45	.02	.19	.10	.61	1.8	253	241	302	177	59	35
21	45	.02	.19	.23	.65	1.9	264	218	322	175	158	35
22	45	.08	.19	.23	.61	1.8	270	205	326	164	377	35
23	46	.09	.15	.24	.61	1.9	272	205	324	153	420	35
24	46	.05	.14	.28	.64	1.9	255	205	323	150	363	35
25	46	.05	.15	.28	.66	2.0	234	203	321	150	161	35
26	15	.03	.17	.33	.66	2.2	230	205	320	148	39	33
27	1.4	.01	.18	.33	.68	2.4	207	181	318	147	38	34
28	1.6	.01	.18	.33	.78	2.5	198	187	318	153	30	32
29	1.9	.01	.18	.33	---	2.8	186	195	321	154	28	31
30	1.9	.05	.19	.32	---	2.7	180	195	326	155	36	36
31	1.8	---	.15	.30	---	2.9	---	205	---	160	37	---
TOTAL	1559.6	17.85	4.85	5.20	14.63	49.36	4764.1	6933	8344	6888	3463	1113
MEAN	50.3	.59	.16	.17	.52	1.59	159	224	278	222	112	37.1
MAX	98	1.9	.23	.33	.78	2.9	272	328	326	336	420	43
MIN	1.4	.01	.00	.05	.34	.82	3.1	137	208	147	28	31
AC-FT	3090	35	9.6	10	29	98	9450	13750	16550	13660	6870	2210

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1936 - 1994, BY WATER YEAR (WY)

	36.8	1.09	1.83	7.19	22.6	79.7	293	352	281	275	217	138
MEAN	36.8	1.09	1.83	7.19	22.6	79.7	293	352	281	275	217	138
MAX	134	35.5	62.7	287	478	936	856	810	510	402	399	341
(WY)	1954	1936	1943	1943	1965	1983	1958	1983	1974	1979	1980	1945
MIN	.086	.000	.000	.000	.000	.000	2.29	120	53.7	39.5	30.4	31.9
(WY)	1974	1938	1938	1936	1938	1938	1981	1977	1939	1992	1992	1961

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1936 - 1994

ANNUAL TOTAL	66796.97	33156.59	142
ANNUAL MEAN	183	90.8	335
HIGHEST ANNUAL MEAN			54.6
LOWEST ANNUAL MEAN			3700
HIGHEST DAILY MEAN	1180	Apr 5	420
LOWEST DAILY MEAN	.00	Jan 12	.00
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 12	.03
ANNUAL RUNOFF (AC-FT)	132500	65770	103100
10 PERCENT EXCEEDS	532	272	363
50 PERCENT EXCEEDS	79	38	41
90 PERCENT EXCEEDS	.00	.13	.10

## MALHEUR RIVER BASIN

13226800 BULLY CREEK RESERVOIR NEAR VALE, OR

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

DRAINAGE AREA.--547 mi<sup>2</sup>.

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

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

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

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

EXTREMES FOR PERIOD OF RECORD.--Maximum contents not determined, occurred during period Apr. 4 to May 2, 1969, elevation above 2,516.00 ft, spillway crest; no usable contents at times in 1973, 1977, 1978, 1988, 1989, 1991, 1992, 1994.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 21,600 acre-ft Apr. 11, elevation, 2,506.78 ft; no storage at times during September. Minimum elevation not determined as water surface dropped below minimum recording limit of instrument.

REVISION.--Revised values of gage heights for 24:00 hours in feet for water year 1993 are given below. These figures supersede those published in the report for 1993.

Sept. 7	2499.91	Sept. 15	2497.91	Sept. 23	2496.38
8	2499.69	16	2497.67	24	2496.31
9	2499.46	17	2497.43	25	2496.25
10	2499.21	18	2497.20	26	2496.22
11	2498.98	19	2496.98	27	2496.16
12	2498.66	20	2496.77	28	2496.11
13	2498.40	21	2496.62	29	2496.05
14	2498.17	22	2496.48	30	2495.99

Maximum for September 1993 2501.15  
Minimum for September 1993 2495.99

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

2,456.5	0	2,480	5,430	2,505	20,130
2,460	465	2,485	7,430	2,510	24,370
2,465	1,310	2,490	9,930	2,515	29,000
2,470	2,401	2,495	12,900	2,520	34,040
2,475	3,770	2,500	16,290		

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2495.93	2494.09	2497.96	2499.12	2500.31	2503.52	2506.19	2504.41	2501.02	2492.92	2479.29	---
2	2495.87	2494.28	2498.12	2499.16	2500.34	2503.77	2506.21	2504.31	2500.89	2492.40	2478.68	---
3	2495.81	2494.46	2498.22	2499.23	2500.36	2504.01	2506.16	2504.20	2500.74	2492.18	2478.20	---
4	2495.73	2494.58	2498.28	2499.28	2500.39	2504.19	2506.15	2504.06	2500.58	2491.76	2477.75	---
5	2495.60	2494.69	2498.32	2499.30	2500.43	2504.34	2506.16	2503.93	2500.41	2490.92	2477.03	---
6	2495.55	2494.84	2498.35	2499.33	2500.47	2504.47	2506.17	2503.81	2500.20	2490.94	2476.46	---
7	2495.42	2494.99	2498.41	2499.37	2500.52	2504.60	2506.28	2503.64	2499.99	2490.57	2475.86	---
8	2495.32	2495.13	2498.47	2499.42	2500.53	2504.72	2506.34	2503.50	2499.80	2490.22	2475.11	---
9	2495.24	2495.29	2498.51	2499.47	2500.57	2504.86	2506.54	2503.37	2499.59	2489.73	2474.46	---
10	2495.16	2495.43	2498.55	2499.50	2500.64	2504.97	2506.67	2503.21	2499.37	2489.25	2473.94	---
11	2495.10	2495.57	2498.63	2499.54	2500.65	2505.06	2506.70	2503.04	2499.14	2489.00	2473.30	---
12	2494.96	2495.75	2498.60	2499.59	2500.69	2505.14	2506.65	2502.84	2498.87	2488.49	2472.59	---
13	2494.84	2495.90	2498.64	2499.63	2500.73	2505.24	2506.58	2502.63	2498.59	2488.08	2471.92	---
14	2494.69	2495.99	2498.68	2499.67	2500.89	2505.33	2506.49	2502.45	2498.31	2487.67	2471.32	---
15	2494.56	2496.14	2498.70	2499.71	2501.03	2505.42	2506.41	2502.30	2498.04	2487.25	2470.48	---
16	2494.44	2496.29	2498.72	2499.74	2501.22	2505.46	2506.31	2502.23	2497.78	2486.77	2469.74	---
17	2494.28	2496.44	2498.74	2499.78	2501.40	2505.55	2506.23	2502.24	2497.52	2486.38	2469.05	---
18	2494.15	2496.55	2498.76	2499.81	2501.52	2505.61	2506.12	2502.24	2497.23	2485.71	2468.29	---
19	2494.03	2496.62	2498.77	2499.85	2501.67	2505.64	2505.97	2502.24	2496.96	2485.34	2467.56	---
20	2493.93	2496.73	2498.79	2499.88	2501.81	2505.73	2505.83	2502.24	2496.69	2485.03	---	---
21	2493.83	2496.83	2498.81	2499.93	2501.98	2505.78	2505.66	2502.27	2496.39	2484.60	---	---
22	2493.77	2496.97	2498.83	2499.97	2502.15	2505.82	2505.46	2502.25	2496.05	2484.23	---	---
23	2493.71	2497.09	2498.85	2500.02	2502.31	2505.91	2505.32	2502.19	2495.71	2483.57	---	---
24	2493.63	2497.15	2498.87	2500.06	2502.44	2505.98	2505.24	2502.09	2495.35	2483.05	---	---
25	2493.56	2497.23	2498.89	2500.10	2502.59	2506.05	2505.13	2501.95	2495.01	2482.75	---	---
26	2493.45	2497.33	2498.92	2500.16	2502.78	2506.12	2504.99	2501.82	2494.63	2482.29	---	---
27	2493.37	2497.43	2498.94	2500.18	2502.98	2506.15	2504.82	2501.68	2494.47	2481.84	---	---
28	2493.33	2497.53	2498.98	2500.20	2503.24	2506.17	2504.69	2501.56	2494.09	2481.35	---	---
29	2493.49	2497.64	2499.00	2500.26	---	2506.16	2504.59	2501.43	2493.67	2480.76	---	---
30	2493.73	2497.80	2499.03	2500.27	---	2506.19	2504.50	2501.32	2493.24	2480.25	2459.00	---
31	2493.96	---	2499.08	2500.29	---	2506.17	---	2501.18	---	2479.75	---	---
MAX	2495.93	2497.80	2499.08	2500.29	2503.24	2506.19	2506.70	2504.41	2501.02	2492.92	---	---
MIN	2493.33	2494.09	2497.96	2499.12	2500.31	2503.52	2504.50	2501.18	2493.24	2479.75	---	---
(†)	12250	14750	15630	16500	18730	21090	19720	17160	11800	5340	a269	a0
(‡)	-1286	+2500	+880	+870	+2230	+2360	-1370	-2560	-5360	-6460	-5071	-269

CAL YR 1993 AC-FT† +13255  
WTR YR 1994 AC-FT† -13536

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



## MALHEUR RIVER BASIN

67

## 13233300 MALHEUR RIVER BELOW NEVADA DAM, NEAR VALE, OR

LOCATION.--Lat 43°59'20", long 117°13'10", in NE 1/4 SW 1/4 sec.21, T.18 S., R.45 E., Malheur County, Hydrologic Unit 17050117, on right bank, 510 ft downstream from dam and headgates of Nevada Canal, and 1.5 mi northeast of Vale.

DRAINAGE AREA.--3,880 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--June 1926 to September 1934, April 1936 to March 1942, March 1944 to September 1954, October 1993 to September 1994. Monthly discharge only for some periods, published in WSP 1317.

GAGE.--Water-stage recorder. Elevation of gage is 2,220 ft above sea level, from topographic map. Prior to Nov. 17, 1930, at datum 1.00 ft higher.

REMARKS.--Records good except for estimated daily discharges, which are fair. Many diversions for irrigation upstream from station. Since March 1930, Vale-Oregon Canal has diverted in sec.31 T.20 S., R.41 E., for irrigation upstream from station and on Willow Creek, a tributary which enters partly above and partly below station. Gilleman-Frohman Canal diverts on left bank in sec.8 T.19 S., R.44 E., for irrigation above and below station. Nevada Canal diverts on right bank 300 ft above station for irrigation below station. Flow regulated by Warm Springs Reservoir and, since December 1935, by Beulah Reservoir.

AVERAGE DISCHARGE.--14 years (water years 1937-41, 1945-52, 1994), 200 ft<sup>3</sup>/s.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,530 ft<sup>3</sup>/s Feb. 28, 1940, gage height, 8.88 ft; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Feb. 24, 1957 reached a stage of 14.6 ft, discharge 21,000 ft<sup>3</sup>/s. Flood of Mar. 19, 1993 reached a stage of 13.31 ft, discharge 16,000 ft<sup>3</sup>/s.

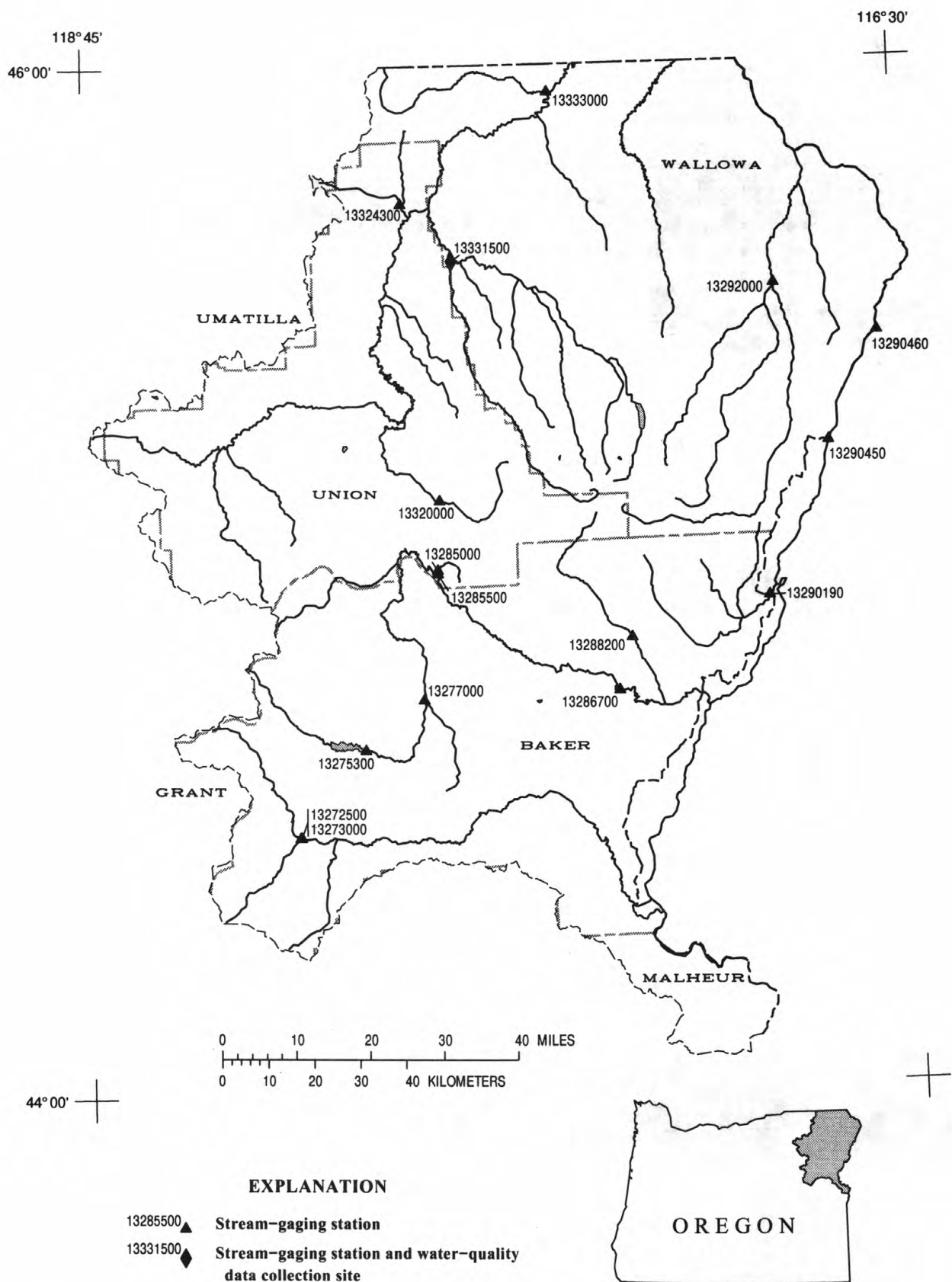
EXTREMES FOR CURRENT YEAR.--Maximum discharge, 599 ft<sup>3</sup>/s Oct 27, gage height, 2.80 ft; minimum discharge, 7.5 ft<sup>3</sup>/s Sept. 28, 29, gage height, 1.02 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

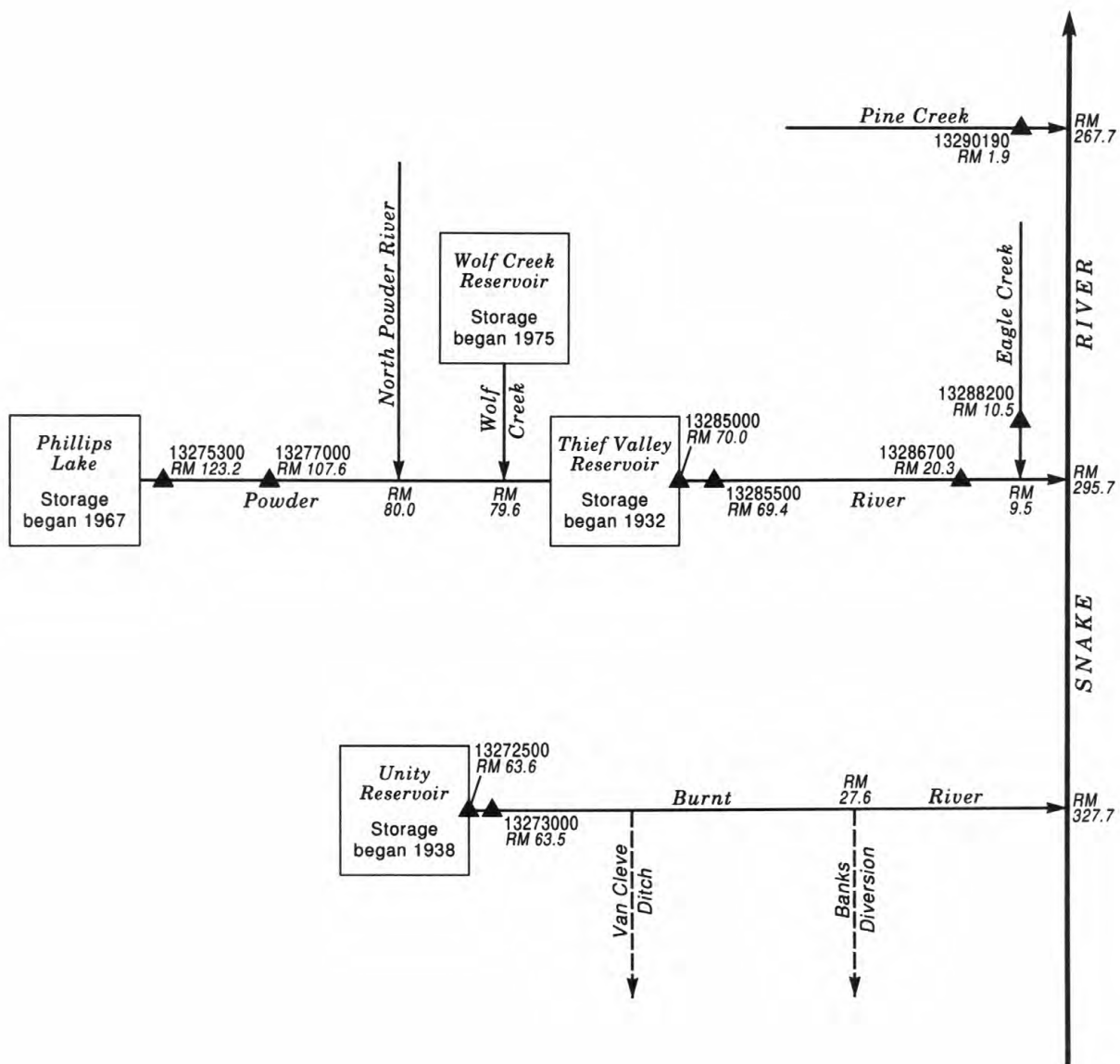
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e290	162	114	131	108	109	15	53	87	22	60	14
2	e285	158	117	127	103	106	15	44	79	21	55	14
3	e280	155	128	134	100	103	36	25	67	23	57	14
4	e260	152	141	136	102	99	55	20	60	28	40	12
5	e250	156	149	138	104	84	54	20	68	44	29	12
6	234	150	147	136	106	80	26	31	64	62	21	12
7	217	145	141	131	121	80	18	40	69	60	19	12
8	213	143	145	131	114	80	26	59	76	54	20	12
9	214	137	153	131	106	80	43	73	81	54	19	11
10	220	135	149	135	115	80	68	42	70	42	18	11
11	227	135	146	135	112	80	78	59	62	42	18	11
12	229	132	149	129	94	80	70	62	61	42	16	11
13	225	127	145	132	93	80	51	57	62	42	17	11
14	236	122	143	131	85	80	35	66	47	36	18	10
15	247	122	142	129	85	80	33	129	55	25	15	9.8
16	233	123	140	129	85	72	53	296	59	22	14	9.8
17	246	123	138	129	83	69	46	152	61	21	13	9.8
18	221	120	138	129	85	67	24	183	53	20	13	9.8
19	206	114	135	129	84	67	18	165	52	20	13	9.8
20	194	112	126	129	81	67	25	162	46	21	13	9.8
21	199	111	126	129	81	67	23	160	36	20	13	9.8
22	197	116	133	128	80	67	17	216	41	21	13	9.8
23	189	115	117	126	78	57	17	192	33	20	13	9.8
24	185	103	118	122	77	44	26	181	31	19	14	9.8
25	192	102	113	121	77	26	64	164	40	22	20	10
26	190	100	115	124	81	20	75	127	44	38	15	11
27	233	99	125	121	87	23	59	119	85	40	14	11
28	236	106	119	122	110	28	63	107	61	44	14	10
29	217	104	120	120	---	32	56	81	38	44	14	8.0
30	196	110	125	118	---	21	55	80	24	42	14	11
31	178	---	126	114	---	16	---	81	---	48	14	---
TOTAL	6939	3789	4123	3976	2637	2044	1244	3246	1712	1059	646	326.0
MEAN	224	126	133	128	94.2	65.9	41.5	105	57.1	34.2	20.8	10.9
MAX	290	162	153	138	121	109	78	296	87	62	60	14
MIN	178	99	113	114	77	16	15	20	24	19	13	8.0
AC-FT	13760	7520	8180	7890	5230	4050	2470	6440	3400	2100	1280	647

WTR YR 1994 TOTAL 31741.0 MEAN 87.0 MAX 296 MIN 8.0 AC-FT 62960

e Estimated



**Figure 8.** Location of surface-water and water-quality stations in the Burnt River, Powder River, Pine Creek, Imnaha River, and Grande Ronde River Basins.



- EXPLANATION**
- ▲ 13285000 Stream-gaging station
  - RM 70.0 River mile
  - Stream—Arrow shows direction of flow
  - Tunnel, canal or pipe—Arrow shows direction of flow

**Figure 9.** Schematic diagram showing gaging stations in Burnt and Powder River Basins.

## BURNT RIVER BASIN

13272500 UNITY RESERVOIR NEAR UNITY, OR

LOCATION.--Lat 44°30'13", long 118°10'45", in SE 1/4 SW 1/4 sec.21, T.12 S., R.37 E., Baker County, Hydrologic Unit 17050202, at spillway near right end of dam on Burnt River, 4.4 mi north of Unity, and at mile 63.6.

DRAINAGE AREA.--309 mi<sup>2</sup>.

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

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

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

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

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

EXTREMES FOR CURRENT YEAR.--Maximum contents, 24,880 acre-ft May 6, 8, elevation, 3,819.63 ft; minimum recorded contents, 1,899 acre-ft Sept. 11, elevation, 3,784.82, but was probably lower during period of missing record Sept. 12-30.

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

3,780	590	3,805	12,960
3,785	1,960	3,810	16,680
3,790	4,020	3,815	20,770
3,795	6,610	3,820	25,220
3,800	9,600	3,821	26,150

RESERVOIR ELEVATION SURFACE WATER (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3797.02	3798.49	3800.45	3803.33	3806.17	3809.06	3815.33	3819.47	3815.66	3809.62	3801.25	3789.74
2	3796.95	3798.60	3800.54	3803.43	3806.27	3809.22	3815.57	3819.44	3815.53	3809.38	3800.84	3789.29
3	3796.89	3798.72	3800.64	3803.56	3806.34	3809.38	3815.80	3819.46	3815.34	3809.12	3800.55	3788.87
4	3796.86	3798.82	3800.74	3803.71	3806.41	3809.56	3816.03	3819.47	3815.20	3808.95	3800.25	3788.38
5	3796.84	3798.91	3800.83	3803.84	3806.47	3809.76	3816.21	3819.53	3815.02	3808.71	3799.83	3787.90
6	3796.85	3799.03	3800.94	3803.92	3806.56	3809.95	3816.39	3819.57	3814.83	3808.53	3799.51	3787.40
7	3796.82	3799.12	3801.05	3804.01	3806.64	3810.11	3816.57	3819.57	3814.65	3808.04	3799.21	3786.89
8	3796.80	3799.21	3801.20	3804.11	3806.70	3810.28	3816.75	3819.57	3814.57	3807.95	3798.84	3786.43
9	3796.83	3799.29	3801.30	3804.22	3806.79	3810.44	3816.93	3819.55	3814.45	3807.73	3798.44	3785.90
10	3796.84	3799.40	3801.44	3804.30	3806.90	3810.64	3817.15	3819.48	3814.34	3807.46	3798.07	3785.28
11	3796.86	3799.50	3801.56	3804.40	3806.96	3810.87	3817.34	3819.32	3814.14	3807.21	3797.73	3784.85
12	3796.91	3799.57	3801.64	3804.50	3807.03	3811.11	3817.49	3819.17	3813.94	3806.94	3797.37	---
13	3796.99	3799.63	3801.74	3804.62	3807.13	3811.34	3817.66	3819.01	3813.66	3806.72	3797.04	---
14	3797.05	3799.69	3801.84	3804.69	3807.23	3811.57	3817.83	3818.82	3813.45	3806.42	3796.67	---
15	3797.09	3799.75	3801.93	3804.81	3807.31	3811.91	3818.00	3818.54	3813.20	3806.20	3796.30	---
16	3797.14	3799.82	3802.02	3804.90	3807.36	3812.23	3818.16	3818.34	3813.01	3805.96	3795.96	---
17	3797.24	3799.91	3802.12	3805.00	3807.49	3812.52	3818.35	3818.14	3812.84	3805.71	3795.58	---
18	3797.31	3799.95	3802.21	3805.09	3807.57	3812.77	3818.54	3817.95	3812.62	3805.40	3795.24	---
19	3797.35	3799.98	3802.29	3805.17	3807.66	3812.98	3818.75	3817.81	3812.44	3805.13	3794.89	---
20	3797.41	3800.01	3802.35	3805.25	3807.73	3813.23	3818.97	3817.64	3812.23	3804.86	3794.53	---
21	3797.46	3800.05	3802.42	3805.33	3807.81	3813.45	3819.09	3817.52	3812.03	3804.63	3794.17	---
22	3797.53	3800.13	3802.52	3805.43	3807.89	3813.58	3819.20	3817.45	3811.84	3804.27	3793.80	---
23	3797.59	3800.13	3802.59	3805.52	3808.00	3813.72	3819.25	3817.35	3811.57	3803.95	3793.48	---
24	3797.64	3800.12	3802.66	3805.60	3808.26	3813.85	3819.29	3817.26	3811.34	3803.61	3793.10	---
25	3797.72	3800.10	3802.72	3805.70	3808.42	3813.98	3819.38	3817.13	3811.09	3803.32	3792.76	---
26	3797.82	3800.09	3802.79	3805.77	3808.60	3814.09	3819.42	3816.95	3810.82	3803.04	---	---
27	3797.93	3800.11	3802.89	3805.85	3808.76	3814.21	3819.42	3816.65	3810.61	3802.75	---	---
28	3798.06	3800.13	3802.96	3805.94	3808.91	3814.40	3819.44	3816.44	3810.40	3802.40	---	---
29	3798.17	3800.21	3803.03	3806.03	---	3814.59	3819.46	3816.24	3810.11	3802.13	---	---
30	3798.26	3800.31	3803.12	3806.09	---	3814.81	3819.44	3816.04	3809.87	3801.79	3790.61	---
31	3798.39	---	3803.21	3806.15	---	3815.02	---	3815.80	---	3801.49	3790.18	---
MAX	3798.39	3800.31	3803.21	3806.15	3808.91	3815.02	3819.46	3819.57	3815.66	3809.62	---	---
MIN	3796.80	3798.49	3800.45	3803.33	3806.17	3809.06	3815.33	3815.80	3809.87	3801.49	---	---
(†)	8590	9800	11710	13780	15850	20790	24710	21460	16580	10560	4110	a530
(†)	+780	+1210	+1910	+2070	+2070	+4940	+3920	-3250	-4880	-6020	-6450	-3580

CAL YR 1993 MAX 3820.52 MIN --- AC-FT# +6110  
WTR YR 1994 MAX 3819.63 MIN --- AC-FT# -7280

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



## BURNT RIVER BASIN

71

13273000 BURNT RIVER NEAR HEREFORD, OR

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

DRAINAGE AREA.--309 mi<sup>2</sup>.

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

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

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

REMARKS.--Records good. Flow regulated since 1938 by Unity Reservoir (station 13272500). Diversions for irrigation upstream from station. U.S. Bureau of Reclamation satellite telemeter at station.

AVERAGE DISCHARGE.--66 years (water years 1929-94), 84.8 ft<sup>3</sup>/s, 61,440 acre-ft/yr.

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 135 ft<sup>3</sup>/s June 4, gage height, 3.79 ft; minimum discharge, 0.08 ft<sup>3</sup>/s Sept. 22, 23.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	39	8.1	7.7	5.6	5.7	8.1	3.7	39	109	97	107	102
2	30	8.1	7.7	5.5	5.5	8.3	4.0	39	101	93	106	104
3	30	8.1	7.7	5.7	5.6	8.5	3.0	39	100	92	106	103
4	22	8.1	7.9	5.8	5.7	6.9	2.3	35	96	92	108	101
5	15	8.1	8.1	5.8	5.6	6.2	6.3	33	84	90	110	101
6	15	8.1	8.1	5.8	5.4	6.6	8.5	33	84	89	109	104
7	15	8.1	8.1	5.9	5.4	6.9	8.5	33	81	95	108	103
8	14	8.1	8.0	6.1	5.3	7.2	8.8	33	75	98	107	100
9	12	8.1	7.7	6.1	5.2	8.5	8.7	39	74	98	106	100
10	12	8.4	7.7	6.1	5.2	6.8	8.6	54	77	98	105	103
11	12	8.5	7.7	6.4	5.3	6.8	8.9	79	90	97	104	100
12	12	13	7.7	6.4	5.4	6.3	8.8	79	96	96	103	102
13	12	16	7.7	7.4	5.5	6.1	8.9	86	110	96	102	100
14	12	16	7.7	7.9	5.5	6.1	8.6	119	110	96	101	95
15	12	16	8.0	7.1	5.5	6.1	9.1	118	110	96	100	87
16	12	16	8.1	6.7	5.7	6.1	9.3	118	109	95	98	87
17	e9.7	16	8.1	6.5	5.9	5.8	9.7	118	105	94	97	89
18	8.1	16	8.1	6.1	6.1	5.4	9.9	118	95	94	96	47
19	7.7	19	7.8	6.1	6.1	4.8	10	118	94	100	94	28
20	7.7	21	7.7	5.9	6.2	4.7	10	117	94	104	93	9.8
21	7.7	21	7.7	5.5	6.1	4.3	10	99	94	103	91	.54
22	8.0	21	7.7	5.4	6.2	3.1	43	82	93	106	90	.21
23	8.1	21	7.7	5.3	6.3	2.2	60	77	93	114	89	.92
24	8.1	21	7.7	5.5	6.6	2.3	60	77	97	114	92	1.5
25	8.1	21	7.7	5.7	6.9	2.4	60	81	101	112	93	2.0
26	8.1	21	7.8	5.8	7.2	2.1	59	115	103	109	98	4.0
27	8.1	21	8.1	5.8	7.7	1.9	59	124	104	102	99	13
28	8.1	19	8.1	5.8	8.1	2.1	52	124	103	101	97	12
29	8.1	15	7.2	6.0	--	3.1	42	123	103	103	95	5.9
30	8.1	12	5.8	6.1	--	3.7	39	123	102	109	101	5.1
31	8.1	--	5.8	6.0	--	3.6	--	123	--	108	104	--
TOTAL	397.8	431.8	238.6	187.8	166.9	163.0	639.6	2595	2887	3091	3109	1810.97
MEAN	12.8	14.4	7.70	6.06	5.96	5.26	21.3	83.7	96.2	99.7	100	60.4
MAX	39	21	8.1	7.9	8.1	8.5	60	124	110	114	110	104
MIN	7.7	8.1	5.8	5.3	5.2	1.9	2.3	33	74	89	89	.21
AC-FT	789	856	473	373	331	323	1270	5150	5730	6130	6170	3590

CAL YR 1993 TOTAL 43045.0 MEAN 118 MAX 864 MIN 4.0 AC-FT 85380  
WTR YR 1994 TOTAL 15718.47 MEAN 43.1 MAX 124 MIN .21 AC-FT 31180

e Estimated

## POWDER RIVER BASIN

13275300 POWDER RIVER NEAR SUMPTER, OR

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

DRAINAGE AREA.--168 mi<sup>2</sup>, approximately. Prior to Oct. 1, 1970, 170 mi<sup>2</sup> at cableway, 0.5 mi downstream.

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

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

REMARKS.--No estimated daily discharges. Records good except for the period Jan. 3 to Mar. 4, which are fair and discharges below 5 ft<sup>3</sup>/s, which are poor. Flow completely regulated since Oct. 31, 1967, by Phillips Lake, active capacity, 90,540 acre-ft. Many small diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--29 years (water years 1966-94), 106 ft<sup>3</sup>/s, 76,800 acre-ft/yr, not adjusted for storage in Phillips Lake.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 971 ft<sup>3</sup>/s Apr. 30, 1965, gage height, 4.43 ft; no flow Nov. 12, 1967; Nov. 23-29, 1988; Sept. 29, 1989.

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 315 ft<sup>3</sup>/s Aug. 13, gage height, 3.22 ft; minimum discharge, 7.3 ft<sup>3</sup>/s Feb. 2-7.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	33	8.0	13	19	8.2	9.4	23	186	203	230	239	139
2	10	8.4	13	25	7.5	8.1	23	184	188	227	237	131
3	9.3	9.0	13	32	7.3	8.2	23	179	175	234	235	131
4	8.6	10	13	30	7.3	8.8	28	169	175	239	251	121
5	8.2	11	13	8.9	7.3	8.6	44	170	184	239	245	116
6	8.2	11	13	8.6	7.3	8.6	60	170	207	239	230	103
7	8.0	11	13	8.5	7.5	8.6	60	180	203	239	226	83
8	7.7	11	13	9.3	7.9	8.6	60	191	189	237	239	76
9	7.7	11	13	9.8	8.7	8.6	60	204	159	236	249	75
10	7.7	12	13	11	10	8.6	60	225	131	230	259	75
11	8.1	12	13	11	12	8.6	60	233	122	224	262	69
12	8.2	12	13	11	12	8.6	60	233	122	222	280	46
13	8.2	12	13	8.6	9.6	8.6	60	245	133	237	305	35
14	8.2	12	13	8.8	8.3	8.6	60	252	145	246	314	35
15	8.2	12	13	9.9	9.4	8.6	75	252	136	246	311	35
16	8.2	13	13	12	9.6	8.6	83	256	115	246	309	35
17	8.2	13	13	15	9.6	8.6	83	269	106	246	281	35
18	8.5	13	13	18	11	8.6	122	269	106	269	276	35
19	8.6	13	13	19	12	8.6	174	260	106	282	276	35
20	8.6	13	13	17	12	8.6	188	228	110	278	276	24
21	8.6	13	13	9.6	12	8.9	186	214	129	270	276	19
22	8.6	13	13	11	11	9.6	197	215	165	243	259	18
23	8.4	13	13	12	11	9.6	203	230	206	208	252	19
24	8.2	13	13	14	11	9.6	205	239	230	199	228	19
25	8.5	13	14	12	11	9.6	192	240	220	194	217	19
26	8.6	13	14	15	15	9.9	163	240	214	217	229	19
27	8.6	13	15	14	12	10	161	239	214	227	234	19
28	8.3	12	16	12	10	10	179	239	230	233	221	19
29	8.2	12	18	11	---	9.9	186	233	239	242	202	19
30	8.0	13	17	10	---	9.6	186	212	238	242	187	19
31	7.7	---	15	9.0	---	18	---	203	---	241	153	---
TOTAL	283.1	355.4	421	422.0	277.5	286.8	3264	6859	5100	7362	7758	1623
MEAN	9.13	11.8	13.6	13.6	9.91	9.25	109	221	170	237	250	54.1
MAX	33	13	18	32	15	18	205	269	239	282	314	139
MIN	7.7	8.0	13	8.5	7.3	8.1	23	169	106	194	153	18
AC-FT	562	705	835	837	550	569	6470	13600	10120	14600	15390	3220

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 1994, BY WATER YEAR (WY)

MEAN	11.4	8.27	7.92	13.0	15.6	49.4	125	289	269	204	214	81.2
MAX	19.6	16.0	14.0	105	67.7	317	355	519	546	411	301	171
(WY)	1981	1985	1984	1984	1984	1982	1984	1975	1983	1984	1974	1974
MIN	2.55	.46	.50	.36	.78	1.10	4.81	123	101	77.1	56.0	21.7
(WY)	1974	1968	1968	1968	1968	1968	1993	1991	1990	1992	1976	1984

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1968 - 1994

ANNUAL TOTAL	28827.2	34011.8	108
ANNUAL MEAN	79.0	93.2	186
HIGHEST ANNUAL MEAN			60.0
LOWEST ANNUAL MEAN			592
HIGHEST DAILY MEAN	382	Aug 6	314
LOWEST DAILY MEAN	1.2	Apr 11	7.3
ANNUAL SEVEN-DAY MINIMUM	1.8	Mar 13	7.4
ANNUAL RUNOFF (AC-FT)	57180	67460	78140
10 PERCENT EXCEEDS	236	240	303
50 PERCENT EXCEEDS	13	19	18
90 PERCENT EXCEEDS	4.3	8.6	4.5

## POWDER RIVER BASIN

73

## 13277000 POWDER RIVER AT BAKER CITY, OR

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

DRAINAGE AREA.--351 mi<sup>2</sup>.

PERIOD OF RECORD.--May to September 1913, April to July 1914, November 1971 to current year. Monthly discharge only May 1913, April 1914 published in WSP 1317. November 1971 to September 1978 in reports of Oregon Water Resources Department. Prior to October 1990, published as "at Baker".

REVISED RECORDS.--WSP 1317: 1913.

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

REMARKS.--Records good except for the period Mar. 3 to Apr. 5, which are fair and for estimated daily discharges, which are poor. Flow regulated since Oct. 31, 1967, by Phillips Lake, active capacity, 90,540 acre-ft. Old Settlers Slough diverts from left bank 0.2 mi upstream for irrigation downstream from station. U.S. Bureau of Reclamation satellite telemeter at station. Continuous water-quality records for the period October 1960 to September 1961 have been collected at this location.

AVERAGE DISCHARGE.--22 years, 101 ft<sup>3</sup>/s, 73,170 acre-ft/yr.

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 234 ft<sup>3</sup>/s May 19, Aug. 14, gage height, 2.87 ft; minimum daily discharge, 9.7 ft<sup>3</sup>/s Oct. 12, Sept. 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	41	15	e25	e30	27	49	18	110	147	151	161	79
2	22	15	e25	34	25	46	18	111	140	147	161	70
3	19	18	e25	44	25	39	18	114	123	151	162	73
4	16	17	e26	42	25	36	18	112	120	159	180	73
5	13	18	e30	28	25	38	17	115	120	161	180	67
6	11	18	e37	22	26	38	e25	107	148	167	170	66
7	11	18	48	28	e21	37	e35	111	150	165	157	54
8	10	19	54	27	e16	35	33	125	140	165	169	50
9	10	20	57	19	e20	34	33	132	126	163	175	53
10	9.8	19	49	19	e24	33	32	153	102	162	184	55
11	9.8	20	38	19	e29	32	31	161	80	151	191	54
12	9.7	20	30	18	35	31	27	155	77	148	197	45
13	11	20	40	19	40	30	25	158	80	157	216	23
14	12	26	38	20	41	29	25	169	95	173	230	19
15	13	29	24	20	39	29	29	167	91	172	229	23
16	13	24	24	20	38	29	45	170	79	169	227	25
17	13	20	23	19	36	29	45	188	68	174	207	26
18	12	20	23	22	31	29	56	192	67	186	189	26
19	13	21	e22	23	22	28	103	206	67	212	186	27
20	17	27	e21	23	23	28	117	194	63	202	186	30
21	17	30	e22	31	25	27	115	158	74	200	185	17
22	17	25	e22	30	23	27	117	156	95	178	180	13
23	17	e21	e22	25	17	26	128	160	129	146	169	12
24	17	e18	e22	20	32	26	142	173	167	133	160	14
25	16	e17	e22	18	25	25	131	168	157	125	142	14
26	16	e19	e22	18	48	24	104	169	149	133	145	14
27	16	e21	e22	15	89	23	87	173	143	149	153	14
28	15	e22	e25	17	46	23	97	174	144	150	148	11
29	15	e23	e27	23	---	22	107	173	160	161	134	9.7
30	15	e24	e30	21	---	21	111	156	156	160	123	12
31	15	---	e26	23	---	20	---	141	---	163	93	---
TOTAL	462.3	624	921	737	873	943	1889	4751	3457	5033	5389	1068.7
MEAN	14.9	20.8	29.7	23.8	31.2	30.4	63.0	153	115	162	174	35.6
MAX	41	30	57	44	89	49	142	206	167	212	230	79
MIN	9.7	15	21	15	16	20	17	107	63	125	93	9.7
AC-FT	917	1240	1830	1460	1730	1870	3750	9420	6860	9980	10690	2120

CAL YR 1993 TOTAL 29441.0 MEAN 80.7 MAX 357 MIN 8.0 AC-FT 58400  
WTR YR 1994 TOTAL 26148.0 MEAN 71.6 MAX 230 MIN 9.7 AC-FT 51860

e Estimated

## POWDER RIVER BASIN

13285000 THIEF VALLEY RESERVOIR NEAR NORTH POWDER, OR

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

DRAINAGE AREA.--910 mi<sup>2</sup>, approximately.

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

GAGE.--Water-stage recorder. Datum of gage is sea level (Bureau of Reclamation bench mark).

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

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

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 18,900 acre-ft July 2, 1982, elevation, 3,134.99 ft; no contents observed Sept. 17, 1987; probably no contents most days during September 1987, Sept. 7-18, 1988, August to September 1992, several days in October 1992, August 25 to September 30, 1994.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 17,830 acre-ft Feb. 28, elevation, 3,133.57 no usable contents August 25 to September 30.

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

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

RESERVOIR ELEVATION SURFACE WATER (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3114.81	3118.90	3125.67	3133.24	3133.18	3133.52	3133.33	3133.21	3133.35	3129.43	3117.77	---
2	3114.58	3119.17	3125.94	3133.23	3133.18	3133.52	3133.32	3133.19	3133.40	3129.03	3117.28	---
3	3114.36	3119.39	3126.27	3133.27	3133.18	3133.52	3133.30	3133.23	3133.41	3128.67	3116.80	---
4	3114.12	3119.60	3126.54	3133.33	3133.18	3133.54	3133.26	3133.24	3133.39	3128.35	3116.28	---
5	3113.88	3119.78	3126.80	3133.33	3133.18	3133.47	3133.29	3133.24	3133.29	3128.01	3115.77	---
6	3113.62	3120.04	3127.05	3133.29	3133.18	3133.43	3133.29	3133.26	3133.30	3127.72	3115.23	---
7	3113.34	3120.25	3127.42	3133.26	3133.18	3133.39	3133.28	3133.23	3133.27	3127.45	3114.74	---
8	3113.28	3120.50	3127.74	3133.26	3133.13	3133.38	3133.29	3133.18	3133.32	3127.17	3114.19	---
9	3113.39	3120.72	3128.17	3133.27	3133.16	3133.39	3133.30	3133.23	3133.29	3126.89	3113.69	---
10	3113.56	3120.95	3128.66	3133.26	3133.21	3133.38	3133.26	3133.30	3133.28	3126.53	3113.19	---
11	3113.76	3121.17	3129.29	3133.27	3133.22	3133.36	3133.29	3133.29	3133.27	3126.19	3112.66	---
12	3114.02	3121.45	3129.75	3133.27	3133.19	3133.37	3133.26	3133.31	3133.22	3125.84	3112.02	---
13	3114.25	3121.72	3130.15	3133.28	3133.18	3133.37	3133.24	3133.28	3133.08	3125.45	3111.28	---
14	3114.52	3121.90	3130.49	3133.31	3133.22	3133.38	3133.23	3133.23	3132.93	3125.06	3110.57	---
15	3114.82	3122.10	3130.87	3133.32	3133.24	3133.38	3133.25	3133.18	3132.83	3124.65	3109.82	---
16	3115.16	3122.38	3131.15	3133.30	3133.26	3133.36	3133.24	3133.16	3132.80	3124.28	3109.09	---
17	3115.44	3122.50	3131.52	3133.27	3133.29	3133.36	3133.23	3133.06	3132.79	3123.89	3108.39	---
18	3115.67	3122.86	3131.81	3133.26	3133.30	3133.34	3133.23	3132.97	3132.73	3123.45	3107.65	---
19	3115.93	3123.09	3132.04	3133.25	3133.28	3133.33	3133.20	3132.93	3132.66	3123.02	3106.82	---
20	3116.23	3123.31	3132.30	3133.25	3133.26	3133.32	3133.24	3133.08	3132.57	3122.62	3105.89	---
21	3116.45	3123.51	3132.56	3133.26	3133.25	3133.31	3133.20	3133.24	3132.39	3122.25	3104.83	---
22	3116.74	3123.79	3132.83	3133.29	3133.25	3133.29	3133.21	3133.30	3132.11	3121.89	3103.66	---
23	3117.02	3123.95	3133.04	3133.26	3133.26	3133.29	3133.21	3133.34	3131.78	3121.54	3102.29	---
24	3117.22	3123.99	3133.13	3133.28	3133.29	3133.30	3133.21	3133.36	3131.46	3121.20	3100.39	---
25	3117.36	3124.15	3133.17	3133.28	3133.29	3133.28	3133.26	3133.39	3131.17	3120.82	---	---
26	3117.53	3124.39	3133.19	3133.28	3133.34	3133.30	3133.25	3133.39	3130.82	3120.41	---	---
27	3117.70	3124.60	3133.21	3133.23	3133.54	3133.32	3133.24	3133.48	3130.55	3119.99	---	---
28	3117.99	3124.87	3133.19	3133.24	3133.56	3133.32	3133.21	3133.45	3130.24	3119.58	---	---
29	3118.22	3125.09	3133.19	3133.23	---	3133.32	3133.22	3133.39	3129.91	3119.15	---	---
30	3118.43	3125.36	3133.20	3133.24	---	3133.32	3133.19	3133.38	3129.71	3118.69	---	---
31	3118.68	---	3133.22	3133.20	---	3133.33	---	3133.36	---	3118.25	---	---
MAX	3118.68	3125.36	3133.22	3133.33	3133.56	3133.54	3133.33	3133.48	3133.41	3129.43	---	---
MIN	3113.28	3118.90	3125.67	3133.20	3133.13	3133.28	3133.19	3132.93	3129.71	3118.25	---	---
(†)	8230	12100	17560	17550	17820	17650	17540	17670	15010	8000	a0	a0
(+)	+1840	+3870	+5460	-10	+270	-170	-110	+130	-2660	-7010	-8000	0

CAL YR 1993 AC-FT† +9390

WTR YR 1994 AC-FT† -6390

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

† Change in contents, in acre-ft.

a Interpolated.



## 75

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

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

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

AVERAGE DISCHARGE.--16 years (water years 1979-94), 193 ft<sup>3</sup>/s, 139,800 acre-ft/yr.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 351 ft<sup>3</sup>/s Feb. 28, gage height, 6.69 ft; minimum daily discharge, 0.42 ft<sup>3</sup>/s Dec. 19.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	90	3.6	1.7	92	75	278	95	38	141	93	120	4.7
2	90	3.6	1.6	90	73	254	88	43	149	128	118	3.8
3	90	3.6	1.4	95	76	246	90	36	169	121	117	3.2
4	90	3.4	1.3	126	75	263	80	41	161	113	116	4.4
5	89	3.4	1.2	150	75	264	67	53	146	110	114	6.1
6	89	3.3	1.3	138	73	222	77	58	137	110	112	6.0
7	89	3.3	.99	114	87	185	81	70	126	109	111	4.6
8	54	3.4	1.1	107	66	166	75	77	126	108	109	2.8
9	31	3.4	.80	110	52	155	89	70	118	110	108	2.4
10	22	3.1	.80	110	68	155	85	104	95	126	106	3.8
11	8.3	3.1	.73	107	78	149	65	120	89	126	104	4.1
12	7.9	3.1	.73	107	80	136	69	131	78	126	123	3.7
13	7.6	3.3	.66	110	72	135	67	137	95	125	131	4.9
14	7.1	3.3	.66	118	68	132	60	101	105	124	116	21
15	7.1	3.3	.53	134	86	130	49	81	104	123	113	20
16	7.2	3.3	.80	130	89	130	43	81	101	123	110	13
17	7.2	3.3	.53	117	97	127	34	86	100	122	107	9.4
18	7.3	3.4	.53	109	108	128	28	89	100	121	104	7.9
19	7.3	3.4	.42	104	106	121	32	87	100	120	102	5.7
20	7.3	3.4	.48	104	92	116	27	88	100	118	100	4.8
21	7.3	3.4	.48	94	91	116	42	119	103	117	97	4.5
22	7.6	3.4	.59	106	91	113	37	159	125	116	93	4.9
23	7.6	2.8	1.1	104	98	98	35	157	125	115	91	5.6
24	12	2.7	51	98	113	98	42	135	125	115	88	4.7
25	21	2.4	60	101	113	100	63	143	125	114	69	4.1
26	21	2.2	67	108	126	94	82	162	125	113	6.7	3.7
27	14	2.2	79	107	216	88	82	233	125	112	5.3	3.6
28	3.9	2.3	76	96	335	88	58	232	124	111	3.8	4.1
29	3.8	2.3	76	91	---	86	39	204	120	110	2.3	4.3
30	3.8	1.7	81	97	---	86	44	162	72	108	1.6	5.3
31	3.6	---	80	85	---	90	---	150	---	113	2.8	---
TOTAL	913.9	92.4	590.43	3359	2779	4549	1825	3447	3509	3600	2701.5	181.1
MEAN	29.5	3.08	19.0	108	99.2	147	60.8	111	117	116	87.1	6.04
MAX	90	3.6	81	150	335	278	95	233	169	128	131	21
MIN	3.6	1.7	.42	85	52	86	27	36	72	93	1.6	2.4
AC-FT	1810	183	1170	6660	5510	9020	3620	6840	6960	7140	5360	359
CAL YR 1993	TOTAL 63551.03			MEAN 174	MAX 1420	MIN .00	AC-FT 126100					
WTR YR 1994	TOTAL 27547.33			MEAN 75.5	MAX 335	MIN .42	AC-FT 54640					

## POWDER RIVER BASIN

13286700 POWDER RIVER NEAR RICHLAND, OR

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

DRAINAGE AREA.--1,310 mi<sup>2</sup>, approximately.

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

GAGE.--Water-stage recorder. Datum of gage is 2,277.42 ft above sea level.

REMARKS.--Records good except for estimated daily discharges, which are poor. Flow regulated by Phillips Lake since October 1967, usable capacity, 90,540 acre-ft, Wolf Creek Reservoir since April 1975, usable capacity, 10,400 acre-ft, Thief Valley Reservoir since February 1932, usable capacity, 17,400 acre-ft, and Pilcher Creek Reservoir since April 1984, usable capacity, 5,560 acre-ft. Diversions for irrigation upstream and downstream from station. Continuous water-quality records for the period June 1959 to September 1961 have been collected at this location.

AVERAGE DISCHARGE.--37 years, 250 ft<sup>3</sup>/s, 181,100 acre-ft/yr.

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 645 ft<sup>3</sup>/s Feb. 28, gage height, 3.24 ft; maximum gage height 3.72 ft Feb. 6, backwater from ice; minimum discharge, 3.2 ft<sup>3</sup>/s July 19, 20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	66	44	e39	e136	e110	485	234	94	86	55	32	37
2	66	43	e37	e135	e110	459	242	85	78	47	40	24
3	68	42	e43	e145	e115	436	251	80	81	38	37	16
4	72	41	e42	e185	e115	446	253	69	94	35	36	15
5	77	41	e36	208	e110	460	228	65	100	35	35	16
6	80	40	e42	207	e110	400	209	76	132	47	33	15
7	91	41	e46	181	e125	336	217	62	135	42	31	14
8	84	41	e49	163	e105	292	203	46	123	40	36	13
9	88	e40	49	154	e85	267	197	51	87	29	34	12
10	72	40	51	154	e100	257	206	47	82	23	31	12
11	80	e40	50	159	e110	256	194	40	72	20	29	12
12	68	40	51	157	e115	248	177	46	60	30	28	12
13	60	40	47	161	e105	241	180	53	62	33	30	11
14	61	e39	43	167	e100	241	169	62	59	26	35	11
15	59	e39	43	188	120	246	160	59	68	22	41	12
16	57	40	41	199	124	269	153	45	78	23	34	14
17	59	41	39	185	126	273	157	36	73	12	33	14
18	59	41	e37	167	136	259	177	33	64	6.1	32	15
19	56	e37	e33	156	142	249	195	39	62	3.9	32	13
20	53	e32	e35	149	139	230	206	45	70	4.2	26	12
21	53	e35	e35	137	125	217	200	40	66	3.5	12	10
22	49	e38	e36	140	122	207	182	37	65	7.0	6.7	10
23	47	e34	e40	150	126	195	152	71	66	8.6	5.5	11
24	47	e30	e39	148	165	176	153	85	73	6.6	6.0	11
25	47	e27	e39	144	179	172	150	61	69	21	11	10
26	48	e28	e55	148	194	169	152	66	74	31	11	9.9
27	58	e31	e120	152	400	161	150	79	80	31	12	9.7
28	59	e34	e118	144	517	166	144	127	72	32	18	9.5
29	54	e37	e118	132	---	186	124	149	67	23	15	9.6
30	45	e39	e125	134	---	203	99	132	58	26	25	9.8
31	44	---	e123	123	---	213	---	102	---	44	33	---
TOTAL	1927	1135	1701	4908	4130	8415	5514	2082	2356	804.9	820.2	400.5
MEAN	62.2	37.8	54.9	158	147	271	184	67.2	78.5	26.0	26.5	13.3
MAX	91	44	125	208	517	485	253	149	135	55	41	37
MIN	44	27	33	123	85	161	99	33	58	3.5	5.5	9.5
AC-FT	3820	2250	3370	9740	8190	16690	10940	4130	4670	1600	1630	794

CAL YR 1993 TOTAL 97178 MEAN 266 MAX 2590 MIN 12 AC-FT 192800  
WTR YR 1994 TOTAL 34193.6 MEAN 93.7 MAX 517 MIN 3.5 AC-FT 67820

e Estimated

## POWDER RIVER BASIN

77

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

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

DRAINAGE AREA.--156 mi<sup>2</sup>.

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

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

REMARKS.--Records good except for estimated daily discharges, which are poor. No regulation. Some diversions upstream from station for irrigation and one small interbasin diversion for irrigation supply. All diversions are small compared to flow at station during irrigation season. Continuous water-quality records for the period June 1959 to September 1961 have been collected at this location.

AVERAGE DISCHARGE.--37 years, 310 ft<sup>3</sup>/s, 224,600 acre-ft/yr.

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

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

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
May 12	0430	*1,650	*3.52				

Minimum daily discharge, 51 ft<sup>3</sup>/s Feb. 10, during period of ice effect.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	93	77	e80	e64	e58	82	227	409	548	235	116	77
2	91	79	e80	e64	e58	96	260	401	531	224	110	76
3	91	81	e79	e66	e58	111	304	416	581	209	108	76
4	89	80	e78	e69	e57	149	288	534	612	192	105	81
5	87	77	e73	e70	e56	141	261	686	579	189	103	77
6	85	77	e72	70	e55	116	269	717	554	250	102	76
7	85	78	e72	69	e53	105	249	835	493	202	101	75
8	85	76	e73	68	e52	99	234	1030	426	184	100	74
9	83	76	e74	68	e52	98	241	1200	412	173	104	73
10	82	78	76	67	e51	103	231	1230	454	164	103	74
11	79	76	76	68	e52	108	234	1170	501	154	101	74
12	79	76	73	67	e52	111	250	1390	533	143	99	73
13	84	74	69	67	e54	119	242	1100	582	137	97	71
14	81	72	69	68	e56	127	239	869	481	132	97	69
15	82	e74	68	68	e59	156	243	769	399	127	99	65
16	82	76	69	66	e62	184	284	674	360	123	97	64
17	83	76	68	68	e64	168	392	611	324	118	94	62
18	78	73	68	e67	e64	158	554	549	321	114	91	61
19	76	70	69	e65	61	148	719	530	342	109	90	60
20	77	e71	e68	e65	60	135	813	511	375	106	89	60
21	85	e73	e68	e66	61	128	883	478	428	119	86	60
22	84	e74	e68	e67	63	123	804	470	448	120	83	60
23	82	e71	e67	67	63	113	715	478	414	119	79	60
24	81	e65	e66	66	63	110	702	527	385	118	76	60
25	79	e61	e64	66	64	110	623	606	339	117	76	59
26	79	e62	e64	65	70	113	555	727	299	117	74	58
27	79	e68	e63	63	83	125	505	770	270	116	72	58
28	79	e72	e62	e61	80	148	464	678	257	117	71	58
29	78	e76	e62	e60	---	180	444	566	257	115	80	69
30	76	e80	e62	e60	---	200	447	523	250	114	80	71
31	76	---	e63	e59	---	215	---	536	---	114	78	---
TOTAL	2550	2219	2163	2044	1681	4079	12676	21990	12755	4571	2861	2031
MEAN	82.3	74.0	69.8	65.9	60.0	132	423	709	425	147	92.3	67.7
MAX	93	81	80	70	83	215	883	1390	612	250	116	81
MIN	76	61	62	59	51	82	227	401	250	106	71	58
AC-FT	5060	4400	4290	4050	3330	8090	25140	43620	25300	9070	5670	4030

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1958 - 1994, BY WATER YEAR (WY)

	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	1994		
MEAN	106	121	112	107	120	185	417	915	987	399	144	104																											
MAX	323	264	211	191	230	493	658	1747	2134	1011	253	172																											
(WY)	1960	1974	1959	1974	1963	1986	1990	1958	1974	1975	1983	1978																											
MIN	56.1	67.9	69.8	52.7	60.0	64.8	191	252	276	84.0	62.8	61.4																											
(WY)	1989	1988	1994	1993	1994	1977	1967	1977	1977	1977	1977	1988																											

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1958 - 1994

	1993	1994	1958-1994
ANNUAL TOTAL	117035	71620	
ANNUAL MEAN	321	196	310
HIGHEST ANNUAL MEAN			519
LOWEST ANNUAL MEAN			118
HIGHEST DAILY MEAN	2020	1390	3400
LOWEST DAILY MEAN	40	51	30
ANNUAL SEVEN-DAY MINIMUM	42	52	42
ANNUAL RUNOFF (AC-FT)	232100	142100	224600
10 PERCENT EXCEEDS	978	533	826
50 PERCENT EXCEEDS	107	84	138
90 PERCENT EXCEEDS	62	62	78

e Estimated

## PINE CREEK BASIN

13290190 PINE CREEK NEAR OXBOW, OR

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

DRAINAGE AREA.--230 mi<sup>2</sup>, approximately.

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

GAGE.--Water-stage recorder. Datum of gage is 1,850.48 ft above sea level (levels by Idaho Power Co.). Prior to Aug. 24, 1967, nonrecording gage at site 1.7 mi downstream at different datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Diversions upstream from station for irrigation of about 19,000 acres (1966 determination).

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	41	73	e90	83	102	475	435	508	393	46	25	20
2	42	71	87	89	e98	560	483	478	385	45	25	19
3	42	71	78	102	e95	647	549	464	357	44	24	20
4	42	72	86	146	e98	900	516	486	337	43	23	20
5	43	71	85	181	e95	877	446	568	301	45	22	21
6	43	69	75	162	e89	679	429	615	284	66	21	20
7	44	69	77	144	e81	593	412	684	283	54	21	19
8	44	68	101	139	e76	547	371	787	271	50	22	18
9	45	67	109	133	e78	533	377	910	231	44	22	17
10	49	74	103	128	e80	554	374	924	205	40	21	17
11	57	68	104	127	e80	629	377	855	196	38	21	18
12	59	70	109	124	81	652	409	883	212	37	20	19
13	60	68	99	124	94	615	392	749	206	35	19	19
14	67	66	94	133	88	617	371	622	189	34	18	20
15	67	64	92	149	86	701	345	572	169	34	18	21
16	67	72	88	149	84	802	380	517	171	32	19	21
17	68	68	87	142	89	701	478	505	177	32	18	21
18	68	66	86	134	103	601	628	461	158	30	19	20
19	67	56	78	129	106	564	750	422	147	30	19	20
20	66	e52	80	120	104	486	824	494	138	28	20	20
21	65	e53	80	114	106	435	853	473	121	28	19	19
22	65	e54	78	117	107	392	833	480	105	28	19	19
23	66	e46	67	110	116	349	723	447	96	27	20	19
24	67	e41	74	117	205	314	867	456	90	28	20	20
25	66	49	75	128	206	292	836	476	84	26	19	20
26	68	e43	80	137	206	282	748	510	74	26	20	20
27	70	e47	76	144	472	301	649	584	65	25	19	20
28	71	e54	74	141	502	336	582	523	58	26	18	20
29	71	e65	80	135	---	389	546	466	55	26	18	23
30	71	e92	74	134	---	421	535	418	49	25	19	28
31	72	---	74	113	---	436	---	392	---	25	19	---
TOTAL	1833	1899	2640	4028	3727	16680	16518	17729	5607	1097	627	598
MEAN	59.1	63.3	85.2	130	133	538	551	572	187	35.4	20.2	19.9
MAX	72	92	109	181	502	900	867	924	393	66	25	28
MIN	41	41	67	83	76	282	345	392	49	25	18	17
AC-FT	3640	3770	5240	7990	7390	33080	32760	35170	11120	2180	1240	1190

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1967 - 1994, BY WATER YEAR (WY)

	MEAN	67.7	127	202	249	364	618	648	857	740	187	47.5	51.9
MAX	135	491	619	962	1042	1140	1031	1604	1929	541	95.3	119	
(WY)	1983	1974	1974	1974	1986	1983	1989	1971	1974	1983	1983	1978	
MIN	23.9	45.1	58.3	51.9	65.9	69.0	64.9	94.0	67.3	20.6	14.2	19.9	
(WY)	1989	1988	1979	1979	1977	1977	1977	1977	1977	1977	1977	1994	

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1967 - 1994
ANNUAL TOTAL	138954	72983	
ANNUAL MEAN	381	200	345
HIGHEST ANNUAL MEAN			674
LOWEST ANNUAL MEAN			55.3
HIGHEST DAILY MEAN	3190	924	5430
LOWEST DAILY MEAN	36	17	10
ANNUAL SEVEN-DAY MINIMUM	36	18	11
INSTANTANEOUS PEAK FLOW		1130	7110
INSTANTANEOUS PEAK STAGE		5.59	9.82
INSTANTANEOUS LOW FLOW		a16	b10
ANNUAL RUNOFF (AC-FT)	275600	144800	249900
10 PERCENT EXCEEDS	1120	566	935
50 PERCENT EXCEEDS	118	85	149
90 PERCENT EXCEEDS	44	20	36

e Estimated

a Also occurred on Sept. 10.

b Occurred Aug. 17-24, 1977; gage height, 2.12 ft.



## SNAKE RIVER MAIN STEM

79

## 13290450 SNAKE RIVER AT HELLS CANYON DAM, IDAHO-OREGON STATE LINE

LOCATION.--Lat 45°15'05", long 116°41'50", in SE 1/4 SE 1/4 sec.33, T.3 S., R.49 E., unsurveyed (Willamette meridian), Wallowa County, Wallowa-Whitman National Forest, Hydrologic Unit 17050201, on left bank, 0.2 mi upstream from Hells Canyon Creek, 0.4 mi downstream from Deep Creek, 0.6 mi downstream from Hells Canyon Dam, 15.5 mi northeast of Homestead, Oregon, and at mile 247.0.

DRAINAGE AREA.--73,300 mi<sup>2</sup>, approximately.

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

REVISED RECORDS.--WDR ID-78-2: 1969-70, 1972-76, WDR ID-79-2: 1972-73(m).

GAGE.--Water-stage recorder. Datum of gage is 1,400 ft above sea level (levels by Idaho Power Company.)

REMARKS.--No estimated daily discharges. Records good. Station equipment includes satellite telemetry. 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, 38 mi upstream. Diurnal fluctuations caused by Hells Canyon powerplant. Diversions upstream from station for irrigation of about 3,820,000 acres, of which 742,000 acres are irrigated by withdrawals from ground water (1966 determination).

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22800	9450	9550	9750	10100	9560	9410	24300	9500	12000	5700	7060
2	23600	9450	9560	9520	10600	9870	9400	22700	9480	11900	5550	9210
3	15400	9450	9530	9560	11000	11700	9410	23100	9430	12400	5420	6950
4	24700	9470	9550	9610	12600	10500	9340	23300	9530	12600	5390	6760
5	19000	9510	9490	13500	12700	11900	9350	24400	9520	17200	5510	6660
6	18600	9460	9490	12400	10400	13600	11000	24900	9500	17300	5630	9110
7	19600	9450	9500	14500	14800	15300	12700	24800	9480	17900	5660	12300
8	18400	9500	9540	14200	19700	15900	13100	24400	9500	13300	5670	10800
9	15200	9580	9540	14100	22600	13600	12000	25300	9530	14000	5780	10900
10	13700	9540	9490	14000	12500	13800	15100	25100	9520	14700	5930	6680
11	18500	9520	9560	15400	12800	13100	14200	23300	8810	15400	6010	6710
12	18200	9490	9570	12700	13400	11400	17400	10700	8150	14900	6020	7190
13	17400	9500	9570	14500	11600	12900	12100	9560	7770	14300	6030	11000
14	21500	9520	9590	15700	13400	15700	13600	9550	7600	14400	6010	7470
15	22100	9600	9570	11800	14600	14300	13300	11300	7310	14900	7530	9490
16	19700	9520	9550	13700	15600	16900	11300	9570	6940	14400	9680	8330
17	16500	9450	9540	19200	14500	21100	9630	9590	6880	13200	7500	7250
18	14500	9630	10200	19400	15700	15600	13300	9630	6350	13600	7920	6780
19	11200	9610	12500	15200	16800	20800	9770	10400	6270	13800	7060	6990
20	13800	9580	14300	15500	15500	14600	10200	9580	6580	11300	6420	8730
21	11700	9560	13200	17700	14400	22100	9690	9480	6740	12600	6370	9750
22	11600	9580	12500	12100	14400	12700	11700	9480	6790	14700	6430	12100
23	9520	9590	13100	12100	16100	17900	16200	11300	8220	14300	7780	8080
24	9560	9540	11600	14200	13700	16800	13900	17000	7740	13500	10800	6680
25	9480	9480	11500	13200	11000	12800	11800	14700	6390	12300	10700	6640
26	9510	9520	11700	16400	9820	9410	14200	13800	6350	13500	8510	10000
27	9520	9530	11700	15600	9800	9360	19400	14600	6340	14000	6740	9990
28	9550	9510	12400	10100	11300	10100	17000	13700	6280	16700	7010	8190
29	9530	9500	12200	9620	---	9410	24100	13800	6240	11900	11000	6800
30	9490	9510	12200	10100	---	9380	24300	14300	6680	8200	8140	6890
31	9480	---	10600	11800	---	9380	---	15200	---	8080	7900	---
TOTAL	473340	285600	331890	417160	381420	421470	397900	502840	235420	423280	217800	251490
MEAN	15270	9520	10710	13460	13620	13600	13260	16220	7847	13650	7026	8383
MAX	24700	9630	14300	19400	22600	22100	24300	25300	9530	17900	11000	12300
MIN	9480	9450	9490	9520	9800	9360	9340	9480	6240	8080	5390	6640
AC-FT	938900	566500	658300	827400	756500	836000	789200	997400	467000	839600	432000	498800

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1966 - 1994, 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	1994
MEAN	15680	16740	18630	21880	23580	27630	29260	26400	22970	13380	10900	13650																	
MAX	24140	28630	30410	38230	44670	66340	61960	68840	59080	25550	17090	19120																	
(WY)	1972	1985	1984	1984	1971	1986	1984	1984	1984	1983	1983	1984																	
MIN	9962	9193	9391	12850	11570	10600	7371	6401	5868	6901	6583	6887																	
(WY)	1989	1993	1993	1991	1988	1991	1988	1977	1992	1977	1992	1977																	

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1966 - 1994
ANNUAL TOTAL	6803690	4339610	
ANNUAL MEAN	18640	11890	20020
HIGHEST ANNUAL MEAN			36560
LOWEST ANNUAL MEAN			9746
HIGHEST DAILY MEAN	54800	Mar 25	78100
LOWEST DAILY MEAN	5950	Sep 13	4360
ANNUAL SEVEN-DAY MINIMUM	7310	Sep 12	5330
INSTANTANEOUS PEAK FLOW			87800
INSTANTANEOUS PEAK STAGE			84.05
INSTANTANEOUS LOW FLOW			1580
ANNUAL RUNOFF (AC-FT)	13500000	8608000	14510000
10 PERCENT EXCEEDS	34100	17500	37600
50 PERCENT EXCEEDS	14700	10700	16100
90 PERCENT EXCEEDS	9510	6800	8910

a Gage height, 62.82 ft.  
b Gage height, 59.9 ft.

## SNAKE RIVER MAIN STEM

13290460 SNAKE RIVER AT JOHNSON BAR, ID

LOCATION.--Lat 45°27'50", long 116°33'16", in SE 1/4 NE 1/4 sec.22, T.1 S., R.50 E., (Willamette meridian), Wallowa County, Hydrologic Unit 17050101, Hells Canyon National Recreation Area, on left bank opposite lower end of Johnson Bar, 0.5 mi upstream from mouth of Sheep Creek, and at mile 229.9.

DRAINAGE AREA.--73,400 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--July 1959 to September 1992 (gage heights only), October 1992 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,226 ft above sea level (levels by Corps of Engineers.)

REMARKS.--Records good. Station equipment includes satellite telemetry. Diurnal fluctuations in stage are caused by Hells Canyon Powerplant. Records for years prior to the 1991 water year were not published, but are available from the Boise, Idaho Field Office.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22200	9500	9440	9890	10300	9790	9570	24100	9830	11600	7250	e9000
2	23500	9540	9450	9590	10700	9940	9570	23000	9610	12000	5540	10500
3	16200	9450	9390	9640	11000	12000	9520	23100	9600	12100	5360	7170
4	24700	9380	9440	9680	12400	10500	9490	23000	9750	12600	5400	6810
5	19600	9380	9390	13100	12700	11900	9360	24200	9800	16700	5490	6640
6	18600	9380	9380	12700	10400	13300	10800	24900	9770	17000	5580	8480
7	19400	9340	9400	13800	14400	15300	12900	25100	9750	17800	5600	e12000
8	18400	9340	9430	14600	19100	15900	13100	24500	9770	13400	5780	e11800
9	15500	9470	9450	13800	22300	13600	11800	25500	9650	13700	5780	11200
10	13300	9470	9410	13900	12600	13500	15300	25400	9830	14500	5840	6860
11	18400	9340	9500	15400	12900	13200	13900	23600	9190	15000	5950	6810
12	17900	9340	9380	12600	13200	11300	17600	11700	8590	14800	5960	7130
13	17300	9380	9420	14300	11600	12900	12500	9910	8180	14200	6010	10800
14	20800	9390	9440	15300	13300	15500	13400	9840	7880	13900	6030	7830
15	21900	9510	9430	12000	14300	14400	13700	11500	7540	14900	6900	9140
16	19700	9480	9510	13300	15400	16400	11300	9840	7120	14100	8660	8730
17	16600	9360	9600	18900	14700	20900	10100	9800	7040	13300	7890	7410
18	14400	9490	10200	18900	15600	15800	13100	9840	6590	13100	7720	6920
19	11600	9420	12300	15400	16600	20300	10500	10500	6410	13800	7720	7050
20	13700	9470	14100	15200	15300	15000	10300	9910	6630	10800	6640	8470
21	11900	9510	13300	17600	14300	22300	10100	9730	6860	12900	6330	9620
22	11700	9580	12300	12300	14400	12800	12000	9750	6910	14100	6460	11800
23	9670	9610	12900	12100	15800	17800	15800	11300	7810	13600	7360	8740
24	9700	9390	11700	14000	14000	17100	14600	17000	8300	12500	9410	6800
25	9540	9380	11200	12900	11100	13000	12300	15000	6510	12800	10200	6780
26	9650	9390	11600	16400	9920	9630	13900	13700	6430	13200	9050	9730
27	9600	9410	11600	15400	9940	9590	19800	14700	6420	12200	7300	9920
28	9540	9390	12200	10500	11400	10400	16700	14000	6310	16200	6770	8270
29	9450	9380	12400	9640	---	9680	23700	13800	6300	11800	9800	7120
30	9440	9400	12200	10100	---	9620	24200	14400	6630	8120	9350	6820
31	9420	---	10800	11600	---	9600	---	15300	---	8070	7920	---
TOTAL	473310	282870	329260	414540	379660	422950	400910	507920	241010	414790	217050	256350
MEAN	15270	9429	10620	13370	13560	13640	13360	16380	8034	13380	7002	8545
MAX	24700	9610	14100	18900	22300	22300	24200	25500	9830	17800	10200	12000
MIN	9420	9340	9380	9590	9920	9590	9360	9730	6300	8070	5360	6640
AC-FT	938800	561100	653100	822200	753100	838900	795200	1007000	478000	822700	430500	508500

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1993 - 1994, BY WATER YEAR (WY)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
MEAN	12750	9354	10040	13100	13910	19390	21890	24700	19510	14280	10540	10960
MAX	15270	9429	10620	13370	14260	25140	30410	33020	30980	15180	14070	13370
(WY)	1994	1994	1994	1994	1993	1993	1993	1993	1993	1993	1993	1993
MIN	10240	9279	9450	12830	13560	13640	13360	16380	8034	13380	7002	8545
(WY)	1993	1993	1993	1993	1994	1994	1994	1994	1994	1994	1994	1994

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1993 - 1994

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
ANNUAL TOTAL	6834910	4340620	15040	18190	11890	55800	Mar 25	25500	May 9	55800	Mar 25	1993
ANNUAL MEAN	18730	11890	15040	18190	11890	55800	Mar 25	25500	May 9	55800	Mar 25	1993
HIGHEST ANNUAL MEAN												1994
LOWEST ANNUAL MEAN												1994
HIGHEST DAILY MEAN	55800	Mar 25	25500	May 9	55800	Mar 25	1993					
LOWEST DAILY MEAN	5720	Sep 16	5360	Aug 3	5360	Aug 3	1994					
ANNUAL SEVEN-DAY MINIMUM	7110	Sep 12	5540	Aug 2	5540	Aug 2	1994					
INSTANTANEOUS PEAK FLOW			31600	Oct 4								
INSTANTANEOUS PEAK STAGE			11.10	Oct 4								
ANNUAL RUNOFF (AC-FT)	13560000	8610000	10900000									
10 PERCENT EXCEEDS	34900	17600	27900									
50 PERCENT EXCEEDS	14400	10500	12000									
90 PERCENT EXCEEDS	9420	6920	9000									

e Estimated

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LOCATION.--Lat 45°33'45", long 116°50'00", in SW 1/4 sec.16, T.1 N., R.48 E., Wallowa County, Hydrologic Unit 17060102, on left bank at Imnaha, 0.3 mi downstream from Big Sheep Creek, and at mile 19.3.

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

GAGE.--Water-stage recorder. Datum of gage is 1,941.14 ft above sea level. Prior to Aug. 6, 1934, nonrecording gage at site 0.25 mi upstream at different datum. Aug. 6-31, 1934, nonrecording gage at present site and datum.

REMARKS.--Records good except for estimated daily discharges, which are poor. No regulation. Diversions for irrigation upstream from station. Water is diverted from Big Sheep Creek and tributaries upstream from station for irrigation in Wallowa River basin. National Weather Service satellite telemeter at station. Continuous water-quality records for the period August 1965 to September 1968 and from May 1976 to September 1977 have been collected at this location.

AVERAGE DISCHARGE.--66 years, 503 ft<sup>3</sup>/s, 364,400 acre-ft/yr.

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

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

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
May 12	1030	*1,540	*4.13				
Minimum discharge, 26 ft <sup>3</sup> /s Nov. 25.							

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	127	135	152	144	63	160	382	813	837	340	142	102
2	126	132	143	134	e70	455	436	757	826	328	140	102
3	126	132	136	138	e85	465	542	723	804	315	145	105
4	123	132	146	140	e95	514	550	756	845	298	138	114
5	123	134	130	154	e100	512	481	919	814	288	133	110
6	124	129	114	141	e105	426	452	940	793	346	131	104
7	142	125	132	125	e110	356	437	995	767	307	127	100
8	147	119	144	132	119	324	408	1110	695	281	125	98
9	137	123	145	134	115	292	420	1260	632	264	123	97
10	133	142	139	128	e115	287	408	1300	632	248	122	99
11	130	129	151	127	e110	277	403	1270	669	238	120	102
12	129	126	149	128	120	257	437	1430	702	228	118	103
13	131	138	137	128	116	251	476	1300	778	220	115	106
14	150	131	134	127	134	262	490	1110	707	213	113	109
15	147	118	137	128	133	298	480	1010	611	205	109	106
16	143	136	134	128	131	378	539	901	588	198	110	104
17	155	133	131	119	137	389	718	975	547	193	109	100
18	146	130	124	e115	147	363	1010	958	518	191	108	98
19	144	111	98	e114	125	346	1230	969	520	187	107	97
20	142	99	89	e112	126	315	1300	993	528	182	106	95
21	140	126	99	e117	125	302	1320	988	554	175	106	95
22	135	142	99	e122	121	278	1250	998	575	169	107	94
23	133	127	113	128	125	251	1140	941	545	165	108	94
24	131	90	91	136	134	239	1240	968	513	168	106	92
25	129	40	107	136	126	234	1260	966	463	164	104	92
26	129	37	122	136	132	223	1280	1040	428	159	102	93
27	129	e55	133	132	149	224	1170	1140	396	152	103	93
28	136	e130	110	130	149	244	1050	1030	378	147	102	93
29	147	e160	128	116	---	290	937	914	366	143	101	97
30	137	e160	148	130	---	337	884	822	356	142	102	111
31	134	---	138	90	---	374	---	812	---	141	102	---
TOTAL	4205	3621	3953	3969	3317	9923	23130	31108	18387	6795	3584	3005
MEAN	136	121	128	128	118	320	771	1003	613	219	116	100
MAX	155	160	152	154	149	514	1320	1430	845	346	145	114
MIN	123	37	89	90	63	160	382	723	356	141	101	92
AC-FT	8340	7180	7840	7870	6580	19680	45880	61700	36470	13480	7110	5960

MEAN	157	184	206	195	235	396	924	1537	1312	545	191	143
MAX	501	625	806	855	569	993	1760	2804	2612	1348	380	256
(WY)	1963	1974	1942	1974	1982	1986	1956	1948	1974	1975	1982	1978
MIN	81.5	80.0	88.6	69.3	82.4	114	345	445	361	123	78.8	82.8
(WY)	1937	1937	1936	1937	1937	1977	1977	1977	1992	1977	1931	1931

ANNUAL TOTAL	198753		114997			
ANNUAL MEAN	545		315		503	
HIGHEST ANNUAL MEAN					897	1974
LOWEST ANNUAL MEAN					184	1977
HIGHEST DAILY MEAN	3000	May 14	1430	May 12	5880	Apr 27 1978
LOWEST DAILY MEAN	25	Jan 13	37	Nov 26	25	Nov 22 1931
ANNUAL SEVEN-DAY MINIMUM	43	Jan 8	87	Jan 31	43	Jan 8 1993
ANNUAL RUNOFF (AC- FT)	394200		228100		364100	
10 PERCENT EXCEEDS	1800		906		1370	
50 PERCENT EXCEEDS	169		141		225	
90 PERCENT EXCEEDS	109		102		111	

e Estimated

## GRANDE RONDE RIVER BASIN

13320000 CATHERINE CREEK NEAR UNION, OR

LOCATION.--Lat 45°09'20", long 117°46'26", in NW 1/4 SE 1/4 sec.2, T.5 S., R.40 E., Union County, Hydrologic Unit 17060104, on right bank 3.0 mi downstream from Little Catherine Creek, 5.5 mi southeast of Union, and at mile 25.4.

DRAINAGE AREA.--105 mi<sup>2</sup>.

PERIOD OF RECORD.--May 1906 to May 1907 (gage heights only), August 1911 to December 1912, March to September 1915, February 1918 to September 1919, October 1925 to current year. Monthly discharge only for some periods, published in WSP 1317.

REVISED RECORDS.--WSP 1397: 1912-13, 1919, 1926, 1928-33, 1937, 1939, 1940(M), 1941-43, 1950.

GAGE.--Water-stage recorder. Datum of gage is 3,081.76 ft above sea level (Oregon State Highway Department bench mark). Prior to Nov. 28, 1938, nonrecording gage at several sites within 1.8 mi of present site at various datums. Nov. 28, 1938, to May 16, 1939, water-stage recorder at site 400 ft downstream at datum 4.29 ft lower.

REMARKS.--Records good except for estimated daily discharges, which are poor. No regulation. Several small diversions for irrigation upstream from station. Since 1937, diversion to Big Creek in Powder River basin provides a small part of the water used for irrigation in that basin.

AVERAGE DISCHARGE.--71 years (water years 1912, 1919, 1926-94), 118 ft<sup>3</sup>/s, 85,490 acre-ft/yr.

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

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

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Apr. 20	2130	*525	*2.78	No other peak greater than base discharge.			

Minimum daily discharge, 9.0 ft<sup>3</sup>/s Nov. 25, result of freezeup.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e24	28	e29	e17	e25	48	133	204	196	69	30	21
2	e24	27	e26	e20	e23	65	155	197	184	67	28	22
3	e24	28	e24	e30	e24	85	186	199	186	64	28	23
4	e23	28	e24	33	e24	118	168	253	189	61	28	27
5	e22	25	e25	32	e24	124	148	283	182	62	26	23
6	e22	e24	e26	28	e24	101	145	299	187	77	26	22
7	e25	e23	e28	27	e25	84	131	334	170	60	26	21
8	e28	e23	e31	25	e23	72	121	379	154	56	26	21
9	e28	e24	e31	25	e22	66	129	415	143	53	26	21
10	e26	e26	29	24	e23	67	121	420	142	50	25	22
11	e25	e24	31	25	e24	67	123	409	146	49	24	22
12	e26	e24	28	26	e23	68	135	450	148	48	25	22
13	e27	e25	25	30	e22	72	139	386	161	46	24	22
14	e28	e23	24	32	e22	79	139	326	146	45	24	22
15	e29	e23	24	30	e22	99	141	291	137	44	24	22
16	e31	e25	23	29	e22	127	174	261	140	42	24	21
17	e32	e25	23	e27	e23	114	264	241	125	41	24	20
18	e32	e24	23	e26	e24	101	348	216	116	40	24	20
19	e31	e21	e20	e26	24	88	423	215	112	38	24	20
20	29	e20	e14	e26	24	78	459	237	110	37	24	19
21	29	e24	e16	e25	23	72	467	230	111	36	24	19
22	28	e25	e15	26	23	65	406	229	110	34	24	19
23	28	e23	e14	26	23	61	356	222	105	34	24	19
24	28	e16	e14	28	25	56	367	226	100	35	23	19
25	27	e9.0	e16	27	25	54	331	243	94	35	23	19
26	27	e10	e17	27	25	54	296	271	89	32	22	18
27	27	e11	e16	26	34	61	267	274	84	31	22	18
28	29	e17	e19	26	36	77	245	256	79	30	22	18
29	29	e23	e20	e25	---	103	229	226	75	29	21	22
30	28	e26	e18	e26	---	119	226	206	72	29	22	22
31	28	---	e19	e28	---	128	---	202	---	29	21	---
TOTAL	844	674.0	692	828	681	2573	6972	8600	3993	1403	758	626
MEAN	27.2	22.5	22.3	26.7	24.3	83.0	232	277	133	45.3	24.5	20.9
MAX	32	28	31	33	36	128	467	450	196	77	30	27
MIN	22	9.0	14	17	22	48	121	197	72	29	21	18
AC-FT	1670	1340	1370	1640	1350	5100	13830	17060	7920	2780	1500	1240

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1911 - 1994, BY WATER YEAR (WY)

	MEAN	32.5	38.8	42.8	44.1	54.9	96.8	240	411	298	89.9	35.9	29.3
MAX	138	157	125	101	136	268	445	776	686	248	63.0	57.8	57.8
(WY)	1960	1928	1942	1971	1986	1986	1952	1912	1974	1984	1912	1959	1959
MIN	17.6	14.2	13.0	12.0	22.0	27.6	83.4	121	65.6	25.7	11.1	15.6	15.6
(WY)	1937	1931	1931	1930	1933	1977	1955	1977	1934	1926	1930	1930	1930

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1911 - 1994
ANNUAL TOTAL	50249.0	28644.0	118
ANNUAL MEAN	138	78.5	185
HIGHEST ANNUAL MEAN			48.7
LOWEST ANNUAL MEAN			1912
HIGHEST DAILY MEAN	1100	467	1500
LOWEST DAILY MEAN	9.0	9.0	8.0
ANNUAL SEVEN-DAY MINIMUM	11	15	10
ANNUAL RUNOFF (AC-FT)	99670	56820	85210
10 PERCENT EXCEEDS	395	226	329
50 PERCENT EXCEEDS	38	28	47
90 PERCENT EXCEEDS	20	21	24

e Estimated



## GRANDE RONDE RIVER BASIN

83

13324300 LOOKINGGLASS CREEK NEAR LOOKING GLASS, OR

LOCATION.--Lat 45°43'55", long 117°51'50", in NW 1/4 NW 1/4 sec.19, T.3 N., R.40 E., Union County, Hydrologic Unit 17060104, on left bank at Oregon State Fish and Wildlife Service fish hatchery, 310 ft upstream from Jarboe Creek, 2.3 mi northwest of Looking Glass, and at mile 2.3.

DRAINAGE AREA.--78.3 mi<sup>2</sup>.

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

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 2,530 ft above sea level, from topographic map.

REMARKS.--Records fair. Records include a diversion by the fish hatchery 0.3 mi upstream from station of up to 50 ft<sup>3</sup>/s that is returned through the fish ladder to the gage pool.

AVERAGE DISCHARGE.--12 years, 126 ft<sup>3</sup>/s 91,290 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,240 ft<sup>3</sup>/s May 12, 1993, gage height, 6.55 ft; minimum discharge, 25 ft<sup>3</sup>/s Oct. 11, 1983, result of regulation at fish hatchery upstream.

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

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Apr. 20	2100	*818	*6.05	May 8	1730	538	5.62

Minimum daily discharge, 35 ft<sup>3</sup>/s several days in August.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	48	47	63	67	61	92	171	337	127	51	e41	e37
2	47	45	59	69	61	126	198	345	124	50	e42	e37
3	47	e50	58	86	60	168	228	333	124	49	e42	e38
4	49	50	59	105	60	204	214	399	129	49	e41	e41
5	51	49	55	106	60	173	204	404	111	52	e40	e40
6	52	50	54	86	60	143	214	423	111	62	e39	e39
7	51	50	56	73	60	124	214	418	107	52	e39	e38
8	50	49	64	68	58	113	214	442	105	51	e38	e37
9	49	49	62	67	56	111	235	458	100	51	e38	e37
10	50	51	62	64	56	109	242	428	96	50	e38	e39
11	52	50	63	67	56	120	245	385	93	48	e38	e40
12	53	49	60	67	55	118	249	363	89	47	e37	e41
13	54	48	56	70	56	118	245	324	91	47	e37	e42
14	51	48	57	72	56	124	238	316	87	46	e37	e42
15	55	51	56	72	56	141	235	285	83	45	e36	e41
16	57	52	56	71	56	157	281	256	76	46	e35	e41
17	54	53	54	69	59	149	376	245	70	46	e35	e41
18	53	53	52	66	60	144	500	235	68	44	e35	e40
19	48	50	53	65	58	141	628	224	67	44	e35	e40
20	43	50	54	63	57	132	712	252	64	45	e35	e40
21	45	51	52	62	57	136	747	245	60	46	e35	e40
22	44	52	52	62	57	124	666	245	59	46	e35	e40
23	48	50	54	62	63	120	591	242	57	45	e36	e40
24	47	e53	55	64	64	113	556	214	54	47	e36	e40
25	41	e55	56	63	61	115	522	208	53	45	e35	e40
26	41	e56	56	63	62	115	468	192	52	45	e35	e40
27	44	e60	53	62	70	122	438	182	51	e43	e35	e41
28	47	59	52	61	74	122	381	171	52	e42	e36	e43
29	46	55	55	59	---	132	385	152	51	e41	e36	e45
30	43	56	57	59	---	154	372	139	51	e41	e36	e44
31	46	---	58	57	---	160	---	132	---	e41	e36	---
TOTAL	1506	1541	1753	2147	1669	4120	10969	8994	2462	1457	1149	1204
MEAN	48.6	51.4	56.5	69.3	59.6	133	366	290	82.1	47.0	37.1	40.1
MAX	57	60	64	106	74	204	747	458	129	62	42	45
MIN	41	45	52	57	55	92	171	132	51	41	35	37
AC-FT	2990	3060	3480	4260	3310	8170	21760	17840	4880	2890	2280	2390

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1982 - 1994, BY WATER YEAR (WY)

	53.5	64.4	66.2	73.9	101	174	310	338	159	67.7	53.2	52.3
MEAN	53.5	64.4	66.2	73.9	101	174	310	338	159	67.7	53.2	52.3
MAX	66.7	79.5	86.0	129	174	314	441	588	425	117	65.3	61.9
(WY)	1986	1985	1983	1983	1983	1986	1989	1993	1984	1984	1985	1984
MIN	46.1	46.8	53.2	52.9	54.8	83.3	220	114	57.4	47.0	37.1	40.1
(WY)	1988	1988	1988	1987	1993	1985	1991	1992	1992	1994	1994	1994

SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1982 - 1994

ANNUAL TOTAL	49756	38971	126
ANNUAL MEAN	136	107	175
HIGHEST ANNUAL MEAN			1984
LOWEST ANNUAL MEAN			1988
HIGHEST DAILY MEAN	1010	May 13	1010
LOWEST DAILY MEAN	41	Aug 11	35
ANNUAL SEVEN-DAY MINIMUM	44	Oct 25	35
ANNUAL RUNOFF (AC-FT)	98690	77300	91270
10 PERCENT EXCEEDS	319	245	300
50 PERCENT EXCEEDS	56	56	67
90 PERCENT EXCEEDS	48	40	50

e Estimated



## GRANDE RONDE RIVER BASIN

85

13331500 MINAM RIVER AT MINAM, OR--Continued

## WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: October 1965 to September 1985.

REMARKS.--Some samples were analyzed by different methods and may have data with different levels of detection.

## WATER-QUALITY DATA

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 WATER (DEG C)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREP-TOCOCCI, KF AGAR (COLS. PER 100 ML)	
		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 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)	
NOV 1993 22...	1215	E54	58	7.9	0.0	0.2	13.7	690	104	K6	K14	
MAR 1994 16...	1230	303	56	7.8	5.5	3.9	11.2	690	98	K2	K2	
MAY 31...	1300	1040	34	7.4	8.0	0.5	11.1	692	103	<1	K5	
AUG 02...	1345	117	49	8.4	25.5	0.2	7.6	695	103	37	K18	
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, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)
NOV 1993 22...	22	6.5	1.5	2.5	19	0.2	1.2	26	31	0	1.2	
MAR 1994 16...	22	5.8	1.8	2.4	18	0.2	1.1	24	29	0	0.8	
MAY 31...	11	3.1	0.69	1.3	20	0.2	0.7	14	16	0	0.5	
AUG 02...	17	4.9	1.1	2.0	19	0.2	1.0	25	30	0	0.7	
DATE		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)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)
NOV 1993 22...	0.6	0.1	19	50	48	0.07	E7.29	<0.01	<0.01	<0.2	<0.05	
MAR 1994 16...	1.6	<0.1	23	58	51	0.08	47.4	0.01	<0.01	<0.2	<0.05	
MAY 31...	0.2	<0.1	12	28	26	0.04	78.6	0.02	<0.01	<0.2	<0.05	
AUG 02...	0.6	<0.1	15	40	40	0.05	12.6	<0.01	<0.01	<0.2	<0.05	
NOV 1993 22...	0.02	<0.01	<0.01	<10	4	<3	5	<4	<1	<10	<1	
MAR 1994 16...	0.02	0.02	0.01	210	5	<3	150	<4	2	<10	<1	
MAY 31...	0.01	0.01	<0.01	20	<2	<3	15	<4	<1	<10	<1	
AUG 02...	<0.01	0.02	0.01	<10	3	<3	9	<4	<1	10	1	
DATE		SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	URANIUM NATURAL DIS-SOLVED (UG/L AS U)	URANIUM NATURAL 2 SIGMA WATER, DISS. (UG/L)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	RADIUM 226, DIS-SOLVED, RADON METHOD (PCI/L)	RA-226 2 SIGMA WATER, DISS. (PCI/L)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	
NOV 1993 22...	<1	<1	24	--	--	<6	--	--	1	E0.15		
MAR 1994 16...	<1	<1	22	--	--	<6	--	--	4	3.3		
MAY 31...	<1	<1	13	0.17	<1	<6	<0.02	<0.01	4	11		
AUG 02...	<1	<1	17	0.29	<1	<6	0.02	<0.01	2	0.63		

E - Estimated.

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

## GRANDE RONDE RIVER BASIN

13333000 GRANDE RONDE RIVER AT TROY, OR

LOCATION.--Lat 45°56'47", long 117°26'54", in NE 1/4 NW 1/4 sec.4, T.5 N., R.43 E., Wallowa County, Hydrologic Unit 17060106, on left bank 500 ft downstream from bridge at Troy, 600 ft downstream from Wenaha River, and at mile 45.2.

DRAINAGE AREA.--3,275 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1944 to current year. Monthly discharge only August 1944, published in WSP 1317.

REVISED RECORDS.--WSP 1397: 1946(M), 1948-50.

GAGE.--Water-stage recorder. Datum of gage is 1,585.98 ft 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 those for July 28 to Sept. 30, which are fair and 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.--50 years, 2,995 ft<sup>3</sup>/s, 2,170,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 42,200 ft<sup>3</sup>/s Dec. 23, 1964, gage height, 11.25 ft; minimum discharge, 321 ft<sup>3</sup>/s Nov. 25, 1993; 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 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Apr. 21	0730	*8,660	*6.36				

Minimum discharge, 321 ft<sup>3</sup>/s Nov. 25, result of freezeup, but may have been less during period of ice effect that day.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	583	669	903	759	790	3030	4000	4330	3510	1460	483	403
2	598	650	1010	880	760	4630	4460	4080	3380	1370	514	411
3	609	639	891	1370	779	6400	5030	3930	3300	1360	538	435
4	604	646	845	1680	818	7470	5080	4010	3510	1270	578	475
5	601	636	815	2290	772	6840	4710	4600	3430	1260	551	422
6	598	628	734	1880	799	5700	4680	4770	3310	1380	510	417
7	589	619	726	1520	825	4710	4720	4960	3200	1440	488	396
8	625	609	773	1290	770	3880	4510	5490	2890	1320	458	410
9	650	587	806	1190	702	3250	4530	6130	2640	1210	465	421
10	643	596	816	1140	746	2970	4570	6510	2520	1110	452	432
11	633	614	856	1140	796	2910	4480	6330	2610	1020	451	448
12	640	609	882	1210	757	2890	4570	6910	2720	957	449	445
13	674	601	820	1290	739	2900	4560	6540	3050	905	434	441
14	698	574	764	1440	730	3040	4380	5570	3220	852	442	447
15	704	582	744	1610	725	3450	4070	4980	2780	798	433	447
16	734	619	729	1620	721	4220	4170	4660	2590	744	409	451
17	763	641	704	1490	750	4270	4730	4270	2460	690	405	443
18	763	648	e660	1350	872	3970	5690	4060	2300	656	401	424
19	728	629	e500	1260	841	3740	6960	3900	2220	626	395	416
20	705	588	e460	1180	788	3370	7620	4300	2250	590	392	391
21	694	565	e500	1110	763	3140	8360	4710	2390	565	396	388
22	682	604	e520	1080	749	2920	7940	4820	2580	553	393	387
23	675	611	584	1070	832	2650	7020	4850	2610	532	395	381
24	665	522	e470	1070	1340	2420	6660	4850	2470	521	409	378
25	649	e370	e540	1050	1230	2260	6490	4880	2180	560	413	368
26	646	e540	e640	1050	1170	2150	6130	4970	2020	536	408	366
27	633	e600	e610	1040	1390	2170	5530	5120	1850	504	395	369
28	642	e970	e540	1000	2180	2430	5080	4830	1720	489	396	370
29	668	981	643	958	---	2940	4740	4490	1650	504	395	417
30	673	847	696	919	---	3460	4580	4030	1570	511	390	449
31	661	---	686	874	---	3850	---	3770	---	488	396	---
TOTAL	20430	18994	21867	38810	25134	114030	160050	151650	78930	26781	13634	12408
MEAN	659	633	705	1252	898	3678	5335	4892	2631	864	440	414
MAX	763	981	1010	2290	2180	7470	8360	6910	3510	1460	578	451
MIN	583	370	460	759	702	2150	4000	3770	1570	488	390	366
AC-FT.	40520	37670	43370	76980	49850	226200	317500	300800	156600	53120	27040	24610

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1945 - 1994, BY WATER YEAR (WY)

	MEAN	879	1198	1900	2064	2916	4121	6224	7284	5661	2144	843	766
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	414	
(WY)	1988	1988	1945	1979	1977	1977	1968	1977	1992	1977	1992	1994	

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

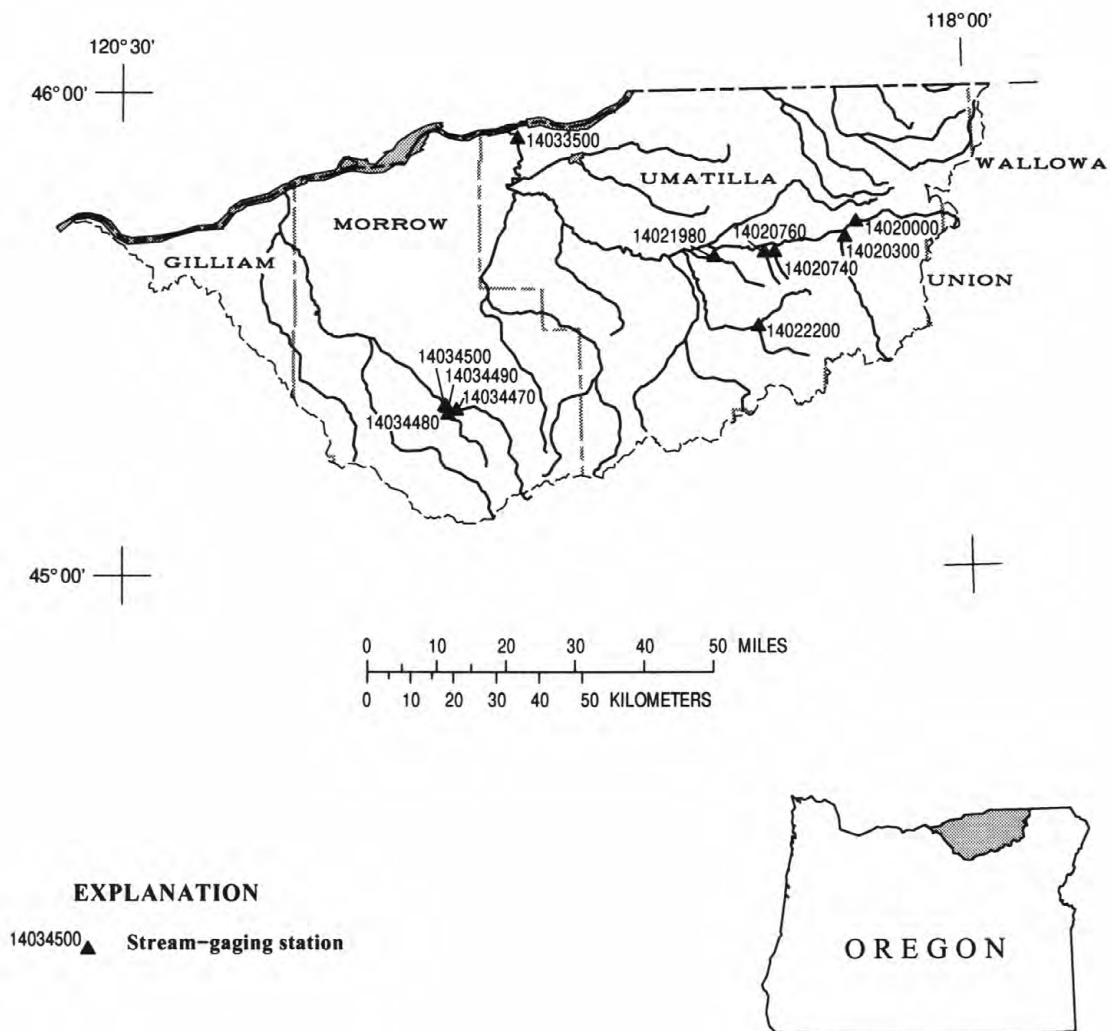
## FOR 1994 WATER YEAR

## WATER YEARS 1945 - 1994

ANNUAL TOTAL	1127376	682718											
ANNUAL MEAN	3089	1870								2996			
HIGHEST ANNUAL MEAN										4912		1974	
LOWEST ANNUAL MEAN										1136		1977	
HIGHEST DAILY MEAN	16000	May 14	8360	Apr 21	35700	Dec 23	1964						
LOWEST DAILY MEAN	370	Nov 25	366	Sep 26	344	Aug 20	1977						
ANNUAL SEVEN-DAY MINIMUM	511	Dec 19	374	Sep 22	361	Aug 18	1977						
ANNUAL RUNOFF (AC-FT)	2236000		1354000		2170000								
10 PERCENT EXCEEDS	9020		4720		7320								
50 PERCENT EXCEEDS	1010		832		1590								
90 PERCENT EXCEEDS	600		429		691								

e Estimated





**Figure 10.** Location of surface-water stations in the Umatilla and Willow Creek Basins.

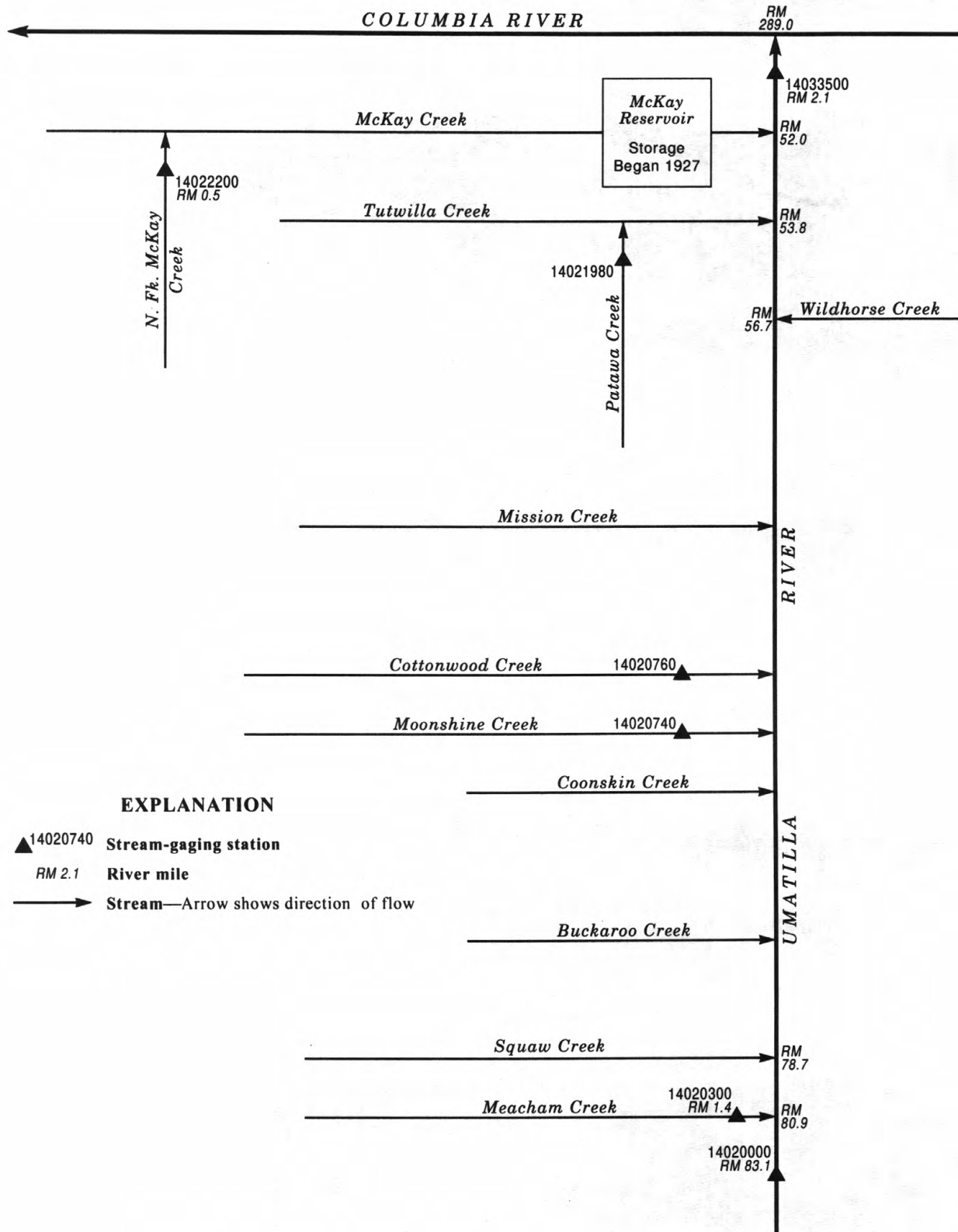


Figure 11. Schematic diagram showing gaging stations in the Umatilla River Basin.

## UMATILLA RIVER BASIN

89

14020000 UMATILLA RIVER ABOVE MEACHAM CREEK, NEAR GIBBON, OR

LOCATION.--Lat 45°43'11", long 118°19'20", in SE 1/4 SW 1/4 sec.21, T.3 N., R.36 E., Umatilla County, Hydrologic Unit 17070103, Umatilla Indian Reservation, on right bank 0.8 mi downstream from Ryan Creek, 2.2 mi upstream from Meacham Creek, 2.5 mi northeast of Gibbon, and at mile 83.1.

DRAINAGE AREA.--131 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1933 to current year.

REVISED RECORDS.--WSP 1935: 1946-48(M), 1950(M), 1953(M), 1956-59(M), drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,854.81 ft above sea level. Prior to June 27, 1939, at site 1 mi downstream at datum 43.94 ft lower.

REMARKS.--Records good except for estimated daily discharges, which are fair. No regulation or diversion upstream from station. Continuous water-quality records for the period June 1959 to September 1980 have been collected at this location.

AVERAGE DISCHARGE.--61 years, 223 ft<sup>3</sup>/s, 23.12 in/yr, 161,600 acre-ft/yr.

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

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

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 2	2230	*1,470	5.23	No other peak greater than base discharge.			
Minimum discharge, 37 ft <sup>3</sup> /s Aug. 27-31, but may have been lower during period of ice effect Nov. 26-28.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42	45	92	241	90	938	366	291	122	56	41	38
2	42	44	101	290	86	1400	445	281	114	58	40	39
3	42	44	79	710	84	1300	481	274	112	56	41	40
4	42	44	78	627	79	1310	412	294	113	55	41	40
5	42	44	71	600	76	918	351	289	103	60	40	39
6	42	44	64	430	74	619	365	286	123	76	40	39
7	43	44	62	289	73	454	372	285	119	61	40	39
8	43	44	63	226	e60	359	365	276	113	57	40	39
9	43	44	67	230	e64	301	404	259	104	54	40	41
10	43	44	73	261	68	282	418	235	98	52	40	42
11	43	44	79	290	65	270	428	213	93	51	39	41
12	44	44	83	357	63	255	470	201	91	49	39	41
13	47	46	75	551	62	254	461	174	91	49	39	40
14	46	45	68	585	62	277	418	156	92	48	39	41
15	48	45	64	442	61	335	379	152	90	48	39	41
16	52	45	59	340	61	408	462	141	84	47	39	41
17	48	47	56	273	64	358	608	133	80	46	39	40
18	46	49	54	233	71	323	736	125	77	46	39	40
19	45	46	52	207	68	289	790	153	74	46	39	40
20	44	45	50	186	66	262	746	679	72	45	39	40
21	44	46	49	172	67	259	732	686	69	44	39	40
22	43	48	47	163	67	247	614	455	67	44	39	40
23	43	45	46	159	91	238	519	340	67	44	39	40
24	43	e44	45	159	193	224	495	270	65	44	39	40
25	43	e40	45	155	161	211	440	228	64	43	38	40
26	43	e38	44	144	143	199	405	199	64	42	38	40
27	44	e38	44	134	159	192	374	176	62	42	38	40
28	46	e38	43	122	302	200	352	161	60	41	38	40
29	46	43	43	112	---	241	332	151	59	41	38	46
30	45	55	44	105	---	301	319	137	57	41	38	46
31	45	---	49	96	---	320	---	128	---	41	38	---
TOTAL	1372	1332	1889	8889	2580	13544	14059	7828	2599	1527	1215	1213
MEAN	44.3	44.4	60.9	287	92.1	437	469	253	86.6	49.3	39.2	40.4
MAX	52	55	101	710	302	1400	790	686	123	76	41	46
MIN	42	38	43	96	60	192	319	125	57	41	38	38
AC-FT	2720	2640	3750	17630	5120	26860	27890	15530	5160	3030	2410	2410
CFSM	.34	.34	.47	2.19	.70	3.34	3.58	1.93	.66	.38	.30	.31
IN.	.39	.38	.54	2.52	.73	3.85	3.99	2.22	.74	.43	.35	.34

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1933 - 1994, BY WATER YEAR (WY)

	MEAN	57.8	125	229	256	311	386	538	446	192	65.0	47.4	47.0
MAX	169	405	716	656	910	989	885	1135	591	110	63.4	81.6	
(WY)	1952	1948	1976	1965	1982	1972	1974	1948	1974	1948	1975	1959	
MIN	39.1	40.2	44.4	45.7	71.8	189	162	67.0	49.4	39.5	36.9	34.9	
(WY)	1936	1936	1966	1937	1977	1955	1941	1934	1992	1934	1939	1935	

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1933 - 1994

ANNUAL TOTAL	89611	58047	
ANNUAL MEAN	246	159	223
HIGHEST ANNUAL MEAN			415
LOWEST ANNUAL MEAN			114
HIGHEST DAILY MEAN	2810	May 4	5130
LOWEST DAILY MEAN	38	Nov 26	28
ANNUAL SEVEN-DAY MINIMUM	41	Nov 23	31
ANNUAL RUNOFF (AC-FT)	177700	115100	161700
ANNUAL RUNOFF (CFSM)	1.87	1.21	1.70
ANNUAL RUNOFF (INCHES)	25.45	16.48	23.15
10 PERCENT EXCEEDS	732	406	548
50 PERCENT EXCEEDS	80	64	116
90 PERCENT EXCEEDS	43	40	44

e Estimated

## UMATILLA RIVER BASIN

14020300 MEACHAM CREEK AT GIBBON, OR

LOCATION.--Lat 45°41'20", long 118°21'20", in SE 1/4 SE 1/4 sec.31, T.3. N., R.36 E., Umatilla County, Hydrologic Unit 17070103, on left bank 250 ft downstream from Union Pacific railroad bridge, 0.9 mi southeast of Gibbon, and at mile 1.4.

DRAINAGE AREA.--176 mi<sup>2</sup>.

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

GAGE.--Water-stage recorder. Datum of gage is 1,803.05 ft above sea level.

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

AVERAGE DISCHARGE.--19 years, 193 ft<sup>3</sup>/s, 14.89 in/yr, 139,800 acre-ft.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,750 ft<sup>3</sup>/s Feb. 20, 1982, gage height, 6.60 ft, from floodmark, from rating curve extended above 2,600 ft<sup>3</sup>/s; minimum discharge, 6.6 ft<sup>3</sup>/s Aug. 29, 1984.

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

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

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 4	0630	*1,760	*5.03	No other peak greater than base discharge.			

Minimum discharge, 9.5 ft<sup>3</sup>/s many days in August and September.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	13	32	58	108	951	535	140	81	21	11	9.5
2	13	13	36	126	102	1510	591	132	75	21	11	9.5
3	13	13	31	305	96	1610	623	127	71	21	11	9.5
4	13	14	29	476	90	1650	530	132	73	20	11	9.6
5	13	14	28	572	83	1270	441	136	66	22	11	9.5
6	13	13	28	402	80	865	432	132	68	24	11	9.5
7	13	13	28	288	79	643	452	131	74	23	11	9.5
8	13	13	28	225	64	510	439	125	74	22	11	9.5
9	13	13	28	208	71	423	478	116	67	21	11	9.5
10	13	13	34	213	72	398	504	104	61	20	11	9.5
11	13	14	41	231	67	417	485	95	57	19	11	9.5
12	13	14	48	268	63	410	475	91	55	18	11	9.7
13	14	14	47	448	60	432	452	84	53	18	11	9.5
14	13	14	43	637	59	490	405	76	54	17	10	10
15	14	14	39	492	58	599	343	74	54	16	10	10
16	15	14	35	384	55	713	350	72	50	16	10	10
17	15	14	31	308	55	598	423	71	47	15	10	10
18	14	16	28	263	63	510	498	70	44	14	10	10
19	14	15	26	234	64	433	514	79	42	14	10	10
20	15	14	24	212	61	364	455	229	38	13	10	10
21	14	14	22	203	61	340	433	363	36	13	10	10
22	13	16	21	195	62	296	347	281	34	12	10	9.8
23	13	15	20	186	68	265	269	226	32	12	10	9.6
24	13	14	19	184	120	237	243	184	31	12	10	9.5
25	13	14	18	181	127	215	208	156	30	13	10	9.5
26	13	14	18	179	126	202	188	142	29	12	9.8	9.5
27	13	14	17	167	148	202	169	122	28	12	9.5	9.5
28	14	13	16	155	340	239	158	105	24	12	9.5	9.5
29	14	14	16	142	---	339	152	99	23	12	9.5	10
30	13	17	16	132	---	452	150	92	22	11	9.5	10
31	13	---	17	118	---	490	---	84	---	11	9.5	---
TOTAL	416	420	864	8192	2502	18073	11742	4070	1493	507	320.3	290.7
MEAN	13.4	14.0	27.9	264	89.4	583	391	131	49.8	16.4	10.3	9.69
MAX	15	17	48	637	340	1650	623	363	81	24	11	10
MIN	13	13	16	58	55	202	150	70	22	11	9.5	9.5
AC-FT	825	833	1710	16250	4960	35850	23290	8070	2960	1010	635	577
CFSM	.08	.08	.16	1.50	.51	3.31	2.22	.75	.28	.09	.06	.06
IN.	.09	.09	.18	1.73	.53	3.82	2.48	.86	.32	.11	.07	.06

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 1994, BY WATER YEAR (WY)

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
MEAN	16.3	68.6	183	208	353	486	547	307	106	24.7	13.1	12.3								
MAX	26.7	200	582	503	950	804	956	668	354	52.2	20.7	16.7								
(WY)	1985	1987	1976	1984	1986	1984	1985	1991	1984	1984	1993	1978								
MIN	8.48	11.2	18.0	22.2	27.1	134	228	58.3	21.7	13.2	8.48	9.37								
(WY)	1988	1988	1977	1977	1977	1977	1986	1992	1992	1977	1986	1987								

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1975 - 1994
ANNUAL TOTAL	84004	48890.0	
ANNUAL MEAN	230	134	193
HIGHEST ANNUAL MEAN			301
LOWEST ANNUAL MEAN			66.2
HIGHEST DAILY MEAN	1960	1650	4220
LOWEST DAILY MEAN	13	9.5	7.5
ANNUAL SEVEN-DAY MINIMUM	13	9.5	7.7
ANNUAL RUNOFF (AC-FT)	166600	96970	139700
ANNUAL RUNOFF (CFSM)	1.31	.76	1.10
ANNUAL RUNOFF (INCHES)	17.76	10.33	14.88
10 PERCENT EXCEEDS	796	433	526
50 PERCENT EXCEEDS	49	32	62
90 PERCENT EXCEEDS	14	10	11

e Estimated



## UMATILLA RIVER BASIN

91

14020740 MOONSHINE CREEK NEAR MISSION, OR

LOCATION.--Lat 45°39'37", long 118°35'42", in NW 1/4 NE 1/4 sec.16, T.2 N., R.34 E., Umatilla County, Hydrologic Unit 17070103, Umatilla Indian Reservation, on left bank, 60 ft upstream from county road crossing, 5.7 mi west of Mission, and at mile 1.1.

DRAINAGE AREA.--Not determined.

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

REVISED RECORDS.--WDR OR-93-1: 1992(M).

GAGE.--Water-stage recorder. Elevation of gage is 1,600 ft above sea level, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are fair. No known regulation.

AVERAGE DISCHARGE.--2 years (water years 1993-94), 2.47 ft<sup>3</sup>/s, 1,790 acre-ft per year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 67 ft<sup>3</sup>/s Jan. 1, 1994, gage height, 5.30 ft; no flow many days each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 67 ft<sup>3</sup>/s Jan. 1, gage height, 5.30 ft; no flow part of or all of Oct. 2, 15-19.

REVISIONS.--Revised figures of discharge for the water year 1993 superseding those published in the report for 1993 are given below.

EXTREMES FOR 1993 WATER YEAR.--Maximum discharge, 65 ft<sup>3</sup>/s May 4, gage height, 5.29 ft; no flow part or all of 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	.36	3.8	2.7	5.6	e1.4	6.5	6.2	.56	.12	.05	.04
2	.00	.35	3.5	2.5	4.9	1.6	6.0	5.9	.57	.12	.05	.04
3	.03	.34	3.1	2.4	4.2	2.0	7.5	7.5	.84	.11	.04	.03
4	.00	.36	2.7	2.3	3.8	9.9	9.7	47	.79	.10	.04	.03
5	.00	.35	2.5	2.1	3.4	19	9.3	33	1.0	.09	.03	.03
6	.00	.35	2.2	1.9	3.2	16	8.6	25	1.3	.08	.03	.02
7	.00	.39	2.0	e1.6	3.1	16	8.3	19	1.1	.08	.03	.02
8	.01	.42	2.0	e1.4	3.3	14	9.1	15	.95	.07	.03	.02
9	.00	.40	2.1	e1.1	3.7	11	11	11	.87	.06	.03	.02
10	.00	.40	2.5	e.82	4.2	9.6	11	8.5	.77	.06	.03	.01
11	.00	.40	2.8	e.84	4.7	8.0	11	6.5	.74	.05	.03	.01
12	.00	.45	2.6	e.86	4.6	6.8	9.6	4.9	.69	.05	.02	.03
13	.00	.46	2.4	e.88	4.3	6.0	8.5	3.8	.58	.05	.02	.03
14	.02	.46	2.5	e.88	4.3	6.6	7.3	3.0	.49	.06	.03	.03
15	.06	.49	2.8	e.90	4.0	10	6.3	2.4	.46	.06	.03	.03
16	.12	.52	2.9	e.96	3.2	9.8	5.4	2.0	.41	.06	.13	.04
17	.17	.58	2.8	e1.2	3.0	12	5.1	1.6	.35	.06	.05	.04
18	.19	.63	2.6	1.3	2.9	19	5.3	1.4	.31	.05	.04	.04
19	.18	.77	2.4	3.7	2.7	15	4.8	1.1	.27	.06	.04	.03
20	.19	.81	2.6	24	2.5	17	4.6	.98	.25	.06	.05	.03
21	.20	1.6	2.6	12	2.2	14	4.2	.92	.26	.05	.05	.04
22	.16	9.9	2.7	10	2.0	12	3.9	.80	.24	.05	.05	.04
23	.12	7.5	3.5	7.6	2.0	18	3.6	.70	.23	.05	.05	.04
24	.19	4.6	3.5	10	e1.7	29	3.5	.60	.20	.04	.05	.04
25	.20	3.3	3.3	24	e1.6	24	3.8	.54	.19	.05	.05	.03
26	.22	2.7	3.5	16	e1.5	17	7.5	.49	.17	.05	.05	.03
27	.25	2.6	3.9	11	e1.3	13	7.3	.45	.17	.04	.04	.02
28	.27	4.6	3.8	8.9	e1.2	11	6.7	.49	.15	.05	.04	.02
29	.31	4.6	3.6	9.0	---	9.0	6.6	.48	.14	.06	.04	.02
30	.39	4.0	3.1	7.8	---	7.6	6.5	.41	.13	.05	.04	.02
31	.37	---	3.0	6.6	---	6.6	---	.45	.13	.05	.04	---
TOTAL	3.65	54.69	89.3	177.24	89.1	371.9	208.5	212.11	15.18	1.99	1.30	0.87
MEAN	.12	1.82	2.88	5.72	3.18	12.0	6.95	6.84	.51	.064	.042	.029
MAX	.39	9.9	3.9	24	5.6	29	11	47	1.3	.12	.13	.04
MIN	.00	.34	2.0	.82	1.2	1.4	3.5	.41	.13	.04	.02	.01
AC-FT	7.2	108	177	352	177	738	414	421	30	3.9	2.6	1.7

## 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	.12	1.82	3.89	3.83	3.26	7.20	3.76	3.49	.25	.033	.021	.014
MAX	.12	1.82	4.89	5.72	3.34	12.0	6.95	6.84	.51	.064	.042	.029
(WY)	1993	1993	1992	1993	1993	1993	1993	1993	1993	1993	1993	1993
MIN	.12	1.82	2.88	1.93	3.18	2.41	.58	.13	.000	.002	.001	.000
(WY)	1993	1993	1993	1992	1993	1992	1992	1992	1992	1992	1992	1992

## SUMMARY STATISTICS

## FOR 1992 CALENDAR YEAR

## FOR 1993 WATER YEAR

## WATER YEARS 1992 - 1993

ANNUAL TOTAL	400.74	1225.83	
ANNUAL MEAN	1.09	3.36	3.36
HIGHEST ANNUAL MEAN			3.36
LOWEST ANNUAL MEAN			3.36
HIGHEST DAILY MEAN	9.9	Nov 22	47
LOWEST DAILY MEAN	.00	May 17	.00
ANNUAL SEVEN-DAY MINIMUM	.00	May 17	.00
ANNUAL RUNOFF (AC-FT)	795	2430	2430
10 PERCENT EXCEEDS	3.5	9.8	7.5
50 PERCENT EXCEEDS	.36	.88	.59
90 PERCENT EXCEEDS	.00	.03	.00

e Estimated

## UMATILLA RIVER BASIN

14020740 MOONSHINE CREEK NEAR MISSION, OR--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.02	.26	.17	28	.88	29	1.7	.57	1.1	.18	.10	.05
2	.02	.26	.14	12	.86	21	1.6	.54	.94	.19	.10	.05
3	.02	.26	.17	20	.83	16	1.5	.50	.97	.18	.11	.04
4	.02	.28	.23	16	.77	16	1.4	.48	.91	.18	.11	.04
5	.03	.26	.24	10	.72	11	1.3	.47	.79	.21	.10	.04
6	.03	.26	.26	7.5	.72	8.4	1.5	.45	.95	.18	.09	.04
7	.04	.29	.31	5.8	.72	6.9	1.4	.42	.94	.15	.09	.04
8	.05	.29	.31	4.8	.66	5.8	1.4	.40	.84	.14	.10	.03
9	.06	.27	.33	5.1	.61	5.0	1.7	.36	.73	.13	.11	.04
10	.06	.30	.39	5.0	.60	4.6	1.7	.34	.70	.11	.12	.04
11	.07	.30	.66	7.3	.60	4.1	1.7	.33	.64	.11	.12	.04
12	.07	.30	.76	8.9	.60	3.7	1.7	.32	.61	.17	.13	.03
13	.07	.27	.79	11	.60	3.3	1.7	.29	.61	.22	.12	.03
14	.09	.29	.74	8.2	.60	3.1	1.6	.29	.60	.21	.12	.03
15	.08	.30	.72	6.5	.60	2.9	1.4	.33	.57	.18	.13	.03
16	.00	.30	.72	5.2	.60	2.8	1.4	.30	.56	.18	.13	.04
17	.00	.29	.66	4.4	.61	2.6	1.3	.30	.50	.17	.13	.04
18	.00	.26	.66	3.8	.63	2.8	1.1	.30	.44	.15	.13	.04
19	.03	.26	.66	3.2	.66	2.6	1.1	.40	.41	.15	.13	.04
20	.13	.27	.64	2.8	.65	2.6	.96	12	.36	.15	.13	.03
21	.16	.26	.60	2.5	.63	3.0	.91	11	.34	.15	.13	.03
22	.17	.26	.57	2.2	.65	3.0	.86	8.1	.32	.15	.13	.03
23	.15	.25	.54	2.0	.67	3.0	.81	6.0	.30	.16	.13	.03
24	.14	.23	.54	1.8	1.4	2.9	.76	4.5	.27	.16	.12	.03
25	.15	.23	.53	1.7	1.6	2.8	.74	3.5	.25	.17	.11	.03
26	.18	.20	.48	1.5	1.9	2.6	.93	2.8	.25	.15	.10	.03
27	.19	.19	.47	1.3	3.9	2.4	.73	2.2	.24	.14	.10	.03
28	.25	.19	.43	1.2	29	2.3	.66	2.0	.21	.11	.09	.04
29	.26	.20	.43	1.1	---	2.1	.62	1.7	.20	.11	.09	.05
30	.26	.21	.41	1.1	---	1.9	.60	1.4	.19	.11	.07	.05
31	.25	---	.40	.97	---	1.9	---	1.2	---	.11	.05	---
TOTAL	3.05	7.79	14.96	192.87	53.27	182.1	36.78	63.79	16.74	4.86	3.42	1.11
MEAN	.098	.26	.48	6.22	1.90	5.87	1.23	2.06	.56	.16	.11	.037
MAX	.26	.30	.79	28	29	29	1.7	12	1.1	.22	.13	.05
MIN	.00	.19	.14	.97	.60	1.9	.60	.29	.19	.11	.05	.03
AC-FT	6.0	15	30	383	106	361	73	127	33	9.6	6.8	2.2

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1992 - 1994, BY WATER YEAR (WY)

	1992	1993	1994	1992	1993	1994	1992	1993	1994	1992	1993	1994
MEAN	.11	1.04	2.75	4.62	2.81	6.76	2.92	3.01	.35	.074	.051	.022
MAX	.12	1.82	4.89	6.22	3.34	12.0	6.95	6.84	.56	.16	.11	.037
(WY)	1993	1993	1992	1994	1992	1993	1993	1993	1994	1994	1994	1994
MIN	.098	.26	.48	1.93	1.90	2.41	.58	.13	.000	.002	.001	.000
(WY)	1994	1994	1994	1992	1994	1992	1992	1992	1992	1992	1992	1992

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1992 - 1994

ANNUAL TOTAL	1103.99	580.74	
ANNUAL MEAN	3.02	1.59	
HIGHEST ANNUAL MEAN			2.47
LOWEST ANNUAL MEAN			3.36
HIGHEST DAILY MEAN	47	29	1.59
LOWEST DAILY MEAN	.00	.00	47
ANNUAL SEVEN-DAY MINIMUM	.02	.03	.00
ANNUAL RUNOFF (AC-FT)	2190	1150	.00
10 PERCENT EXCEEDS	9.7	3.7	6.6
50 PERCENT EXCEEDS	.43	.36	.51
90 PERCENT EXCEEDS	.03	.04	.00

UMATILLA RIVER BASIN

93

14020760 COTTONWOOD CREEK NEAR MISSION, OR

LOCATION.--Lat 45°39'38", long 118°33'52", in SW 1/4 SW 1/4 sec.8, T.2 N., R.34 E., Umatilla County, Hydrologic Unit 17070103, Umatilla Indian Reservation, on right bank, on downstream side of county road crossing, 4.5 mi west of Mission, and at mile 1.3.

DRAINAGE AREA.--Not determined.

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

GAGE.--Water-stage recorder, elevation of gage is 1,500 ft above sea level, from topographic map.

REMARKS.--No estimated daily discharges. Records good. No known regulation.

AVERAGE DISCHARGE.--2 years, 1.78 ft<sup>3</sup>/s, 1,290 acre-ft.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 57 ft<sup>3</sup>/s May 20, 1994, gage height, 5.08 ft, no flow many days each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 57 ft<sup>3</sup>/s May 20, gage height, 5.08 ft; no flow many days during year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	19	.49	30	.91	.00	.20	.01	.00	.00
2	.00	.00	.00	13	.42	20	.73	.00	.18	.00	.00	.00
3	.00	.00	.00	21	.41	15	.60	.00	.18	.00	.00	.00
4	.00	.00	.00	16	.33	15	.47	.00	.18	.00	.00	.00
5	.00	.00	.00	11	.20	12	.25	.00	.18	.00	.00	.00
6	.00	.00	.00	7.5	.16	9.1	.62	.00	.19	.00	.00	.00
7	.00	.00	.00	5.8	.15	7.4	.50	.00	.18	.00	.00	.00
8	.00	.00	.00	4.8	.07	6.2	.40	.00	.17	.00	.00	.00
9	.00	.00	.00	5.1	.00	5.2	.79	.00	.13	.00	.00	.00
10	.00	.00	.00	5.0	.00	4.6	.74	.00	.07	.00	.00	.00
11	.00	.00	.00	6.7	.00	3.9	.80	.00	.03	.00	.00	.00
12	.00	.00	.00	8.6	.00	3.4	.88	.00	.02	.00	.00	.00
13	.00	.00	.00	10	.00	2.9	.87	.00	.02	.00	.00	.00
14	.00	.00	.00	8.0	.00	2.6	.78	.00	.02	.00	.00	.00
15	.00	.00	.00	6.4	.00	2.3	.67	.00	.02	.00	.00	.00
16	.00	.00	.00	5.3	.00	2.2	.58	.00	.02	.00	.00	.00
17	.00	.00	.00	4.5	.00	1.9	.37	.00	.02	.00	.00	.00
18	.00	.00	.00	3.8	.00	2.1	.24	.00	.02	.00	.00	.00
19	.00	.00	.00	3.2	.00	1.9	.12	.00	.01	.00	.00	.00
20	.00	.00	.00	2.6	.00	1.9	.00	28	.01	.00	.00	.00
21	.00	.00	.00	2.2	.00	2.3	.00	20	.01	.00	.00	.00
22	.00	.00	.00	1.9	.00	2.4	.00	14	.01	.00	.00	.00
23	.00	.00	.00	1.7	.00	2.5	.00	9.4	.01	.00	.00	.00
24	.00	.00	.00	1.4	.30	2.4	.00	6.4	.01	.00	.00	.00
25	.00	.00	.00	1.2	.46	2.3	.00	4.1	.01	.00	.00	.00
26	.00	.00	.00	.95	.72	2.0	.00	2.5	.01	.00	.00	.00
27	.00	.00	.00	.68	2.6	1.8	.00	1.6	.01	.00	.00	.00
28	.00	.00	.00	.53	25	1.6	.00	1.0	.01	.00	.00	.00
29	.00	.00	.00	.49	---	1.4	.00	.71	.01	.00	.00	.00
30	.00	.00	.00	.49	---	1.2	.00	.41	.01	.00	.00	.00
31	.00	---	.00	.49	---	1.1	---	.27	---	.00	.00	---
TOTAL	0.00	0.00	0.00	179.33	31.31	170.6	11.32	88.39	1.95	0.01	0.00	0.00
MEAN	.0000	.0000	.0000	5.78	1.12	5.50	.38	2.85	.065	.0000	.0000	.0000
MAX	.00	.00	.00	21	25	30	.91	28	.20	.01	.00	.00
MIN	.00	.00	.00	.49	.00	1.1	.00	.00	.01	.00	.00	.00
AC-FT	.00	.00	.00	356	62	338	22	175	3.9	.02	.00	.00

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1992 - 1994, BY WATER YEAR (WY)

	1992	1993	1994	1992	1993	1994	1992	1993	1994	1992	1993	1994
MEAN	.0000	.43	1.80	3.44	1.81	5.10	1.98	2.66	.049	.0000	.0001	.0000
MAX	.0000	.87	3.78	5.78	2.18	8.07	5.44	5.12	.082	.0000	.0003	.0000
(WY)	1993	1993	1992	1994	1993	1993	1993	1993	1993	1994	1993	1992
MIN	.0000	.0000	.0000	.97	1.12	1.74	.11	.0000	.0000	.0000	.0000	.0000
(WY)	1993	1994	1994	1992	1994	1992	1992	1992	1992	1992	1992	1992

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1992 - 1994
ANNUAL TOTAL	746.30	482.91	
ANNUAL MEAN	2.04	1.32	1.79
HIGHEST ANNUAL MEAN			2.25
LOWEST ANNUAL MEAN			1.32
HIGHEST DAILY MEAN	31 May 4	30 Mar 1	31 May 4 1993
LOWEST DAILY MEAN	.00 Jun 18	.00 Oct 1	.00 Apr 27 1992
ANNUAL SEVEN-DAY MINIMUM	.00 Jun 18	.00 Oct 1	.00 Apr 27 1992
ANNUAL RUNOFF (AC-FT)	1480	958	1300
10 PERCENT EXCEEDS	7.1	3.6	5.3
50 PERCENT EXCEEDS	.00	.00	.00
90 PERCENT EXCEEDS	.00	.00	.00

## UMATILLA RIVER BASIN

14021980 PATAWA CREEK AT WEST RESERVATION BOUNDARY, NEAR PENDLETON, OR

LOCATION.--Lat 45°39'11", long 118°44'39", in NW 1/4 SW 1/4 sec. 18, T.2 N., R.33 E., Umatilla County, Hydrologic Unit 17070103, Umatilla Indian Reservation, on left bank, at downstream side of county road crossing, 2 mi southwest of Pendleton City Hall, and at mile 2.9.

DRAINAGE AREA.--30 mi<sup>2</sup>, excludes about 1 mi<sup>2</sup> in upper basin where water has been diverted directly to the Umatilla River.

PERIOD OF RECORD.--December 1973 to April 1975 (discharge measurements only), October 1991 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,220 ft above sea level, from topographic map.

REMARKS.--Records fair except for estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--3 years (water years 1992-94), 3.66 ft<sup>3</sup>/s, 1.66 in/yr, 2,652 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 356 ft<sup>3</sup>/s May 20, 1994, gage height, 7.82 ft; minimum discharge, 0.09 ft<sup>3</sup>/s Oct. 30, 1992.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 356 ft<sup>3</sup>/s May 20, gage height, 7.82 ft; minimum discharge, 0.38 ft<sup>3</sup>/s many days in September.

REVISIONS.--The maximum discharge for water year 1993 has been revised to 102 ft<sup>3</sup>/s Mar. 4, gage height, 6.49 ft, superseding figures published in the report for 1993.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.64	.71	1.2	13	2.3	40	3.1	1.9	2.8	.97	.64	.43
2	.63	.71	.95	11	2.3	26	3.0	1.8	2.4	.95	.61	.43
3	.65	.69	.95	23	2.3	20	2.8	1.8	2.3	.93	.61	.44
4	.66	.69	.91	19	2.2	22	2.8	1.8	2.6	.92	.63	.43
5	.67	.70	.89	12	2.2	18	2.8	1.7	2.1	1.0	.60	.43
6	.71	.77	.91	7.9	2.3	15	2.9	1.6	2.3	.99	.60	.43
7	.75	.81	.96	5.9	2.3	13	2.9	1.6	3.5	.93	.60	.43
8	.74	.82	1.0	4.7	2.1	e11	2.8	1.6	3.4	.91	.58	.42
9	.75	.84	1.2	4.3	2.2	e10	3.0	1.5	2.5	.88	.58	.43
10	.74	.85	1.3	3.9	2.3	e9.0	3.1	1.4	2.1	.85	.56	.43
11	.73	.85	1.2	4.5	2.3	e8.0	3.1	1.4	1.9	.86	.55	.43
12	.71	.85	1.3	6.1	2.3	e7.0	3.2	1.4	1.8	.85	.54	.43
13	.69	.85	1.3	8.5	2.3	e6.6	3.1	1.4	1.7	.84	.53	.43
14	.68	.84	1.3	7.4	2.3	e6.2	3.0	1.4	1.7	.84	.52	.43
15	.71	.85	1.3	6.2	2.3	e5.8	2.9	1.8	1.6	.82	.50	.43
16	.69	.82	1.3	5.1	2.2	e5.4	2.7	1.4	1.5	.81	.50	.43
17	.69	.85	1.3	4.4	2.2	e5.2	2.7	1.4	1.5	.79	.49	.42
18	.70	.86	1.4	4.1	2.2	e5.4	2.6	1.4	1.4	.78	.48	.41
19	.67	.72	1.4	3.7	2.2	e5.2	2.5	6.1	1.4	.77	.48	.40
20	.66	.77	1.4	3.5	2.2	e5.2	2.4	148	1.3	.76	.48	.40
21	.70	.83	1.4	3.4	2.3	e5.4	2.3	54	1.3	.75	.47	.39
22	.72	.90	1.5	3.2	2.2	e5.4	2.3	37	1.3	.72	.47	.39
23	.70	.90	1.4	3.1	2.3	e5.2	2.2	24	1.2	.73	.47	.39
24	.69	.81	1.5	2.9	2.7	e4.8	2.2	e18	1.2	.72	.47	.39
25	.69	.81	1.5	2.7	2.6	e4.6	2.0	e13	1.2	.72	.46	.39
26	.70	.81	1.5	2.6	2.6	e4.4	2.2	9.1	1.2	.70	.46	.38
27	.75	.80	1.5	2.5	4.6	e4.2	2.2	6.9	1.1	.68	.45	.38
28	.76	.74	1.5	2.5	38	e4.0	2.1	5.6	1.1	.67	.45	.38
29	.76	.71	1.5	2.4	---	e3.8	2.0	4.9	1.0	.66	.43	.42
30	.79	.96	1.5	2.4	---	e3.6	1.9	3.9	1.0	.65	.44	.43
31	.74	---	1.5	2.3	---	e3.2	---	3.2	---	.64	.44	---
TOTAL	21.87	24.12	39.77	188.2	102.3	292.6	78.8	362.0	53.4	25.09	16.09	12.45
MEAN	.71	.80	1.28	6.07	3.65	9.44	2.63	11.7	1.78	.81	.52	.41
MAX	.79	.96	1.5	23	38	40	3.2	148	3.5	1.0	.64	.44
MIN	.63	.69	.89	2.3	2.1	3.2	1.9	1.4	1.0	.64	.43	.38
AC-FT	43	48	79	373	203	580	156	718	106	50	32	25
CFSM	.02	.03	.04	.20	.12	.31	.09	.39	.06	.03	.02	.01
IN.	.03	.03	.05	.23	.13	.36	.10	.45	.07	.03	.02	.02

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1992 - 1994, BY WATER YEAR (WY)

	MEAN	.50	2.51	2.32	5.31	3.99	11.6	7.07	7.42	1.33	.60	.58	.61
MAX	.71	5.88	5.01	8.55	5.51	20.2	16.8	11.7	1.78	.81	.98	.89	
(WY)	1994	1992	1992	1993	1993	1993	1993	1994	1994	1994	1993	1993	1993
MIN	.31	.80	.65	1.30	2.84	5.19	1.81	1.01	.48	.22	.24	.41	
(WY)	1993	1994	1993	1992	1992	1992	1992	1992	1992	1992	1992	1994	

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1992 - 1994

ANNUAL TOTAL	2063.57	1216.69	3.66	
ANNUAL MEAN	5.65	3.33	5.57	1993
HIGHEST ANNUAL MEAN			2.08	1992
LOWEST ANNUAL MEAN				
HIGHEST DAILY MEAN	43	Mar 24	148	May 20 1994
LOWEST DAILY MEAN	.40	Jan 10	.38	Sep 26
ANNUAL SEVEN-DAY MINIMUM	.42	Jan 9	.39	Sep 22
ANNUAL RUNOFF (AC-FT)	4090	2410	2650	
ANNUAL RUNOFF (CFSM)	.19	.11	.12	
ANNUAL RUNOFF (INCHES)	2.56	1.51	1.66	
10 PERCENT EXCEEDS	18	5.7	10	
50 PERCENT EXCEEDS	1.1	1.4	1.1	
90 PERCENT EXCEEDS	.65	.46	.34	

e Estimated



UMATILLA RIVER BASIN

95

14022200 NORTH FORK MCKAY CREEK NEAR PILOT ROCK, OR

LOCATION.--Lat 45°30'24", long 118°36'57", in NE 1/4 SE 1/4 sec.1, T.1 S., R.33 E., Umatilla County, Hydrologic Unit 17070103, Umatilla Indian Reservation, on left bank 10 mi northeast of Pilot Rock and at mile 0.5.

DRAINAGE AREA.--48.6 mi<sup>2</sup>.

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

GAGE.--Water-stage recorder. Elevation of gage is 1,870 ft above sea level, from topographic map.

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

AVERAGE DISCHARGE.--21 years, 41.5 ft<sup>3</sup>/s, 30,070 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,980 ft<sup>3</sup>/s Jan. 25, 1975, gage height, 8.48 ft, from floodmark, from rating curve extended above 150 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; minimum discharge, 0.22 ft<sup>3</sup>/s June 26, 1985 (result of temporary construction upstream).

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

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 1	1130	311	3.19	Mar. 1	1630	454	3.68
Jan. 3	0300	367	3.39	May 20	1230	*750	*4.73

Minimum discharge, 0.75 ft<sup>3</sup>/s several days in August and September.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	1.8	8.7	168	18	357	44	12	17	2.5	.96	.99
2	1.2	1.7	22	132	17	335	41	11	15	2.5	.91	.98
3	1.2	1.7	20	268	15	286	39	11	15	2.4	.91	1.1
4	1.2	1.7	18	218	14	298	36	11	14	2.3	.97	1.2
5	1.2	1.7	16	147	13	209	33	10	13	2.5	.98	1.0
6	1.2	1.7	14	107	e12	145	38	9.4	14	2.7	.91	.90
7	1.3	1.7	12	83	e11	113	43	8.4	16	2.4	.89	.83
8	1.4	1.7	11	68	e9.5	92	43	7.5	17	2.2	.95	.82
9	1.4	1.7	9.9	78	e10	79	62	7.0	15	2.1	.99	.96
10	1.4	1.7	13	91	12	77	62	6.5	13	1.9	.99	1.0
11	1.4	1.7	15	124	11	71	58	5.9	12	1.9	.98	1.1
12	1.4	1.7	16	156	10	64	54	5.8	11	1.8	.97	1.0
13	1.4	1.7	16	222	9.9	62	49	5.2	11	1.7	.92	1.0
14	1.4	1.8	15	162	10	63	45	4.8	11	1.7	.95	1.0
15	1.5	1.8	13	119	9.8	63	40	5.6	9.7	1.6	.85	1.0
16	1.7	1.8	12	93	9.8	63	35	6.4	8.9	1.5	.85	.96
17	1.8	1.8	11	75	10	58	32	6.4	7.8	1.5	.87	.90
18	1.8	2.1	9.8	64	12	58	29	6.0	7.1	1.4	.91	.86
19	1.7	2.1	8.9	56	11	54	26	21	6.5	1.4	.90	.83
20	1.6	2.0	8.3	48	11	51	23	425	5.9	1.3	.89	.85
21	1.6	2.0	7.7	42	11	59	21	295	5.3	1.3	.91	.87
22	1.6	2.0	7.1	38	11	59	19	201	4.9	1.2	.94	.88
23	1.6	2.1	6.5	36	11	56	17	129	4.4	1.2	.91	.88
24	1.6	1.8	5.9	33	21	53	16	93	4.0	1.2	.89	.88
25	1.6	e1.6	5.3	32	23	49	16	69	3.7	1.2	.88	.87
26	1.6	e1.5	5.1	29	26	46	18	52	3.7	1.1	.91	.84
27	1.6	e1.5	5.1	27	41	44	17	38	3.4	.96	.91	.77
28	1.7	e1.5	4.7	25	153	44	15	30	3.1	.96	.92	.82
29	1.8	e1.6	4.3	23	---	44	13	25	2.8	.96	.88	1.1
30	1.8	2.4	4.3	22	---	44	13	21	2.6	.94	.92	1.3
31	1.8	---	4.5	19	---	45	---	18	---	.94	.92	---
TOTAL	46.7	53.6	330.1	2805	533.0	3141	997	1556.9	277.8	51.26	28.54	28.49
MEAN	1.51	1.79	10.6	90.5	19.0	101	33.2	50.2	9.26	1.65	.92	.95
MAX	1.8	2.4	22	268	153	357	62	425	17	2.7	.99	1.3
MIN	1.2	1.5	4.3	19	9.5	44	13	4.8	2.6	.94	.85	.77
AC-FT	93	106	655	5560	1060	6230	1980	3090	551	102	57	57

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1973 - 1994, BY WATER YEAR (WY)

	MEAN	MAX	(WY)	MIN	(WY)
1973	2.61	8.50	1983	.90	1988
1974	21.5	74.6	1992	1.30	1988
1975	51.3	197	1974	3.11	1977
1976	74.0	170	1976	5.01	1977
1977	89.1	213	1982	4.39	1977
1978	113	223	1984	29.3	1992
1979	87.0	200	1974	16.2	1992
1980	43.1	136	1991	5.08	1992
1981	13.6	60.4	1984	2.09	1973
1982	2.26	4.97	1991	.73	1985
1983	1.15	2.77	1993	.72	1987
1984	1.26	2.74	1977	.78	1987

SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1973 - 1994

ANNUAL TOTAL	17738.1	9849.39	
ANNUAL MEAN	48.6	27.0	41.6
HIGHEST ANNUAL MEAN			72.5
LOWEST ANNUAL MEAN			10.7
HIGHEST DAILY MEAN	655	425	1070
LOWEST DAILY MEAN	1.0	.77	.45
ANNUAL SEVEN-DAY MINIMUM	1.2	.85	.50
ANNUAL RUNOFF (AC-FT)	35180	19540	30160
10 PERCENT EXCEEDS	155	64	118
50 PERCENT EXCEEDS	11	6.5	9.8
90 PERCENT EXCEEDS	1.4	.93	1.0

e Estimated

## UMATILLA RIVER BASIN

14033500 UMATILLA RIVER NEAR UMATILLA, OR

LOCATION.--Lat 45°54'11", long 119°19'33", in SW 1/4 NW 1/4 sec.21, T.5 N., R.28 E., Umatilla County, Hydrologic Unit 17070103, on left bank 1.6 mi downstream from West Division main canal of Umatilla project, 1.2 mi southeast of Umatilla, and at mile 2.1.

DRAINAGE AREA.--2,290 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--October 1903 to current year.

REVISED RECORDS.--WSP 794: Drainage area. WSP 1398: 1909, 1911, 1914, 1928, 1935.

GAGE.--Water-stage recorder. Datum of gage is 330.47 ft above sea level. Oct. 21, 1903, to Jan. 25, 1931, nonrecording gage.

REMARKS.--Records fair. Some regulation since 1927 by McKay Reservoir (station 14023000). Many diversions upstream from station for irrigation of lands upstream and downstream from station; Brownell Canal diverts downstream from station. Diversions since 1908 to Cold Springs Reservoir, an off-channel reservoir, capacity, 52,380 acre-ft. Continuous water-quality records for the period October 1962 to September 1969 have been collected at this location. U.S. Bureau of Reclamation satellite telemeter at station.

AVERAGE DISCHARGE.--67 years (water years 1928-94), 458 ft<sup>3</sup>/s, 331,800 acre-ft/yr. Water years prior to 1928 not included in computation of average discharge owing to increased regulation and diversion since 1927.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 19,800 ft<sup>3</sup>/s Jan. 30, 1965, gage height, 10.75 ft; no flow at times.

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

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 4	2015	*3,630	*5.39	No other peak greater than base discharge.			

Minimum discharge, 1.2 ft<sup>3</sup>/s Aug. 5-6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	143	214	211	87	156	1540	479	260	94	28	2.1	65
2	159	215	234	682	138	2960	566	213	76	4.2	1.5	61
3	198	214	269	747	108	3380	685	183	65	1.9	2.3	60
4	202	211	241	1430	105	3380	763	180	68	1.9	2.3	57
5	196	213	231	1580	98	3180	595	197	113	7.3	2.5	58
6	190	214	179	1420	94	2260	423	197	105	2.2	1.4	56
7	178	214	129	1040	97	1590	443	178	142	1.7	1.6	56
8	163	214	103	753	e86	1210	440	166	118	1.7	1.5	56
9	186	219	120	606	e94	957	442	131	81	2.0	1.5	55
10	164	222	95	552	e94	785	512	117	75	1.9	2.0	54
11	188	209	90	518	e90	706	529	88	68	1.8	1.7	49
12	191	166	91	625	86	677	505	86	67	1.8	1.6	56
13	199	158	95	852	83	647	565	60	70	2.9	1.6	58
14	210	155	85	1370	81	715	512	56	81	1.8	1.7	56
15	204	154	87	1390	81	767	395	87	86	1.5	1.5	55
16	230	153	84	1100	85	934	386	120	68	1.9	1.7	55
17	211	140	84	848	79	1030	454	141	65	2.0	2.7	56
18	228	152	84	665	78	853	595	123	60	1.7	1.9	57
19	224	153	83	524	79	731	778	104	68	1.7	34	54
20	226	158	83	457	79	619	791	379	90	5.9	56	51
21	222	158	83	361	78	525	696	2420	88	2.0	61	52
22	217	156	88	334	77	466	648	1840	74	1.7	59	54
23	211	154	81	304	69	403	478	1220	66	1.8	59	51
24	208	149	84	269	91	305	344	743	69	1.7	54	58
25	196	132	83	306	301	267	307	452	68	1.7	51	59
26	199	132	83	290	344	202	372	264	75	3.0	52	63
27	214	132	85	287	343	180	362	231	88	4.7	51	65
28	213	133	85	258	390	220	297	273	81	1.7	52	60
29	211	137	84	236	---	217	242	203	66	2.3	51	59
30	223	157	84	214	---	266	260	169	61	2.0	51	59
31	218	---	89	181	---	373	---	110	---	4.5	54	---
TOTAL	6222	5188	3607	20286	3584	32345	14864	10991	2396	102.9	718.1	1705
MEAN	201	173	116	654	128	1043	495	355	79.9	3.32	23.2	56.8
MAX	230	222	269	1580	390	3380	791	2420	142	28	61	65
MIN	143	132	81	87	69	180	242	56	60	1.5	1.4	49
AC-FT	12340	10290	7150	40240	7110	64160	29480	21800	4750	204	1420	3380

CAL YR 1993 TOTAL 254306 MEAN 697 MAX 8260 MIN 54 AC-FT 504400  
WTR YR 1994 TOTAL 102009.0 MEAN 279 MAX 3380 MIN 1.4 AC-FT 202300

e Estimated

## WILLOW CREEK BASIN

97

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

LOCATION.--Lat 45°20'27", long 119°30'53", in NE 1/4 NE 1/4 sec.1, T.3 S., R.26 E., Morrow County, Hydrologic Unit 17070104, on right bank 1.5 mi southeast of Heppner, 1.7 mi upstream from Willow Creek dam, and at mile 54.1.

DRAINAGE AREA.--67.6 mi<sup>2</sup>.

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

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 2,085.41 ft above sea level (levels by Corps of Engineers).

REMARKS.--No estimated daily discharges. Records good except those below 2 ft<sup>3</sup>/s, which are fair. Many diversions for irrigation upstream from station. Part of flow of Ditch Creek (John Day River basin) is diverted to Willow Creek upstream from station.

AVERAGE DISCHARGE.--12 years, 20.9 ft<sup>3</sup>/s, 15,150 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 445 ft<sup>3</sup>/s Mar. 4, 1983, gage height, 6.93 ft; minimum discharge, 0.01 ft<sup>3</sup>/s July 31 to Sept. 14, 1988, Aug. 20, 1992, but may have been less during period of no gage-height record July 31 to Sept. 14, 1988.

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

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
May 20	1415	*140	*6.55	No other peak greater than base discharge.			
Minimum discharge, 0.13 ft <sup>3</sup> /s Aug. 16.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	3.8	8.9	12	7.7	35	24	4.2	25	4.8	.45	.30
2	1.6	3.7	11	11	6.9	42	24	4.8	23	4.8	.40	.29
3	1.2	3.6	9.3	21	6.6	44	25	5.0	23	5.4	.30	.30
4	1.1	3.4	8.6	26	6.3	49	25	7.5	27	4.1	.31	.30
5	1.4	3.6	7.2	24	6.0	45	23	7.4	24	5.5	.35	.27
6	1.7	3.5	5.8	21	7.4	40	24	5.2	36	11	.39	.24
7	1.6	3.6	6.2	17	7.1	35	23	5.7	73	8.1	.44	.24
8	1.8	3.7	7.7	16	3.8	31	22	5.6	70	6.7	.49	.24
9	2.0	3.9	9.0	15	7.7	26	23	5.4	60	5.7	.46	.35
10	2.1	4.3	6.8	14	8.2	25	22	4.0	49	5.1	.29	.48
11	2.0	4.0	7.3	15	7.1	23	22	3.0	40	4.0	.27	.53
12	2.1	3.9	8.2	16	6.6	21	22	2.5	35	3.5	.20	.55
13	2.5	2.5	6.8	27	6.4	20	21	2.2	32	3.3	.17	.59
14	2.5	3.4	6.4	28	6.3	20	21	2.1	28	3.1	.16	.58
15	2.6	4.6	6.4	26	6.3	20	20	7.2	26	2.9	.16	.62
16	3.9	5.0	6.3	22	6.5	22	18	11	22	3.1	.17	.52
17	3.6	5.0	6.0	20	7.7	21	19	11	21	3.0	.17	.40
18	2.3	5.2	4.7	18	8.2	22	21	9.8	19	2.7	.20	.39
19	1.9	4.7	4.6	16	7.0	21	20	17	17	2.7	.22	.41
20	2.4	4.7	4.7	15	6.5	20	19	97	17	2.3	.29	.40
21	2.6	5.0	5.3	14	6.4	20	20	123	15	2.0	.30	.38
22	2.7	5.9	4.1	14	6.0	17	18	98	16	1.7	.35	.43
23	2.3	4.1	3.4	13	6.4	18	17	79	16	1.3	.39	.49
24	2.9	2.7	3.8	14	8.0	18	14	64	13	1.3	.42	.47
25	3.8	3.4	4.2	14	7.3	17	12	52	11	1.7	.43	.52
26	3.7	3.2	4.5	13	8.2	16	14	44	7.9	1.5	.43	.50
27	3.7	3.6	4.6	12	12	16	11	37	7.3	1.3	.42	.57
28	4.3	4.0	4.0	11	20	16	11	31	7.1	.78	.40	.58
29	4.2	6.4	4.1	9.4	---	17	8.3	27	5.8	.33	.32	.93
30	4.1	9.3	4.1	12	---	18	7.0	24	5.3	.49	.37	1.3
31	4.0	---	5.1	6.4	---	21	---	22	---	.71	.35	---
TOTAL	80.6	127.7	189.1	512.8	210.6	776	570.3	818.6	771.4	104.91	10.07	14.17
MEAN	2.60	4.26	6.10	16.5	7.52	25.0	19.0	26.4	25.7	3.38	.32	.47
MAX	4.3	9.3	11	28	20	49	25	123	73	11	.49	1.3
MIN	1.1	2.5	3.4	6.4	3.8	16	7.0	2.1	5.3	.33	.16	.24
AC-FT	160	253	375	1020	418	1540	1130	1620	1530	208	20	28

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 1994, BY WATER YEAR (WY)

	3.30	8.14	12.7	17.4	29.6	60.0	53.3	43.0	17.4	4.20	1.22	1.41
MEAN	3.30	8.14	12.7	17.4	29.6	60.0	53.3	43.0	17.4	4.20	1.22	1.41
MAX	7.10	21.2	29.8	53.1	95.5	128	116	102	55.4	11.2	3.44	6.13
(WY)	1983	1987	1984	1984	1986	1993	1984	1983	1984	1993	1984	1984
MIN	.20	2.79	4.02	6.68	7.52	9.81	11.9	2.73	1.60	.88	.010	.064
(WY)	1989	1988	1991	1990	1994	1988	1992	1992	1992	1985	1988	1988

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1983 - 1994
ANNUAL TOTAL	12651.23	4186.25	
ANNUAL MEAN	34.7	11.5	20.9
HIGHEST ANNUAL MEAN			44.3
LOWEST ANNUAL MEAN			6.84
HIGHEST DAILY MEAN	271	123	300
LOWEST DAILY MEAN	.87	.16	.01
ANNUAL SEVEN-DAY MINIMUM	1.1	.18	.01
ANNUAL RUNOFF (AC-FT)	25090	8300	15150
10 PERCENT EXCEEDS	113	25	60
50 PERCENT EXCEEDS	9.3	6.3	8.3
90 PERCENT EXCEEDS	2.0	.40	.52

## WILLOW CREEK BASIN

14034480 BALM FORK NEAR HEPPNER, OR

LOCATION.--Lat 45°19'56", long 119°32'24", in NW 1/4 SE 1/4 sec.2, T.3 S., R.26 E., Morrow County, Hydrologic Unit 17070104, on right bank, 0.7 mi upstream from bridge on Willow Creek Road, 1.0 mi southeast of Heppner, 1.2 mi upstream from Willow Creek dam, and at mile 1.1.

DRAINAGE AREA.--26.3 mi<sup>2</sup>.

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

REVISED RECORDS.--WDR OR-83-1: Drainage area. WDR OR-88-1: 1987(M).

GAGE.--Water-stage recorder. Concrete control since Aug. 24, 1982. Datum of gage is 2,101.52 ft above sea level (Corps of Engineers bench mark).

REMARKS.--Records poor. Diversion for irrigation of about 170 acres upstream from station.

AVERAGE DISCHARGE.--12 years, 2.56 ft<sup>3</sup>/s, 1,850 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 190 ft<sup>3</sup>/s Mar. 4, 1983, gage height, 4.90 ft, from rating curve extended above 82 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; no flow for part or all of several days in 1982, 1990, 1991, 1992.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge, about 36,000 ft<sup>3</sup>/s June 14, 1903, by computation of slope-area measurement (see WSP 96).

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 60 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
June 7	0800	*11	*3.50				

Minimum discharge, 0.02 ft<sup>3</sup>/s several days in October, July and August.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.03	.39	.69	.98	.85	.58	1.5	1.5	2.9	.56	.03	.05
2	.04	.40	.70	.96	.86	.76	1.6	1.5	2.9	.58	.03	.06
3	.03	.40	.73	.96	.86	.95	1.8	1.3	2.7	.50	.03	.04
4	.04	.41	.70	.95	.81	.94	1.9	1.6	2.8	.47	.03	.04
5	.04	.42	.73	.90	.81	.87	2.0	1.6	2.7	.54	.03	.04
6	.03	.41	.73	.90	.81	.98	2.0	1.5	2.9	.54	.03	.04
7	.03	.41	.75	.90	.83	1.5	1.8	1.4	5.4	.42	.04	.04
8	.04	.41	.74	.90	e.80	1.7	1.8	.91	5.0	.36	.04	.04
9	.19	.41	.77	.87	.83	1.7	1.9	.82	3.7	.30	.04	.05
10	.21	.42	.76	.86	.84	1.4	1.6	.85	3.1	.27	.04	.05
11	.22	.43	.80	.86	.81	1.5	1.7	.89	2.6	.22	.04	.05
12	.23	.43	.77	.91	.77	1.6	2.0	.88	2.6	.17	.04	.05
13	.25	.45	.79	.90	.80	1.8	1.9	.84	3.0	.15	.06	.05
14	.25	.45	.81	.95	.76	1.8	1.6	.78	3.1	.15	.04	.05
15	.24	.47	.82	.95	.76	1.7	1.5	1.2	3.0	.16	.04	.05
16	.27	.48	.82	.95	.73	1.7	1.4	1.3	2.8	.16	.04	.05
17	.27	.49	.85	.95	.77	1.6	1.4	1.3	2.6	.29	.04	.05
18	.28	.50	.85	.93	.80	1.6	1.4	1.3	2.5	.16	.04	.05
19	.29	.50	.86	.90	.78	1.6	1.3	1.7	2.4	.16	.04	.06
20	.30	.52	.86	.92	.77	1.7	1.2	1.7	2.3	.14	.04	.06
21	.30	.53	.84	.95	.82	1.7	1.3	2.0	2.2	.15	.04	.06
22	.32	.55	.81	.94	.81	1.7	1.2	2.1	2.1	.11	.04	.06
23	.32	.57	.81	.95	.81	1.9	1.2	2.4	1.7	.09	.04	.06
24	.32	e.54	.81	.95	.81	1.7	1.1	2.6	1.5	.06	.03	.05
25	.33	e.52	.81	.95	.74	1.6	1.1	2.6	1.4	.05	.03	.05
26	.34	e.54	.81	.95	.77	1.4	1.1	2.5	1.1	.05	.03	.05
27	.35	e.54	.81	.95	.54	1.4	.97	2.6	1.0	.04	.03	.05
28	.36	.56	.81	.90	.43	1.2	.77	2.7	.87	.04	.03	.05
29	.36	.59	.83	.90	---	1.1	.70	2.8	.72	.03	.03	.05
30	.37	.65	.85	.90	---	1.2	1.0	2.8	.65	.03	.03	.05
31	.38	---	.87	.90	---	1.4	---	2.4	---	.03	.04	---
TOTAL	7.03	14.39	24.59	28.64	21.78	44.28	43.74	52.37	74.24	6.98	1.13	1.50
MEAN	.23	.48	.79	.92	.78	1.43	1.46	1.69	2.47	.23	.036	.050
MAX	.38	.65	.87	.98	.86	1.9	2.0	2.8	5.4	.58	.06	.06
MIN	.03	.39	.69	.86	.43	.58	.70	.78	.65	.03	.03	.04
AC-FT	14	29	49	57	43	88	87	104	147	14	2.2	3.0

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 1994, BY WATER YEAR (WY)

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
MEAN	.40	.89	1.80	2.71	4.99	8.81	5.03	3.92	1.42	.43	.18	.25
MAX	1.53	3.01	4.60	7.81	17.1	21.0	16.4	10.4	3.82	1.24	.51	1.02
(WY)	1985	1987	1984	1984	1986	1993	1984	1983	1984	1993	1984	1984
MIN	.000	.002	.038	.28	.66	.47	.29	.24	.077	.034	.012	.006
(WY)	1992	1992	1991	1991	1990	1992	1992	1992	1992	1992	1992	1991

SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1983 - 1994

ANNUAL TOTAL	1821.39	320.67	
ANNUAL MEAN	4.99	.88	
HIGHEST ANNUAL MEAN			2.56
LOWEST ANNUAL MEAN			6.15
HIGHEST DAILY MEAN	40	Mar 7	.24
LOWEST DAILY MEAN	.03	Oct 1	80
ANNUAL SEVEN-DAY MINIMUM	.03	Oct 1	.00
ANNUAL RUNOFF (AC-FT)	3610		.00
10 PERCENT EXCEEDS	17		1850
50 PERCENT EXCEEDS	1.2		6.6
90 PERCENT EXCEEDS	.18		.78
			.04

e Estimated



## WILLOW CREEK BASIN

99

## 14034490 WILLOW CREEK LAKE AT HEPPNER, OR

LOCATION.--Lat 45°20'50", long 119°32'37", in NW 1/4 SE 1/4 sec.35, T.2 S., R.26 E., Morrow County, Hydrologic Unit 17070104, U.S. Corps of Engineers land, on top left side of spillway on dam on Willow Creek, 2,000 ft upstream from Court Street bridge and at mile 52.4.

DRAINAGE AREA.--96.6 mi<sup>2</sup>.

PERIOD OF RECORD.--February 1983 to current year.

GAGE.--Water-stage recorder. Datum of gage is sea level (levels by Corps of Engineers). Prior to Dec. 22, 1983, nonrecording gage at nearby site at present datum. U.S. Geological Survey satellite telemeter at station.

REMARKS.--Lake is formed behind roller-compacted, concrete dam; storage began Feb. 16, 1983. Capacity, 14,020 acre-ft between elevations 2,000.0 ft, sill of outlet gates, and 2,113.5 ft, crest of spillway. Average minimum lake elevation 2,047.0 ft, storing 2,540 acre-ft. Dead storage, 73 acre-ft below elevation 2,000.0 ft. Reservoir used for flood control. Figures given herein represent total contents.

COOPERATION.--Capacity table furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 6,820 acre-ft May 5, 1993, elevation, 2,080.04 ft; no usable contents at times.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 6,550 acre-ft June 10, elevation, 2,078.41 ft; minimum contents, 4,280 acre-ft Feb. 1, 2, elevation, 2,062.64 ft.

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

2,050	2,840	2,060	3,950	2,070	5,280	2,080	6,820
2,055	3,370	2,065	4,590	2,075	6,020		

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2075.14	2069.32	---	2062.79	2062.65	2064.43	2071.66	2074.82	2077.32	2076.09	2075.09	2073.33
2	2075.11	2069.31	---	2062.86	2062.67	2064.94	2071.87	2074.79	2077.10	2076.06	2075.04	2073.27
3	2075.07	2069.31	---	2063.07	2062.69	2065.53	2072.09	2074.79	2077.04	2076.04	2074.97	2073.21
4	2075.03	2069.33	---	2063.30	2062.73	2066.07	2072.30	2074.85	2077.08	2076.01	2074.90	2073.16
5	2075.01	2069.35	---	2063.51	2062.76	2066.58	2072.57	2074.86	2077.10	2076.03	2074.84	2073.12
6	2074.96	2069.37	---	2063.60	2062.82	2066.98	2072.79	2074.82	2077.26	2076.06	2074.78	2073.07
7	2074.93	2069.39	2063.26	2063.61	2062.87	2067.32	2072.99	2074.79	2077.82	2076.04	2074.72	2073.02
8	2074.90	2069.41	2063.26	2063.60	2062.88	2067.62	2073.19	2074.75	2078.20	2076.00	2074.66	2072.97
9	2074.87	2069.43	2063.31	2063.57	2062.95	2067.86	2073.40	2074.70	2078.34	2075.93	2074.61	2072.94
10	2074.85	2069.46	2063.26	2063.55	2063.02	2068.09	2073.60	2074.67	2078.34	2075.86	2074.55	2072.90
11	2074.83	2069.49	2063.27	2063.52	2063.06	2068.30	2073.80	2074.65	2078.16	2075.82	2074.50	2072.85
12	2074.81	2069.51	2063.29	2063.53	2063.09	2068.50	2073.99	2074.61	2077.91	2075.81	2074.44	2072.81
13	2074.80	2069.38	2063.27	2063.59	2063.11	2068.67	2074.19	2074.59	2077.58	2075.78	2074.38	2072.76
14	2074.74	---	2063.25	2063.66	2063.15	2068.85	2074.30	2074.58	2077.25	2075.76	2074.32	2072.72
15	2074.62	---	2063.23	2063.69	2063.19	2069.02	2074.51	2074.71	2076.88	2075.75	2074.25	2072.68
16	2074.41	---	2063.24	2063.72	2063.21	2069.22	2074.70	2074.76	2076.69	2075.73	2074.19	2072.64
17	2074.14	---	2063.22	2063.72	2063.24	2069.40	2074.86	2074.74	2076.68	2075.70	2074.14	2072.60
18	2073.86	---	2063.18	2063.64	2063.29	2069.61	2074.99	2074.72	2076.62	2075.69	2074.08	2072.56
19	2073.57	---	2063.14	2063.50	2063.33	2069.79	2075.10	2074.86	2076.54	2075.67	2074.02	2072.50
20	2073.29	---	2063.10	2063.35	2063.36	2069.95	2075.19	2075.76	2076.50	2075.65	2073.97	2072.46
21	---	---	2063.06	2063.20	2063.38	2070.11	2075.22	2076.80	2076.45	2075.62	2073.90	2072.41
22	2072.76	---	2063.01	2063.03	2063.39	2070.26	2075.19	2077.58	2076.40	2075.59	2073.85	2072.37
23	2072.51	---	2062.95	2062.87	2063.43	2070.40	2075.15	2078.01	2076.34	2075.54	2073.81	2072.32
24	---	---	2062.91	2062.75	2063.55	2070.55	2075.08	2078.22	2076.30	2075.51	2073.75	2072.27
25	2071.94	---	2062.87	2062.70	2063.59	2070.67	2075.02	2078.30	2076.25	2075.47	2073.70	2072.23
26	2071.71	---	2062.84	2062.69	2063.67	2070.79	2075.05	2078.29	2076.17	2075.43	2073.65	2072.19
27	2071.45	---	2062.81	2062.71	2063.78	2070.90	2075.02	2078.22	2076.15	2075.38	2073.60	2072.14
28	2071.20	---	2062.78	2062.72	2063.98	2071.00	2074.98	2078.10	2076.16	2075.33	2073.53	2072.10
29	2070.81	---	2062.74	2062.71	---	2071.11	2074.95	2077.92	2076.14	2075.26	2073.48	2072.07
30	2070.27	---	2062.72	2062.72	---	2071.26	2074.90	2077.72	2076.11	2075.20	2073.43	2072.04
31	2069.73	---	2062.70	2062.67	---	2071.45	---	2077.50	---	2075.15	2073.38	---
MAX	---	---	---	2063.72	2063.98	2071.45	2075.22	2078.30	2078.34	2076.09	2075.09	2073.33
MIN	---	---	---	2062.67	2062.65	2064.43	2071.66	2074.58	2076.11	2075.15	2073.38	2072.04
(†)	5240	a4340	4290	4280	4450	5480	6000	6410	6190	6040	5770	5570
(‡)	-800	-900	-50	-10	+170	+1030	+520	+410	-220	-150	-270	-200

CAL YR 1993 AC-FT† +790  
WTR YR 1994 AC-FT† -470

a From information provided by Corps of Engineers.  
† Contents, in acre-feet, at 2400, on last day of month.  
‡ Change in contents, in acre-feet.

## WILLOW CREEK BASIN

14034500 WILLOW CREEK AT HEPPNER, OR

LOCATION.--Lat 45°21'02", long 119°32'56", in SE 1/4 NW 1/4 sec.35, T.2 S., R.26 E., Morrow County, Hydrologic Unit 17070104, on right bank at Heppner, 100 ft upstream from Court Street bridge, 800 ft southeast of Morrow County courthouse, 0.2 mi downstream from Willow Creek Dam and at mile 52.2.

DRAINAGE AREA.--96.8 mi<sup>2</sup>.

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

REVISED RECORDS.--WDR OR-83-1: Drainage area.

GAGE.--Water-stage recorder. Concrete control since September 1985. Datum of gage is 1,952.73 ft above sea level.

REMARKS.--No estimated daily discharges. Records fair. Flow regulated by Willow Creek Lake, 0.2 mi upstream, since Feb. 16, 1983. Many diversions for irrigation upstream from station. Part of flow of Ditch Creek (John Day River basin) is diverted to Willow Creek upstream from station. Continuous water-quality records for the period February 1963 to June 1968 and March 1972 to September 1973 have been collected at this location.

AVERAGE DISCHARGE.--31 years (water years 1952-82), 19.1 ft<sup>3</sup>/s, 13,840 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 812 ft<sup>3</sup>/s May 10, 1957, gage height, 6.15 ft, from rating curve extended above 230 ft<sup>3</sup>/s; maximum gage height, 6.46 ft May 25, 1971, backwater from Shobe Canyon; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge, about 36,000 ft<sup>3</sup>/s June 14, 1903, result of slope-area measurement (see WSP 96). Discharge for flood of Feb. 22, 1949, was 1,700 ft<sup>3</sup>/s, result of slope-area measurement.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 58 ft<sup>3</sup>/s several days in June, gage height, 3.82 ft; maximum gage height, 3.99 ft Sept. 14; minimum discharge, 2.2 ft<sup>3</sup>/s Dec. 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.2	36	3.8	8.7	10	3.8	8.5	12	43	6.1	3.1	3.0
2	3.2	5.6	5.3	8.7	7.4	2.7	8.3	9.0	43	6.1	3.1	3.0
3	3.1	2.7	9.2	8.7	6.3	4.7	8.2	6.7	31	6.1	3.1	3.0
4	2.8	2.7	9.2	8.8	6.1	9.2	7.7	6.7	24	6.1	3.1	3.0
5	2.9	2.7	9.2	8.9	5.8	9.2	7.4	9.2	24	5.6	3.1	3.0
6	3.0	2.8	9.2	14	5.6	9.1	7.4	11	25	6.3	3.1	3.0
7	3.0	2.7	9.2	16	5.2	8.9	7.4	10	25	9.0	3.1	3.0
8	3.1	2.7	9.2	16	4.7	8.9	7.4	9.6	36	9.0	3.0	3.0
9	3.1	2.7	9.2	16	4.6	9.1	7.4	9.7	47	8.9	3.1	3.0
10	3.1	2.7	9.2	16	5.1	9.0	7.4	8.0	52	8.9	3.1	3.0
11	3.1	2.7	9.2	15	5.9	8.5	7.4	5.8	58	6.3	3.1	2.9
12	3.1	2.7	9.2	15	6.0	8.5	7.4	4.7	58	4.7	3.1	3.0
13	3.1	11	9.2	18	5.8	8.5	7.6	3.6	58	4.7	3.0	3.2
14	6.0	28	9.2	19	5.5	8.5	7.4	3.6	58	4.2	3.1	3.2
15	13	36	9.2	19	6.0	8.5	7.4	3.7	58	3.9	3.1	3.0
16	21	36	6.4	19	7.0	8.5	7.6	8.2	39	3.8	3.4	3.1
17	23	36	8.9	19	6.5	8.5	7.5	12	23	3.6	3.1	3.2
18	23	36	8.9	24	6.3	8.6	9.2	12	23	3.4	3.1	3.2
19	24	36	8.9	28	5.9	9.5	12	12	23	3.2	3.1	3.0
20	24	35	8.9	28	5.9	10	12	13	20	3.2	3.1	2.9
21	23	35	8.9	28	5.7	10	17	24	18	3.1	3.1	3.2
22	23	35	8.9	28	5.6	10	18	24	17	3.2	2.8	3.2
23	23	35	8.5	28	5.6	10	18	35	14	3.2	2.9	3.2
24	23	36	8.3	25	5.8	9.1	18	42	13	3.2	3.1	3.2
25	23	36	8.4	20	5.6	8.3	15	43	12	3.2	3.0	3.2
26	23	36	8.5	15	5.6	8.3	12	43	12	3.1	3.0	3.2
27	23	35	8.5	13	5.6	7.9	14	43	9.0	3.1	3.0	3.2
28	23	35	8.5	13	5.6	8.7	14	43	6.1	3.1	3.0	3.2
29	34	18	8.5	13	---	9.2	11	43	6.2	3.1	3.0	3.2
30	46	3.6	8.7	13	---	9.5	11	43	6.2	3.1	3.0	3.2
31	46	---	8.7	12	---	9.1	---	43	---	3.1	3.0	---
TOTAL	483.8	627.3	265.1	533.8	166.7	262.3	310.6	596.5	881.5	147.6	95.0	92.8
MEAN	15.6	20.9	8.55	17.2	5.95	8.46	10.4	19.2	29.4	4.76	3.06	3.09
MAX	46	36	9.2	28	10	10	18	43	58	9.0	3.4	3.3
MIN	2.8	2.7	3.8	8.7	4.6	2.7	7.4	3.6	6.1	3.1	2.8	2.9
AC-FT	960	1240	526	1060	331	520	616	1180	1750	293	188	184

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1984 - 1994, BY WATER YEAR (WY)

	5.30	7.96	13.1	17.9	25.1	51.0	53.6	37.3	18.3	5.79	5.19	4.46
MEAN	5.30	7.96	13.1	17.9	25.1	51.0	53.6	37.3	18.3	5.79	5.19	4.46
MAX	15.6	20.9	37.5	70.1	105	113	152	99.1	54.2	10.5	14.3	12.4
(WY)	1994	1994	1984	1984	1986	1993	1984	1993	1984	1993	1992	1988
MIN	1.93	1.69	2.65	3.40	5.95	8.09	10.4	2.15	2.17	2.56	2.79	2.56
(WY)	1992	1992	1993	1991	1994	1988	1994	1992	1992	1987	1991	1991

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1984 - 1994

ANNUAL TOTAL	13398.7	4463.0	
ANNUAL MEAN	36.7	12.2	
HIGHEST ANNUAL MEAN			20.4
LOWEST ANNUAL MEAN			45.5
HIGHEST DAILY MEAN	250	Mar 20	7.79
LOWEST DAILY MEAN	2.0	Jan 3	264
ANNUAL SEVEN-DAY MINIMUM	2.2	Jan 1	1.4
ANNUAL RUNOFF (AC-FT)	26580	8850	14770
10 PERCENT EXCEEDS	116	35	55
50 PERCENT EXCEEDS	14	8.5	7.6
90 PERCENT EXCEEDS	2.8	3.0	2.8

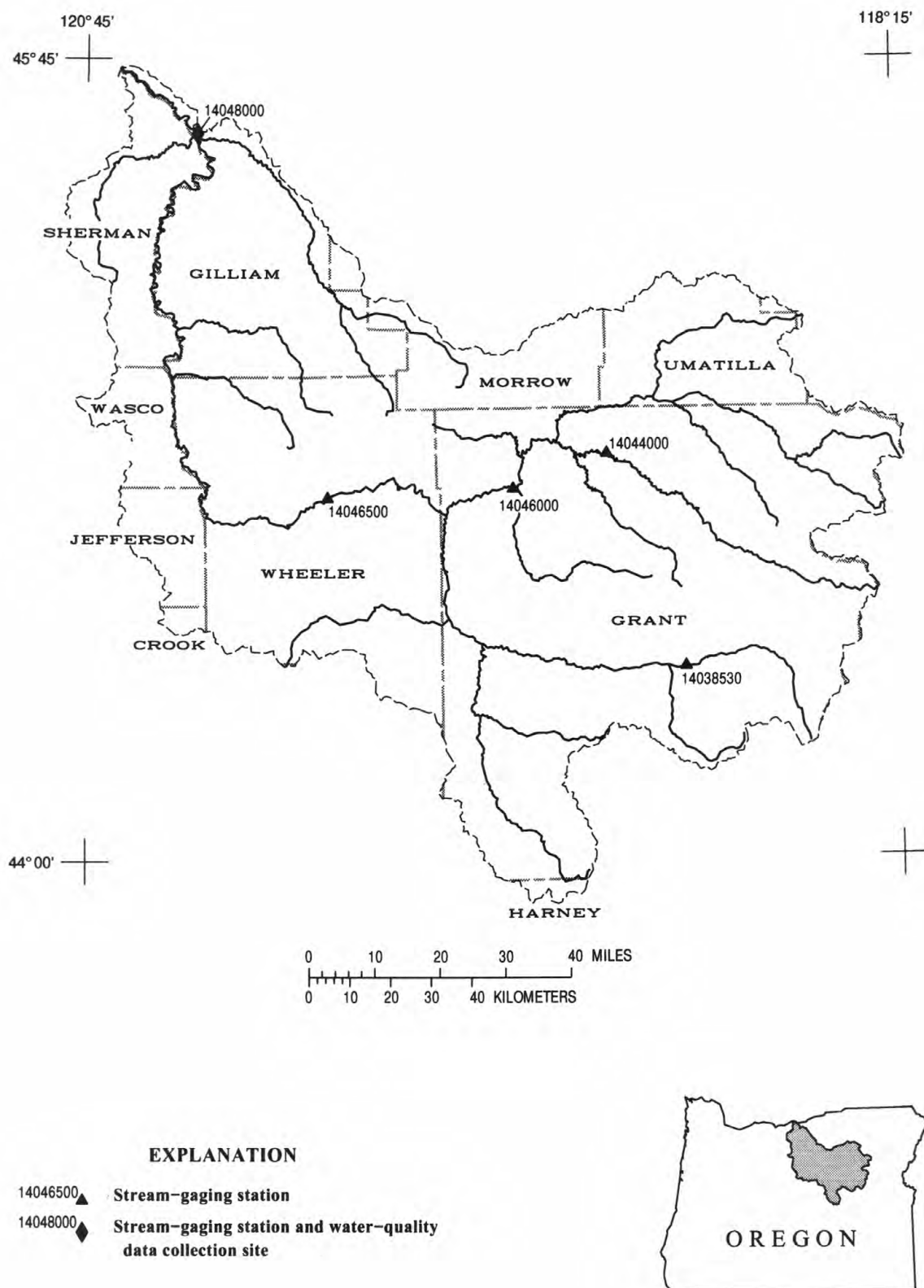


Figure 12. Location of surface-water and water-quality stations in the John Day River Basin.

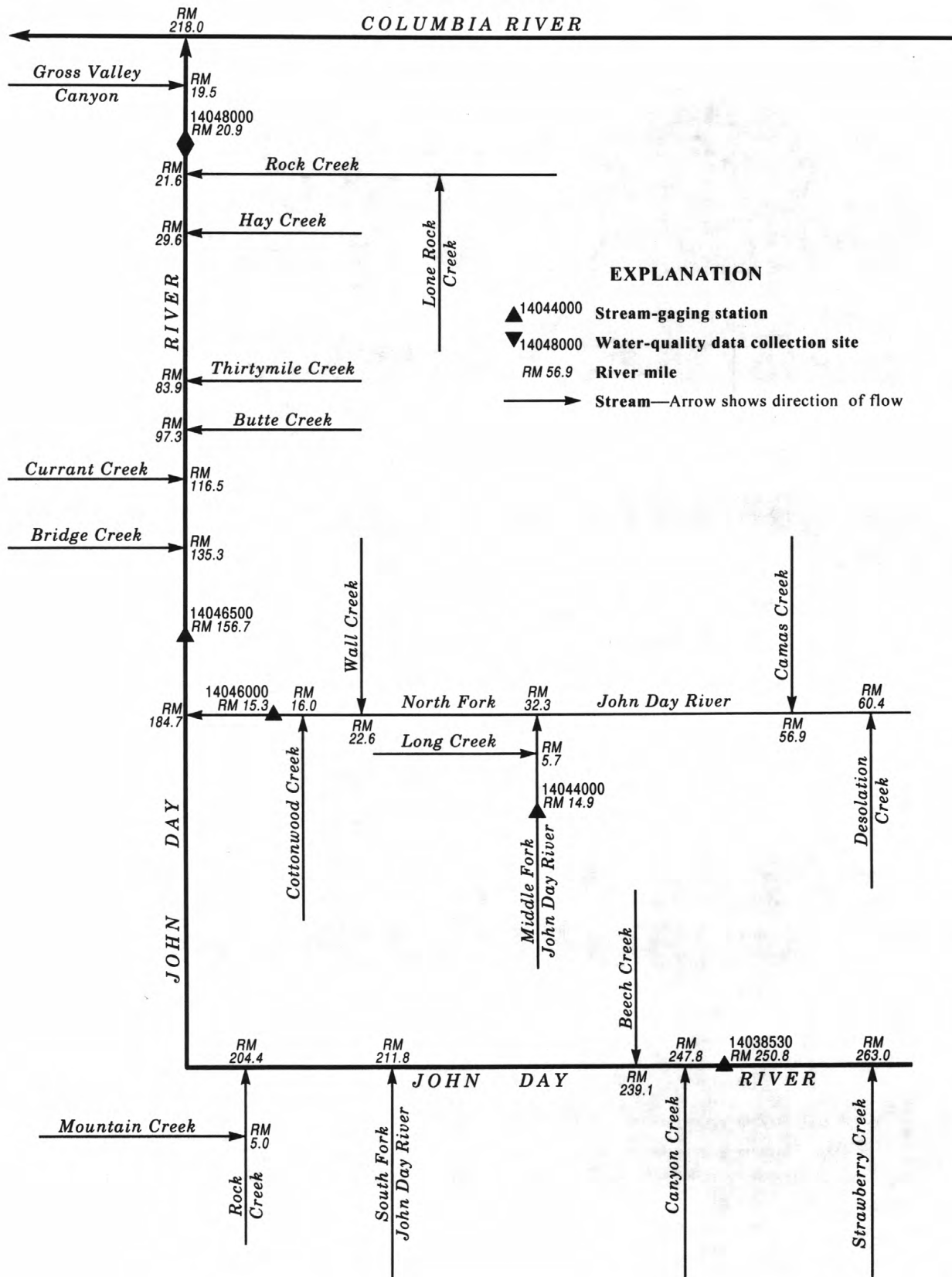


Figure 13. Schematic diagram showing gaging stations in the John Day River Basin.



## JOHN DAY RIVER BASIN

103

14038530 JOHN DAY RIVER NEAR JOHN DAY, OR

LOCATION.--Lat 44°25'07", long 118°54'19", in SW 1/4 SE 1/4 sec.19, T.13 S., R.32 E., Grant County, Hydrologic Unit 17070201, on left bank 1,200 ft downstream from Dog Creek, 2.5 mi east of John Day, and at mile 250.8.

DRAINAGE AREA.--386 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1968 to September 1994 (discontinued).

GAGE.--Water-stage recorder. Datum of gage is 3,130.56 ft above sea level.

REMARKS.--Records fair except for estimated daily discharges, which are poor. No regulation upstream. Many diversions upstream from station for irrigation.

AVERAGE DISCHARGE.--26 years, 202 ft<sup>3</sup>/s, 146,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,830 ft<sup>3</sup>/s June 9, 1969, gage height, 10.80 ft, from floodmark; minimum discharge, 3.5 ft<sup>3</sup>/s Aug. 26-28, 1969.

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

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
June 1	0500	*372	*4.73				

Minimum discharge, 7.2 ft<sup>3</sup>/s Aug. 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	81	100	149	117	97	e165	172	225	301	29	23	14
2	98	100	150	113	100	e170	172	213	231	29	25	12
3	93	100	132	131	101	e175	186	202	202	28	25	12
4	90	100	138	144	99	e175	182	205	188	32	22	15
5	93	97	124	140	99	e200	175	225	176	34	21	16
6	94	98	118	127	100	e220	184	227	194	75	21	16
7	98	99	119	117	105	e190	180	234	210	65	20	16
8	105	97	153	119	88	e150	173	267	186	57	21	16
9	104	97	146	121	101	e140	205	310	153	49	20	18
10	101	99	134	121	109	e130	203	319	134	44	18	22
11	101	97	135	121	103	e130	189	296	114	43	15	25
12	105	98	134	124	100	e130	185	306	108	40	14	29
13	103	99	125	e160	100	e130	186	280	100	44	13	28
14	104	98	123	e190	103	e145	183	254	100	44	12	26
15	107	99	119	e180	103	e145	178	236	101	41	12	27
16	114	101	116	e170	106	e170	183	229	107	36	11	31
17	116	101	114	e150	118	e200	204	232	97	34	9.0	32
18	110	102	110	e130	115	e180	241	234	94	26	8.3	32
19	106	97	108	e120	105	e170	281	275	89	27	9.4	33
20	104	99	e100	e100	101	e160	311	301	78	32	10	34
21	104	99	e95	e110	102	e140	330	286	65	32	9.6	33
22	102	104	102	e120	101	e130	314	311	62	34	10	34
23	101	99	e92	e120	104	127	288	270	56	34	11	33
24	100	e80	e100	e120	e125	126	328	253	47	30	11	31
25	99	e68	116	e120	e175	124	300	247	44	31	11	29
26	100	e72	105	114	e180	122	288	277	46	28	12	28
27	100	e74	104	110	e190	122	267	265	43	24	13	29
28	100	e115	102	106	e210	124	250	252	42	23	16	31
29	100	129	101	105	---	131	236	245	37	22	16	34
30	100	133	102	109	---	138	238	211	29	21	16	41
31	100	---	102	93	---	167	---	200	---	21	16	---
TOTAL	3133	2951	3668	3922	3240	4726	6812	7887	3434	1109	471.3	777
MEAN	101	98.4	118	127	116	152	227	254	114	35.8	15.2	25.9
MAX	116	133	153	190	210	220	330	319	301	75	25	41
MIN	81	68	92	93	88	122	172	200	29	21	8.3	12
AC-FT	6210	5850	7280	7780	6430	9370	13510	15640	6810	2200	935	1540

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1969 - 1994, 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	1994
MEAN	93.6	125	154	197	231	321	334	431	330	111	42.6	54.4														
MAX	156	244	385	514	689	746	718	845	810	314	116	145														
(WY)	1983	1974	1974	1971	1982	1984	1984	1984	1982	1982	1984	1984														
MIN	65.8	87.5	90.0	88.1	88.8	88.6	88.1	85.4	53.9	25.9	10.4	24.2														
(WY)	1989	1979	1989	1977	1977	1977	1977	1992	1992	1973	1973	1990														

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1969 - 1994

	1993	1994	1969-1994
ANNUAL TOTAL	91779	42130.3	
ANNUAL MEAN	251	115	202
HIGHEST ANNUAL MEAN			393
LOWEST ANNUAL MEAN			73.5
HIGHEST DAILY MEAN	1360	330	2640
LOWEST DAILY MEAN	30	8.3	3.5
ANNUAL SEVEN-DAY MINIMUM	33	9.6	4.3
ANNUAL RUNOFF (AC-FT)	182000	83570	146100
10 PERCENT EXCEEDS	597	231	455
50 PERCENT EXCEEDS	124	104	128
90 PERCENT EXCEEDS	61	21	36

e Estimated

## JOHN DAY RIVER BASIN

## 14044000 MIDDLE FORK JOHN DAY RIVER AT RITTER, OR

LOCATION.--Lat 44°53'20", long 119°08'25", in SW 1/4 NW 1/4 sec.8, T.8 S., R.30 E., Grant County, Hydrologic Unit 17070203, on left bank 0.2 mi south of Ritter, 0.8 mi downstream from Twelvemile Creek, and at mile 14.9.

DRAINAGE AREA.--515 mi<sup>2</sup>.

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

REVISED RECORDS.--WSP 739: 1931. WSP 1218: 1950. WSP 1448: 1930-32, 1937, drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,544.56 ft above sea level.

REMARKS.--Records good except for estimated daily discharges, which are poor. No regulation. Diversions for irrigation upstream from station. Continuous water-quality records for the period July 1966 to September 1968 have been collected at this location.

AVERAGE DISCHARGE.--65 years, 252 ft<sup>3</sup>/s, 182,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,730 ft<sup>3</sup>/s Jan. 30, 1965, gage height, 8.39 ft, from rating curve extended above 2,200 ft<sup>3</sup>/s; maximum gage height, 9.13 ft Feb. 1, 1963, ice jam; minimum discharge, 0.90 ft<sup>3</sup>/s Aug. 19, 20, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
May 20	1300	*1,440	*5.42	No other peak greater than base discharge.			
Minimum discharge, 11 ft <sup>3</sup> /s Dec. 21, result of freezeup, but may have been less during ice effect that day.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42	50	101	79	e48	259	366	405	398	70	28	21
2	43	50	96	84	e45	339	381	378	374	67	30	21
3	43	49	92	92	e40	376	457	364	348	64	34	23
4	42	49	86	135	e42	449	430	388	349	61	33	24
5	42	49	72	144	e44	458	389	482	309	60	30	24
6	42	43	65	112	e40	348	384	469	310	86	27	23
7	45	45	62	81	e36	288	393	492	324	87	26	22
8	54	47	69	82	e50	254	383	521	337	72	26	21
9	52	47	81	81	e62	229	434	537	297	64	26	22
10	49	59	92	77	e68	235	452	553	267	57	24	23
11	48	49	90	77	e68	247	420	507	246	52	24	25
12	49	54	93	83	e68	248	406	498	229	50	24	27
13	49	52	74	145	65	258	403	449	214	48	23	26
14	50	41	72	163	66	274	382	402	205	46	23	25
15	62	39	70	135	68	314	358	374	205	44	22	25
16	67	66	63	113	68	392	370	349	193	42	22	24
17	66	57	60	95	76	358	432	331	185	41	22	24
18	60	55	51	85	82	331	531	340	166	39	23	23
19	56	42	e35	83	66	305	634	582	151	37	22	23
20	54	35	e22	81	59	272	668	1130	138	36	22	23
21	53	e30	e38	83	64	254	697	888	129	34	21	23
22	52	e27	e40	83	61	229	641	770	116	33	21	22
23	51	e25	e43	83	60	209	555	593	109	31	22	22
24	51	e24	e44	81	69	193	580	508	103	33	22	22
25	50	e27	e45	79	85	183	567	458	96	43	22	22
26	49	e35	e50	77	135	177	564	487	93	42	21	21
27	49	e42	e52	75	310	182	504	452	89	36	21	22
28	49	110	e54	65	267	202	464	412	85	33	21	22
29	51	116	e53	58	---	246	430	392	78	31	21	23
30	50	113	52	e54	---	291	422	358	73	29	21	25
31	49	---	58	e52	---	327	---	337	---	28	21	---
TOTAL	1569	1527	1975	2817	2212	8727	14097	15206	6216	1496	745	693
MEAN	50.6	50.9	63.7	90.9	79.0	282	470	491	207	48.3	24.0	23.1
MAX	67	116	101	163	310	458	697	1130	398	87	34	27
MIN	42	24	22	52	36	177	358	331	73	28	21	21
AC-FT	3110	3030	3920	5590	4390	17310	27960	30160	12330	2970	1480	1370

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1930 - 1994, BY WATER YEAR (WY)

	MEAN	43.9	72.5	122	152	232	460	743	704	352	80.1	31.4	31.5
MAX	99.5	231	482	580	707	1214	1426	1457	1127	285	98.4	108	108
(WY)	1983	1974	1956	1965	1958	1972	1984	1984	1984	1984	1984	1984	1984
MIN	17.4	20.2	29.0	23.4	31.3	69.8	175	79.2	56.6	17.4	3.75	10.0	10.0
(WY)	1937	1937	1933	1937	1937	1977	1968	1934	1992	1973	1966	1935	1935

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1930 - 1994

ANNUAL TOTAL	145950	57280	252	1984
ANNUAL MEAN	400	157	538	1977
HIGHEST ANNUAL MEAN			85.1	1965
LOWEST ANNUAL MEAN			4360	1966
HIGHEST DAILY MEAN	2680	Mar 24	1130	May 20
LOWEST DAILY MEAN	22	Dec 20	21	Aug 21
ANNUAL SEVEN-DAY MINIMUM	29	Nov 20	21	Aug 26
ANNUAL RUNOFF (AC-FT)	289500		113600	
10 PERCENT EXCEEDS	1410		430	
50 PERCENT EXCEEDS	103		67	
90 PERCENT EXCEEDS	45		23	

e Estimated

LOCATION.--Lat 44°48'50", long 119°25'50", in SE 1/4 sec.2, T.9 S., R.27 E., Grant County, Hydrologic Unit 17070202, on right bank just downstream from entrance to canyon, 0.7 mi downstream from Cottonwood Creek, 0.8 mi west of Monument, and at mile 15.3.

PERIOD OF RECORD.--March 1925 to current year. Monthly discharge only for some periods, published in WSP 1318.

REVISED RECORDS.--WSP 754: 1932(M). WSP 1448: 1927, 1931(M), 1949.

GAGE.--Water-stage recorder. Datum of gage is 1,959.64 ft above sea level. Prior to Nov. 24, 1925, nonrecording gage and Nov. 24, 1925, to Oct. 16, 1928, water-stage recorder at datum 1.10 ft higher. Oct. 17, 1928, to Sept. 30, 1930, water-stage recorder at datum 1.00 ft higher.

REMARKS.--Records good except for estimated daily discharges, which are fair. Very slight regulation by small reservoirs upstream. Many small diversions for irrigation upstream from station. Continuous water-quality records for the period July 1966 to September 1968 have been collected at this location. National Weather Service gage-height telemeter at station.

AVERAGE DISCHARGE.--69 years (water years 1926-94), 1,274 ft<sup>3</sup>/s, 923,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD:--Maximum discharge, 33,400 ft<sup>3</sup>/s Jan. 30, 1965, gage height, 18.45 ft, from rating curve extended above 17,000 ft<sup>3</sup>/s; minimum discharge, 6 ft<sup>3</sup>/s sometime during period Nov. 2-13, 1936 (result of freezeup); minimum daily, 17 ft<sup>3</sup>/s Dec. 12, 1932.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,300 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
May 20	2300	*7,820	*8.94	No other peak greater than base discharge.			
Minimum discharge, 63 ft <sup>3</sup> /s Nov. 25, but may have been less during period of ice effect that day.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	150	175	264	261	206	e1040	2070	1920	1910	334	118	75
2	149	176	284	294	e180	e1420	2230	1740	1960	317	117	75
3	148	175	308	339	e160	e2080	2570	1650	1720	307	134	76
4	150	171	316	524	e170	e2690	2510	1690	1780	297	146	78
5	150	174	278	745	e170	2780	2170	2230	1580	290	137	82
6	149	163	270	596	e165	2100	2100	2170	1520	308	126	84
7	151	134	239	453	e150	1710	2110	2160	1850	493	118	81
8	164	119	256	414	e180	1450	1950	2250	1980	379	113	76
9	183	122	288	409	e215	1280	2030	2300	1720	314	111	76
10	185	167	320	407	e250	1230	2170	2340	1490	281	110	78
11	177	164	332	392	e315	1260	2070	2210	1340	258	106	82
12	172	170	331	400	e300	1230	2060	2170	1240	240	104	83
13	174	169	289	625	e295	1250	2110	1990	1150	226	101	87
14	182	156	274	915	e280	1370	2040	1710	1100	216	96	89
15	191	135	264	794	e290	1580	1940	1570	1100	206	93	89
16	234	168	252	672	e295	1970	2080	1530	1020	199	90	86
17	244	228	238	574	e305	1890	2530	1440	960	188	87	84
18	227	207	210	496	e330	1670	3280	1500	891	178	88	82
19	210	169	154	457	e325	1530	3900	2750	802	171	88	77
20	197	137	124	411	e275	1350	4020	6010	730	164	88	75
21	192	e100	e98	405	e265	1290	4030	6750	667	159	86	74
22	188	e94	e92	455	e255	1130	3640	5850	609	153	84	74
23	185	e88	e100	441	e270	1040	3130	4530	559	148	83	71
24	182	e84	e120	425	e265	966	3020	3700	515	149	82	71
25	178	e78	e120	414	e355	910	2950	3170	481	152	82	70
26	176	e80	e130	399	e430	868	2720	2980	460	156	83	70
27	173	84	e150	386	e840	883	2470	2740	439	152	83	69
28	174	103	e160	370	e970	988	2220	2350	412	140	80	68
29	176	168	e170	315	---	1270	2030	2200	383	133	78	75
30	178	268	e190	307	---	1640	1940	1930	355	126	78	78
31	181	---	221	312	---	1910	---	1730	---	121	76	---
TOTAL	5570	4426	6842	14407	8506	45775	76090	81260	32723	6955	3066	2335
MEAN	180	148	221	465	304	1477	2536	2621	1091	224	98.9	77.8
MAX	244	268	332	915	970	2780	4030	6750	1980	493	146	89
MIN	148	78	92	261	150	868	1940	1440	355	121	76	68
AC-FT	11050	8780	13570	28580	16870	90790	150900	161200	64910	13800	6080	4630

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 1994, BY WATER YEAR (WY)

MEAN	162	316	695	891	1361	2400	3613	3589	1691	384	133	121
MAX	420	1621	3374	4126	4970	6456	6695	8794	5227	1211	345	423
(WY)	1983	1974	1965	1965	1982	1983	1943	1948	1948	1982	1984	1984
MIN	58.5	64.5	96.6	75.8	134	345	822	378	259	97.4	36.6	45.2
(WY)	1937	1937	1937	1937	1929	1977	1968	1934	1992	1973	1931	1934

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1929 - 1994
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ANNUAL TOTAL	692653			287955			
ANNUAL MEAN	1898			789		1277	
HIGHEST ANNUAL MEAN						2608	1984
LOWEST ANNUAL MEAN						441	1977
HIGHEST DAILY MEAN	15900	Mar 24		6750	May 21	31900	Jan 30 1965
LOWEST DAILY MEAN	78	Nov 25		68	Sep 28	17	Dec 12 1932
ANNUAL SEVEN-DAY MINIMUM	87	Nov 21		70	Sep 22	29	Aug 28 1931
ANNUAL RUNOFF (AC-FT)	1374000			571200		925400	
10 PERCENT EXCEEDS	6650			2170		3690	
50 PERCENT EXCEEDS	428			280		420	
90 PERCENT EXCEEDS	158			84		96	

e Estimated

## JOHN DAY RIVER BASIN

14046500 JOHN DAY RIVER AT SERVICE CREEK, OR

LOCATION.--Lat 44°47'38", long 120°00'20", in NW 1/4 NE 1/4 sec.18, T.9 S., R.23 E., Wheeler County, Hydrologic Unit 17070204, on left bank 0.2 mi downstream from bridge on State Highway 207, 0.8 mi downstream from Service Creek, 0.5 mi southwest of town of Service Creek, and at mile 156.7.

DRAINAGE AREA.--5,090 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--March 1925 to September 1926, October 1929 to current year. Monthly discharge only March 1925 to September 1926, published in WSP 1318.

GAGE.--Water-stage recorder. Datum of gage is 1,632.42 ft above sea level. See WSP 1738 for history of changes prior to Feb. 24, 1957.

REMARKS.--Records good except for estimated daily discharges, which are fair. Slight regulation by several small reservoirs upstream from station. Many small diversions for irrigation upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--66 years (water years 1926, 1930-94), 1,899 ft<sup>3</sup>/s, 1,376,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 40,200 ft<sup>3</sup>/s Dec. 23, 1964, gage height, 17.85 ft, from rating curve extended above 14,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; minimum discharge, 6.0 ft<sup>3</sup>/s Aug. 23, 24, 1973.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 7,300 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
May 21	0530	*8,520	*8.32	No other peak greater than base discharge.			
Minimum discharge, 36 ft <sup>3</sup> /s Aug. 21, Sept. 4.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	257	421	631	506	519	1700	2730	2580	2190	398	90	49
2	268	415	641	553	416	1930	2810	2370	2650	374	84	47
3	293	415	688	631	409	2290	2960	2210	2320	353	81	40
4	323	414	662	701	440	2830	3240	2120	2230	339	89	36
5	333	408	640	1020	471	3310	2860	2450	2160	319	99	41
6	344	408	569	1130	484	2880	2630	2740	1990	330	97	60
7	360	390	556	916	e440	2300	2700	2580	2200	379	88	70
8	372	357	565	787	e420	1990	2540	2630	2400	499	79	67
9	400	333	659	762	e400	1760	2450	2700	2300	387	72	65
10	428	333	708	753	484	1630	2730	2770	1980	327	65	63
11	426	401	698	745	574	1650	2700	2730	1750	290	57	71
12	419	395	700	731	570	1650	2580	2550	1600	267	57	75
13	424	401	689	766	566	1600	2620	2530	1480	243	57	84
14	427	375	623	1120	560	1680	2590	2230	1400	226	67	90
15	436	355	602	1220	560	1820	2450	2020	1370	213	54	92
16	463	356	587	1110	570	2140	2400	2000	1350	196	47	97
17	518	422	564	985	573	2420	2740	1880	1250	190	43	96
18	524	475	541	881	608	2150	3360	1850	1200	181	38	92
19	500	449	487	800	651	2040	4120	2060	1090	171	40	86
20	477	381	405	755	602	1840	4520	5440	1000	160	42	87
21	462	331	337	702	546	1690	4550	8010	918	150	37	84
22	456	324	313	739	539	1630	4330	6820	834	139	43	82
23	444	e270	e300	780	524	1460	3800	5740	750	138	47	82
24	434	e240	e320	757	555	1370	3500	4530	684	125	41	81
25	424	e220	e330	746	620	1300	3670	3790	636	140	42	73
26	418	e200	e350	730	750	1250	3380	3430	592	141	41	73
27	412	e200	e340	706	988	1220	3250	3370	565	134	40	76
28	411	e250	e330	691	1760	1260	2950	2950	529	130	43	80
29	417	353	e360	655	---	1420	2720	2720	483	117	48	77
30	420	489	e400	586	---	1770	2520	2480	432	109	55	81
31	421	---	478	613	---	2260	---	2200	---	99	53	---
TOTAL	12711	10781	16073	24577	16599	58240	92400	96480	42333	7264	1836	2197
MEAN	410	359	518	793	593	1879	3080	3112	1411	234	59.2	73.2
MAX	524	489	708	1220	1760	3310	4550	8010	2650	499	99	97
MIN	257	200	300	506	400	1220	2400	1850	432	99	37	36
AC - FT	25210	21380	31880	48750	32920	115500	183300	191400	83970	14410	3640	4360

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1930 - 1994, BY WATER YEAR (WY)

MEAN	325	593	1168	1504	2245	3677	5209	4908	2429	568	180	183
MAX	811	2284	5540	6335	7930	9773	10280	12050	8327	1850	594	862
(WY)	1985	1974	1965	1965	1982	1983	1984	1948	1948	1982	1984	1984
MIN	70.5	152	216	195	358	597	1010	491	302	90.6	15.2	31.4
(WY)	1937	1937	1936	1937	1937	1977	1968	1934	1992	1973	1973	1935

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1930 - 1994
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ANNUAL TOTAL	1030039		381491				
ANNUAL MEAN	2822		1045			1911	
HIGHEST ANNUAL MEAN						4116	1984
LOWEST ANNUAL MEAN						619	1977
HIGHEST DAILY MEAN	20300	Mar 24	8010	May 21	36400		Jan 30 1965
LOWEST DAILY MEAN	200	Nov 26	36	Sep 4		6.2	Aug 23 1973
ANNUAL SEVEN-DAY MINIMUM	219	Sep 12	41	Aug 18		7.7	Aug 19 1973
ANNUAL RUNOFF (AC-FT)	2043000		756700			1385000	
10 PERCENT EXCEEDS	9420		2700			5320	
50 PERCENT EXCEEDS	779		541			738	
90 PERCENT EXCEEDS	275		74			130	

e Estimated



## JOHN DAY RIVER BASIN

107

14048000 JOHN DAY RIVER AT McDONALD FERRY, OR  
(National stream quality accounting network station)

LOCATION.--Lat 45°35'16", long 120°24'30", in NE 1/4 NW 1/4 sec.11, T.1 N., R.19 E., Sherman County, Hydrologic Unit 17070204, on left bank at McDonald Ferry, 0.8 mi downstream from Rock Creek, 10 mi east of Klondike, and at mile 20.9.

GAGE AREA.--7,580 mi<sup>2</sup>, approximately.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--December 1904 to current year. Prior to Oct. 1, 1930, published as "at McDonald."

REVISED RECORDS.--WSP 1094: 1894(M), 1932(M). WSP 1448: 1908-9, 1912, 1916, 1920(M), 1922, 1932.

GAGE.--Water-stage recorder. Datum of gage is 392.27 ft above sea level. Prior to Aug. 30, 1930, nonrecording gage at same site and datum.

REMARKS.--Water-discharge records good except those below 35 ft<sup>3</sup>/s and estimated daily discharges, which are fair. No regulation. Many diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--89 years (water years 1906-94), 2,069 ft<sup>3</sup>/s, 1,499,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 42,800 ft<sup>3</sup>/s Dec. 24, 1964, gage height, 13.59 ft, from floodmark, from rating curve extended above 11,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; no flow for part of Sept. 2, 1966, Aug. 15 to Sept. 16, 1973, Aug. 13, 14, 19-25, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of 1894 reached a stage of 12.8 ft, from floodmarks, discharge, 39,100 ft<sup>3</sup>/s, from rating curve extended above 22,000 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,900 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
May 22	0530	*8,530	*6.82	No other peak greater than base discharge.			

Minimum discharge, 9.0 ft<sup>3</sup>/s Aug. 30 to Sept. 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	304	460	444	553	678	1440	2330	2720	2420	493	91	12
2	299	460	535	558	684	1930	2870	2710	2270	453	84	13
3	294	459	638	570	649	1950	3010	2580	2680	426	83	25
4	300	453	664	607	584	2410	3120	2390	2540	410	70	29
5	315	453	695	675	537	2890	3450	2290	2360	390	61	28
6	337	453	676	755	584	3430	3180	2370	2410	382	57	29
7	354	449	669	1090	591	3120	2900	2850	2170	361	52	32
8	361	452	623	1080	e560	2530	2910	2690	2210	345	50	28
9	381	446	588	922	e500	2200	2810	2690	2480	342	44	26
10	411	427	593	839	632	1980	2660	2760	2510	432	55	26
11	419	407	667	822	644	1820	2850	2820	2180	420	58	26
12	450	393	712	815	600	1770	2920	2850	1910	359	58	26
13	454	411	710	813	668	1770	2760	2650	1720	323	47	37
14	448	448	714	804	676	1720	2750	2640	1560	296	39	49
15	452	442	702	861	669	1760	2770	2440	1470	277	31	54
16	459	439	647	1260	664	1870	2650	2200	1410	256	28	53
17	459	423	626	1230	665	2120	2540	2120	1380	234	28	61
18	478	399	610	1130	674	2530	2770	2020	1300	211	24	66
19	517	425	593	1030	670	2320	3340	1990	1210	190	24	72
20	540	487	573	938	692	2170	4140	2120	1150	183	24	77
21	529	482	545	873	728	2010	4640	5320	1050	169	25	84
22	516	459	487	835	692	1840	4680	8040	957	150	21	75
23	500	416	444	796	645	1780	4520	6950	870	134	18	73
24	494	e240	394	832	672	1630	4080	5880	804	127	16	62
25	484	e240	365	870	654	1540	3680	4790	718	121	16	59
26	472	e250	373	838	662	1450	3840	4070	664	130	17	57
27	466	e290	419	822	727	1380	3570	3620	633	120	19	58
28	461	e350	449	807	862	1320	3450	3560	612	106	20	60
29	457	370	480	787	---	1310	3170	3210	576	94	16	61
30	453	400	524	771	---	1410	2940	2910	538	99	11	64
31	457	---	519	738	---	1760	---	2730	---	89	11	---
TOTAL	13321	12283	17678	26321	18263	61160	97300	100980	46762	8122	1198	1422
MEAN	430	409	570	849	652	1973	3243	3257	1559	262	38.6	47.4
MAX	540	487	714	1260	862	3430	4680	8040	2680	493	91	84
MIN	294	240	365	553	500	1310	2330	1990	538	89	11	12
AC-FT	26420	24360	35060	52210	36220	121300	193000	200300	92750	16110	2380	2820

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1906 - 1994, BY WATER YEAR (WY)

	MEAN	328	611	1186	1639	2565	3978	5668	5181	2707	657	194	184
MAX	892	2310	7030	6402	8882	11450	11900	13180	9531	2131	700	923	
(WY)	1985	1974	1965	1965	1982	1983	1984	1917	1948	1984	1984	1984	
MIN	59.9	157	221	217	374	557	964	533	285	88.0	5.70	23.8	
(WY)	1937	1937	1937	1937	1933	1977	1968	1934	1992	1926	1973	1934	

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1906 - 1994

ANNUAL TOTAL	1170893	404810		
ANNUAL MEAN	3208	1109		
HIGHEST ANNUAL MEAN			2069	
LOWEST ANNUAL MEAN			4724	1984
HIGHEST DAILY MEAN	25000	Mar 25	8040	May 22
LOWEST DAILY MEAN	222	Sep 16	11	Aug 30
ANNUAL SEVEN-DAY MINIMUM	234	Sep 14	15	Aug 27
ANNUAL RUNOFF (AC-FT)	2322000		802900	1499000
10 PERCENT EXCEEDS	10200		2830	5800
50 PERCENT EXCEEDS	875		607	789
90 PERCENT EXCEEDS	336		53	140

e Estimated

## JOHN DAY RIVER BASIN

14048000 JOHN DAY RIVER AT MCDONALD FERRY, OR--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1911-12, 1960-68, 1975 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: December 1975 to September 1981.

WATER TEMPERATURE: October 1962 to September 1968, October 1975 to September 1981.

SEDIMENT CONCENTRATION: October 1962 to September 1968.

SEDIMENT DISCHARGE: October 1962 to September 1968.

REMARKS.--Some samples were analyzed by different methods and may have data with different levels of detection.

## WATER-QUALITY DATA

DATE	TIME	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)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DIS-SOLVED (PER CENT SATURATION)	COLIFORM, FECA, 0.7 UM-MF (COLS./100 ML)
DEC 1993 01...	1200	427	289	8.4	0.0	0.6	14.6	750	102	31
FEB 1994 22...	1235	693	241	8.5	6.0	1.7	12.6	757	102	K12
JUN 16...	1215	1420	170	8.4	19.0	1.0	9.6	753	104	K4
AUG 03...	1310	89	275	8.8	25.5	0.3	9.9	750	123	27

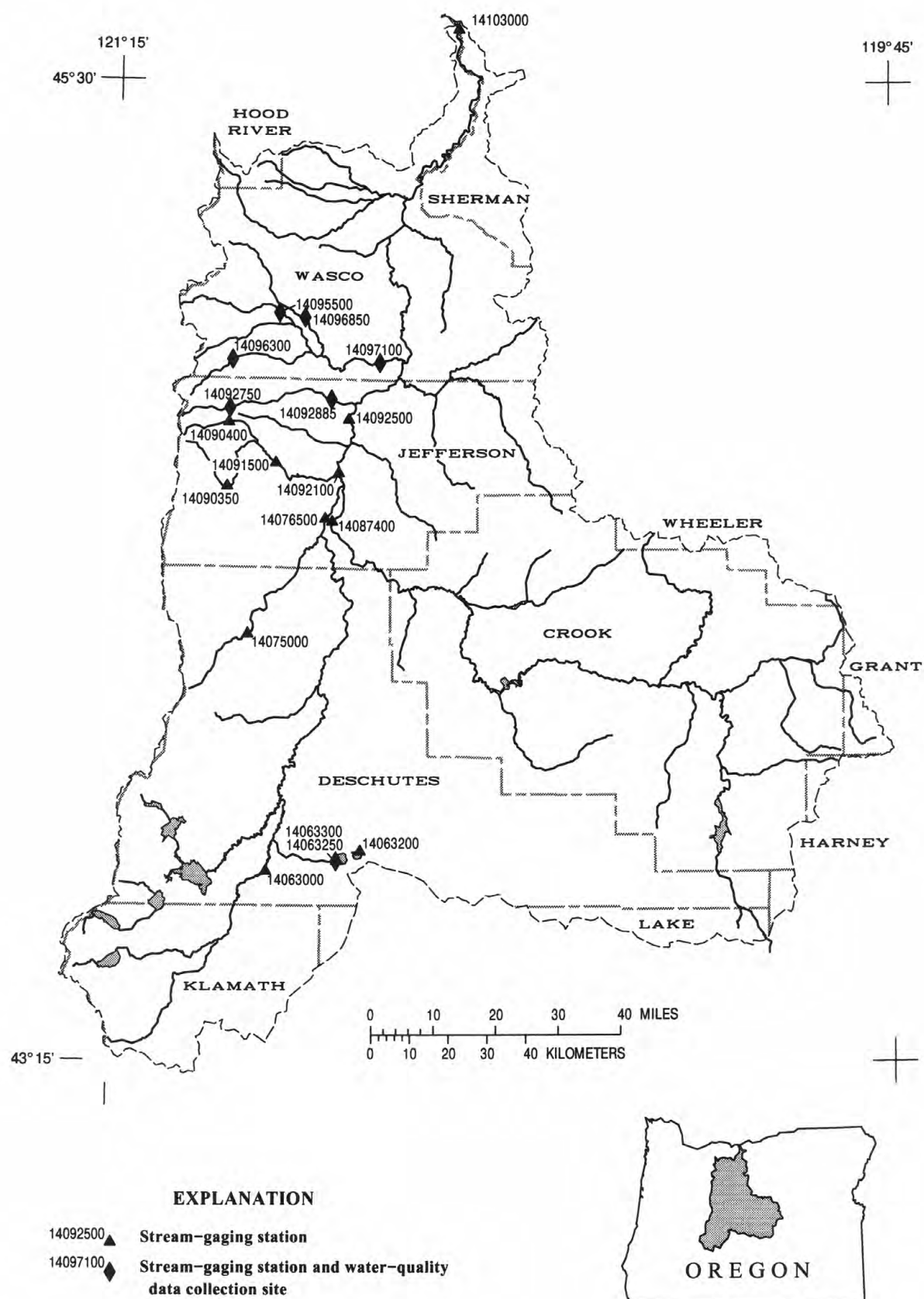
DATE	STREPTOCOCCI FECA, KF AGAR (COLS. PER 100 ML)	HARDNESS, TOTAL (MG/L AS CaCO3)	CALCIUM, DIS-SOLVED (MG/L AS Ca)	MAGNESIUM, DIS-SOLVED (MG/L AS Mg)	SODIUM, DIS-SOLVED (MG/L AS Na)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DIS-SOLVED (MG/L AS K)	ALKALINITY, DIS IT FIELD (MG/L AS CaCO3)	BICARBONATE, DIS IT FIELD (MG/L AS HCO3)
DEC 1993 01...	5400	110	26	12	16	23	0.7	1.9	136	166
FEB 1994 22...	K9	100	24	9.9	13	22	0.6	1.6	115	140
JUN 16...	230	70	17	6.6	8.2	20	0.4	1.7	81	89
AUG 03...	53	94	21	10	19	30	0.9	2.8	132	134

DATE	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)	SILICA, DIS-SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C (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)
DEC 1993 01...	0	13	3.1	0.2	26	176	180	0.24	203	0.01
FEB 1994 22...	0	8.8	2.5	0.1	21	148	150	0.20	277	0.02
JUN 16...	5	3.9	1.9	<0.1	25	111	113	0.15	426	0.04
AUG 03...	13	9.8	3.8	0.2	22	171	168	0.23	41.1	0.02

DATE	NITROGEN, NITRITE DIS-SOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, DIS-SOLVED (MG/L AS P)	PHOSPHORUS, ORTHO, DIS-SOLVED (MG/L AS P)	ALUMINUM, 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 1993 01...	<0.01	<0.2	<0.05	<0.01	<0.01	<0.01	<10	12	<3	<3
FEB 1994 22...	0.02	<0.2	<0.05	0.03	<0.01	<0.01	10	11	<3	7
JUN 16...	<0.01	0.2	<0.05	0.02	<0.01	<0.01	40	8	<3	40
AUG 03...	<0.01	0.3	<0.05	0.02	0.01	<0.01	<10	13	<3	6

DATE	LITHIUM, DIS-SOLVED (UG/L AS LI)	MANGANESE, DIS-SOLVED (UG/L AS MN)	MOLYBDENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELENIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRONTIUM, DIS-SOLVED (UG/L AS SR)	VANADIUM, DIS-SOLVED (UG/L AS V)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)
DEC 1993 01...	<4	1	<10	<1	<1	<1	120	<6	1	1.2
FEB 1994 22...	<4	2	<10	<1	<1	<1	100	7	4	7.5
JUN 16...	<4	2	<10	<1	<1	<1	72	8	5	19
AUG 03...	<4	3	<10	2	<1	<1	99	8	11	2.6

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



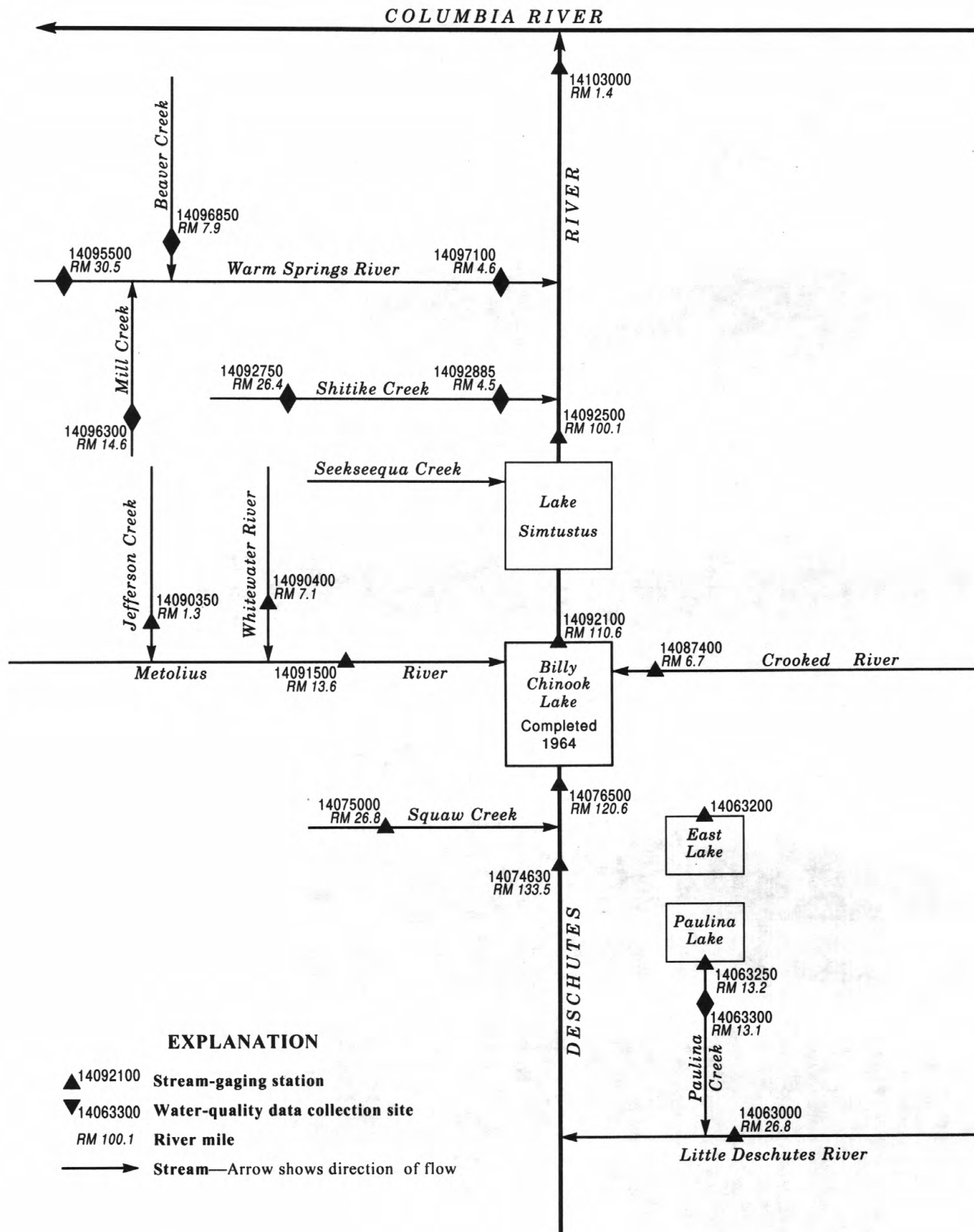


Figure 15. Schematic diagram showing gaging stations in the Deschutes River Basin.



DESCHUTES RIVER BASIN

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14063000 LITTLE DESCHUTES RIVER NEAR LA PINE, OR

LOCATION.--Lat 43°41'21", long 121°30'06", in SW 1/4 SW 1/4 sec.2, T.22 S., R.10 E., Deschutes County, Hydrologic Unit 17070302, on right bank 10 ft downstream from highway bridge, 1.1 mi north of La Pine, and at mile 26.8.

DRAINAGE AREA.--859 mi<sup>2</sup>, hydrologic drainage boundary uncertain owing to ground-water exchange.

PERIOD OF RECORD.--September 1910 to January 1911, March, April, August 1911, March to September 1912, June to October 1913, June to November 1918, August to October 1920, May 1924 to current September 1994 (discontinued). Monthly discharge only for some periods, published in WSP 1318. Published as Deschutes River near Lapine 1910-12, as East Fork Deschutes River near Lapine 1913-20, and as Little Deschutes River near Lapine 1924-64.

REVISED RECORDS.--WSP 1218: 1950.

GAGE.--Water-stage recorder. Datum of gage is 4,192.81 ft above sea level. Sept. 1, 1910, to Aug. 31, 1911, nonrecording gage at present site at different datum. Mar. 1 to Sept. 30, 1912, nonrecording gage at site 1.2 mi downstream at different datum. June 1, 1913, to Sept. 28, 1928, nonrecording gage and Sept. 29, 1928, to Sept. 30, 1931, water-stage recorder at present site at different datums.

REMARKS.--Records fair except for estimated daily discharges, which are poor. Flow regulated since 1922 by Crescent Lake (station 14059500). Many diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--70 years (water years 1925-94), 200 ft<sup>3</sup>/s, 145,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,660 ft<sup>3</sup>/s Dec. 25, 1964, gage height, 8.18 ft; minimum discharge, 5.5 ft<sup>3</sup>/s Sept. 27, 28, 1994.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 185 ft<sup>3</sup>/s Jan. 6, gage height, 2.97 ft; minimum discharge, 5.5 ft<sup>3</sup>/s Sept. 27, 28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	60	55	100	93	66	79	119	97	65	102	92	15
2	58	55	110	97	68	90	112	92	64	108	81	14
3	55	57	125	103	67	111	110	88	63	108	91	16
4	53	57	e140	112	64	e120	107	90	62	105	82	13
5	52	58	e130	156	67	e110	105	96	58	102	84	13
6	52	56	e130	169	e60	e110	104	101	62	102	75	13
7	53	52	133	e130	e60	e110	106	99	68	101	74	13
8	56	50	147	e120	e55	e95	111	94	71	109	61	13
9	57	e46	169	111	e60	e95	112	94	89	121	54	13
10	58	54	154	e100	e60	e95	112	95	93	149	60	13
11	59	59	148	110	e60	e95	112	99	90	158	55	13
12	61	54	e140	99	e60	e100	107	103	87	156	56	12
13	65	e52	e120	94	e65	105	103	104	83	149	49	11
14	75	e48	e120	100	e65	106	102	100	80	144	47	10
15	79	e48	114	96	71	109	100	91	80	152	41	9.8
16	79	e50	104	e85	e75	112	97	83	96	152	36	10
17	79	55	e90	e85	e65	115	95	84	102	148	38	10
18	78	e56	e90	e80	e60	109	96	81	102	145	35	10
19	74	50	e85	e80	e60	e100	87	76	101	138	36	10
20	70	e46	e80	e85	e60	103	86	73	97	141	33	9.2
21	68	50	e80	82	e50	99	93	70	92	139	32	8.5
22	62	e38	e85	79	e50	e99	99	69	90	133	31	7.9
23	58	e36	74	87	53	92	105	70	86	129	30	7.6
24	55	e40	79	e85	54	86	114	64	91	123	29	7.5
25	54	e44	82	e60	60	81	116	57	92	110	27	9.2
26	53	e50	e80	e55	71	86	119	53	90	101	27	8.2
27	52	62	e75	e65	75	87	123	51	88	120	26	5.8
28	52	66	e75	e65	76	89	118	49	84	116	22	8.0
29	52	75	e80	e60	---	92	110	61	83	103	18	12
30	50	87	93	e60	---	101	104	66	82	93	16	15
31	52	---	92	e65	---	114	---	66	---	102	16	---
TOTAL	1881	1606	3324	2868	1757	3095	3184	2516	2491	3859	1454	330.7
MEAN	60.7	53.5	107	92.5	62.7	99.8	106	81.2	83.0	124	46.9	11.0
MAX	79	87	169	169	76	120	123	104	102	158	92	16
MIN	50	36	74	55	50	79	86	49	58	93	16	5.8
AC-FT	3730	3190	6590	5690	3490	6140	6320	4990	4940	7650	2880	656

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1925 - 1994, BY WATER YEAR (WY)

	MEAN	112	153	152	177	201	290	375	318	233	191	121
MAX	350	356	712	656	562	709	716	990	788	470	342	320
(WY)	1957	1951	1965	1965	1951	1972	1943	1956	1974	1974	1976	1956
MIN	17.3	27.1	23.4	21.4	17.8	60.4	67.5	81.2	63.2	92.7	30.0	9.76
(WY)	1932	1932	1993	1993	1993	1933	1977	1994	1931	1931	1931	1992

SUMMARY STATISTICS FOR 1993 CALENDAR YEAR FOR 1994 WATER YEAR WATER YEARS 1925 - 1994

ANNUAL TOTAL	72297	28365.7	200
ANNUAL MEAN	198	77.7	374
HIGHEST ANNUAL MEAN			65.8
LOWEST ANNUAL MEAN			3240
HIGHEST DAILY MEAN	705	May 28	169
LOWEST DAILY MEAN	13	Jan 3	5.8
ANNUAL SEVEN-DAY MINIMUM	14	Feb 26	7.7
ANNUAL RUNOFF (AC-FT)	143400	56260	145100
10 PERCENT EXCEEDS	480	119	400
50 PERCENT EXCEEDS	144	80	160
90 PERCENT EXCEEDS	19	27	55

e Estimated



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LOCATION.--Lat 43°42'48", long 121°16'34", in NW 1/4 SE 1/4 sec.34, T.21 S., R.12 E., Deschutes County, Hydrologic Unit 17070302, Deschutes National Forest, on left bank, at outflow gate, 12 mi northeast of La Pine, and at mile 13.2.

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

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

REMARKS.--Lake is one of two lakes in Newberry Crater. Outflow is controlled by concrete spillway and fish-screen gates.

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation, 6,332.83 ft Mar. 17, 1993; minimum elevation, 6,329.89 ft Sept. 8, 10, 1994.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 6.332.66 ft Jan. 5; minimum elevation, 6.329.89 ft Sept. 8, 10.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6332.20	6332.09	6332.19	6332.54	6332.52	6332.59	6332.56	6332.56	6332.58	6332.33	6331.73	6330.27
2	6332.20	6332.07	6332.19	6332.57	6332.52	6332.59	6332.55	6332.56	6332.56	6332.31	6331.70	6330.28
3	6332.20	6332.07	6332.22	6332.59	6332.51	6332.61	6332.54	6332.57	6332.56	6332.29	6331.68	6330.30
4	6332.19	6332.05	6332.23	6332.61	6332.51	6332.58	6332.53	6332.60	6332.56	6332.27	6331.65	6330.16
5	6332.19	6332.04	6332.24	6332.65	6332.51	6332.57	6332.55	6332.60	6332.57	6332.25	6331.61	6330.06
6	6332.19	6332.03	6332.24	6332.63	6332.52	6332.56	6332.57	6332.59	6332.59	6332.23	6331.58	6329.99
7	6332.20	6332.02	6332.39	6332.61	6332.52	6332.55	6332.58	6332.57	6332.58	6332.21	6331.54	6330.05
8	6332.20	6332.01	6332.50	6332.61	6332.51	6332.54	6332.59	6332.56	6332.57	6332.20	6331.50	6330.02
9	6332.19	6332.00	6332.51	6332.63	6332.55	6332.54	6332.58	6332.56	6332.57	6332.18	6331.47	6330.05
10	6332.18	6331.99	6332.43	6332.59	6332.54	6332.54	6332.57	6332.56	6332.57	6332.17	6331.43	6330.02
11	6332.19	6331.98	6332.47	6332.62	6332.55	6332.53	6332.57	6332.55	6332.56	6332.15	6331.39	6330.66
12	6332.18	6331.95	6332.47	6332.61	6332.51	6332.53	6332.56	6332.54	6332.54	6332.13	6331.36	6330.50
13	6332.21	6332.03	6332.48	6332.58	6332.53	6332.52	6332.55	6332.54	6332.53	6332.11	6331.33	6330.33
14	6332.25	6331.93	6332.49	6332.60	6332.54	6332.52	6332.54	6332.53	6332.53	6332.09	6331.29	6330.28
15	6332.27	6331.91	6332.50	6332.57	6332.51	6332.52	6332.54	6332.56	6332.53	6332.08	6331.24	6330.37
16	6332.27	6331.91	6332.48	6332.57	6332.45	6332.53	6332.53	6332.56	6332.52	6332.06	6331.20	6330.46
17	6332.25	6331.90	6332.48	6332.57	6332.55	6332.52	6332.53	6332.55	6332.52	6332.04	6331.16	6330.39
18	6332.24	6331.89	6332.48	6332.56	6332.53	6332.55	6332.53	6332.55	6332.52	6332.03	6331.10	6330.41
19	6332.23	6331.88	6332.48	6332.55	6332.55	6332.54	6332.53	6332.62	6332.52	6332.02	6331.06	6330.43
20	6332.22	6331.87	6332.48	6332.55	6332.47	6332.54	6332.53	6332.61	6332.52	6332.00	6331.01	6330.44
21	6332.21	6331.86	6332.48	6332.54	6332.55	6332.56	6332.53	6332.63	6332.52	6332.01	6330.97	6330.38
22	6332.21	6331.93	6332.47	6332.57	6332.56	6332.56	6332.53	6332.63	6332.51	6331.97	6330.92	6330.36
23	6332.19	6331.94	6332.48	6332.48	6332.58	6332.55	6332.54	6332.61	6332.49	6331.98	6330.87	6330.39
24	6332.19	6331.96	6332.48	6332.56	6332.58	6332.54	6332.56	6332.61	6332.47	6331.96	6330.83	6330.37
25	6332.19	6331.97	6332.49	6332.55	6332.59	6332.53	6332.58	6332.60	6332.44	6331.94	6330.76	6330.37
26	6332.16	6331.98	6332.48	6332.55	6332.59	6332.53	6332.60	6332.59	6332.43	6331.93	6330.68	6330.59
27	6332.15	6331.99	6332.49	6332.54	6332.60	6332.53	6332.59	6332.58	6332.41	6331.87	6330.57	6330.61
28	6332.14	6332.02	6332.49	6332.53	6332.59	6332.52	6332.59	6332.58	6332.39	6331.85	6330.46	6330.80
29	6332.13	6332.10	6332.49	6332.53	---	6332.52	6332.58	6332.57	6332.37	6331.82	6330.37	6330.79
30	6332.12	6332.11	6332.48	6332.52	---	6332.54	6332.58	6332.57	6332.35	6331.79	6330.28	6330.71
31	6332.10	---	6332.51	6332.52	---	6332.56	---	6332.57	---	6331.76	6330.14	---
MAX	6332.27	6332.11	6332.51	6332.65	6332.60	6332.61	6332.60	6332.63	6332.59	6332.33	6331.73	6330.80
MIN	6332.10	6331.86	6332.19	6332.48	6332.45	6332.52	6332.53	6332.53	6332.35	6331.76	6330.14	6329.99
CAL YR 1993	MAX	6332.79	MIN	6331.86								
WTR YR 1994	MAX	6332.65	MIN	6329.99								

## DESCHUTES RIVER BASIN

14063300 PAULINA CREEK NEAR LA PINE, OR

LOCATION.--Lat 43°42'47", long 121°16'39", in SW 1/4 NE 1/4 sec.34, T.21 S., R.12 E., Deschutes County, Hydrologic Unit 17070302, on right bank 180 ft downstream from dam at outlet of Paulina Lake, 12 mi east of La Pine, and at mile 13.1.

DRAINAGE AREA.--10.1 mi<sup>2</sup>, of which 2.2 mi<sup>2</sup> is lake surface at elevation 6,331 ft, hydrologic drainage boundary uncertain because of interbasin ground-water exchange.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1982 to September 1989, October 1991 to current year.

GAGE.--Water-stage recorder. Datum of gage is 6,315.31 ft above sea level.

REMARKS.--Records good except for estimated daily discharges, which are poor. Flow regulated by dam at outlet of Paulina Lake 180 ft upstream.

AVERAGE DISCHARGE.--10 years (water years 1983-89, 1992-94), 18.4 ft<sup>3</sup>/s, 13,330 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 66 ft<sup>3</sup>/s Apr. 29, 1983, gage height, 2.35 ft; minimum discharge, 0.19 ft<sup>3</sup>/s Oct. 19, 1982, Nov. 22, 1983.

EXTREMES FOR CURRENT YEAR.--Maximum discharge recorded, 45 ft<sup>3</sup>/s Oct. 5, 15, gage height, 1.86 ft, result of regulation, but may have been higher during period of estimated record; minimum discharge recorded, 0.70 ft<sup>3</sup>/s Nov. 22, result of regulation.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	18	2.5	13	13	17	16	17	16	22	e18	e15
2	14	18	2.8	14	13	17	16	16	16	22	e18	14
3	14	18	2.8	16	13	16	15	16	15	22	e17	13
4	14	18	3.2	17	13	17	15	18	15	22	e17	13
5	14	18	3.3	20	13	16	14	19	15	e21	e16	13
6	12	18	3.4	20	13	15	16	19	17	e21	e16	12
7	12	18	3.8	19	13	15	17	17	17	e21	e16	12
8	12	18	8.5	19	13	e15	17	17	17	e20	e15	11
9	12	18	11	20	13	e15	18	16	16	e20	e15	11
10	12	18	11	20	15	14	17	16	16	e19	e15	11
11	13	17	11	20	15	14	17	16	16	e19	e14	12
12	13	17	11	19	14	14	16	15	15	e18	e14	13
13	14	17	11	19	14	13	16	15	13	e18	e14	12
14	14	17	11	18	14	13	15	14	12	e17	e15	12
15	16	17	11	17	14	13	15	15	12	e17	e16	12
16	18	17	11	16	14	13	14	15	12	e16	e19	12
17	17	17	11	16	14	13	14	15	13	e16	e19	12
18	17	17	11	16	14	14	14	15	15	e15	e19	12
19	17	17	11	15	14	14	14	17	17	e15	e18	12
20	17	17	11	15	14	14	14	20	17	e15	e18	12
21	16	17	11	15	15	16	14	20	18	e14	e17	12
22	16	8.0	11	14	15	16	14	21	18	e14	e17	12
23	16	.92	11	15	16	15	14	20	23	e14	e17	12
24	16	.92	11	15	17	15	15	19	29	e15	e16	12
25	16	1.0	11	15	17	14	16	18	27	e15	e16	12
26	17	1.1	11	15	17	14	18	17	26	e16	e17	11
27	18	1.2	11	15	18	13	18	17	26	e24	e17	10
28	18	1.4	11	14	18	13	18	16	25	e21	e16	10
29	18	1.7	11	14	---	13	17	16	24	e19	e16	10
30	18	2.0	11	14	---	14	17	15	23	e19	e16	11
31	18	---	11	13	---	16	---	15	---	e18	e15	---
TOTAL	473	385.24	283.3	508	406	451	471	522	541	565	509	358
MEAN	15.3	12.8	9.14	16.4	14.5	14.5	15.7	16.8	18.0	18.2	16.4	11.9
MAX	18	18	11	20	18	17	18	21	29	24	19	15
MIN	12	.92	2.5	13	13	13	14	14	12	14	14	10
AC-FT	938	764	562	1010	805	895	934	1040	1070	1120	1010	710

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 1994, BY WATER YEAR (WY)

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
MEAN	15.3	9.67	10.6	16.9	21.0	21.3	20.1	21.2	22.5	20.5	21.7	19.5
MAX	21.4	14.6	21.5	22.0	36.3	27.4	25.5	29.5	32.7	29.1	32.8	31.1
(WY)	1984	1993	1985	1989	1983	1989	1984	1983	1984	1985	1983	1984
MIN	10.2	5.16	4.54	3.87	8.91	13.3	15.7	13.7	15.9	13.9	14.3	11.9
(WY)	1992	1989	1988	1993	1993	1992	1994	1992	1992	1993	1992	1994

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1983 - 1994

ANNUAL TOTAL	5685.04	5472.54	18.3
ANNUAL MEAN	15.6	15.0	23.4
HIGHEST ANNUAL MEAN			13.1
LOWEST ANNUAL MEAN			59
HIGHEST DAILY MEAN	30 Jun 1	29 Jun 24	59 Apr 30
LOWEST DAILY MEAN	.92 Nov 23	.92 Nov 23	.23 Nov 23
ANNUAL SEVEN-DAY MINIMUM	1.2 Nov 23	1.2 Nov 23	.37 Nov 23
ANNUAL RUNOFF (AC-FT)	11280	10850	13290
10 PERCENT EXCEEDS	24	19	28
50 PERCENT EXCEEDS	16	15	18
90 PERCENT EXCEEDS	4.0	11	7.9

e Estimated



## DESCHUTES RIVER BASIN

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14063300 PAULINA CREEK NEAR LA PINE, OR--Continued

## WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: November 1991 to current year.

WATER TEMPERATURE: November 1991 to current year.

INSTRUMENTATION.--Water-quality monitor and data logger.

EXTREMES FOR PERIOD OF RECORD.--

SPECIFIC CONDUCTANCE: Maximum recorded, 647 microsiemens Apr. 28, 1992; minimum recorded, 368 microsiemens

Oct. 15, 1993.

WATER TEMPERATURE: Maximum recorded, 23.0°C July 15, 1992, July 20, 21, Aug. 2, 1994; minimum recorded, 0.0°C several days during winter months.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum recorded, 618 microsiemens Oct. 1-5; minimum recorded, 368 microsiemens Oct. 15.

WATER TEMPERATURE: Maximum recorded, 23.0°C July 20, 21, Aug. 2; minimum recorded, 0.0°C Dec. 8.

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	618	607	612	508	495	502	545	536	541	571	562	567
2	618	609	613	509	496	504	557	540	549	574	565	569
3	618	608	614	511	495	502	560	551	556	570	562	567
4	618	609	614	518	507	513	565	550	557	569	559	564
5	618	591	610	522	512	518	571	562	568	566	558	563
6	611	596	605	526	517	522	575	566	570	573	563	569
7	609	594	602	528	518	523	570	557	564	576	564	570
8	605	595	600	526	520	523	573	556	562	571	564	567
9	604	596	600	534	523	529	578	571	575	569	563	567
10	606	594	599	534	528	531	582	572	576	574	567	571
11	603	567	589	537	528	533	585	574	579	572	565	569
12	589	580	584	538	527	533	589	581	586	573	566	570
13	589	572	582	540	532	536	589	582	586	572	566	570
14	579	559	573	542	536	539	592	584	588	575	568	572
15	579	368	518	544	536	540	591	568	582	575	567	571
16	501	488	496	546	536	541	584	570	577	575	567	571
17	513	494	505	544	533	539	584	569	576	578	570	573
18	523	508	515	545	538	542	578	570	574	582	572	577
19	526	515	521	546	539	543	583	570	577	580	573	577
20	527	520	524	550	543	547	585	574	579	583	572	578
21	527	502	518	552	539	546	589	579	585	578	567	572
22	523	512	517	545	500	523	593	570	583	573	564	570
23	521	513	517	518	495	511	580	569	575	572	562	566
24	521	513	518	539	491	519	576	564	570	572	561	566
25	525	513	518	550	522	539	578	568	572	578	569	573
26	520	398	458	547	538	543	577	569	573	579	569	576
27	430	414	423	546	531	536	579	570	574	580	572	576
28	439	425	432	535	520	528	576	569	573	581	573	578
29	472	433	444	537	521	527	578	570	574	585	574	579
30	486	472	477	541	532	537	574	564	570	580	572	576
31	504	483	489	---	---	---	573	564	569	586	576	581
MONTH	618	368	542	552	491	529	593	536	572	586	558	571
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	583	574	579	573	565	569	583	570	577	582	574	578
2	584	575	580	571	562	567	578	571	574	584	576	579
3	584	576	580	569	560	565	578	566	572	585	574	581
4	583	576	580	566	559	563	575	564	568	587	577	582
5	585	576	581	566	558	563	577	565	572	588	581	585
6	584	574	579	566	560	562	578	568	573	589	581	585
7	580	572	577	579	561	569	579	573	576	590	582	586
8	577	570	574	---	---	---	581	570	576	592	583	588
9	574	567	570	---	---	---	582	574	578	592	583	588
10	573	566	570	579	572	576	583	574	579	593	582	588
11	573	567	570	583	573	578	581	571	576	590	581	586
12	576	566	570	583	573	578	576	569	573	590	581	587
13	571	563	567	581	573	577	578	569	574	589	583	586
14	573	564	568	582	573	577	574	563	570	591	583	587
15	572	564	568	579	570	575	571	556	566	589	578	583
16	569	561	566	577	568	572	573	557	564	590	582	586
17	570	559	563	581	572	575	579	564	574	593	584	588
18	571	565	568	578	569	575	582	537	575	592	586	589
19	572	565	568	586	574	579	581	571	575	590	576	583
20	572	565	569	584	573	579	580	562	573	592	577	584
21	569	563	567	583	571	578	579	569	573	584	574	580
22	572	564	568	587	577	582	579	568	574	590	580	587
23	572	563	567	585	577	581	580	568	575	591	581	587
24	571	562	567	585	575	580	582	566	575	590	582	587
25	572	564	568	585	576	580	581	572	577	591	579	586
26	572	563	568	584	575	580	577	560	567	589	579	584
27	572	566	568	584	576	580	575	565	569	588	580	584
28	572	565	569	584	572	578	578	572	575	589	579	584
29	---	---	---	579	565	573	580	572	576	590	581	584
30	---	---	---	574	566	570	580	571	576	589	582	585
31	---	---	---	578	569	573	---	---	---	588	577	584
MONTH	585	559	571	---	---	---	583	537	573	593	574	585

## DESCHUTES RIVER BASIN

14063300 PAULINA CREEK NEAR LA PINE, OR--CONTINUED

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	587	579	583	591	578	585	590	575	582	602	578	591
2	588	577	583	588	578	584	588	572	581	602	576	591
3	587	578	583	588	578	583	587	572	581	603	583	594
4	589	578	583	586	575	582	587	571	580	604	579	592
5	586	577	582	585	575	580	588	573	580	601	580	591
6	583	573	578	583	574	578	586	571	580	598	571	587
7	585	578	581	587	574	581	587	572	580	597	578	588
8	586	577	582	589	576	583	588	570	579	595	566	584
9	586	576	582	587	574	581	585	571	578	594	569	583
10	586	576	582	584	574	579	584	574	579	592	569	580
11	586	576	581	585	573	580	584	571	578	587	562	576
12	585	574	581	588	574	582	583	568	575	587	562	578
13	584	574	580	588	575	583	582	570	577	588	565	577
14	584	576	580	596	575	584	581	567	575	586	564	576
15	585	575	581	587	572	581	583	567	575	590	569	580
16	586	573	579	587	571	580	585	566	575	588	573	581
17	585	574	579	584	571	578	584	563	575	586	566	577
18	586	573	580	587	573	581	582	564	573	585	569	577
19	584	573	579	594	576	583	583	562	573	585	564	574
20	583	573	579	590	574	583	583	561	573	583	564	573
21	584	574	579	592	575	584	582	561	572	582	564	573
22	587	573	580	588	577	583	582	562	573	584	560	574
23	583	573	580	588	571	581	581	560	571	582	562	572
24	590	580	584	586	572	580	579	559	569	579	560	571
25	590	580	585	587	570	580	579	555	570	582	565	574
26	588	579	584	588	573	581	581	563	574	583	562	574
27	592	580	586	585	574	580	589	570	579	584	564	575
28	593	582	588	588	574	581	592	569	582	584	550	573
29	590	579	586	589	571	580	596	574	585	583	565	575
30	591	578	585	587	574	580	599	575	587	587	563	577
31	---	---	---	587	573	580	601	578	590	---	---	---
MONTH	593	573	582	596	570	581	601	555	577	604	550	580

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	14.5	10.5	12.5	9.5	6.0	8.0	2.0	1.0	1.5	2.5	1.5	2.0
2	15.5	11.0	13.0	9.5	7.0	8.0	2.5	.5	1.5	2.5	2.0	2.5
3	15.5	12.0	13.5	8.5	7.0	7.5	2.5	2.0	2.5	3.0	2.5	3.0
4	14.5	11.5	13.0	9.0	6.0	7.5	2.0	1.0	1.5	3.0	2.0	2.5
5	15.0	12.0	13.5	8.5	6.0	7.0	2.5	2.0	2.0	2.0	1.0	1.5
6	13.0	11.5	12.5	9.0	6.0	7.0	2.5	2.0	2.5	2.5	1.5	2.0
7	11.5	10.0	11.0	8.5	5.5	7.0	2.0	.5	1.5	3.0	2.0	2.5
8	11.5	9.0	10.0	8.0	5.0	6.5	1.5	.0	1.0	2.0	2.0	2.0
9	12.5	8.5	10.5	7.5	6.0	6.5	2.5	1.5	2.0	2.0	1.5	2.0
10	12.0	10.0	11.0	8.0	6.0	7.0	3.0	2.0	2.5	3.0	2.0	2.0
11	12.0	10.0	11.0	7.5	5.5	6.5	2.5	2.0	2.5	2.5	2.0	2.0
12	12.0	10.5	11.0	7.0	5.0	6.0	3.0	2.0	2.5	3.0	2.0	2.5
13	12.0	10.5	11.0	6.5	2.5	5.0	3.5	2.0	2.5	3.0	1.5	2.0
14	11.0	9.5	10.0	7.0	2.5	5.0	3.0	2.0	2.5	3.0	2.0	2.5
15	10.0	9.0	9.5	7.0	4.0	5.5	2.5	1.5	2.0	3.0	2.0	2.5
16	10.5	9.0	9.5	6.5	5.0	5.5	3.0	.5	2.0	3.0	2.0	2.5
17	11.0	8.5	9.5	5.5	4.5	5.0	2.5	1.5	2.0	3.5	2.0	2.5
18	11.5	8.5	10.0	5.5	3.5	4.5	2.0	1.0	1.5	3.5	2.0	2.5
19	11.5	8.5	10.0	6.0	3.0	4.0	2.5	1.5	2.0	3.5	2.0	2.5
20	11.0	8.5	10.0	6.0	3.0	4.5	2.0	1.5	2.0	3.5	2.0	2.5
21	11.0	9.5	10.0	4.5	3.5	4.0	2.5	1.5	2.0	3.0	2.0	2.5
22	11.0	8.5	10.0	3.5	1.5	2.5	2.5	1.5	2.0	3.5	2.0	2.5
23	11.0	8.0	9.5	2.0	1.0	1.5	2.5	1.5	2.0	2.5	1.5	2.0
24	11.5	9.0	10.0	1.5	1.0	1.0	3.0	1.5	2.5	2.0	1.5	1.5
25	11.5	8.0	9.5	2.5	1.0	2.0	3.0	2.0	2.5	2.5	1.5	2.0
26	11.5	8.0	9.5	2.5	1.5	2.0	2.5	2.0	2.0	2.5	1.5	2.0
27	10.5	8.0	9.0	3.0	2.0	2.5	3.5	2.5	3.0	2.0	1.0	1.5
28	10.0	9.0	9.5	3.0	1.5	2.5	3.0	2.0	2.5	2.5	1.0	1.5
29	11.0	8.5	9.5	1.5	.5	1.0	2.5	2.0	2.5	3.0	1.5	2.0
30	10.5	8.0	9.0	2.0	1.5	2.0	2.5	2.5	2.5	2.5	1.5	2.0
31	10.0	7.5	9.0	---	---	---	2.5	2.0	2.5	3.0	1.5	2.0
MONTH	15.5	7.5	10.5	9.5	.5	5.0	3.5	.0	2.0	3.5	1.0	2.0

## DESCHUTES RIVER BASIN

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14063300 PAULINA CREEK NEAR LA PINE, OR--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	3.0	1.5	2.0	3.0	1.5	2.0	6.0	2.5	4.0	9.0	4.5	7.0
2	3.0	1.5	2.0	3.0	1.5	2.0	5.0	3.0	4.0	8.5	4.0	6.0
3	3.0	1.5	2.0	2.5	2.0	2.0	6.0	3.0	4.5	8.0	5.0	6.5
4	3.0	2.0	2.0	3.5	1.5	2.0	7.0	3.0	4.5	8.0	5.5	6.5
5	3.0	2.0	2.0	3.5	1.5	2.0	5.0	3.0	4.0	9.5	5.5	7.5
6	2.5	1.5	2.0	3.5	1.0	2.0	4.5	3.0	3.5	11.0	5.0	8.0
7	2.0	1.5	2.0	4.0	1.5	2.5	4.5	3.0	3.5	11.5	5.5	8.5
8	2.0	1.5	1.5	---	---	---	4.0	3.0	3.0	12.5	6.5	9.5
9	1.5	1.5	1.5	---	---	---	4.5	3.0	3.5	13.0	8.5	10.5
10	2.0	1.5	1.5	3.5	2.5	3.0	6.5	3.0	4.0	12.0	6.0	8.5
11	2.0	1.0	1.5	5.0	2.5	3.5	6.5	3.0	4.0	11.0	7.0	9.0
12	2.0	1.0	1.5	5.0	2.5	3.5	5.5	3.5	4.0	12.0	6.5	8.5
13	1.5	1.0	1.0	5.0	2.5	3.5	6.0	3.5	4.5	11.0	5.0	8.0
14	2.5	1.0	1.5	5.5	2.5	3.5	8.0	3.5	5.0	10.5	7.0	8.5
15	2.0	1.5	1.5	6.0	3.0	4.0	8.0	4.0	5.5	9.0	6.0	7.0
16	2.0	1.0	1.5	4.0	2.5	3.0	7.0	4.0	5.0	8.5	4.5	6.5
17	1.5	1.0	1.0	4.5	2.0	3.0	8.5	4.0	6.0	8.5	6.5	7.5
18	2.0	1.0	1.5	2.5	2.0	2.5	9.5	3.5	7.0	10.0	6.0	8.0
19	2.0	1.5	1.5	5.0	2.0	3.0	9.5	5.5	7.5	8.5	7.0	7.5
20	2.0	1.0	1.5	3.5	2.0	2.5	10.0	6.0	8.0	8.5	6.0	7.0
21	1.5	.5	1.0	2.5	1.5	2.0	8.0	5.5	6.5	8.5	6.5	7.5
22	1.5	1.0	1.5	3.5	2.0	2.5	7.0	4.0	5.5	9.5	6.5	8.0
23	1.5	1.0	1.0	3.5	2.0	2.5	7.0	4.5	5.5	13.0	7.5	10.0
24	1.5	1.0	1.0	4.0	1.5	2.5	8.0	3.5	5.5	13.5	8.5	11.0
25	2.0	1.0	1.5	4.5	1.5	2.5	7.0	4.0	5.5	14.5	9.5	11.5
26	2.0	1.0	1.5	5.0	2.0	3.0	5.0	3.5	4.5	12.0	9.5	10.5
27	2.5	1.0	1.5	5.5	2.0	3.5	5.0	3.0	4.0	13.0	7.5	10.0
28	2.5	1.5	2.0	6.0	2.0	3.5	9.0	3.5	6.0	10.0	7.5	8.5
29	---	---	---	6.0	2.5	4.0	7.5	4.5	6.0	9.5	6.0	8.0
30	---	---	---	4.5	3.0	3.5	9.5	4.0	6.5	13.5	6.5	10.0
31	---	---	---	3.5	2.5	3.0	---	---	---	12.0	9.5	10.5
MONTH	3.0	.5	1.5	---	---	---	10.0	2.5	5.0	14.5	4.0	8.5

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

LOCATION.--Lat 44°14'02", long 121°33'57", in SE 1/4 SW 1/4 sec.29, T.15 S., R.10 E., Deschutes County, Hydrologic Unit 17070301, on right bank 800 ft upstream from intake of McAllister ditch, 4 mi south of Sisters, and at mile 26.8.

PERIOD OF RECORD.--July 1906 to October 1918, June to August 1919, October 1919 to September 1920, May 1921 to September 1924 (no winter records), April 1925 to September 1994 (discontinued). Monthly discharge only for some periods, published in WSP 1318.

GAGE.--Water-stage recorder. Elevation of gage is 3,490 ft above sea level, by barometer. July 1, 1906, to May 29, 1913, nonrecording gage at site 1,000 ft downstream at different datum, below intake of McAllister ditch (records include flow in McAllister ditch). May 30, 1913, to Sept. 2, 1915, nonrecording gage and Mar. 24, 1916, to Oct. 5, 1928, water-stage recorder at site 300 ft downstream at different datum. Oct. 6, 1928, to Nov. 7, 1967, water-stage recorder at site 200 ft downstream at datum 2.64 ft lower.

AVERAGE DISCHARGE.--82 years (water years 1907-18, 1920, 1926-94), 103 ft<sup>3</sup>/s, 74,830 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge since 1909, 2,000 ft<sup>3</sup>/s Dec. 25, 1980, from rating curve extended above 690 ft/s on basis of slope-area measurement of peak flow; a maximum gage height of 9.2 ft from water-borne ice was observed on Jan. 11, 1979, and probably occurred on Jan. 10, 1979; previous maximum gage height, about 8.75 ft, over top of gage Nov. 22, 1909, site and datum then in use (discharge not determined); minimum discharge, 14 ft<sup>3</sup>/s Mar. 2, 1966.

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 8	2330	(a)	*3.71	(b)	unknown	unknown	unknown

(a) Backwater from ice.

(b) Sometime during the period June 11-15.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1906 - 1994, BY WATER YEAR (WY)

MEAN	64.2	77.5	79.5	68.9	67.5	61.4	77.2	141	219	188	119	80.0
MAX	132	255	220	180	220	158	133	279	390	347	209	136
(WY)	1948	1910	1965	1971	1907	1972	1934	1956	1933	1917	1916	1913
MIN	39.9	36.5	35.1	23.6	24.3	33.5	36.9	57.9	106	69.5	67.7	50.6
(WY)	1978	1940	1932	1937	1937	1966	1929	1977	1992	1975	1944	1944

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1906 - 1994
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ANNUAL TOTAL	34080			24488					
ANNUAL MEAN	93.4			67.1				103	
HIGHEST ANNUAL MEAN								164	1956
LOWEST ANNUAL MEAN								60.6	1977
HIGHEST DAILY MEAN	339	May 25		210	Jun 13			1230	Dec 25 1980
LOWEST DAILY MEAN	18	Feb 17		34	Feb 8			18	Feb 17 1993
ANNUAL SEVEN - DAY MINIMUM	22	Feb 15		39	Feb 2			21	Jan 7 1937
ANNUAL RUNOFF (AC - FT)	67600			48570				74830	
10 PERCENT EXCEEDS	195			110				204	
50 PERCENT EXCEEDS	68			53				79	
90 PERCENT EXCEEDS	33			41				45	

e Estimated



## DESCHUTES RIVER BASIN

119

14076500 DESCHUTES RIVER NEAR CULVER, OR

LOCATION.--Lat 44°29'56", long 121°19'12", in NW 1/4 SE 1/4 sec.29, T.12 S., R.12 E., Jefferson County, Hydrologic Unit 17070301, on right bank 2.5 mi downstream from Squaw Creek, 6.0 mi southwest of Culver, and at mile 120.6.

DRAINAGE AREA.--2,705 mi<sup>2</sup>.

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

GAGE.--Water-stage recorder. Datum of gage is 1,980 ft above sea level (river-profile survey). July 14, 1952, to Sept. 30, 1961, at site 4.1 mi downstream at different datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Flow regulated by Crescent Lake and Crane Prairie and Wickiup Reservoirs. Many diversions for irrigation upstream from station. Continuous water-quality records for the period October 1954 to September 1957 and January 1959 to September 1974 have been collected at this location.

AVERAGE DISCHARGE.--42 years, 897 ft<sup>3</sup>/s, 649,800 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,680 ft<sup>3</sup>/s Dec. 24, 1964, gage height, 10.00 ft, from rating curve extended above 2,200 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; minimum discharge, 418 ft<sup>3</sup>/s July 7, 8, 1964.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,200 ft<sup>3</sup>/s Nov. 16, gage height, 3.85 ft; minimum discharge, 474 ft<sup>3</sup>/s several days in July, but may have been lower during period of no record.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	498	965	978	941	936	911	1120	495	495	478	476	489
2	538	979	958	951	927	910	1100	494	495	477	476	489
3	539	985	936	1070	931	911	1160	494	492	479	479	486
4	541	985	933	1050	929	952	868	505	491	478	481	486
5	542	982	931	1070	920	969	715	505	488	478	481	481
6	543	986	932	1040	948	962	712	521	495	476	479	481
7	545	986	969	1020	934	980	716	501	498	476	481	481
8	560	983	1040	1020	811	783	716	513	486	476	481	481
9	622	883	1090	1030	918	759	714	508	482	479	481	484
10	551	796	900	1060	965	744	631	507	484	481	481	484
11	554	796	875	857	947	730	638	508	493	481	481	484
12	580	793	870	823	934	895	620	499	497	479	484	486
13	595	918	862	824	940	980	518	494	491	479	481	486
14	571	979	784	818	939	1000	514	495	506	476	481	486
15	556	980	740	1010	808	814	513	494	490	476	479	e484
16	586	824	731	1030	707	749	509	496	484	476	479	e484
17	626	685	727	1030	684	751	506	496	486	476	479	e486
18	615	678	988	835	697	756	504	495	485	476	479	e486
19	667	669	976	766	845	919	501	498	491	476	479	e484
20	664	823	950	762	920	998	502	498	493	476	481	e500
21	657	969	943	763	920	1000	506	635	491	479	484	e513
22	636	968	946	871	921	987	509	620	500	481	481	e513
23	605	974	958	963	921	973	502	607	498	479	484	e510
24	599	921	965	941	927	1010	499	553	499	481	489	e507
25	594	912	951	922	925	1040	497	505	482	484	484	e507
26	675	903	966	910	939	1080	498	511	478	481	484	e518
27	933	974	973	896	936	1130	500	509	482	481	484	e518
28	935	1030	967	829	944	1120	497	493	481	474	484	e518
29	932	1000	962	853	---	1060	495	487	481	474	481	524
30	932	955	968	935	---	1060	494	490	483	474	479	530
31	933	---	935	946	---	1090	---	488	---	474	494	---
TOTAL	19924	27281	28704	28836	25073	29023	18774	15914	14697	14811	14927	14866
MEAN	643	909	926	930	895	936	626	513	490	478	482	496
MAX	935	1030	1090	1070	965	1130	1160	635	506	484	494	530
MIN	498	669	727	762	684	730	494	487	478	474	476	481
AC-FT	39520	54110	56930	57200	49730	57570	37240	31570	29150	29380	29610	29490

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 1994, BY WATER YEAR (WY)

	704	1142	1256	1320	1369	1330	840	583	626	545	526	550
MEAN	704	1142	1256	1320	1369	1330	840	583	626	545	526	550
MAX	1172	1706	2130	2012	2034	2360	1799	1228	1020	766	741	782
(WY)	1985	1985	1985	1975	1975	1972	1984	1956	1956	1975	1953	1953
MIN	470	837	849	882	892	839	510	457	455	430	441	455
(WY)	1964	1965	1993	1992	1993	1964	1968	1964	1964	1964	1964	1963

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1953 - 1994

ANNUAL TOTAL	278837	252830	
ANNUAL MEAN	764	693	897
HIGHEST ANNUAL MEAN			1283
LOWEST ANNUAL MEAN			677
HIGHEST DAILY MEAN	1500	1160	4790
LOWEST DAILY MEAN	493	474	425
ANNUAL SEVEN-DAY MINIMUM	495	475	426
ANNUAL RUNOFF (AC-FT)	553100	501500	649800
10 PERCENT EXCEEDS	1010	982	1550
50 PERCENT EXCEEDS	742	594	734
90 PERCENT EXCEEDS	498	481	489

e Estimated

## DESCHUTES RIVER BASIN

14087400 CROOKED RIVER BELOW OPAL SPRINGS, NEAR CULVER, OR

LOCATION.--Lat 44°29'33", long 121°17'50", in NW 1/4 NE 1/4 sec.33, T.12 S., R.12 E., Jefferson County, Hydrologic Unit 17070305, on right bank 0.2 mi downstream from Opal Springs, 4.8 mi southwest of Culver, and at mile 6.7.

DRAINAGE AREA.--4,300 mi<sup>2</sup>, approximately, of which 500 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--October 1961 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,953.60 ft above sea level (Portland General Electric Co. bench mark).

REMARKS.--Records good except those for Oct. 1-13, July 20, 21, which are fair. Flow regulated since December 1960 by Prineville Reservoir, active capacity of 152,800 acre-ft and Ochoco Reservoir, active capacity, 46,500 acre-ft. Dam and powerplant 500 ft upstream, completed in 1985, causes brief fluctuations in flow. Many diversions for irrigation upstream from station. Practically all of the summer flow comes from Opal Springs and other springs within 15 mi upstream from station. Simultaneous records (1961-63) at former gaging station 5.6 mi downstream indicated over 15 percent increase to summer flow from springs downstream from this station. Continuous water-quality records for the period October 1963 to September 1974 have been collected at this location.

AVERAGE DISCHARGE.--33 years, 1,562 ft<sup>3</sup>/s, 1,132,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,660 ft<sup>3</sup>/s Dec. 24, 1964, gage height, 9.36 ft; minimum daily discharge, 1,090 ft<sup>3</sup>/s May 11, 1981.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,690 ft<sup>3</sup>/s Oct. 17, gage height, 4.81 ft, due to powerplant operation; minimum recorded discharge, 661 ft<sup>3</sup>/s Oct. 12, due to powerplant operation.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1400	1340	1350	1530	1340	1330	1350	1330	1180	1190	1180	1200
2	1440	1340	1330	1520	1340	1310	1340	1310	1190	1190	1190	1210
3	1460	1340	1320	1520	1340	1320	1350	1240	1180	1190	1190	1210
4	1490	1340	1320	1510	1340	1320	1350	1220	1180	1180	1190	1210
5	1480	1340	1320	1510	1340	1320	1320	1230	1190	1180	1170	1220
6	1500	1320	1320	1490	1340	1320	1320	1200	1240	1180	1190	1220
7	1510	1350	1320	1480	1340	1310	1300	1190	1340	1180	1190	1220
8	1530	1330	1320	1480	1330	1310	1270	1180	1370	1180	1190	1200
9	1540	1330	1320	1470	1340	1350	1250	1180	1310	1180	1200	1200
10	1550	1340	1340	1450	1340	1350	1250	1170	1220	1180	1190	1200
11	1610	1350	1370	1450	1340	1340	1240	1170	1190	1180	1190	1220
12	1610	1350	1360	1460	1330	1320	1240	1160	1180	1190	1190	1250
13	1590	1340	1370	1460	1330	1300	1240	1170	1190	1180	1190	1260
14	1530	1330	1350	1460	1330	1300	1230	1170	1190	1180	1190	1270
15	1480	1330	1340	1420	1330	1300	1210	1170	1210	1190	1200	1250
16	1610	1340	1370	1400	1330	1290	1200	1180	1220	1170	1210	1250
17	1610	1330	1410	1390	1350	1300	1190	1200	1210	1180	1200	1240
18	1650	1340	1440	1380	1350	1310	1190	1180	1190	1180	1230	1210
19	1710	1340	1440	1370	1350	1310	1180	1190	1200	1180	1200	1200
20	1530	1340	1430	1380	1340	1300	1180	1210	1180	e1170	1190	1210
21	1370	1330	1460	1380	1320	1290	1170	1250	1190	e1170	1200	1190
22	1360	1340	1500	1380	1320	1300	1170	1270	1180	1180	1190	1190
23	1350	1350	1540	1380	1320	1290	1170	1270	1180	1170	1200	1190
24	1350	1340	1560	1370	1330	1290	1180	1240	1180	1170	1200	1200
25	1340	1320	1560	1360	1320	1290	1180	1200	1180	1180	1210	1190
26	1340	1330	1560	1360	1330	1290	1190	1180	1180	1170	1210	1200
27	1340	1350	1550	1350	1330	1290	1190	1170	1190	1180	1200	1200
28	1340	1360	1550	1350	1330	1290	1200	1170	1190	1180	1190	1200
29	1340	1350	1540	1350	---	1290	1230	1180	1180	1190	1190	1210
30	1340	1360	1540	1350	---	1300	1240	1190	1170	1190	1200	1230
31	1340	---	1530	1350	---	1320	---	1190	---	1180	1200	---
TOTAL	45640	40190	44030	44110	37370	40550	37120	37360	36180	36590	37060	36450
MEAN	1472	1340	1420	1423	1335	1308	1237	1205	1206	1180	1195	1215
MAX	1710	1360	1560	1530	1350	1350	1350	1330	1370	1190	1230	1270
MIN	1340	1320	1320	1350	1320	1290	1170	1160	1170	1170	1170	1190
AC-FT	90530	79720	87330	87490	74120	80430	73630	74100	71760	72580	73510	72300

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 1994, BY WATER YEAR (WY)

MEAN	1432	1378	1505	1598	1775	1982	2141	1691	1318	1270	1302	1365
MAX	1650	2069	2686	3551	3490	4208	4793	3295	1777	1475	1593	1541
(WY)	1970	1985	1965	1965	1965	1972	1984	1984	1984	1983	1976	1965
MIN	1239	1232	1179	1182	1245	1232	1192	1173	1196	1122	1133	1187
(WY)	1969	1964	1964	1964	1989	1977	1977	1964	1977	1981	1980	1980

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1962 - 1994

	1993	1994	1962-1994
ANNUAL TOTAL	668940	472650	
ANNUAL MEAN	1833	1295	1562
HIGHEST ANNUAL MEAN			2196
LOWEST ANNUAL MEAN			1250
HIGHEST DAILY MEAN	4900	1710	6130
LOWEST DAILY MEAN	1190	1160	1090
ANNUAL SEVEN-DAY MINIMUM	1210	1170	1100
ANNUAL RUNOFF (AC-FT)	1327000	937500	1131000
10 PERCENT EXCEEDS	3470	1460	2210
50 PERCENT EXCEEDS	1390	1300	1350
90 PERCENT EXCEEDS	1280	1180	1200

e Estimated

DESCHUTES RIVER BASIN

121

14090350 JEFFERSON CREEK NEAR CAMP SHERMAN, OR

LOCATION.--Lat 44°34'18", long 121°38'17", in SW 1/4 SE 1/4 sec.34, T.11 S., R.9 E., Jefferson County, Hydrologic Unit 17070301, Warm Springs Indian Reservation, on left bank 100 ft upstream from bridge, 7.6 mi north of Camp Sherman, and at mile 1.3.

DRAINAGE AREA.--27.8 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1983 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,780 ft above sea level, from topographic map.

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

AVERAGE DISCHARGE.--11 years, 86.0 ft<sup>3</sup>/s, 42.03 in/yr, 62,310 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 428 ft<sup>3</sup>/s Feb. 23, 1986, gage height, 3.21 ft; minimum daily discharge, 36 ft<sup>3</sup>/s Dec. 22, 1990, but could have been lower during period of ice effect Dec. 19-25, 1990.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 220 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 3	0100	*186	*2.33				

Minimum discharge, 40 ft<sup>3</sup>/s Feb. 8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	77	65	e54	59	55	61	60	69	84	76	66	58
2	77	65	e58	81	54	62	62	68	79	78	66	58
3	76	68	66	151	54	82	64	68	79	75	66	60
4	75	65	66	122	54	92	61	91	87	73	66	60
5	74	65	63	93	53	73	60	92	89	73	66	58
6	74	64	61	76	54	66	60	92	87	72	64	58
7	75	64	63	70	54	63	59	99	83	72	65	58
8	73	64	66	69	48	61	59	107	79	72	65	58
9	73	64	66	67	56	59	59	111	78	73	63	59
10	73	63	69	65	53	59	58	105	82	72	63	58
11	73	63	67	64	52	58	59	100	84	71	63	57
12	72	63	63	63	52	57	61	98	86	71	63	57
13	71	63	62	67	52	57	60	89	105	71	63	57
14	71	61	61	64	52	58	59	84	95	71	63	56
15	71	62	60	63	52	59	60	82	88	70	63	56
16	70	62	58	62	52	60	65	79	83	70	61	56
17	70	62	59	60	52	59	72	76	82	70	61	56
18	69	61	58	60	52	58	84	75	84	70	61	56
19	69	61	56	60	51	57	98	76	82	70	61	56
20	69	61	57	59	51	56	92	85	82	69	61	56
21	68	61	57	59	51	56	97	80	83	69	60	56
22	67	60	57	60	51	55	86	83	84	69	61	56
23	67	58	56	63	52	55	77	82	83	70	60	56
24	67	53	56	61	57	56	75	87	79	70	60	55
25	66	53	55	59	57	55	73	94	78	69	59	55
26	66	53	56	58	55	55	71	91	78	68	59	55
27	66	57	55	57	54	55	69	82	76	67	59	55
28	66	60	54	57	57	56	69	77	76	67	59	55
29	65	e54	54	56	---	59	69	78	77	67	59	56
30	65	e56	55	56	---	62	70	78	76	66	58	56
31	65	---	55	54	---	63	---	78	---	66	58	---
TOTAL	2180	1831	1843	2115	1487	1884	2068	2656	2488	2187	1922	1703
MEAN	70.3	61.0	59.5	68.2	53.1	60.8	68.9	85.7	82.9	70.5	62.0	56.8
MAX	77	68	69	151	57	92	98	111	105	78	66	60
MIN	65	53	54	54	48	55	58	68	76	66	58	55
AC-FT	4320	3630	3660	4200	2950	3740	4100	5270	4930	4340	3810	3380
CFSM	2.53	2.20	2.14	2.45	1.91	2.19	2.48	3.08	2.98	2.54	2.23	2.04
IN.	2.92	2.45	2.47	2.83	1.99	2.52	2.77	3.55	3.33	2.93	2.57	2.28

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1984 - 1994, BY WATER YEAR (WY)

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
MEAN	73.2	78.5	69.3	72.0	71.1	76.9	91.1	112	121	103	87.1
MAX	90.1	101	86.4	112	107	129	110	163	153	145	117
(WY)	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
MIN	55.5	59.3	58.6	57.8	50.6	57.9	68.9	83.3	80.0	70.5	62.0
(WY)	1993	1988	1993	1993	1989	1985	1994	1991	1992	1992	1994

SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1984 - 1994

ANNUAL TOTAL	34507	24364	
ANNUAL MEAN	94.5	66.8	86.0
HIGHEST ANNUAL MEAN			109
LOWEST ANNUAL MEAN			66.8
HIGHEST DAILY MEAN	206	151	312
LOWEST DAILY MEAN	44	48	36
ANNUAL SEVEN-DAY MINIMUM	47	51	38
ANNUAL RUNOFF (AC-FT)	68440	48330	62310
ANNUAL RUNOFF (CFSM)	3.40	2.40	3.09
ANNUAL RUNOFF (INCHES)	46.17	32.60	42.03
10 PERCENT EXCEEDS	154	83	125
50 PERCENT EXCEEDS	86	63	79
90 PERCENT EXCEEDS	56	55	59

e Estimated

## DESCHUTES RIVER BASIN

14090400 WHITEWATER RIVER NEAR CAMP SHERMAN, OR

LOCATION.--Lat 44°43'04", long 121°38'07", in SE 1/4 NE 1/4 sec.11, T.10 S., R.9 E., Jefferson County, Hydrologic Unit 17070301, Warm Springs Indian Reservation, on left bank 0.2 mi downstream from Lionshead Creek, 18 mi north of Camp Sherman, and at mile 7.1.

DRAINAGE AREA.--22.9 mi<sup>2</sup>.

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

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 3,230 ft above sea level, from topographic map.

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

AVERAGE DISCHARGE.--12 years, 76.6 ft<sup>3</sup>/s, 45.46 in/yr, 55,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 613 ft<sup>3</sup>/s Dec. 10, 1987, from rating curve extended above 170 ft<sup>3</sup>/s, gage height, 3.24 ft; minimum daily discharge, 28 ft<sup>3</sup>/s Dec. 22, 1990, but could be less because of ice effect.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 220 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 27	1030	unknown	a*2.48	Jan. 2	2200	*165	1.97

Minimum discharge, 29 ft<sup>3</sup>/s Sept. 13, but may have been lower during period of ice effect Nov. 24-26.

a Backwater from ice.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	56	38	88	49	41	48	46	53	77	82	61	46
2	55	37	60	82	41	52	46	53	72	95	65	43
3	55	40	47	128	40	80	48	53	72	77	70	61
4	54	37	48	116	39	86	46	63	80	72	71	50
5	54	36	42	89	38	68	45	70	83	70	64	44
6	53	36	40	68	37	61	45	72	75	66	59	46
7	53	36	45	63	37	57	45	81	66	70	60	47
8	49	35	55	63	e35	54	45	92	60	78	54	46
9	45	35	52	61	35	54	44	100	60	80	51	41
10	45	35	57	59	35	54	43	100	67	75	54	33
11	45	35	54	57	35	51	42	93	74	68	58	31
12	48	35	48	56	35	49	44	91	80	68	61	30
13	46	35	46	60	35	49	45	82	104	69	63	30
14	46	34	46	60	35	49	44	76	81	70	66	33
15	45	34	45	60	35	49	44	73	67	68	61	35
16	44	34	44	57	35	50	46	68	63	68	55	37
17	41	34	44	56	36	49	54	62	64	73	52	41
18	40	34	42	54	36	49	66	59	69	76	54	43
19	40	33	41	54	35	47	79	60	64	74	51	43
20	40	33	40	53	34	46	74	69	67	72	49	43
21	40	34	39	51	34	46	79	66	77	77	47	43
22	39	34	39	52	32	41	70	68	90	85	48	43
23	39	32	39	54	34	40	66	68	96	88	48	45
24	41	e30	39	54	51	41	63	74	79	90	48	44
25	39	e30	39	52	41	42	61	85	78	80	47	43
26	38	e30	39	49	38	41	58	90	76	68	48	44
27	38	e32	39	47	38	40	55	78	71	65	49	45
28	40	36	38	47	42	41	54	70	77	66	49	43
29	41	38	38	45	---	44	54	66	84	65	46	47
30	39	40	38	45	---	49	54	65	83	60	44	45
31	39	---	39	42	---	49	---	65	---	58	45	---
TOTAL	1387	1042	1410	1883	1039	1576	1605	2265	2256	2273	1698	1265
MEAN	44.7	34.7	45.5	60.7	37.1	50.8	53.5	73.1	75.2	73.3	54.8	42.2
MAX	56	40	88	128	51	86	79	100	104	95	71	61
MIN	38	30	38	42	32	40	42	53	60	58	44	30
AC-FT	2750	2070	2800	3730	2060	3130	3180	4490	4470	4510	3370	2510
CFSM	1.95	1.52	1.99	2.65	1.62	2.22	2.34	3.19	3.28	3.20	2.39	1.84
IN.	2.25	1.69	2.29	3.06	1.69	2.56	2.61	3.68	3.66	3.69	2.76	2.05

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 1994, BY WATER YEAR (WY)

	MEAN	48.6	60.5	59.7	63.9	65.3	74.9	89.1	106	117	99.9	77.3	57.6
MAX	65.3	97.9	93.9	121	125	132	134	177	157	139	109	76.1	42.2
(WY)	1983	1985	1983	1983	1986	1986	1989	1993	1983	1983	1983	1983	1983
MIN	36.0	34.7	45.5	38.4	37.1	50.1	50.3	64.5	60.7	54.0	54.8	42.2	42.2
(WY)	1993	1994	1994	1993	1994	1985	1991	1991	1992	1992	1994	1994	1994

SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1983 - 1994

ANNUAL TOTAL	29102	19699	76.6	
ANNUAL MEAN	79.7	54.0	105	1983
HIGHEST ANNUAL MEAN			54.0	1994
LOWEST ANNUAL MEAN				
HIGHEST DAILY MEAN	246	May 21	460	Feb 23 1986
LOWEST DAILY MEAN	30	Nov 24	28	Dec 22 1990
ANNUAL SEVEN-DAY MINIMUM	32	Nov 21	32	Nov 21 1993
ANNUAL RUNOFF (AC-FT)	57720	39070	55500	
ANNUAL RUNOFF (CFSM)	3.48	2.36	3.35	
ANNUAL RUNOFF (INCHES)	47.27	32.00	45.46	
10 PERCENT EXCEEDS	150	78	124	
50 PERCENT EXCEEDS	61	49	68	
90 PERCENT EXCEEDS	35	35	41	

e Estimated



## 123

LOCATION.--Lat 44°37'33", long 121°28'55", in SE 1/4 SW 1/4 sec.12, T.11 S., R.10 E., Jefferson County, Hydrologic Unit 17070301, Deschutes National Forest, on right bank 1.0 mi upstream from maximum controlled pool of Lake Billy Chinook, 15.0 mi northwest of Culver, and at mile 13.6.

PERIOD OF RECORD.--April 1910 to February 1912 (gage heights and discharge measurements only), March 1912 to December 1913, October 1921 to current year. Published as "at Hubbard's ranch, near Sisters" 1910, and as "at Hubbard's ranch, near Grandview" 1910-13.

GAGE.--Water-stage recorder. Datum of gage is 1,974.36 ft above sea level (levels by Portland General Electric Co.). Prior to Dec. 31, 1913, nonrecording gage at site 2.3 mi upstream at different datum. Oct. 1, 1921, to May 3, 1949, nonrecording gage and May 4, 1949, to June 18, 1963, water-stage recorder at site 2.7 mi downstream at datum 64 ft lower.

REMARKS.--No estimated daily discharges. Records excellent. No regulation. Many small diversions for irrigation upstream from station. Stream is spring fed. Records herein are for measuring site. Continuous water-quality records for the period October 1954 to September 1974 have been collected at this location.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,530 ft<sup>3</sup>/s Dec. 24, 1964, gage height, 6.81 ft; minimum discharge, 1,080 ft<sup>3</sup>/s Feb. 17, 1932, Oct. 2-31, Nov. 6, 7, 10-14, 1942.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,490 ft<sup>3</sup>/s Jan. 3, gage height, 1.55 ft; minimum discharge, 1,120 ft<sup>3</sup>/s Nov. 26.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1260	1220	1340	1220	1200	1220	1230	1250	1270	1250	1190	1170
2	1260	1220	1290	1260	1200	1230	1230	1240	1260	1260	1200	1160
3	1260	1230	1240	1430	1210	1290	1230	1240	1260	1240	1200	1180
4	1260	1220	1240	1390	1200	1330	1230	1280	1270	1230	1200	1170
5	1260	1220	1220	1370	1200	1290	1220	1290	1290	1230	1200	1160
6	1260	1220	1220	1290	1200	1270	1240	1290	1290	1220	1190	1160
7	1260	1220	1240	1260	1200	1260	1240	1310	1270	1230	1190	1160
8	1250	1220	1280	1260	1180	1250	1240	1340	1250	1230	1190	1160
9	1250	1220	1260	1270	1200	1250	1240	1360	1240	1240	1180	1160
10	1250	1220	1250	1260	1200	1240	1230	1360	1250	1230	1180	1160
11	1250	1220	1240	1260	1190	1240	1230	1340	1260	1220	1180	1160
12	1260	1210	1230	1250	1190	1230	1240	1340	1270	1220	1190	1150
13	1250	1210	1220	1260	1190	1230	1240	1310	1320	1220	1190	1150
14	1260	1210	1220	1260	1190	1230	1230	1290	1310	1220	1190	1150
15	1250	1210	1210	1250	1190	1230	1230	1290	1280	1220	1190	1150
16	1250	1210	1210	1250	1190	1230	1240	1280	1260	1210	1180	1150
17	1240	1220	1210	1240	1190	1230	1250	1270	1250	1220	1180	1160
18	1240	1210	1200	1240	1190	1240	1280	1260	1260	1220	1180	1160
19	1240	1210	1200	1240	1190	1230	1310	1260	1250	1220	1180	1160
20	1240	1210	1200	1230	1180	1230	1310	1270	1250	1210	1170	1160
21	1240	1210	1200	1230	1190	1240	1330	1270	1260	1220	1170	1160
22	1240	1210	1200	1240	1180	1230	1320	1270	1270	1230	1170	1160
23	1230	1200	1190	1240	1200	1220	1300	1270	1280	1230	1170	1160
24	1240	1170	1190	1240	1240	1220	1290	1270	1260	1230	1170	1160
25	1230	1160	1190	1230	1220	1220	1290	1290	1250	1220	1170	1150
26	1230	1140	1190	1220	1210	1210	1280	1300	1250	1210	1170	1150
27	1230	1160	1190	1220	1210	1210	1270	1280	1240	1200	1170	1150
28	1230	1200	1190	1220	1220	1220	1260	1260	1240	1200	1170	1150
29	1230	1220	1190	1210	---	1220	1260	1250	1250	1200	1170	1160
30	1230	1220	1190	1210	---	1240	1260	1250	1250	1200	1160	1160
31	1230	---	1190	1200	---	1240	---	1250	---	1190	1160	---
TOTAL	38610	36220	37830	38950	33550	38420	37750	39830	37910	37870	36600	34750
MEAN	1245	1207	1220	1256	1198	1239	1258	1285	1264	1222	1181	1158
MAX	1260	1230	1340	1430	1240	1330	1330	1360	1320	1260	1200	

[illegible]

ANNUAL TOTAL	501060		448290			
ANNUAL MEAN	1373		1228		1480	
HIGHEST ANNUAL MEAN					1845	1956
LOWEST ANNUAL MEAN					1167	1941
HIGHEST DAILY MEAN	2290	Mar 23	1430	Jan 3	7100	Dec 24 1964
LOWEST DAILY MEAN	1120	Jan 13	1140	Nov 26	1080	Feb 17 1932
ANNUAL SEVEN-DAY MINIMUM	1120	Jan 12	1150	Sep 10	1080	Oct 2 1942
ANNUAL RUNOFF (AC-FT)	993900		889200		1072000	
10 PERCENT EXCEEDS	1700		1280		1780	
50 PERCENT EXCEEDS	1280		1230		1440	
90 PERCENT EXCEEDS	1170		1170		1220	

## DESCHUTES RIVER BASIN

14092100 LAKE BILLY CHINOOK NEAR METOLIUS, OR

LOCATION.--Lat 44°36'14", long 121°16'40", in SW 1/4 NE 1/4 sec.22, T.11 S., R.12 E., Jefferson County, Hydrologic Unit 17070301, Warm Springs Indian Reservation, near left end of Round Butte Dam on Deschutes River, 5.0 mi west of Metolius, and at mile 110.6.

DRAINAGE AREA.--7,490 mi<sup>2</sup>, approximately.

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

GAGE.--Nonrecording gage. Datum of gage is sea level (levels by Portland General Electric Co.).

REMARKS.--Reservoir is formed by rock fill dam completed in June 1964 by Portland General Electric Co.; storage began Jan. 2, 1964. Total capacity is 534,700 acre-ft at elevation 1,945.0 ft proposed upper limit of operation, and usable capacity is 273,900 acre-ft between elevations 1,860.0 ft, proposed lower limit of operation, and 1,945.0 ft. Reservoir used for power generation under FERC license 2030. Figures given herein represent total contents.

COOPERATION.--Gage readings and capacity tables furnished by Portland General Electric Co.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 538,700 acre-ft July 15, 16, 1972, elevation, 1,946.00 ft; minimum contents observed since first filling, 431,100 acre-ft Feb. 13, 1972, elevation, 1,917.13 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents observed, 535,900 acre-ft July 25, elevation, 1,945.30 ft; minimum contents observed, 515,200 acre-ft Feb. 18, elevation, 1,939.99 ft.

## MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept.30.....	1,944.39	532,300	--
Oct. 31.....	1,943.45	528,600	-3,700
Nov. 30.....	1,940.94	518,900	-9,700
Dec. 31.....	1,944.06	531,000	+12,100
CAL YR 1993.....	--	--	+26,600
Jan. 31.....	1,942.99	526,800	-4,200
Feb. 28.....	1,940.74	518,100	-8,700
Mar. 31.....	1,944.25	531,800	+13,700
Apr. 30.....	1,941.88	522,500	-9,300
May 31.....	1,942.80	526,100	+3,600
June 30.....	1,942.52	525,000	-1,100
July 31.....	1,944.39	532,300	+7,300
Aug. 31.....	1,943.69	529,600	-2,700
Sept.30.....	1,944.02	530,800	+1,200
WTR YR 1994.....	--	--	-1,500

## 125

LOCATION.--Lat 44°43'34", long 121°14'45", in SE 1/4 SW 1/4 sec.1, T.10 S., R.12 E., Jefferson County, Hydrologic Unit 17070306, on right bank 400 ft downstream from reregulating dam, 2.7 mi downstream from Pelton Dam, 8.5 mi northwest of Madras, and at mile 100.1.

PERIOD OF RECORD.--October 1923 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,390.25 ft above sea level (levels by Portland General Electric Co.). See WSP 1738 for history of changes prior to Nov. 23, 1957.

REMARKS.--No estimated daily discharges. Water-discharge records excellent. Diurnal fluctuation caused by Lake Simustus and reregulating reservoir since 1957, combined capacity for normal operation, 6,500 acre-ft. Some winter and spring runoff stored in Ochoco Reservoir, capacity, 47,500 acre-ft, in Crescent Lake, Crane Prairie and Wickiup Reservoirs, combined capacity, 354,600 acre-ft, and since 1960, in Prineville Reservoir, capacity, 152,800 acre-ft, and since 1964, in Lake Billy Chinook, capacity, 534,700 acre-ft. Large diversions in upper basin for irrigation. Continuous water-quality records for the period October 1978 to September 1988 have been collected at this location.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,500 ft<sup>3</sup>/s July 16, 1983, accidental release from Pelton Dam, gage height, 7.70 ft, from floodmarks; minimum discharge, 916 ft<sup>3</sup>/s July 4, 1982, caused by power company testing control gates on dam.

EXTREMES FOR CURRENT YEAR. - Maximum discharge, 7,370 ft<sup>3</sup>/s Oct. 12, gage height, 3.98 ft, result of regulation;  
minimum discharge, 2,330 ft<sup>3</sup>/s Oct. 11, Aug. 2, result of regulation.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3990	4110	4240	4420	4420	3950	4470	3640	3650	3650	3630	3660
2	3850	4110	4470	4510	4420	3950	4480	3640	3650	3460	3500	3400
3	3820	4110	4470	4540	4430	3960	4470	3640	3660	3440	3520	3400
4	3860	4110	4460	4550	4440	3970	4470	3650	3660	3440	3520	3400
5	3840	4110	4460	4750	4520	3980	4460	3640	3660	3450	3530	3390
6	3830	4140	4490	4740	4530	3930	4430	3640	3650	3440	3540	3400
7	3940	4220	4430	4700	4510	3930	4210	3630	3650	3420	3540	3400
8	4090	4210	4210	4680	4900	3980	4210	3660	3640	3300	3540	3420
9	4070	4220	4230	4650	4950	3970	4210	3580	3640	3310	3540	3640
10	4070	4220	4240	4670	4450	3870	4190	3600	3650	3330	3650	3640
11	4110	4210	3850	4410	4390	3760	4160	3630	3650	3340	3660	3640
12	4100	4230	3840	4420	4160	3760	3780	3630	3640	3350	3670	3600
13	4100	4230	3850	4420	4160	3770	3750	3630	3650	3340	3670	3600
14	4100	4230	3840	4430	4180	3770	3760	3630	3630	3320	3660	3580
15	4120	4200	3790	4420	4200	3780	3760	3630	3630	3300	3650	3570
16	4210	4160	3470	4240	4140	3770	3770	3610	3630	3290	3560	3610
17	4200	4150	3500	4210	4200	3750	3780	3620	3640	3310	3540	3660
18	4200	4150	3470	4250	4120	3550	3790	3640	3640	3320	3490	3660
19	4200	4240	3480	4280	3810	3750	3690	3640	3630	3290	3490	3610
20	4200	4160	3490	4250	3850	3760	3670	3640	3630	3280	3480	3660
21	4330	4170	3490	4180	4200	3760	3680	3640	3630	3290	3490	3710
22	4400	4200	3490	3840	4170	3740	3680	3640	3630	3270	3630	3670
23	4390	4630	3530	3850	4180	3750	3680	3640	3640	3280	3630	3560
24	4390	5060	4150	3840	3980	3760	3680	3660	3630	3290	3640	3580
25	4380	5060	4170	3900	3960	3890	3670	3660	3640	3580	3740	3580
26	4130	4970	4190	4190	3960	3860	3650	3660	3650	3590	3740	3580
27	3910	4450	4310	4200	3960	3900	3650	3640	3640	3800	3740	3590
28	3900	4250	4320	4190	3950	4350	3650	3650	3630	3710	3740	3580
29	3890	4230	4460	4130	---	4340	3650	3640	3650	3640	3720	3590
30	4110	4200	4450	4150	---	4360	3650	3640	3670	3660	3630	3590
31	4110	---	4410	4200	---	4480	---	3650	---	3650	3670	---
TOTAL	126840	128740	125250	134210	119140	121100	118150	112740	109290	106140	111750	106970
MEAN	4092	4291	4040	4329	4255	3906	3938	3637	3643	3424	3605	3566
MAX	4400	5060	4490	4750	4950	4480	4480	3660	3670	3800		

MEAN	4163	4663	5077	5304	5206	5454	5121	4407	4217	4000	3927	3960
MAX	5097	6124	6655	8097	8182	9590	8988	6346	5134	4786	4718	4553
(WY)	1973	1985	1982	1965	1972	1984	1984	1984	1974	1974	1976	1984
MIN	3085	3521	3951	3305	3094	3455	3602	3554	3492	3059	3064	3081
(WY)	1965	1965	1970	1964	1964	1964	1968	1964	1964	1964	1964	1964

ANNUAL TOTAL	1689180			1420320			
ANNUAL MEAN	4628			3891		4622	
HIGHEST ANNUAL MEAN						5878	1984
LOWEST ANNUAL MEAN						3558	1964
HIGHEST DAILY MEAN	10300	Mar 23		5060	Nov 24	15100	Dec 28 1964
LOWEST DAILY MEAN	3290	Feb 13		3270	Jul 22	2770	Feb 21 1969
ANNUAL SEVEN-DAY MINIMUM	3350	Feb 10		3290	Jul 18	3040	Jul 7 1964
ANNUAL RUNOFF (AC-FT)	3350000			2817000		3349000	
10 PERCENT EXCEEDS	7390			4430		6110	
50 PERCENT EXCEEDS	4160			3760		4260	
90 PERCENT EXCEEDS	3650			3490		3630	

## DESCHUTES RIVER BASIN

14092750 SHITIKE CREEK AT PETERS PASTURE, NEAR WARM SPRINGS, OR

LOCATION.--Lat 44°45'02", long 121°37'56", in NW 1/4 NE 1/4 sec.35, T.9 S., R.9 E., Jefferson County, Hydrologic Unit 17070306, Warm Springs Indian Reservation, on left bank 0.5 mi downstream from Peters Pasture, and 18 mi west of town of Warm Springs, and at mile 26.4.

DRAINAGE AREA.--22.9 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Elevation of gage is 3,580 ft, from topographic map.

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

AVERAGE DISCHARGE.--12 years, 69.4 ft<sup>3</sup>/s, 41.16 in/yr, 50,260 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,170 ft<sup>3</sup>/s Feb. 23, 1986, gage height, 3.65 ft, from rating curve extended above 170 ft<sup>3</sup>/s; minimum daily discharge, 17 ft<sup>3</sup>/s Dec. 22, 1990.

EXTREMES FOR CURRENT YEAR.--Maximum gage height and discharge not determined, occurred during period of gage malfunction. Maximum daily discharge, 185 ft<sup>3</sup>/s Jan. 3; minimum daily discharge 18 ft<sup>3</sup>/s Sept. 24-28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26	24	e125	30	31	e45	56	59	68	52	29	21
2	26	24	e70	e75	30	e50	56	55	65	58	28	21
3	26	25	e44	e185	30	e115	58	56	62	50	28	22
4	26	25	e46	e160	28	e125	58	65	71	46	28	24
5	25	24	e36	e110	e28	e80	55	86	76	46	27	22
6	25	24	e34	87	e28	e70	55	88	72	45	27	21
7	26	24	e38	70	e28	e65	53	97	63	45	27	20
8	27	24	e48	62	e26	e55	53	114	57	45	27	20
9	26	24	e44	58	e26	e52	53	122	55	44	27	23
10	26	24	e50	52	e26	e49	51	115	62	42	26	23
11	26	24	e45	50	e26	e46	50	105	69	39	25	22
12	27	24	e38	47	e26	e46	51	102	73	39	25	21
13	27	24	e37	49	e26	e46	53	88	92	38	25	21
14	27	23	36	51	e26	e46	52	77	80	37	24	20
15	30	22	34	50	e26	e44	50	72	68	37	24	20
16	29	22	32	48	e28	e44	52	68	63	36	24	20
17	27	24	31	45	e26	e44	65	60	62	36	24	19
18	27	24	30	43	e26	e42	91	56	68	35	24	19
19	26	23	29	42	e24	e42	132	56	64	34	24	19
20	25	22	27	40	e24	e42	129	62	62	33	24	19
21	25	23	27	39	e24	e40	129	61	70	32	23	19
22	25	24	27	39	e22	e38	113	64	75	32	23	19
23	25	e21	26	41	e26	e36	95	68	73	32	23	19
24	25	e20	26	41	e40	e38	87	74	60	32	22	18
25	24	e20	26	40	e36	e39	79	86	57	31	22	18
26	24	e22	26	38	e34	40	73	87	58	31	22	18
27	24	e22	25	37	e32	40	68	71	54	31	22	18
28	24	e24	25	35	e38	41	63	60	55	30	21	18
29	24	25	25	34	---	43	62	58	57	30	21	19
30	24	26	24	33	---	49	61	55	55	29	21	19
31	24	---	25	32	---	56	---	59	---	29	21	---
TOTAL	798	701	1156	1763	791	1608	2103	2352	1966	1176	758	602
MEAN	25.7	23.4	37.3	56.9	28.2	51.9	70.1	75.9	65.5	37.9	24.5	20.1
MAX	30	26	125	185	40	125	132	122	92	58	29	24
MIN	24	20	24	30	22	36	50	55	54	29	21	18
AC-FT	1580	1390	2290	3500	1570	3190	4170	4670	3900	2330	1500	1190
CFSM	1.12	1.02	1.63	2.48	1.23	2.27	3.06	3.31	2.86	1.66	1.07	.88
IN.	1.30	1.14	1.88	2.86	1.28	2.61	3.42	3.82	3.19	1.91	1.23	.98

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 1994, BY WATER YEAR (WY)

	MEAN	33.6	57.6	56.1	68.2	74.4	85.1	99.6	114	105	65.8	41.6	32.1
MAX	60.2	103	117	152	190	166	137	197	154	111	67.8	48.6	
(WY)	1983	1985	1983	1983	1986	1986	1990	1993	1983	1983	1983	1983	
MIN	20.3	23.4	34.9	35.9	28.2	41.4	50.4	69.4	41.7	33.4	24.5	20.1	
(WY)	1988	1994	1991	1993	1994	1985	1991	1991	1992	1992	1992	1994	

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1983 - 1994

ANNUAL TOTAL	27084	15774	
ANNUAL MEAN	74.2	43.2	69.4
HIGHEST ANNUAL MEAN			106
LOWEST ANNUAL MEAN			43.2
HIGHEST DAILY MEAN	411	185	930
LOWEST DAILY MEAN	20	18	17
ANNUAL SEVEN-DAY MINIMUM	22	18	18
ANNUAL RUNOFF (AC-FT)	53720	31290	50260
ANNUAL RUNOFF (CFSM)	3.24	1.89	3.03
ANNUAL RUNOFF (INCHES)	44.00	25.62	41.16
10 PERCENT EXCEEDS	175	73	130
50 PERCENT EXCEEDS	44	35	53
90 PERCENT EXCEEDS	25	22	26

e Estimated



DESCHUTES RIVER BASIN

127

14092750 SHITIKE CREEK AT PETERS PASTURE, NEAR WARM SPRINGS, OR--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1989 to September 1994 (discontinued).

WATER-QUALITY DATA

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)
OCT 1993					
05...	1245	--	26	<1	<0.07
DEC					
13...	1430	3.0	38	4	0.41
MAR 1994					
25...	1130	3.0	40	1	0.11
MAY					
17...	0905	--	62	3	0.50
JUL					
21...	1625	13.0	32	5	0.43

Sediment discharges shown are instantaneous values. The values were calculated by multiplying the water discharge times the sediment concentration times the coefficient of .0027 to get sediment discharge in tons per day. They do not reflect the actual sediment discharge for the given date.

## DESCHUTES RIVER BASIN

14092885 SHITIKE CREEK BELOW WOLFORD CANYON, NEAR WARM SPRINGS, OR

LOCATION.--Lat 44°46'20", long 121°18'15", in NW 1/4 SE 1/4 sec.21, T.9 S., R.12 E., Jefferson County, Hydrologic Unit 17070306, Warm Springs Indian Reservation, on left bank at bridge crossing 2.3 mi upstream from Tenino Creek, and 2.1 mi northwest of Warm Springs, and at mile 4.53.

DRAINAGE AREA.--75.8 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1974 to current year. Records for June 1911 to October 1916, April 1923 to September 1928, and October 1972 to September 1974 (see sta 14093000) at sites downstream not equivalent owing to difference in drainage areas.

GAGE.--Water-stage recorder. Elevation of gage is 1,600 ft above sea level, from topographic map.

REMARKS.--Water-discharge records fair except those for period July 13 to Aug. 18 and estimated daily discharges, which are poor. No regulation. Some diversion for irrigation and Warm Springs water supply.

AVERAGE DISCHARGE.--20 years, 92.2 ft<sup>3</sup>/s, 16.52 in/yr, 66,760 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,980 ft<sup>3</sup>/s Feb. 23, 1986, gage height, 6.40 ft, from rating curve extended above 860 ft<sup>3</sup>/s; maximum gage height, 7.35 ft Dec. 13, 1977; minimum daily discharge, 17 ft<sup>3</sup>/s Oct. 12-15, 17-22, 24-27, Nov. 12, 1978.

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 400 ft<sup>3</sup>/s and maximum (+):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 4	2100	*328	*4.79				

Minimum daily discharge, 19 ft<sup>3</sup>/s Nov. 24, 25.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	34	43	e72	34	e38	49	69	69	84	71	45	32
2	34	43	133	40	e40	61	68	65	87	77	45	31
3	34	45	65	254	e40	104	70	65	78	71	44	32
4	35	49	59	261	e35	215	70	73	85	62	43	36
5	35	49	52	254	e30	193	67	110	112	62	43	34
6	36	48	47	167	e40	155	66	113	106	62	43	32
7	38	48	49	125	e35	128	66	126	86	59	44	31
8	42	48	66	103	e25	107	64	152	74	55	44	30
9	41	49	66	89	e34	92	63	181	71	54	44	32
10	40	49	62	79	42	82	61	175	75	53	43	35
11	41	48	70	72	e36	74	58	156	90	49	42	35
12	43	49	61	67	e32	69	57	153	94	46	40	34
13	44	49	53	68	31	65	61	132	122	46	41	32
14	44	e47	49	73	32	63	60	109	130	46	39	31
15	49	48	46	69	32	61	57	98	98	46	38	31
16	47	49	43	65	32	61	58	95	85	45	38	30
17	44	50	41	61	33	62	66	81	80	45	38	30
18	42	49	39	59	32	61	106	73	91	44	37	30
19	41	48	37	56	31	61	185	70	89	46	36	29
20	40	e48	34	54	30	57	210	76	81	46	36	29
21	40	47	e27	52	30	61	208	77	88	44	35	29
22	40	50	e27	51	29	55	188	81	96	44	35	29
23	39	e46	e29	56	30	53	153	85	107	44	35	29
24	40	e19	e29	58	47	52	126	90	86	47	34	29
25	41	e19	e29	55	53	50	107	106	75	46	34	29
26	40	e26	e32	51	46	48	101	130	76	47	33	28
27	40	e42	35	49	44	48	89	103	72	48	33	28
28	40	e52	32	47	43	48	79	80	69	47	33	28
29	40	e48	32	e44	---	50	73	73	74	47	33	32
30	41	e46	29	42	---	54	71	79	74	47	33	31
31	41	---	30	e42	---	70	---	75	---	47	32	---
TOTAL	1246	1351	1475	2597	1002	2409	2777	3151	2635	1593	1193	928
MEAN	40.2	45.0	47.6	83.8	35.8	77.7	92.6	102	87.8	51.4	38.5	30.9
MAX	49	52	133	261	53	215	210	181	130	77	45	36
MIN	34	19	27	34	25	48	57	65	69	44	32	28
AC-FT	2470	2680	2930	5150	1990	4780	5510	6250	5230	3160	2370	1840
CFSM	.53	.59	.63	1.11	.47	1.03	1.22	1.34	1.16	.68	.51	.41
IN.	.61	.66	.72	1.27	.49	1.18	1.36	1.55	1.29	.78	.59	.46

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 1994, BY WATER YEAR (WY)

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
MEAN	47.6	76.0	105	96.1	118	117	113	128	124	83.0	55.2	45.5								
MAX	76.5	134	238	183	324	263	167	217	217	147	86.5	67.9								
(WY)	1983	1985	1978	1976	1982	1986	1989	1993	1982	1982	1983	1982								
MIN	17.9	29.7	43.9	40.4	35.8	40.3	50.8	56.3	57.5	37.6	29.0	25.7								
(WY)	1979	1979	1986	1979	1994	1977	1977	1977	1992	1977	1978	1978								

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1975 - 1994
ANNUAL TOTAL	36367	22357	
ANNUAL MEAN	99.6	61.3	92.2
HIGHEST ANNUAL MEAN			143
LOWEST ANNUAL MEAN			46.8
HIGHEST DAILY MEAN	540	261	1360
LOWEST DAILY MEAN	19	19	17
ANNUAL SEVEN-DAY MINIMUM	30	29	17
ANNUAL RUNOFF (AC-FT)	72130	44350	66760
ANNUAL RUNOFF (CFSM)	1.31	.81	1.22
ANNUAL RUNOFF (INCHES)	17.85	10.97	16.52
10 PERCENT EXCEEDS	216	105	163
50 PERCENT EXCEEDS	64	48	72
90 PERCENT EXCEEDS	35	31	38

e Estimated

DESCHUTES RIVER BASIN

129

14092885 SHITIKE CREEK BELOW WOLFORD CANYON, NEAR WARM SPRINGS, OR--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--November 1989 to September 1994 (discontinued).

WATER-QUALITY DATA

DATE	TIME	TEMPER- ATURE WATER (DEG C)	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)
OCT 1993					
06...	1400	13.0	37	1	0.10
DEC					
08...	0950	3.5	60	3	0.49
MAR 1994					
29...	1435	--	51	3	0.41
MAY					
19...	0815	9.5	70	4	0.76
SEP					
29...	0815	13.0	32	4	0.35

Sediment discharges shown are instantaneous values. The values were calculated by multiplying the water discharge times the sediment concentration times the coefficient of .0027 to get sediment discharge in tons per day. They do not reflect the actual sediment discharge for the given date.





## DESCHUTES RIVER BASIN

14095500 WARM SPRINGS RIVER NEAR SIMNASHO, OR--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--November 1989 to September 1994 (discontinued).

## WATER-QUALITY DATA

DATE	TIME	TEMPER- ATURE WATER (DEG C)	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)
OCT 1993					
04...	1345	8.0	108	2	0.58
DEC					
07...	1350	5.0	112	3	0.91
MAR 1994					
28...	1130	6.0	107	4	1.2
MAY					
16...	1100	9.0	105	1	0.28
JUL					
22...	1315	16.0	97	4	1.0

Sediment discharges shown are instantaneous values. The values were calculated by multiplying the water discharge times the sediment concentration times the coefficient of .0027 to get sediment discharge in tons per day. They do not reflect the actual sediment discharge for the given date.

## DESCHUTES RIVER BASIN

14096300 MILL CREEK NEAR BADGER BUTTE, NEAR WARM SPRINGS, OR

LOCATION.--Lat 44°51'42", long 121°37'35", in SW 1/4 sec.23, T.8 S., R.9 E., Wasco County, Hydrologic Unit 17070306, Warm Springs Indian Reservation, on right bank 200 ft upstream from bridge on road B241, 3.4 mi upstream from headworks of Mill Creek Canal, and 19.3 mi northwest of Warm Springs, and at mile 14.6.

DRAINAGE AREA.--26.8 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1983 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 3,380 ft above sea level, from topographic map.

REMARKS.--Water-discharge records good except for estimated daily discharges, which are poor. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--11 years, 59.4 ft<sup>3</sup>/s, 30.11 in/yr, 43,020 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 478 ft<sup>3</sup>/s Apr. 27, 1990; maximum gage height, 7.30 ft Feb. 23, 1986, from high-water mark on crest-stage gage; minimum discharge recorded, 23 ft<sup>3</sup>/s Feb. 15, 25, 1993, but may have been lower during period of estimated record.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 130 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 1	1630	*128	5.53				

Minimum daily discharge, 28 ft<sup>3</sup>/s Sept. 22, 28, but may have been lower during period of freezeup, Feb. 5.DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	35	37	87	47	41	61	57	61	54	39	32	31
2	35	38	61	61	41	61	57	60	52	39	32	31
3	36	38	46	81	41	70	58	59	50	39	32	31
4	36	37	47	83	39	82	58	62	50	38	33	33
5	37	38	43	94	e36	81	56	65	54	38	32	31
6	36	37	41	74	40	75	59	68	56	38	32	30
7	37	38	44	64	39	69	63	72	57	37	32	29
8	37	39	60	67	e35	64	62	75	55	36	33	29
9	37	38	57	70	e41	60	60	78	55	36	33	32
10	37	37	58	66	43	59	59	78	53	34	32	34
11	38	37	52	69	42	56	57	76	50	34	32	34
12	40	37	48	66	41	55	57	73	49	34	32	32
13	39	37	44	67	43	54	57	70	52	34	31	31
14	40	38	42	63	44	53	56	68	56	33	32	30
15	40	37	41	61	44	53	55	68	54	33	32	29
16	39	37	40	58	42	52	55	70	54	33	32	29
17	39	40	39	56	44	53	57	65	53	33	32	30
18	37	40	39	54	43	55	64	64	54	33	32	30
19	37	39	38	53	43	55	85	64	51	33	31	30
20	37	39	37	50	42	54	95	63	50	33	32	29
21	37	40	38	49	42	58	93	65	48	33	31	29
22	37	42	37	48	42	55	88	69	47	32	31	28
23	37	e39	37	49	46	53	81	63	44	32	31	29
24	37	e37	36	48	77	52	78	60	43	32	31	29
25	37	e34	36	48	60	51	73	59	43	32	31	29
26	37	e35	37	46	55	50	71	57	42	32	31	29
27	37	e42	36	46	54	50	68	56	41	32	31	29
28	37	40	36	44	59	49	64	55	41	32	31	28
29	37	42	36	44	---	49	62	55	40	32	31	30
30	37	44	36	44	---	53	62	55	39	32	32	30
31	37	---	37	42	---	59	---	54	---	32	31	---
TOTAL	1156	1153	1366	1812	1259	1801	1967	2007	1487	1060	983	905
MEAN	37.3	38.4	44.1	58.5	45.0	58.1	65.6	64.7	49.6	34.2	31.7	30.2
MAX	40	44	87	94	77	82	95	78	57	39	33	34
MIN	35	34	36	42	35	49	55	54	39	32	31	28
AC-FT	2290	2290	2710	3590	2500	3570	3900	3980	2950	2100	1950	1800
CFSM	1.39	1.43	1.64	2.18	1.68	2.17	2.45	2.42	1.85	1.28	1.18	1.13
IN.	1.60	1.60	1.90	2.52	1.75	2.50	2.73	2.79	2.06	1.47	1.36	1.26

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1984 - 1994, BY WATER YEAR (WY)

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	
MEAN	39.8	57.0	59.3	65.0	66.3	72.9	84.1	82.8	67.0	43.7	38.2	37.5
MAX	50.6	80.5	72.8	92.0	121	106	106	116	92.1	56.5	47.3	48.6
(WY)	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
MIN	30.0	38.2	44.1	43.8	40.0	58.1	62.4	43.7	33.3	34.2	31.1	30.2
(WY)	1993	1988	1994	1992	1993	1994	1991	1992	1992	1994	1992	1994

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1984 - 1994

ANNUAL TOTAL	22466	16956	59.4
ANNUAL MEAN	61.6	46.5	69.0
HIGHEST ANNUAL MEAN			46.5
LOWEST ANNUAL MEAN			342
HIGHEST DAILY MEAN	222	Mar 18	95
LOWEST DAILY MEAN	28	Feb 16	28
ANNUAL SEVEN-DAY MINIMUM	33	Feb 24	29
ANNUAL RUNOFF (AC-FT)	44560	33630	43020
ANNUAL RUNOFF (CFSM)	2.30	1.73	2.22
ANNUAL RUNOFF (INCHES)	31.18	23.54	30.11
10 PERCENT EXCEEDS	115	66	92
50 PERCENT EXCEEDS	45	42	52
90 PERCENT EXCEEDS	37	31	35

e Estimated

DESCHUTES RIVER BASIN

133

14096300 MILL CREEK NEAR BADGER BUTTE, NEAR WARM SPRINGS, OR--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1989 to September 1994 (discontinued).

WATER-QUALITY DATA

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)
OCT 1993					
04...	1630	7.5	37	<1	<0.10
DEC					
07...	1625	--	44	2	0.24
MAR 1994					
28...	1440	6.0	48	1	0.13
MAY					
19...	1250	8.5	64	1	0.17
JUL					
22...	0940	11.0	33	--	--

Sediment discharges shown are instantaneous values. The values were calculated by multiplying the water discharge times the sediment concentration times the coefficient of .0027 to get sediment discharge in tons per day. They do not reflect the actual sediment discharge for the given date.

## DESCHUTES RIVER BASIN

14096850 BEAVER CREEK BELOW QUARTZ CREEK, NEAR SIMNASHO, OR

LOCATION.--Lat 44°57'32", long 121°23'35", in NE 1/4 SW 1/4 sec.14, T.7 S., R.11 E., Wasco County, Hydrologic Unit 17070306, Warm Springs Indian Reservation, on right bank 600 ft downstream from culvert on Warm Springs Reservation Highway 9, 200 ft downstream from Quartz Creek, and 2.4 mi west of Simnasho, and at mile 7.92.

DRAINAGE AREA.--145 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1983 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,260 ft above sea level, from topographic map.

REMARKS.--Water-discharge records good except for estimated daily discharges, which are poor. No regulation or diversions upstream from station.

AVERAGE DISCHARGE.--11 years, 73.1 ft<sup>3</sup>/s, 6.85 in/yr, 52,930 acre-ft/yr.EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,340 ft<sup>3</sup>/s, Feb. 23, 1986, gage height, 7.96 ft; minimum discharge, 4.5 ft<sup>3</sup>/s Jan. 7, 1991.EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 25	0330	(a)	*2.52	Mar. 4	0330	*83	2.44

Minimum daily discharge, 27 ft<sup>3</sup>/s Nov. 24.

(a) Backwater from ice.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	36	35	39	39	e36	59	63	51	39	34	31	30
2	36	35	54	43	e36	63	62	50	38	34	31	30
3	36	36	45	62	e36	73	64	49	37	34	31	31
4	36	36	44	60	e38	82	63	51	37	34	31	31
5	36	35	41	68	39	76	62	52	38	34	31	31
6	36	35	40	63	40	69	63	48	41	33	31	30
7	36	35	40	54	42	65	64	47	41	33	31	30
8	37	35	44	51	38	62	64	46	40	32	31	30
9	36	35	51	51	41	59	63	45	38	32	31	30
10	36	35	47	53	41	58	61	44	37	32	31	31
11	36	35	46	56	40	57	59	44	37	32	31	31
12	37	35	45	58	40	55	59	43	36	32	31	30
13	37	35	43	57	40	55	60	42	36	32	31	30
14	37	35	41	57	40	55	59	42	38	32	31	30
15	37	35	41	55	41	55	58	43	38	32	30	30
16	36	35	40	54	41	56	57	44	37	32	30	30
17	36	36	39	52	42	56	59	44	36	32	30	31
18	36	36	39	50	43	57	60	43	37	32	30	31
19	36	35	38	49	42	58	66	47	36	32	30	30
20	35	35	37	48	41	56	67	48	36	32	30	30
21	36	35	37	47	41	59	67	46	35	32	30	30
22	35	36	37	46	40	57	63	47	35	32	30	30
23	35	34	35	47	42	54	61	44	35	32	30	30
24	35	e27	36	48	56	53	63	42	35	32	30	31
25	35	e29	37	46	55	52	62	41	34	32	30	31
26	35	e32	37	45	54	52	60	40	34	32	30	30
27	35	e46	36	44	54	52	57	40	34	32	31	30
28	35	e48	36	43	57	52	54	40	34	32	30	30
29	35	e38	36	41	---	52	53	40	34	32	30	31
30	35	38	37	43	---	54	52	40	34	31	30	31
31	35	---	37	40	---	64	---	40	---	31	30	---
TOTAL	1110	1067	1255	1570	1196	1827	1825	1383	1097	1002	945	911
MEAN	35.8	35.6	40.5	50.6	42.7	58.9	60.8	44.6	36.6	32.3	30.5	30.4
MAX	37	48	54	68	57	82	67	52	41	34	31	31
MIN	35	27	35	39	36	52	52	40	34	31	30	30
AC-FT	2200	2120	2490	3110	2370	3620	3620	2740	2180	1990	1870	1810
CFSM	.25	.25	.28	.35	.29	.41	.42	.31	.25	.22	.21	.21
IN.	.28	.27	.32	.40	.31	.47	.47	.35	.28	.26	.24	.23

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1984 - 1994, BY WATER YEAR (WY)

	MEAN	MAX	(WY)	MIN	(WY)
1984	37.6	42.6	1985	33.6	1993
1985	48.7	104	1986	35.6	1988
1986	51.9	85.5	1987	40.0	1986
1987	85.3	244	1988	47.6	1987
1988	152	634	1989	58.9	1994
1989	149	305	1990	60.8	1994
1990	114	175	1991	44.6	1994
1991	76.3	110	1992	36.6	1994
1992	54.7	95.5	1993	32.3	1994
1993	40.3	45.4	1984	30.5	1994
1994	36.7	40.2	1986	1994	1994
1995	35.9	40.4	1986	1994	1994

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1984 - 1994
ANNUAL TOTAL	30741	15188	
ANNUAL MEAN	84.2	41.6	73.1
HIGHEST ANNUAL MEAN			123
LOWEST ANNUAL MEAN			41.6
HIGHEST DAILY MEAN	714	82	3680
LOWEST DAILY MEAN	27	27	5.8
ANNUAL SEVEN-DAY MINIMUM	33	30	8.3
ANNUAL RUNOFF (AC-FT)	60970	30130	52930
ANNUAL RUNOFF (CFSM)	.58	.29	.50
ANNUAL RUNOFF (INCHES)	7.89	3.90	6.85
10 PERCENT EXCEEDS	174	59	136
50 PERCENT EXCEEDS	45	37	45
90 PERCENT EXCEEDS	36	30	35

e Estimated

DESCHUTES RIVER BASIN

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14096850 BEAVER CREEK BELOW QUARTZ CREEK, NEAR SIMNASHO, OR--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1989 to September 1994 (discontinued).

WATER-QUALITY DATA

DATE	TIME	TEMPER- ATURE WATER (DEG C)	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)
OCT 1993					
08...	1345	8.0	36	<1	<0.10
MAR 1994					
30...	1305	10.0	53	4	0.57
MAY					
16...	1320	12.0	44	1	0.12
JUL					
22...	1125	16.0	32	1	0.09

Sediment discharges shown are instantaneous values. The values were calculated by multiplying the water discharge times the sediment concentration times the coefficient of .0027 to get sediment discharge in tons per day. They do not reflect the actual sediment discharge for the given date.



## DESCHUTES RIVER BASIN

14097100 WARM SPRINGS RIVER NEAR KAHNEETA HOT SPRINGS, OR

LOCATION.--Lat 44°51'24", long 121°08'55", in SE 1/4 SW 1/4 sec.23, T.8 S., R.13 E., Wasco County, Hydrologic Unit 17070306, Warm Springs Indian Reservation, on right bank 25 ft upstream from bridge, 2.5 mi east of Kahneeta Hot Springs, and at mile 4.6.

DRAINAGE AREA.--526 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Elevation of gage is 1,400 ft above sea level, from topographic map.

REMARKS.--No estimated daily discharges. Water-discharge records good. No regulation. Small diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--22 years, 417 ft<sup>3</sup>/s, 10.76 in/yr, 301,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,240 ft<sup>3</sup>/s Feb. 23, 1986, gage height, 10.54 ft; minimum discharge, 149 ft<sup>3</sup>/s Dec. 20, 1990, but may have been less during period of ice effect Dec. 20, 1990 to Jan. 10, 1991.

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

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 5	1200	*412	*1.86				

Minimum discharge, 156 ft<sup>3</sup>/s Nov. 24.DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	224	224	269	233	224	292	310	303	247	207	196	196
2	223	221	349	250	221	301	309	298	242	208	195	195
3	225	224	283	340	219	319	314	294	240	208	195	197
4	225	228	260	343	226	359	319	304	238	206	196	200
5	225	224	252	396	217	365	316	323	245	205	194	198
6	221	224	239	375	219	349	318	309	266	205	195	196
7	223	224	238	316	237	331	332	303	258	203	197	196
8	225	222	258	307	206	316	330	303	257	202	197	194
9	228	222	304	302	223	307	328	301	249	198	197	196
10	225	223	284	304	240	301	319	299	242	196	197	200
11	227	221	279	303	234	293	311	296	237	196	196	201
12	230	222	265	312	227	284	294	290	236	197	198	201
13	233	225	250	306	229	279	301	284	233	196	193	199
14	232	219	243	303	234	276	304	279	245	195	195	197
15	235	220	238	294	230	276	298	283	247	196	195	196
16	233	226	233	287	231	276	295	287	240	196	195	195
17	229	230	229	280	235	277	299	281	237	195	196	196
18	226	229	227	271	238	282	309	275	242	194	196	198
19	223	222	225	267	233	297	347	284	237	195	195	195
20	223	217	221	261	229	286	390	284	233	195	196	195
21	224	224	215	260	229	295	399	276	230	194	197	194
22	224	233	219	258	228	294	387	300	226	195	198	193
23	224	228	205	258	228	281	373	282	223	194	197	194
24	224	176	207	260	282	277	370	268	218	195	197	195
25	224	199	211	257	326	272	360	262	217	195	196	194
26	223	212	216	248	290	268	351	253	215	195	196	194
27	222	301	218	243	280	266	335	249	214	194	195	193
28	224	306	214	244	283	266	324	248	214	194	195	196
29	223	256	214	236	---	261	314	250	210	194	196	203
30	222	258	217	241	---	268	309	251	209	194	195	204
31	223	---	222	230	---	303	---	249	---	195	196	---
TOTAL	6992	6860	7504	8785	6698	9117	9865	8768	7047	6132	6072	5901
MEAN	226	229	242	283	239	294	329	283	235	198	196	197
MAX	235	306	349	396	326	365	399	323	266	208	198	204
MIN	221	176	205	230	206	261	294	248	209	194	193	193
AC-FT	13870	13610	14880	17430	13290	18080	19570	17390	13980	12160	12040	11700
CFSM	.43	.43	.46	.54	.45	.56	.63	.54	.45	.38	.37	.37
IN.	.49	.49	.53	.62	.47	.64	.70	.62	.50	.43	.43	.42

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1973 - 1994, BY WATER YEAR (WY)

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	
MEAN	256	311	459	534	640	621	555	491	376	274	251	247											
MAX	318	570	1210	1520	1732	1285	814	819	803	401	323	301											
(WY)	1973	1985	1978	1974	1986	1986	1993	1974	1974	1974	1974	1974											
MIN	211	229	242	201	239	274	278	278	235	198	196	197											
(WY)	1993	1994	1994	1979	1994	1977	1977	1994	1994	1994	1994	1994											

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1973 - 1994
ANNUAL TOTAL	152808	89741	
ANNUAL MEAN	419	246	
HIGHEST ANNUAL MEAN			417
LOWEST ANNUAL MEAN			660
HIGHEST DAILY MEAN	2110	Mar 18	1974
LOWEST DAILY MEAN	176	Nov 24	1994
ANNUAL SEVEN-DAY MINIMUM	212	Dec 23	246
ANNUAL RUNOFF (AC-FT)	303100		7560
ANNUAL RUNOFF (CFSM)	.80		Feb 23 1986
ANNUAL RUNOFF (INCHES)	10.81		160
10 PERCENT EXCEEDS	767		Jan 1 1979
50 PERCENT EXCEEDS	277		174
90 PERCENT EXCEEDS	224		Dec 31 1978

DESCHUTES RIVER BASIN

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14097100 WARM SPRINGS RIVER NEAR KAHNEETA HOT SPRINGS, OR--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD...November 1989 to September 1994 (discontinued).

WATER-QUALITY DATA

DATE	TIME	TEMPER- ATURE WATER (DEG C)	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)
OCT 1993					
06...	1715	13.5	222	1	0.60
DEC					
08...	1310	5.5	257	3	2.1
MAR 1994					
30...	1010	10.5	263	4	2.8
MAY					
16...	1610	14.0	290	1	0.78
JUL					
20...	1810	24.0	195	3	1.6

Sediment discharges shown are instantaneous values. The values were calculated by multiplying the water discharge times the sediment concentration times the coefficient of .0027 to get sediment discharge in tons per day. They do not reflect the actual sediment discharge for the given date.

LOCATION.--Lat 45°37'20", long 120°54'05", in SW 1/4 SE 1/4 sec.26, T.2 N., R.15 E., Sherman County, Hydrologic Unit 17070306, on right bank at Moody, 4.0 mi southwest of Biggs, and at mile 1.4.

PERIOD OF RECORD.--October 1897 to December 1899 (published as "near Moro"), July 1906 to current year. Monthly discharge only for some periods, published in WSP 1318.

REVISD RECORDS. - WSP 754: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 167.54 ft above sea level. Oct. 19, 1897, to Dec. 31, 1899, nonrecording gage at site 10 mi upstream at different datum. July 22, 1906, to July 18, 1930, nonrecording gage at site 300 ft downstream at datum 0.50 ft lower.

REMARKS.--No estimated daily discharges. Water-discharge records good. Some fluctuation caused by regulation at Lake Simustus since 1957. Some winter and spring runoff stored in Ochoco Reservoir, capacity, 46,420 acre-ft, in Crescent Lake, Crane Prairie, and Wickiup Reservoirs, combined capacity, 323,390 acre-ft, and since 1960, in Prineville Reservoir, and since 1964 in Lake Billy Chinook (station 14092100). Large diversions in upper river basin for irrigation. Water-quality records for periods 1911-12, 1953-58, 1962-90, have been collected at this location.

AVERAGE DISCHARGE.--90 years (water years, 1898, 1899, 1907-94), 5,797 ft<sup>3</sup>/s, 4,200,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 75,500 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 11.80 ft, from rating curve extended above 47,000 ft<sup>3</sup>/s; minimum discharge, 2,400 ft<sup>3</sup>/s Dec. 5, 1957.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,840 ft<sup>3</sup>/s Jan. 5, 6, gage height, 3.24 ft; minimum discharge, 3,440 ft<sup>3</sup>/s July 23-25.

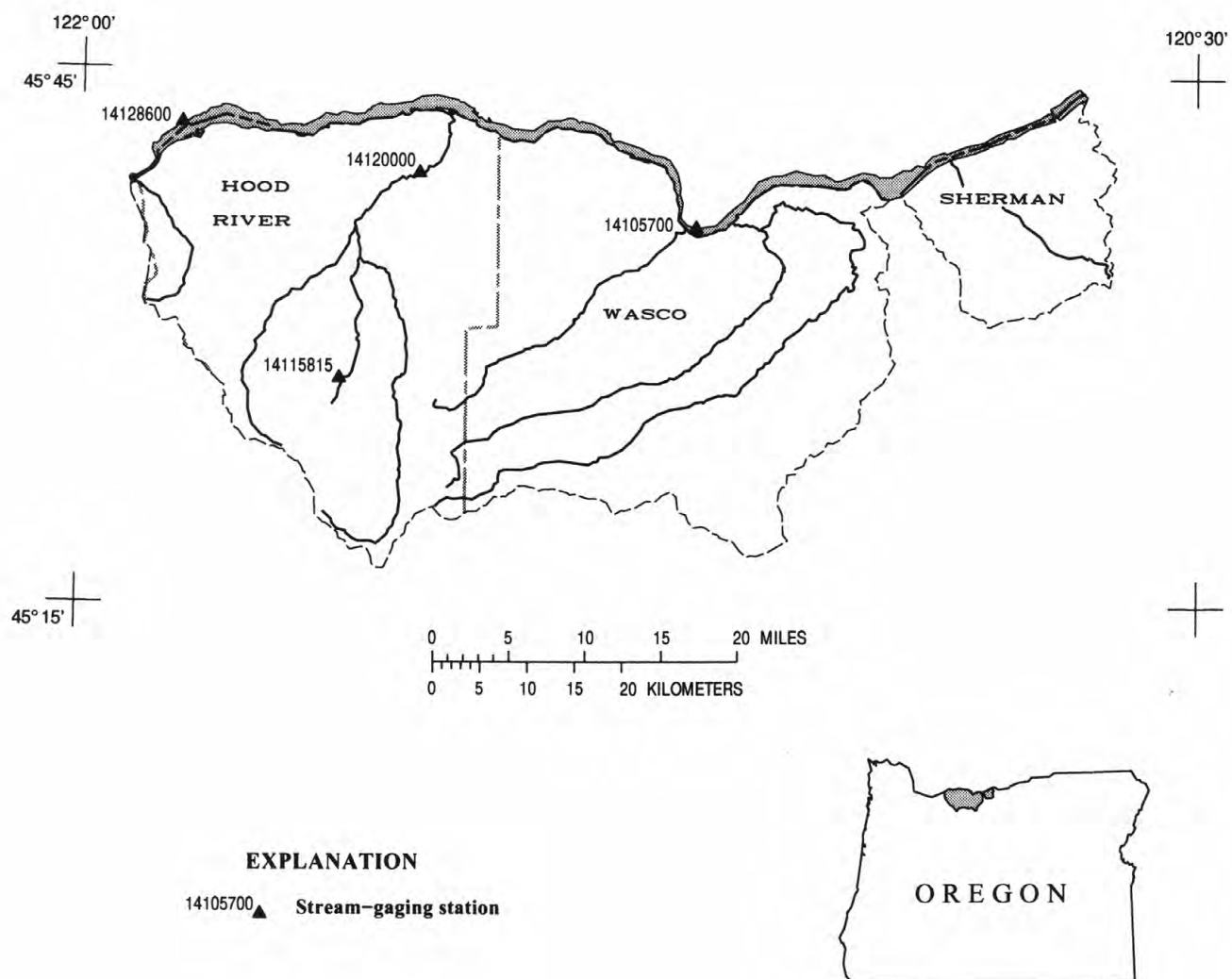
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4310	4520	4680	4810	4650	4500	5120	4220	4050	3910	3840	3860
2	4270	4510	5090	4940	4810	4550	5110	4190	4040	3850	3790	3810
3	4150	4510	5090	5270	4790	4610	5100	4160	4040	3690	3660	3540
4	4140	4520	5000	5600	4790	4790	5100	4180	4060	3660	3660	3560
5	4170	4500	4950	5660	4820	4880	5100	4250	4050	3630	3670	3560
6	4160	4490	4900	5720	4870	4840	5100	4240	4170	3630	3680	3550
7	4190	4560	4910	5520	4910	4660	5000	4200	4130	3640	3690	3560
8	4320	4620	4830	5380	4920	4580	4830	4280	4100	3630	3690	3550
9	4480	4610	4730	5320	5210	4560	4860	4260	4050	3500	3680	3590
10	4460	4600	4790	5330	5230	4510	4840	4210	4000	3470	3700	3800
11	4470	4600	4670	5250	4770	4420	4800	4210	4010	3480	3800	3870
12	4520	4590	4330	5130	4690	4290	4720	4220	4010	3480	3820	3890
13	4520	4610	4280	5150	4490	4220	4310	4200	4010	3510	3820	3840
14	4500	4620	4260	5170	4490	4220	4260	4140	4030	3490	3810	3850
15	4540	4590	4240	5150	4530	4210	4240	4150	4030	3480	3810	3840
16	4610	4540	4080	5090	4500	4220	4230	4170	4000	3480	3770	3830
17	4670	4540	3800	4870	4470	4210	4270	4130	3980	3480	3680	3860
18	4660	4520	3800	4830	4530	4160	4310	4130	3990	3480	3640	3920
19	4650	4540	3780	4860	4350	4010	4440	4180	3980	3470	3590	3890
20	4620	4580	3790	4840	4100	4170	4540	4240	3940	3480	3580	3870
21	4650	4500	3780	4780	4230	4230	4540	4180	3910	3480	3570	3970
22	4780	4540	3790	4630	4480	4220	4560	4170	3920	3480	3610	4030
23	4850	4680	3760	4340	4470	4160	4500	4170	3920	3450	3760	3960
24	4840	5050	3950	4360	4560	4140	4450	4140	3910	3440	3760	3850
25	4830	5250	4500	4360	4490	4170	4470	4130	3870	3440	3790	3880
26	4760	5280	4500	4470	4420	4260	4410	4090	3880	3650	3910	3880
27	4490	5030	4560	4680	4380	4200	4310	4080	3900	3810	3920	3890
28	4290	4760	4660	4660	4370	4390	4280	4060	3890	4010	3910	3890
29	4280	4670	4710	4630	---	4760	4270	4060	3870	3890	3920	3920
30	4340	4630	4810	4560	---	4800	4260	4070	3900	3840	3880	3950
31	4520	---	4810	4560	---	5010	---	4040	---	3860	3790	---
TOTAL	139040	139560	137830	153920	129320	136950	138330	129150	119640	111790	116200	114260
MEAN	4485	4652	4446	4965	4619	4418	4611	4166	3988	3606	3748	3809
MAX	4850	5280	5090	5720	5230	5010	5120	4280	4170	4010		

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 1994, BY WATER YEAR (WY)

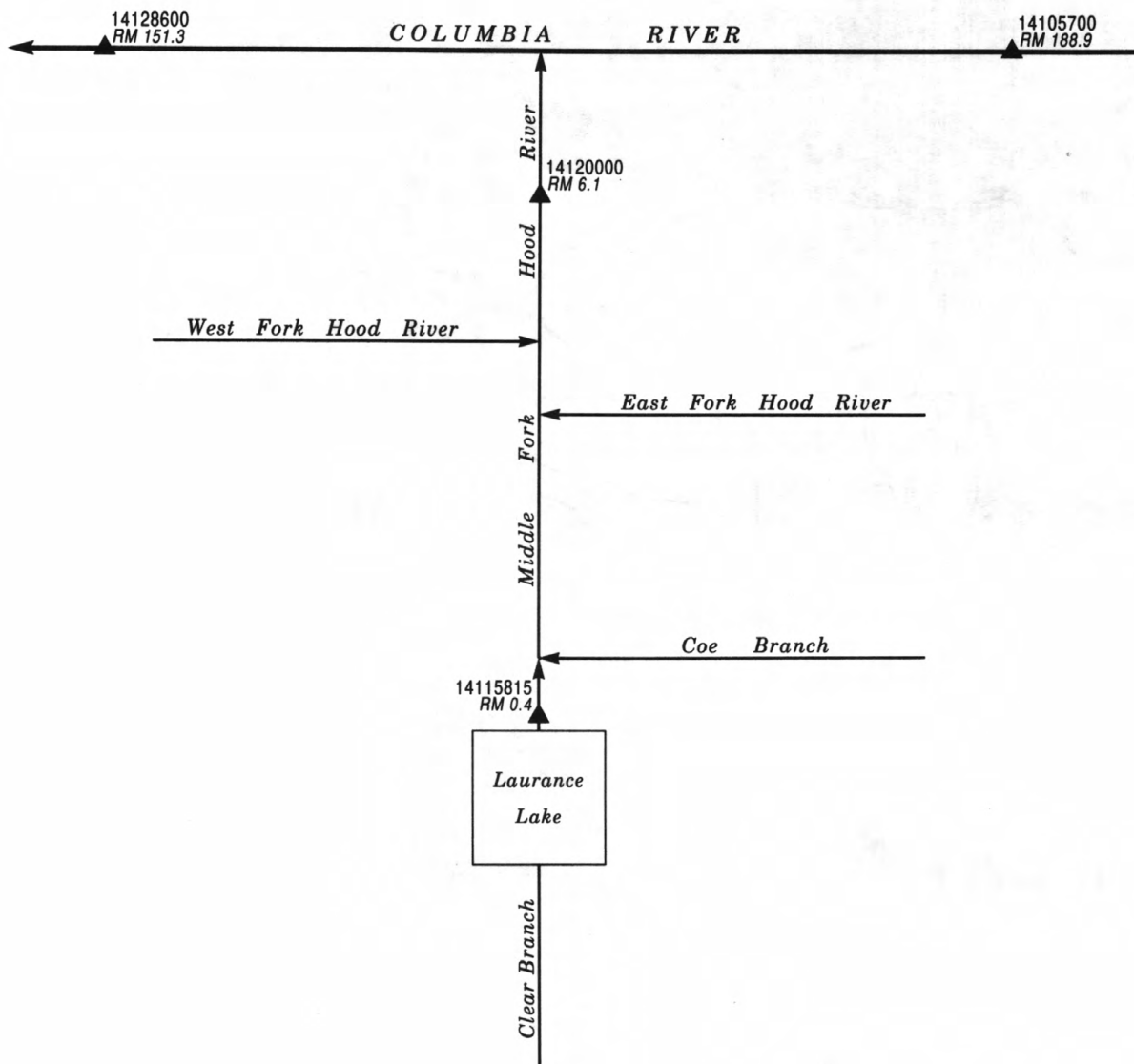
MEAN	4679	5362	6460	7085	7106	7226	6685	5819	5217	4602	4398	4448
MAX	5594	7814	13150	11290	13090	13580	10930	8267	7643	5917	5359	5185
(WY)	1973	1985	1965	1974	1986	1972	1984	1984	1974	1974	1976	1984
MIN	3385	3910	4446	4873	4401	4418	4467	4141	3988	3606	3748	3809
(WY)	1965	1965	1994	1992	1977	1994	1977	1977	1994	1994	1994	1994

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1965 - 1994
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ANNUAL TOTAL	2036220		1565990			
ANNUAL MEAN	5579		4290		5751	
HIGHEST ANNUAL MEAN					7376	1984
LOWEST ANNUAL MEAN					4290	1994
HIGHEST DAILY MEAN	15400	Mar 24	5720	Jan 6	62400	Dec 23 1964
LOWEST DAILY MEAN	3760	Dec 23	3440	Jul 24	3320	Oct 14 1964
ANNUAL SEVEN-DAY MINIMUM	3790	Dec 17	3460	Jul 19	3360	Oct 10 1964
ANNUAL RUNOFF (AC-FT)	4039000		3106000		4166000	
10 PERCENT EXCEEDS	9280		4900		8070	
50 PERCENT EXCEEDS	4650		4240		5090	
90 PERCENT EXCEEDS	4120		3660		4150	



**Figure 16.** Location of surface-water stations in the Columbia River between the Deschutes River and Bonneville Dam and in the Hood River Basin.



#### EXPLANATION

- ▲ 14128600 Stream-gaging station
- RM 6.1 River mile
- Stream—Arrow shows direction of flow

**Figure 17.** Schematic diagram showing gaging stations in the Columbia River between the Deschutes River and Bonneville Dam and in the Hood River Basin.



## COLUMBIA RIVER MAIN STEM

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14105700 COLUMBIA RIVER AT THE DALLES, OR

LOCATION.--Lat 45°36'27", long 121°10'20", in SW 1/4 SW 1/4 sec.34, T.2 N., R.13 E., Wasco County, Hydrologic Unit 17070105, Corps of Engineers land, on left bank 0.3 mi downstream from Mill Creek, 2.6 mi downstream from The Dalles Dam, and at mile 188.9.

DRAINAGE AREA.--237,000 mi<sup>2</sup>, 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. 1-27 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.--116 years, 190,900 ft<sup>3</sup>/s, 138,300,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge (since 1858), 1,240,000 ft<sup>3</sup>/s June 6, 1894, elevation, 106.5 ft; minimum discharge (since 1878), 12,100 ft<sup>3</sup>/s Apr. 16, 1968 (due to closure of John Day dam, recorded by AVM).

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 230,000 ft<sup>3</sup>/s May 12; maximum elevation, 79.31 ft May 12; minimum daily discharge, 61,100 ft<sup>3</sup>/s Aug. 21.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e129000	112000	115000	80500	164000	105000	137000	209000	211000	165000	99600	73400
2	e99500	136000	120000	93100	176000	132000	121000	209000	197000	148000	101000	63800
3	e72700	112000	98800	88400	171000	131000	82400	211000	213000	129000	101000	66000
4	e108000	118000	96700	86600	160000	112000	145000	212000	205000	122000	103000	66100
5	e102000	124000	86500	119000	162000	122000	174000	222000	188000	150000	103000	68000
6	e104000	85500	133000	118000	155000	96000	147000	228000	196000	178000	106000	74000
7	e126000	81300	110000	108000	160000	135000	148000	214000	206000	157000	73800	82200
8	e127000	128000	128000	127000	161000	152000	150000	205000	223000	160000	99500	79600
9	e110000	141000	125000	84500	173000	134000	130000	206000	212000	180000	104000	74600
10	e77700	107000	94100	120000	157000	122000	103000	214000	215000	134000	89600	69200
11	e97700	96300	89800	108000	134000	120000	147000	226000	198000	171000	90600	62700
12	e100000	81200	79200	113000	157000	124000	131000	230000	179000	170000	92600	78600
13	e92600	78800	134000	118000	116000	89600	150000	217000	203000	162000	95900	75300
14	e116000	90900	119000	115000	144000	137000	140000	215000	219000	156000	88700	76100
15	e101000	112000	123000	114000	135000	120000	150000	183000	229000	159000	86800	64100
16	e95400	110000	127000	92700	128000	123000	127000	193000	201000	152000	115000	73500
17	e64900	104000	140000	121000	127000	132000	97000	213000	193000	129000	107000	79100
18	e110000	113000	134000	152000	138000	155000	120000	206000	192000	150000	91700	64700
19	e125000	113000	107000	144000	135000	158000	146000	203000	168000	167000	e94000	80400
20	e114000	100000	144000	137000	106000	149000	163000	202000	177000	157000	e103000	81300
21	e105000	65400	142000	133000	125000	147000	165000	192000	191000	157000	61100	80800
22	e93000	127000	138000	114000	142000	156000	179000	190000	192000	149000	75400	91800
23	e98800	147000	132000	78400	127000	152000	175000	202000	184000	158000	89500	88500
24	e72600	183000	115000	121000	156000	160000	154000	221000	184000	122000	72000	80100
25	e110000	146000	118000	123000	145000	144000	162000	216000	183000	155000	81300	64900
26	e119000	146000	89900	140000	142000	110000	169000	219000	152000	152000	81800	72300
27	e109000	110000	124000	139000	103000	98500	180000	227000	176000	149000	106000	90400
28	107000	93300	131000	146000	104000	102000	198000	215000	161000	142000	74500	92000
29	114000	137000	115000	146000	--	137000	192000	186000	157000	135000	85900	80200
30	100000	124000	92000	123000	--	129000	206000	191000	171000	142000	89900	79000
31	94500	--	104000	150000	--	134000	--	215000	--	106000	87800	--
TOTAL	3195400	3422700	3605000	3653200	4003000	4018100	4488400	6492000	5776000	4663000	2851000	2272700
MEAN	103100	114100	116300	117800	143000	129600	149600	209400	192500	150400	91970	75760
MAX	129000	183000	144000	152000	176000	160000	206000	230000	229000	180000	115000	92000
MIN	64900	65400	79200	78400	103000	89600	82400	183000	152000	106000	61100	62700
AC-FT	6338000	6789000	7151000	7246000	7940000	7970000	8903000	12880000	11460000	9249000	5655000	4508000

CAL YR 1993 TOTAL 56112100 MEAN 153700 MAX 401000 MIN 64900 AC-FT 111300000  
WTR YR 1994 TOTAL 48440500 MEAN 132700 MAX 230000 MIN 61100 AC-FT 96080000

e Estimated

## HOOD RIVER BASIN

14115815 CLEAR BRANCH BELOW LAURANCE LAKE, NEAR PARKDALE, OR

LOCATION.--Lat 45°27'44", long 121°39'04", in SE 1/4 SE 1/4 sec.22, T.1 S., R.9 E., Hood River County, Hydrologic Unit 17070105, on right bank 0.3 mi downstream from Laurance Lake, and 5.0 mi southwest of Parkdale, and at mile 0.35.

DRAINAGE AREA.--8.62 mi<sup>2</sup>.

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

GAGE.--Water-stage recorder. Elevation of gage is 2,790 ft above sea level, from topographic map.

REMARKS.--No estimated daily discharges. Records good. Flow regulated by Laurance Lake 0.3 mi upstream. Diversion for irrigation directly from Laurance Lake bypasses gage via Clear Branch conduit.

AVERAGE DISCHARGE.--8 years, 20.7 ft<sup>3</sup>/s, 14,970 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 184 ft<sup>3</sup>/s Apr. 27, 1990, gage height, 7.03 ft; minimum discharge, no flow Nov. 3, 1992, due to construction upstream from gage.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 36 ft<sup>3</sup>/s May 14, 15, gage height, 6.10 ft; maximum gage height, 6.12 ft Jan. 4; minimum discharge, 2.7 ft<sup>3</sup>/s several days in August.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	19	28	30	27	28	31	34	22	9.1	5.9	12
2	17	19	30	31	26	29	32	34	20	9.1	5.9	16
3	17	20	31	32	27	29	32	34	19	9.1	5.7	16
4	17	20	31	32	24	29	32	34	19	8.9	5.6	16
5	17	20	31	33	22	30	32	34	20	8.8	5.5	16
6	18	21	30	31	22	30	32	34	22	8.8	5.4	16
7	18	21	29	29	21	30	32	34	20	8.8	5.3	16
8	18	21	30	30	21	30	32	34	14	8.8	5.0	14
9	18	21	30	30	21	30	32	35	10	8.8	4.9	13
10	18	21	31	30	23	30	32	35	14	8.6	4.8	12
11	18	21	32	31	24	30	32	35	17	8.4	4.6	12
12	18	21	32	31	22	29	32	35	17	8.4	4.4	12
13	18	21	32	31	22	29	32	35	20	8.4	4.3	12
14	18	21	32	31	22	29	32	35	12	8.4	4.3	12
15	18	21	32	31	22	30	32	15	13	8.4	4.1	12
16	18	21	31	31	22	32	32	7.2	11	8.4	3.9	12
17	18	20	29	31	22	34	32	7.2	9.1	8.1	3.8	12
18	18	21	27	30	22	35	33	7.1	15	8.0	3.6	12
19	18	20	24	30	22	35	33	7.1	14	7.9	3.5	12
20	18	20	23	30	22	34	33	7.1	13	7.7	3.5	12
21	18	20	23	29	21	34	33	7.1	11	7.5	3.3	12
22	18	24	21	29	21	33	33	7.1	9.4	7.3	3.1	12
23	18	30	20	29	26	32	33	7.1	9.4	7.1	3.0	12
24	18	24	20	29	29	32	33	7.2	8.9	7.0	2.9	12
25	18	20	19	29	29	32	34	7.3	8.7	6.9	2.8	12
26	18	20	19	28	29	31	34	7.4	8.7	6.6	2.8	12
27	18	20	18	28	28	31	34	7.5	8.8	6.4	2.7	12
28	18	20	18	28	28	31	34	7.6	8.8	6.3	2.7	12
29	18	20	18	28	---	31	34	8.9	9.1	6.2	2.8	12
30	18	21	18	28	---	31	34	17	9.2	6.2	2.8	12
31	19	---	24	28	---	31	---	21	---	6.1	2.8	---
TOTAL	554	629	813	928	667	961	978	637.9	413.1	244.5	125.7	387
MEAN	17.9	21.0	26.2	29.9	23.8	31.0	32.6	20.6	13.8	7.89	4.05	12.9
MAX	19	30	32	33	29	35	34	35	22	9.1	5.9	16
MIN	17	19	18	28	21	28	31	7.1	8.7	6.1	2.7	12
AC-FT	1100	1250	1610	1840	1320	1910	1940	1270	819	485	249	768

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1987 - 1994, BY WATER YEAR (WY)

	1987	1988	1989	1990	1991	1992	1993	1994
MEAN	14.2	20.7	24.8	26.7	27.9	28.3	33.7	28.4
MAX	20.6	29.8	34.8	41.7	44.4	33.1	48.9	55.1
(WY)	1991	1989	1992	1991	1991	1988	1993	1990
MIN	4.45	5.59	8.53	8.22	10.3	12.0	8.76	12.8
(WY)	1988	1988	1987	1987	1987	1987	1987	1991

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1987 - 1994

ANNUAL TOTAL	8469.0	7338.2	
ANNUAL MEAN	23.2	20.1	20.7
HIGHEST ANNUAL MEAN			25.8
LOWEST ANNUAL MEAN			8.12
HIGHEST DAILY MEAN	78	May 8	149
LOWEST DAILY MEAN	5.4	Aug 31	1.3
ANNUAL SEVEN-DAY MINIMUM	5.8	Aug 25	1.3
ANNUAL RUNOFF (AC-FT)	16800	14560	14970
10 PERCENT EXCEEDS	35	32	33
50 PERCENT EXCEEDS	21	20	18
90 PERCENT EXCEEDS	7.8	6.5	6.6

## 14120000 HOOD RIVER AT TUCKER BRIDGE, NEAR HOOD RIVER, OR

LOCATION.--Lat 45°39'20", long 121°32'50", in SE 1/4 sec.15, T.2 N., R.10 E., Hood River County, Hydrologic Unit 17070105, on right bank 25 ft downstream from Tucker Bridge, 0.5 mi upstream from Odell Creek, 4.0 mi, southwest of town of Hood River, and at mile 6.1.

DRAINAGE AREA.--279 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1897 to December 1899, September 1913 to September 1914, August 1915 to September 1917, January 1965 to current year. Monthly discharge only for some periods, published in WSP 1318.

REVISED RECORDS.--WSP 1318: 1899. WSP 1935: Drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 383.2 ft above sea level (Oregon State Highway Department bench mark). Prior to July 23, 1915, nonrecording gage at bridge at various datums. July 23 to Dec. 21, 1915, water-stage recorder at site 0.8 mi upstream at different datum. January 1916 to September 1917, nonrecording gage at bridge at different datum. Jan. 16 to July 23, 1965, nonrecording gage at bridge.

REMARKS.--No estimated daily discharges. Records good. Some daily fluctuation possibly caused by diversion dam upstream from station and sawmill at Dee. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--34 years (water years 1898-99, 1914, 1916-17, 1966-94), 999 ft<sup>3</sup>/s, 724,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,300 ft<sup>3</sup>/s Dec. 13, 1977, gage height, 15.59 ft; minimum discharge recorded, 136 ft<sup>3</sup>/s Sept. 16, 1915, caused by temporary storage behind dam at Dee.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Dec. 22, 1964, reached a stage of 20.6 ft, present datum, discharge, 33,200 ft<sup>3</sup>/s, from rating curve extended above 1,500 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 2	2100	*5,420	*8.24	No other peak greater than base discharge.			

Minimum discharge, 138 ft<sup>3</sup>/s Sept. 13, 14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	255	270	1660	1330	485	1550	1090	717	474	410	233	188
2	270	265	1160	2370	475	1830	1020	692	446	510	252	190
3	265	328	774	3650	467	2220	976	676	433	424	281	264
4	266	293	904	3350	455	2220	907	837	442	396	278	253
5	263	272	654	3180	443	1730	827	827	481	388	263	188
6	264	270	532	2060	443	1380	941	830	524	352	230	169
7	300	265	513	1410	439	1170	1010	854	578	354	229	179
8	258	262	714	1270	450	1030	1250	872	531	384	216	172
9	246	261	1180	1440	485	925	1320	863	459	374	189	182
10	245	261	1280	1420	436	919	1260	808	431	351	209	156
11	244	260	1210	1760	426	896	1110	790	438	312	216	152
12	252	258	1010	1440	414	833	1120	773	432	301	229	154
13	289	257	779	1370	445	809	1040	725	539	301	234	144
14	316	253	668	1170	451	836	956	686	769	298	242	149
15	333	255	580	1040	442	854	886	656	760	291	223	171
16	331	261	524	933	458	895	906	623	635	301	196	162
17	306	261	484	836	473	939	993	591	540	327	186	165
18	297	264	454	772	512	1240	1120	567	562	345	188	186
19	296	256	431	719	489	1100	1320	591	500	363	193	181
20	293	255	409	679	474	969	1180	592	466	330	189	175
21	293	274	396	652	475	1110	1150	580	471	334	186	181
22	291	321	379	653	471	948	1040	553	471	370	184	179
23	289	276	364	685	1450	854	938	530	505	373	192	190
24	308	297	355	677	2890	799	989	538	458	365	193	206
25	293	298	346	633	1520	760	897	556	422	370	177	200
26	289	303	341	598	1120	733	826	543	434	320	185	203
27	278	344	333	569	1020	743	772	480	405	261	195	210
28	266	352	327	549	1360	783	752	465	393	244	197	214
29	300	354	322	530	---	844	731	504	395	245	192	248
30	322	448	325	516	---	925	757	500	398	242	180	239
31	304	---	466	500	---	1120	---	463	---	230	182	---
TOTAL	8822	8594	19874	38761	19468	33964	30084	20282	14792	10466	6539	5650
MEAN	285	286	641	1250	695	1096	1003	654	493	338	211	188
MAX	333	448	1660	3650	2890	2220	1320	872	769	510	281	264
MIN	244	253	322	500	414	733	731	463	393	230	177	144
AC-FT	17500	17050	39420	76880	38610	67370	59670	40230	29340	20760	12970	11210

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1898 - 1994, BY WATER YEAR (WY)

	MEAN	462	1007	1410	1552	1509	1334	1309	1195	943	592	401	378
MAX	929	1989	4109	3313	3367	2915	2358	2418	2439	1687	1088	804	
(WY)	1900	1898	1978	1974	1982	1972	1916	1969	1899	1899	1899	1899	
MIN	218	282	438	363	430	681	704	532	278	229	209	188	
(WY)	1988	1988	1977	1979	1977	1977	1973	1992	1992	1992	1992	1994	

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1898 - 1994

ANNUAL TOTAL	276483	217296	999
ANNUAL MEAN	757	595	1664
HIGHEST ANNUAL MEAN			1664
LOWEST ANNUAL MEAN			465
HIGHEST DAILY MEAN	4500	Mar 23	3650
LOWEST DAILY MEAN	211	Sep 14	144
ANNUAL SEVEN-DAY MINIMUM	218	Sep 13	155
ANNUAL RUNOFF (AC-FT)	548400	431000	724100
10 PERCENT EXCEEDS	1670	1150	1880
50 PERCENT EXCEEDS	484	446	774
90 PERCENT EXCEEDS	256	196	310

## COLUMBIA RIVER MAIN STEM

14128600 COLUMBIA RIVER AT STEVENSON, WA

LOCATION.--Lat 45°41'58", long 121°52'02", in NW 1/4 SE 1/4 sec.36, T.3 N., R.7-1/2 E., Skamania County,  
Hydrologic Unit 17070105, on right bank 0.9 mi east of Stevenson, and at mile 151.3.

DRAINAGE AREA.--239,800 mi<sup>2</sup>, 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. Data for period Feb. 15 to March 24, Apr. 21 to May 17, May 27,  
furnished by Corps of Engineers.

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, 77.40 ft May 6; minimum, 70.95 ft Nov. 1.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	76.81	76.12	76.53	72.77	70.95	71.48	75.79	74.59	75.25	76.40	75.63	75.98
2	76.74	76.23	76.44	75.90	72.70	74.27	75.79	74.51	75.30	76.85	75.13	75.80
3	76.47	75.27	76.05	76.57	74.92	75.60	76.05	74.96	75.55	76.80	75.65	76.00
4	76.13	75.01	75.47	76.56	75.18	75.65	76.31	74.54	75.23	75.78	74.97	75.38
5	76.54	75.70	76.09	76.50	75.45	76.03	76.48	75.61	75.92	76.10	74.79	75.29
6	76.48	75.91	76.15	76.50	75.41	75.84	76.12	75.02	75.49	76.33	75.47	75.95
7	76.56	75.84	76.05	75.85	74.49	75.00	76.27	74.73	75.44	76.06	75.18	75.77
8	76.29	75.82	76.03	76.01	74.58	75.18	75.97	74.25	75.08	76.19	75.73	75.91
9	76.67	75.38	75.87	76.06	74.68	75.10	76.89	75.20	76.08	76.10	74.89	75.28
10	76.56	75.32	75.84	75.79	74.80	75.28	76.85	76.09	76.42	76.20	75.01	75.66
11	76.28	75.34	75.70	76.13	74.94	75.43	76.71	76.03	76.30	76.18	74.87	75.61
12	76.49	75.84	76.16	76.36	74.82	75.76	76.29	75.14	75.56	76.28	75.07	75.48
13	76.08	75.45	75.78	74.82	74.03	74.46	76.47	75.38	75.96	76.56	74.81	75.52
14	76.18	75.07	75.66	75.55	74.49	75.07	76.62	75.41	75.93	76.62	75.54	76.11
15	76.24	75.20	75.71	75.51	74.35	74.97	76.70	74.79	75.60	75.96	75.41	75.74
16	76.39	75.47	75.84	75.42	74.41	74.83	76.93	75.33	76.30	75.78	74.72	75.19
17	76.48	75.18	75.81	75.84	74.23	74.82	76.85	76.01	76.42	75.70	74.64	75.07
18	76.07	74.95	75.42	76.85	74.84	75.78	76.59	75.48	75.83	75.56	74.34	74.87
19	76.10	75.27	75.77	77.01	76.58	76.81	76.19	75.52	75.75	76.22	75.28	75.78
20	76.16	75.15	75.72	76.86	75.94	76.41	76.13	74.75	75.42	76.28	75.34	75.61
21	76.29	74.55	75.44	76.92	74.85	75.95	76.20	75.35	75.91	75.76	74.62	75.22
22	76.35	75.32	75.83	75.15	73.99	74.66	76.37	75.16	75.69	76.37	74.99	75.45
23	76.33	75.32	75.85	75.01	73.84	74.38	76.36	75.64	76.06	76.35	74.38	75.14
24	76.42	75.29	75.66	75.52	73.65	74.51	76.08	74.67	75.13	74.42	73.16	73.69
25	75.71	75.16	75.53	75.56	74.04	74.86	76.14	74.30	75.27	73.64	72.25	72.65
26	75.89	75.01	75.42	75.61	74.35	75.03	76.10	74.20	74.95	72.64	72.00	72.40
27	75.66	74.51	75.03	75.53	74.65	75.02	75.71	73.63	74.37	72.63	72.27	72.47
28	76.26	74.75	75.52	74.95	73.66	73.99	75.97	75.30	75.66	72.83	72.29	72.60
29	76.04	74.66	75.23	74.96	73.01	73.92	75.66	74.46	75.12	72.82	72.44	72.61
30	76.09	73.80	74.87	75.24	74.05	74.64	75.47	74.31	74.90	72.78	72.41	72.59
31	73.97	71.86	72.66	---	---	---	76.21	74.34	75.20	72.90	72.27	72.59
MONTH	76.81	71.86	75.65	77.01	70.95	75.02	76.93	73.63	75.58	76.85	72.00	74.82

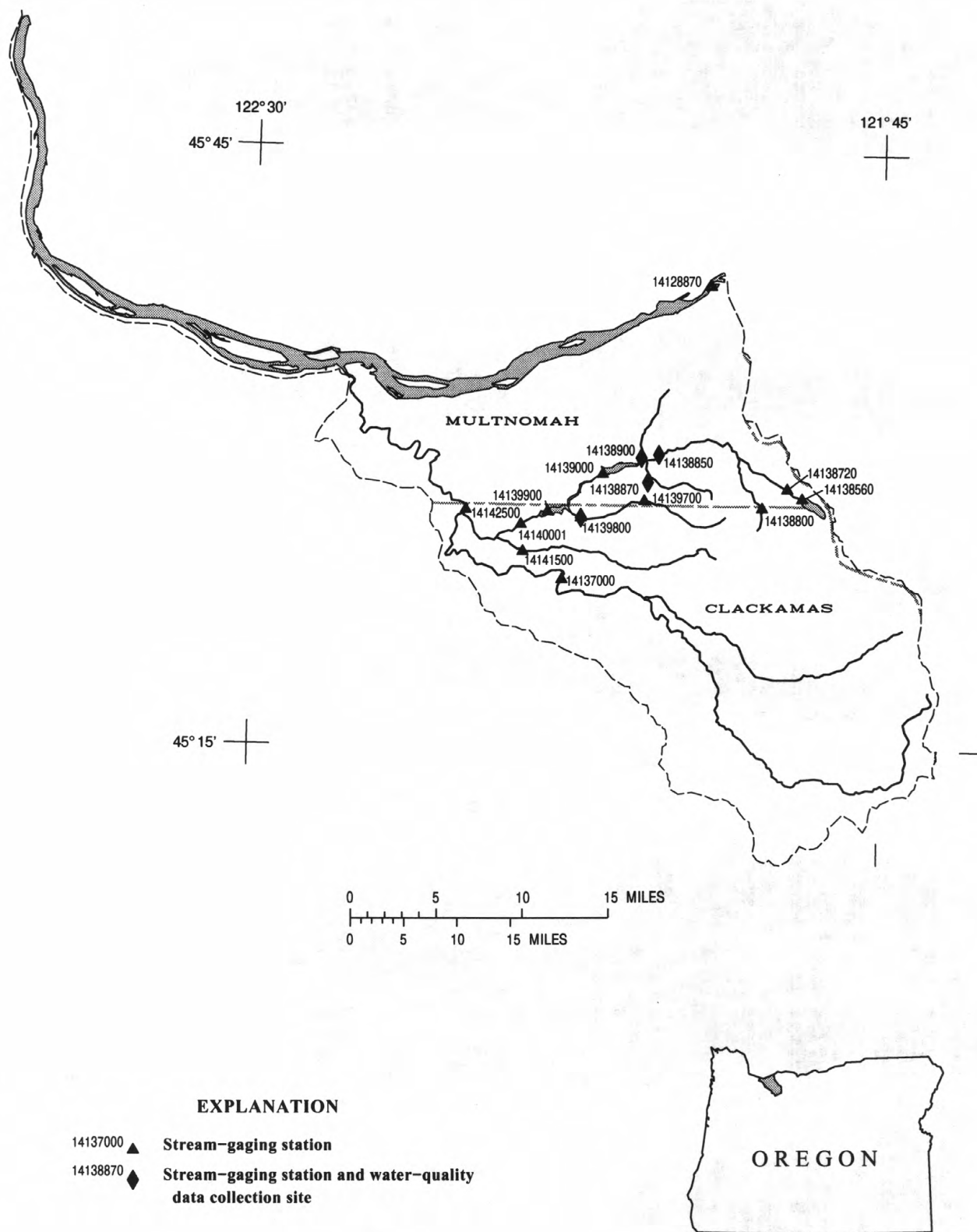
## GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	72.93	72.41	72.68	74.40	73.60	73.98	75.83	74.38	75.14	76.30	76.00	76.14
2	72.88	72.49	72.71	75.90	73.40	74.58	76.62	75.09	75.68	76.80	76.00	76.53
3	73.00	72.57	72.79	76.60	74.80	75.55	76.66	75.02	75.53	76.40	75.50	75.91
4	72.98	72.43	72.70	76.60	75.40	76.14	75.54	74.71	75.05	77.00	76.00	76.54
5	72.97	72.52	72.71	75.60	75.10	75.47	75.74	75.21	75.53	77.20	76.10	76.67
6	74.54	72.68	73.17	75.60	75.10	75.34	75.23	73.82	74.11	77.40	76.50	77.00
7	75.73	74.54	75.19	75.60	75.20	75.37	74.02	72.96	73.41	76.50	75.50	76.13
8	76.50	75.55	75.98	75.60	75.00	75.40	75.30	72.53	73.46	75.50	74.70	75.19
9	76.68	75.85	76.28	75.70	74.10	74.65	76.12	74.48	75.25	76.20	75.60	75.98
10	76.37	75.40	75.83	74.30	73.70	73.90	76.07	74.44	75.25	76.80	75.70	76.08
11	75.91	74.94	75.42	75.50	73.50	74.31	74.54	73.38	73.93	77.00	76.30	76.77
12	75.76	75.03	75.40	76.40	75.40	75.78	74.52	72.99	73.62	77.30	76.10	76.71
13	76.13	75.26	75.55	76.40	75.30	75.92	74.46	72.79	73.37	77.10	76.80	76.95
14	76.31	75.24	75.66	76.30	75.10	75.58	73.87	72.78	73.20	77.00	76.00	76.80
15	75.47	73.40	74.21	76.20	75.20	75.49	76.10	73.76	74.78	76.50	75.60	76.26
16	73.30	72.50	72.82	75.50	74.50	74.78	76.38	75.93	76.12	76.00	75.10	75.68
17	73.20	72.70	72.92	74.90	73.70	73.97	76.42	75.77	76.12	75.66	75.00	75.42
18	73.80	72.50	72.92	74.20	73.70	73.99	76.28	75.41	75.90	75.56	74.47	75.11
19	76.10	73.80	74.87	74.50	73.90	74.22	75.97	74.04	74.92	75.29	73.86	74.52
20	76.60	76.20	76.45	74.30	73.80	73.90	75.91	74.07	75.12	75.33	74.47	74.92
21	77.00	74.80	76.23	74.40	73.70	74.00	76.80	74.10	75.40	75.21	74.77	74.92
22	74.90	73.90	74.39	74.10	73.70	73.89	76.80	76.20	76.41	75.65	74.89	75.18
23	75.10	73.30	74.38	74.30	73.10	73.74	76.90	76.00	76.35	75.77	74.82	75.27
24	76.00	74.50	75.25	74.44	73.10	73.77	76.10	74.10	74.98	75.50	74.92	75.21
25	75.60	75.00	75.32	75.12	73.39	73.90	75.60	74.00	74.69	76.99	75.04	75.89
26	76.00	75.30	75.65	75.84	74.96	75.34	75.40	74.50	75.00	77.07	75.94	76.59
27	76.50	75.90	76.28	75.79	75.08	75.40	75.80	74.60	75.16	76.80	76.10	76.50
28	77.00	74.40	76.12	75.73	74.56	74.95	76.80	75.70	76.29	76.72	75.63	76.22
29	---	---	---	75.58	74.37	74.97	76.80	76.30	76.56	76.56	74.69	75.69
30	---	---	---	75.74	74.51	74.96	76.40	75.90	76.15	74.72	74.27	74.58
31	---	---	---	75.52	74.06	74.77	---	---	---	74.91	73.61	74.26
MONTH	77.00	72.41	74.64	76.60	73.10	74.77	76.90	72.53	75.08	77.40	73.61	75.86

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	75.23	74.77	75.03	76.68	75.25	75.79	75.78	74.42	75.10	76.17	75.73	75.96
2	75.26	74.41	74.77	75.88	75.07	75.36	75.77	74.59	75.17	76.08	75.27	75.72
3	75.68	74.52	75.25	75.93	75.09	75.54	76.33	74.85	75.71	75.35	74.81	75.02
4	75.70	74.62	75.28	75.11	74.31	74.71	76.13	74.19	74.82	74.94	74.27	74.57
5	75.77	74.82	75.18	75.53	74.28	74.79	74.68	73.37	73.83	74.28	73.74	73.98
6	75.17	74.80	74.94	75.96	75.22	75.56	74.79	72.55	73.11	73.97	73.53	73.75
7	75.31	74.62	75.01	75.95	74.27	75.03	74.95	73.96	74.28	74.85	73.72	74.07
8	75.33	74.60	74.98	75.70	74.12	75.04	74.12	73.01	73.52	75.78	74.85	75.13
9	75.48	74.73	75.04	76.34	74.44	75.13	74.20	73.11	73.47	76.22	75.72	75.95
10	76.26	75.24	75.85	76.50	74.64	75.25	73.68	72.27	72.94	76.21	75.88	76.03
11	76.18	75.25	75.68	75.80	74.53	75.14	74.91	72.81	73.80	75.91	74.77	75.34
12	75.61	74.02	74.57	76.00	74.91	75.49	75.85	73.98	74.77	75.32	74.69	74.99
13	75.64	74.32	74.97	75.93	75.00	75.34	76.50	75.06	75.61	75.84	75.31	75.57
14	75.97	75.19	75.70	75.96	74.21	75.14	76.80	75.60	76.08	76.53	75.58	75.89
15	76.03	75.39	75.82	75.86	74.29	75.01	75.81	74.19	74.84	76.62	75.64	76.16
16	76.63	75.20	76.00	76.04	74.64	75.22	75.25	72.94	73.82	75.64	75.33	75.50
17	76.63	75.02	75.51	76.04	75.43	75.65	76.32	74.11	74.89	76.09	75.25	75.77
18	75.58	73.71	74.68	76.07	74.87	75.42	76.40	75.24	75.93	75.96	75.10	75.53
19	75.57	74.34	74.74	76.37	75.72	76.07	75.24	74.03	74.36	76.07	74.84	75.28
20	75.54	74.73	75.13	76.36	75.38	75.81	76.32	73.62	74.69	76.31	75.41	75.85
21	75.76	74.66	75.15	76.59	74.90	75.75	76.06	74.23	75.16	76.38	76.05	76.22
22	75.79	74.37	75.04	76.43	73.51	74.63	74.61	73.36	73.92	76.54	75.74	76.09
23	76.00	74.48	74.97	76.26	75.10	75.49	75.69	73.45	74.23	76.65	75.99	76.36
24	76.06	74.48	75.08	76.18	74.44	75.09	75.58	74.91	75.21	76.33	75.79	76.06
25	76.14	74.25	75.15	76.53	73.74	74.98	76.35	74.89	75.38	76.24	75.39	75.73
26	76.17	75.16	75.55	76.58	74.13	75.21	76.42	75.92	76.18	75.77	75.31	75.54
27	76.05	74.85	75.37	76.55	74.36	75.35	76.57	76.01	76.26	76.12	74.98	75.42
28	76.10	75.09	75.65	76.46	74.46	75.28	76.57	75.23	75.70	76.57	75.68	76.10
29	76.33	74.78	75.35	76.21	74.55	75.20	76.12	75.22	75.45	76.49	76.08	76.30
30	76.68	75.80	76.34	76.40	73.20	74.84	75.85	74.78	75.28	76.17	74.98	75.59
31	---	---	---	76.47	75.41	75.67	76.15	75.42	75.76	---	---	---
MONTH	76.68	73.71	75.26	76.68	73.20	75.29	76.80	72.27	74.82	76.65	73.53	75.52

YEAR	77.40	70.95	75.20
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**Figure 18.** Location of surface-water and water-quality stations in the Columbia River between Bonneville Dam and confluence with the Willamette river and the Sandy River Basin.

## 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 mi<sup>2</sup>, 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, 20.28 ft May 12; minimum, 6.40 ft Sept. 17.

## GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER				NOVEMBER			DECEMBER			JANUARY		
1	13.79	8.16	11.38	11.80	8.82	10.31	13.58	10.59	11.87	11.25	8.39	9.80
2	12.54	8.79	10.22	11.87	8.02	9.83	13.27	10.81	11.71	11.04	8.28	9.86
3	9.70	7.39	8.58	11.62	9.33	10.29	11.43	8.71	10.28	13.05	9.60	11.36
4	10.82	7.67	9.42	12.94	9.79	11.45	10.90	8.56	9.82	12.68	9.12	11.23
5	10.79	8.03	9.55	12.20	9.08	11.12	10.06	8.27	9.31	15.22	10.45	12.99
6	11.22	7.97	9.76	11.10	7.36	9.05	13.48	8.17	11.54	14.73	11.03	13.45
7	13.73	8.48	11.22	9.50	7.20	8.45	12.10	10.24	11.21	13.56	11.37	12.14
8	13.12	9.46	11.59	13.28	7.22	10.18	14.04	9.30	11.88	15.14	10.96	12.87
9	12.01	9.18	9.93	14.35	11.78	12.71	13.97	9.73	12.10	14.02	10.07	11.60
10	10.02	7.87	8.31	12.70	8.73	10.83	12.53	9.50	11.26	14.50	9.21	11.90
11	9.56	7.48	8.38	10.27	7.96	9.05	13.12	9.61	11.35	14.25	11.33	12.42
12	11.69	7.78	9.59	10.41	7.54	9.29	11.63	10.00	10.78	13.81	10.62	12.43
13	10.88	8.19	9.41	9.93	7.82	8.71	15.10	9.40	12.55	13.75	11.31	12.42
14	---	7.94	---	9.54	7.36	8.36	14.42	10.37	12.94	14.80	9.32	12.48
15	11.98	---	---	11.81	8.11	10.62	13.36	10.08	12.28	13.17	10.34	12.14
16	10.37	8.50	9.53	11.99	8.41	10.64	13.60	9.74	12.08	12.55	9.25	10.56
17	9.86	7.90	8.61	10.81	8.69	9.84	14.05	9.60	12.78	13.74	9.02	11.66
18	10.99	8.02	9.87	11.63	8.13	9.96	13.94	10.88	12.46	15.09	12.40	13.92
19	13.02	9.35	11.47	12.32	7.87	10.57	12.68	8.60	10.32	13.89	11.87	12.87
20	12.71	10.54	11.07	10.73	7.52	9.14	13.79	9.13	12.15	13.41	12.93	13.19
21	11.18	8.92	9.90	9.72	7.49	8.59	13.52	9.02	12.05	13.46	10.31	12.19
22	10.07	8.12	---	13.14	8.37	11.02	13.20	10.54	12.36	11.70	9.89	10.91
23	10.74	7.69	8.97	14.38	10.26	12.81	13.49	9.74	11.92	11.28	8.51	10.02
24	9.00	7.19	8.10	16.06	11.37	14.42	11.66	---	---	15.26	9.04	11.97
25	12.09	7.09	9.76	16.01	11.06	12.56	11.78	7.78	9.70	14.50	10.91	13.00
26	12.60	8.13	10.38	13.15	10.88	12.17	11.31	8.18	9.48	15.32	9.69	12.88
27	12.50	8.93	10.18	11.33	8.94	10.08	11.95	7.59	10.22	15.18	11.65	13.53
28	11.91	8.08	9.90	9.76	8.58	9.06	13.51	8.86	11.49	14.64	11.18	13.52
29	12.29	9.22	10.59	12.88	9.06	11.13	---	---	---	15.17	11.24	13.54
30	12.95	8.71	11.09	12.82	10.08	11.56	---	---	---	13.99	10.37	12.30
31	13.61	8.63	10.83	---	---	---	11.41	---	---	15.56	9.15	13.08
MONTH	---	---	---	16.06	7.20	10.46	---	---	---	15.56	8.28	12.20

## COLUMBIA RIVER MAIN STEM

14128870 COLUMBIA RIVER BELOW BONNEVILLE DAM, OR--Continued

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY				MARCH			APRIL			MAY		
1	15.73	12.10	14.41	14.15	11.26	12.82	14.01	12.05	13.28	18.38	17.34	17.75
2	16.27	12.26	14.88	14.78	10.64	12.85	12.83	10.57	11.73	18.86	17.37	17.89
3	16.39	11.99	14.73	15.09	12.27	13.75	12.21	9.80	10.55	18.17	17.07	17.49
4	15.40	12.10	13.98	14.99	10.87	13.44	13.83	10.42	13.07	18.50	16.42	17.29
5	15.64	11.68	13.99	14.47	11.10	13.00	16.36	12.79	15.17	19.56	16.91	17.91
6	15.13	10.80	13.18	14.02	10.28	11.02	16.17	13.44	14.94	19.89	17.56	18.71
7	14.59	10.35	13.16	14.55	10.24	12.49	15.54	12.70	14.58	19.97	17.68	18.47
8	15.72	11.36	13.75	15.18	12.96	14.00	14.67	11.85	13.56	18.87	16.45	17.56
9	16.52	13.87	15.35	14.85	12.51	14.00	13.76	11.96	13.05	18.57	16.51	17.20
10	15.50	13.25	14.55	13.39	11.66	12.59	13.14	11.39	12.52	19.91	16.75	17.61
11	15.14	12.40	13.24	13.09	9.59	11.19	14.94	12.87	14.09	20.13	16.72	18.42
12	16.11	11.72	13.74	12.31	9.86	11.33	14.81	12.69	13.61	20.28	17.54	18.83
13	15.00	10.16	11.90	11.39	9.33	10.39	16.04	13.11	14.82	19.48	17.71	18.31
14	15.18	11.85	13.68	14.07	8.60	11.95	14.69	12.60	13.97	20.21	17.68	18.34
15	14.91	13.33	14.17	14.73	10.04	12.46	13.44	11.07	12.44	18.73	16.36	16.87
16	14.47	11.68	12.97	14.19	10.17	12.78	12.99	10.73	12.24	18.60	15.67	16.74
17	14.18	10.68	12.40	14.90	12.13	13.77	12.39	9.62	10.40	18.65	17.09	17.88
18	14.75	10.96	12.90	16.79	11.00	14.58	13.49	9.63	11.83	19.50	15.68	17.30
19	12.29	10.19	11.38	16.13	12.67	14.83	14.32	11.50	13.68	18.17	16.95	17.48
20	11.36	9.30	10.39	15.12	12.30	14.30	15.34	13.62	14.68	18.48	16.91	17.33
21	15.54	9.00	12.71	15.46	12.01	14.14	15.42	14.22	14.67	17.21	16.41	16.76
22	15.03	11.59	13.82	15.51	13.28	14.77	16.59	13.90	15.54	16.84	15.74	16.25
23	15.26	11.22	13.12	14.73	12.81	13.89	16.69	15.34	16.04	18.48	16.74	17.35
24	16.11	14.01	15.01	15.34	14.64	14.90	16.00	14.72	15.22	18.79	17.05	18.07
25	16.71	14.08	15.09	14.72	11.74	13.07	15.72	14.64	15.11	18.59	16.83	17.47
26	15.45	12.83	14.24	11.80	10.55	11.00	16.23	14.07	15.56	19.02	17.10	18.43
27	14.76	11.83	12.40	11.35	9.94	10.65	16.23	15.25	15.90	19.18	18.72	18.92
28	15.63	10.51	13.53	12.67	9.57	11.30	17.12	16.19	16.64	18.88	17.58	17.97
29	---	---	---	15.33	9.67	12.71	17.23	16.44	16.78	18.18	16.23	17.52
30	---	---	---	15.22	11.70	13.30	18.29	16.99	17.49	17.25	15.97	16.67
31	---	---	---	14.12	12.33	13.31	---	---	---	17.96	15.04	17.22
MONTH	16.71	9.00	13.52	16.79	8.60	12.92	18.29	9.62	14.11	20.28	15.04	17.68

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE				JULY			AUGUST			SEPTEMBER		
1	18.28	17.11	17.57	16.53	14.52	15.38	10.92	9.08	9.80	8.03	6.65	7.36
2	18.01	16.12	17.19	14.76	12.72	13.79	10.39	8.48	9.39	8.09	6.68	7.28
3	18.22	15.45	16.95	13.26	11.99	12.72	10.79	7.80	9.37	8.32	6.78	7.50
4	18.18	16.47	17.16	12.56	11.37	11.93	11.60	9.51	10.86	8.69	6.71	7.51
5	17.96	16.13	16.81	13.99	11.33	12.64	11.79	9.71	10.94	8.22	6.69	7.37
6	18.19	16.71	17.10	16.11	13.30	14.95	11.45	8.56	9.81	8.33	6.64	7.49
7	18.06	16.55	17.36	15.20	14.05	14.43	9.42	7.55	8.56	8.68	6.84	7.67
8	19.24	16.65	18.06	14.87	13.91	14.49	10.32	8.62	9.60	8.79	6.89	7.75
9	19.37	16.21	17.98	15.80	14.36	15.09	11.23	9.59	10.62	8.77	6.87	7.71
10	19.27	15.31	17.32	14.99	12.74	13.68	10.61	8.01	9.21	8.78	6.91	7.67
11	18.52	16.60	17.51	15.64	12.74	14.45	10.00	7.20	8.27	8.75	7.00	7.65
12	17.16	15.30	16.24	16.46	13.71	14.95	9.90	7.43	8.59	8.54	6.89	7.50
13	18.16	16.06	16.97	15.71	14.37	14.72	10.04	8.26	9.02	8.41	6.49	7.25
14	19.70	16.04	17.86	14.94	13.66	14.20	10.66	6.79	8.92	8.05	6.52	7.13
15	19.79	17.75	18.96	15.34	13.57	14.22	10.79	8.41	9.84	8.00	6.47	7.21
16	17.92	16.65	17.17	14.20	13.00	13.39	10.81	9.38	10.30	8.05	6.41	7.08
17	17.97	16.45	17.29	13.63	11.45	12.53	9.83	9.12	9.44	8.37	6.40	7.66
18	17.21	16.32	16.75	14.15	11.42	13.11	10.63	8.96	9.81	8.59	6.97	7.66
19	17.05	14.77	15.82	15.27	12.81	14.18	10.69	9.16	10.04	8.42	6.84	7.61
20	16.70	12.70	15.07	15.25	12.73	14.26	10.41	7.04	8.85	8.65	6.99	7.91
21	17.16	15.42	16.38	14.67	13.48	14.04	9.54	6.85	8.53	9.08	6.86	7.95
22	17.69	15.91	16.85	15.02	13.04	14.29	9.51	6.47	8.21	9.99	7.50	8.43
23	17.16	14.94	16.24	14.67	13.55	14.10	9.48	6.89	8.05	10.22	7.20	8.88
24	17.20	15.15	16.18	14.03	11.92	12.60	8.32	6.97	7.54	9.98	7.14	8.28
25	16.46	15.69	16.12	14.46	11.86	13.39	8.11	6.60	7.28	8.50	6.58	7.29
26	15.69	13.80	14.50	14.85	13.22	14.07	8.52	7.18	7.90	7.98	6.62	7.11
27	16.33	14.22	15.13	14.18	12.69	13.31	11.16	7.14	9.17	8.83	7.03	7.87
28	16.11	13.81	14.85	13.52	12.28	12.95	11.01	7.07	8.05	9.39	7.21	8.32
29	14.10	13.33	13.74	13.56	10.89	12.48	9.34	8.31	8.83	9.04	7.30	8.02
30	16.75	12.68	14.51	13.66	11.06	12.76	9.21	7.24	8.27	9.99	7.06	8.65
31	---	---	---	11.51	9.71	10.69	8.76	7.21	7.94	---	---	---
MONTH	19.79	12.68	16.59	16.53	9.71	13.67	11.79	6.47	9.06	10.22	6.40	7.69

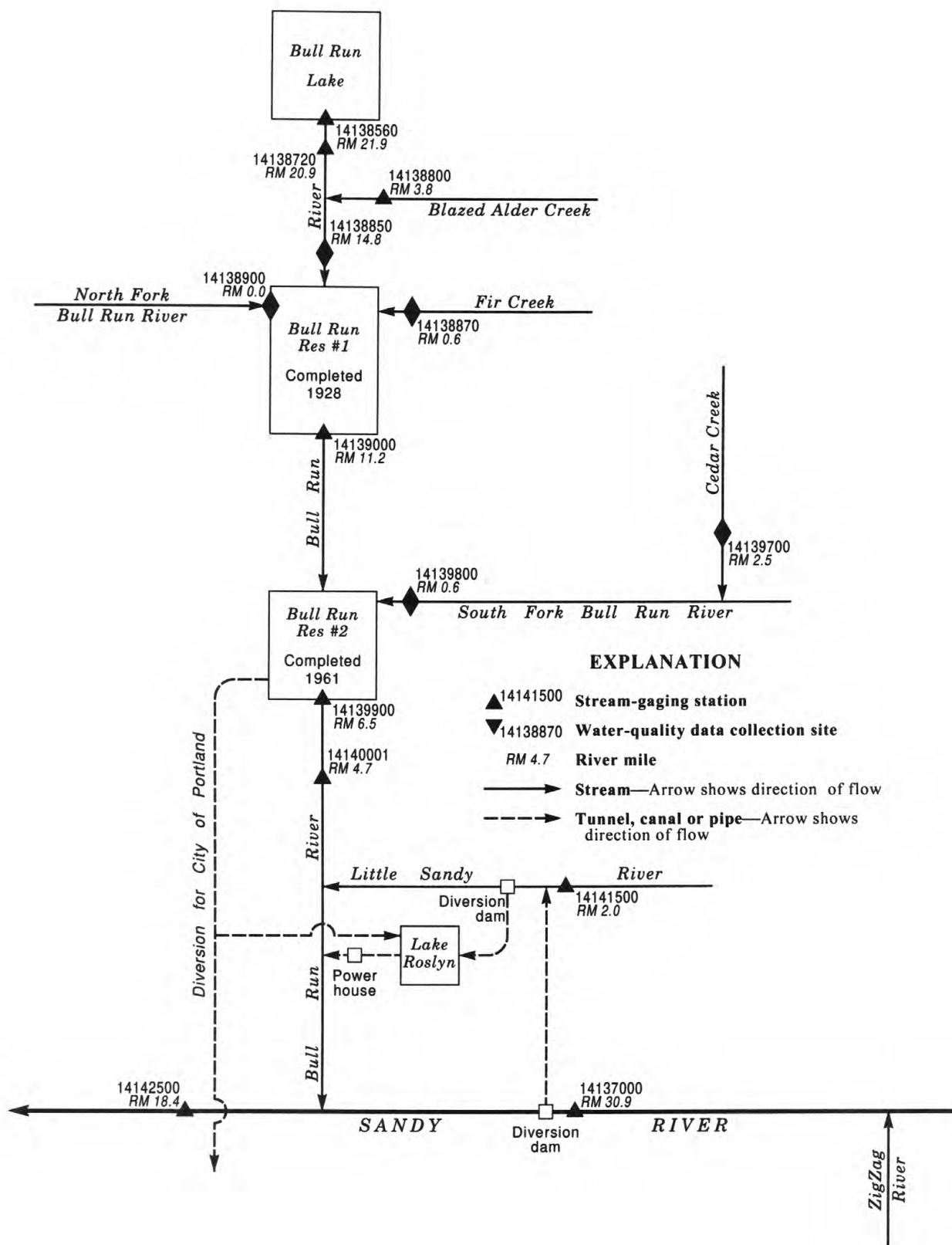


Figure 19. Schematic diagram showing gaging stations and diversions in the Sandy River Basin.

## SANDY RIVER BASIN

14137000 SANDY RIVER NEAR MARMOT, OR

LOCATION.--Lat 45°23'30", long 122°07'40", in SE 1/4 sec.13, T.2 S., R.5 E., Clackamas County, Hydrologic Unit 17080001, on right bank 0.7 mi southwest of Marmot, 0.8 mi upstream from Sandy River Dam of Portland General Electric Co., 6.6 mi downstream from Salmon River, and at mile 30.9.

DRAINAGE AREA.--262 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1911 to current year. Monthly discharges only, January to September 1916, October 1918 to June 1919, published in WSP 1318. Published as "at Marmot" October 1912 to September 1913. Records for January 1916 to June 1919, published as "below dam, near Marmot," obtained by combining records for Sandy River below dam, near Marmot, with records for Sandy River Canal near Marmot.

REVISED RECORDS.--WSP 594: Drainage area. WSP 1288: 1912(M), 1915, 1922, 1924, 1934(M). WSP 1318: 1932(M).

GAGE.--Water-stage recorder. Elevation of gage is 730 ft above sea level, from river-profile map. Aug. 15, 1911, to Dec. 20, 1915, and July 2, 1919, to Oct. 19, 1933, nonrecording gage at site 1.0 mi upstream at different datum. Oct. 20, 1933, to Sept. 30, 1958, water-stage recorder at site 0.6 mi upstream at different datum.

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

AVERAGE DISCHARGE.--83 years, 1,346 ft<sup>3</sup>/s, 69.77 in/yr, 975,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 61,400 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 17.05 ft, from rating curve extended above 7,000 ft<sup>3</sup>/s; maximum gage height, 17.10 ft, Feb. 23, 1986; minimum, 195 ft<sup>3</sup>/s Nov. 27, 28, 1952.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 7,700 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 2	2330	*7,790	*11.40	No other peak greater than base discharge.			
Minimum discharge, 210 ft <sup>3</sup> /s Sept. 26, 27.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	309	285	3550	2150	648	2830	1750	1010	730	568	324	254
2	311	273	2590	3300	629	2900	1580	955	670	689	331	251
3	310	476	1690	6160	610	2980	1500	932	652	571	346	319
4	309	376	1930	4720	589	2880	1430	1160	657	537	343	314
5	306	310	1390	5260	564	2310	1290	1140	677	562	334	263
6	309	292	1030	3970	564	1840	1630	1070	825	539	309	256
7	422	284	1040	2600	553	1530	1930	1070	1180	526	310	251
8	362	277	1780	2320	509	1340	2210	1060	1110	528	307	252
9	313	274	2250	2950	578	1200	2120	1010	920	510	291	267
10	302	271	2230	3160	547	1180	2250	946	817	477	293	254
11	298	269	2200	3880	535	1140	1990	927	766	457	299	242
12	317	266	1700	3280	512	1060	1900	894	729	446	302	236
13	322	266	1340	3190	559	1050	1710	818	906	443	303	230
14	327	264	1140	2590	588	1090	1560	771	1650	439	311	228
15	382	269	985	2170	580	1110	1420	755	1760	431	303	233
16	384	291	868	1820	609	1130	1410	770	1370	435	282	233
17	330	299	778	1550	678	1130	1460	760	1150	436	276	233
18	311	321	712	1370	790	1420	1520	722	1160	423	277	236
19	301	303	661	1230	742	1330	1630	772	996	419	272	232
20	293	288	621	1120	711	1210	1490	948	911	405	272	231
21	287	319	590	1050	700	1480	1440	813	857	416	270	230
22	285	429	554	1060	686	1270	1300	745	819	423	279	224
23	283	333	530	1080	2540	1140	1210	708	796	421	285	225
24	309	e290	514	1030	6300	1040	1420	699	725	416	276	224
25	288	e340	501	943	3920	995	1250	706	683	396	261	224
26	279	451	488	872	2670	964	1150	687	684	372	262	218
27	275	357	471	817	2560	1040	1060	637	637	351	263	220
28	276	344	455	774	2790	1130	1020	623	627	339	264	222
29	282	372	442	735	---	1200	997	756	607	336	259	258
30	278	622	454	703	---	1280	1100	736	588	334	254	249
31	285	---	739	671	---	1740	---	666	---	324	255	---
TOTAL	9645	9811	36223	68525	34261	45939	45727	26266	26659	13969	9013	7309
MEAN	311	327	1168	2210	1224	1482	1524	847	889	451	291	244
MAX	422	622	3550	6160	6300	2980	2250	1160	1760	689	346	319
MIN	275	264	442	671	509	964	997	623	588	324	254	218
AC-FT	19130	19460	71850	135900	67960	91120	90700	52100	52880	27710	17880	14500
CFSM	1.19	1.25	4.46	8.44	4.67	5.66	5.82	3.23	3.39	1.72	1.11	.93
IN.	1.37	1.39	5.14	9.73	4.86	6.52	6.49	3.73	3.79	1.98	1.28	1.04

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1912 - 1994, BY WATER YEAR (WY)

	MEAN	640	1562	2043	2000	1832	1649	1891	1810	1229	644	429	417
MAX	2168	3699	6278	4752	4686	3983	3134	3443	3457	1385	663	1056	
(WY)	1960	1956	1965	1953	1961	1972	1962	1949	1917	1917	1974	1959	
MIN	239	236	445	498	464	631	658	743	420	354	268	244	
(WY)	1988	1937	1977	1937	1977	1941	1941	1992	1992	1992	1940	1994	

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1912 - 1994

	ANNUAL TOTAL	383007		333347		1341	
ANNUAL MEAN		1049		913		1933	1974
HIGHEST ANNUAL MEAN						766	1977
LOWEST ANNUAL MEAN						41400	Dec 22 1964
HIGHEST DAILY MEAN		5500	Mar 23	6300	Feb 24	207	Nov 28 1952
LOWEST DAILY MEAN		264	Nov 14	218	Sep 26	212	Oct 13 1931
ANNUAL SEVEN-DAY MINIMUM		268	Nov 9	222	Sep 22		
ANNUAL RUNOFF (AC-FT)		759700		661200		971500	
ANNUAL RUNOFF (CFSM)		4.01		3.49		5.12	
ANNUAL RUNOFF (INCHES)		54.38		47.33		69.54	
10 PERCENT EXCEEDS		2240		1930		2600	
50 PERCENT EXCEEDS		736		637		987	
90 PERCENT EXCEEDS		306		266		350	

e Estimated



## SANDY RIVER BASIN

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14138560 BULL RUN LAKE NEAR BRIGHTWOOD, OR

LOCATION.--Lat 45°27'39", long 121°50'34", in SE 1/4 SE 1/4 sec.20, T.1 S., R.8 E., Multnomah County, Hydrologic Unit 17080001, in Mount Hood National Forest, in main cabin on northwest side of Bull Run Lake, near outlet structure, 10.7 mi northeast of Brightwood, and at mile 21.9.

DRAINAGE AREA.--3.5 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1992 to current year.

GAGE.--Water-stage recorder. Datum of gage is 3,147.2 ft above sea level, Portland Water Bureau datum.

REMARKS.--Bull Run Lake was formed by natural processes, including a large landslide. A temporary log crib dam was constructed in 1917 to increase the capacity of the lake. In 1920 the log crib dam was reconstructed. A concrete dam and improved outlet valve were constructed in 1958. A lower outlet and tunnel was constructed in 1961. Portland Water Bureau releases water from the lake to augment streamflows during periods of low flow.

COOPERATION.--Capacity table provided by Portland Water Bureau.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 40,480 acre-ft May 8-10, 1994, elevation, 3,166.99 ft; minimum contents observed, 31,080 acre-ft Oct. 29, 1992, elevation, 3,143.97 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 40,480 acre-ft May 8-10, elevation, 3,166.99 ft; minimum contents observed, 35,790 acre-ft Nov. 29, elevation, 3,155.73 ft, but may have been lower during period of missing record in November.

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

2,905	0	3,100	17,280
2,940	228	3,140	29,510
2,980	1,270	3,150	33,550
3,020	3,740	3,160	37,530
3,060	8,880	3,180	46,230

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3159.14	3157.17	3156.78	3158.75	3162.74	---	---	3166.70	3166.25	3165.80	3163.21	3160.59
2	3159.05	3157.11	3156.93	3159.55	3162.69	---	---	3166.68	3166.19	3165.73	3163.12	3160.50
3	3158.98	---	3157.12	3160.15	3162.63	---	---	3166.71	3166.13	3165.67	3163.03	3160.56
4	3158.91	---	3157.33	3160.81	3162.57	---	---	3166.84	3166.12	3165.59	3162.95	3160.49
5	3158.83	---	3157.36	3161.23	3162.51	---	---	3166.90	3166.10	3165.55	3162.85	3160.41
6	3158.81	---	3157.38	3161.34	3162.45	---	---	3166.93	3166.18	3165.49	3162.76	3160.33
7	3158.78	---	3157.51	3161.43	3162.39	---	---	3166.97	3166.23	3165.42	3162.67	3160.25
8	3158.61	---	3157.70	3161.56	3162.32	---	---	3166.98	3166.22	3165.34	3162.58	3160.20
9	3158.61	---	3157.98	3161.90	3162.38	---	---	3166.98	3166.18	3165.26	3162.51	3160.15
10	3158.53	---	3158.28	3162.13	3162.33	---	---	3166.97	3166.14	3165.17	3162.42	3160.07
11	3158.46	---	3158.52	3162.44	3162.29	---	---	3166.94	3166.09	3165.09	3162.34	3160.00
12	3158.41	---	3158.60	3162.67	3162.21	---	---	3166.93	3166.05	3165.00	3162.26	3159.92
13	3158.34	---	3158.64	3162.83	3162.26	---	---	3166.87	3166.13	3164.92	3162.17	3159.84
14	3158.34	---	3158.66	3162.94	3162.20	---	---	3166.82	3166.33	3164.83	3162.08	3159.76
15	3158.33	---	3158.66	3163.04	3162.18	---	3165.94	3166.80	3166.38	3164.75	3161.99	3159.69
16	3158.29	---	3158.66	3163.07	3162.11	---	3166.00	3166.78	3166.38	3164.67	3161.91	3159.61
17	3158.22	---	3158.62	3163.09	3162.13	---	3166.11	3166.73	3166.41	3164.58	3161.82	3159.53
18	3158.14	---	3158.58	3163.09	3162.15	---	3166.25	3166.73	3166.42	3164.49	3161.74	3159.46
19	3158.07	---	3158.55	3163.09	3162.12	---	3166.38	3166.72	3166.38	3164.39	3161.65	3159.38
20	3157.99	---	3158.51	3163.07	3162.07	---	3166.45	3166.71	3166.34	3164.31	3161.56	3159.31
21	3157.92	---	3158.46	3163.05	3162.07	---	3166.55	3166.68	3166.30	3164.22	3161.48	3159.19
22	3157.85	---	3158.43	3163.05	3162.10	---	3166.58	3166.64	3166.25	3164.14	3161.43	3159.12
23	3157.82	---	3158.37	3163.08	3162.44	---	3166.61	3166.59	3166.20	3164.05	3161.35	3159.05
24	3157.75	---	3158.33	3163.09	3162.76	---	---	3166.54	3166.14	3163.95	3161.27	3158.97
25	3157.70	---	3158.29	3163.06	3162.70	---	3166.70	3166.48	3166.08	3163.86	3161.18	3158.90
26	3157.59	---	3158.24	3163.03	3162.66	---	3166.69	3166.40	3166.08	3163.77	3161.09	3158.82
27	3157.52	---	3158.19	3162.96	3162.71	---	3166.68	3166.34	3166.02	3163.68	3161.01	3158.75
28	3157.45	---	3158.15	3162.95	3162.78	---	3166.67	3166.28	3165.96	3163.58	3160.93	3158.68
29	3157.38	3155.75	3158.08	3162.90	---	---	3166.67	3166.38	3165.88	3163.49	3160.84	3158.64
30	3157.30	3155.93	3158.15	3162.86	---	---	3166.71	3166.34	3165.81	3163.39	3160.75	3158.57
31	3157.25	---	3158.32	3162.80	---	---	---	3166.30	---	3163.30	3160.67	---
MAX	3159.14	---	3158.66	3163.09	3162.78	---	---	3166.98	3166.42	3165.80	3163.21	3160.59
MIN	3157.25	---	3156.78	3158.75	3162.07	---	---	3166.28	3165.81	3163.30	3160.67	3158.57
(†)	36410	35870	36840	38700	38690	39330	40360	40180	39970	38910	37810	36940
(‡)	-790	-540	+970	+1860	-10	+640	+1030	-180	-210	-1060	-1100	-870

CAL YR 1993 AC-FT† +3000  
WTR YR 1994 AC-FT† -260

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

## SANDY RIVER BASIN

14138720 BULL RUN RIVER AT LOWER FLUME, NEAR BRIGHTWOOD, OR

LOCATION.--Lat 45°28'14", long 121°51'55", in SE 1/4 NE 1/4 sec.19, T.1 S., R.8 E., Multnomah County, Hydrologic Unit 17080001, at flume, 1.0 mi downstream from outlet structure at Bull Run Lake, 10.4 mi northeast of Brightwood, and at mile 20.9.

DRAINAGE AREA.--Not determined.

PERIOD OF RECORD.--October 1992 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,840 ft above sea level, from topographic map.

REMARKS.--No estimated daily discharges. Records good. Regulation at times by Bull Run Lake.

AVERAGE DISCHARGE.--2 years, 18.1 ft<sup>3</sup>/s, 13,080 acre-ft/yr.EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 49 ft<sup>3</sup>/s Mar. 23, 1993, gage height, 1.95 ft; minimum discharge, 8.2 ft<sup>3</sup>/s Oct. 28, 1992.EXTREMES FOR CURRENT YEAR.--Maximum discharge, 29 ft<sup>3</sup>/s several days in January, maximum gage height, 1.39 ft Jan. 12, 13; minimum discharge, 11 ft<sup>3</sup>/s many days in November and September.DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	12	19	17	21	20	24	24	19	18	15	12
2	12	12	18	21	20	21	24	23	19	18	15	12
3	12	12	16	27	20	23	24	23	18	18	14	12
4	12	12	16	27	20	23	24	23	18	17	14	12
5	12	12	15	29	19	23	23	23	18	17	14	12
6	12	12	15	28	19	22	24	23	18	17	14	12
7	12	12	15	26	19	21	24	23	19	17	14	12
8	12	12	16	26	18	21	25	23	19	17	14	12
9	12	12	18	27	18	20	27	23	19	17	14	12
10	12	12	20	28	18	20	27	23	18	17	14	12
11	12	12	20	29	17	20	27	22	18	17	14	12
12	12	12	20	29	17	20	27	22	18	17	14	12
13	12	12	19	29	17	20	27	22	18	17	14	12
14	12	12	18	29	17	20	26	22	19	16	13	12
15	12	12	18	28	17	21	26	21	19	16	13	12
16	13	12	17	28	17	21	26	21	19	16	13	12
17	12	12	17	27	17	21	25	21	19	16	13	12
18	12	12	17	27	17	23	25	21	19	16	13	12
19	12	12	16	26	16	23	26	20	19	16	13	11
20	12	12	16	26	16	23	26	20	19	16	13	11
21	12	12	16	25	16	23	26	20	19	16	13	11
22	12	12	16	25	16	22	26	20	19	16	13	11
23	12	12	16	24	17	22	25	20	19	15	13	11
24	12	12	16	24	20	22	25	20	18	15	13	11
25	12	12	16	23	18	21	25	19	18	15	13	11
26	12	12	16	23	18	21	25	19	19	15	13	11
27	12	11	15	22	18	21	25	19	18	15	13	11
28	12	11	15	22	19	22	24	19	18	15	13	11
29	12	11	15	22	---	22	24	19	18	15	13	11
30	12	11	15	21	---	22	24	19	18	15	12	11
31	12	---	15	21	---	23	---	19	---	15	12	---
TOTAL	373	356	517	786	502	667	756	656	556	503	416	348
MEAN	12.0	11.9	16.7	25.4	17.9	21.5	25.2	21.2	18.5	16.2	13.4	11.6
MAX	13	12	20	29	21	23	27	24	19	18	15	12
MIN	12	11	15	17	16	20	23	19	18	15	12	11
AC-FT	740	706	1030	1560	996	1320	1500	1300	1100	998	825	690

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1993 - 1994, BY WATER YEAR (WY)

	1993	1994	1993	1994	1993	1994	1993	1994	1993	1994	1993	1994
MEAN	11.3	12.9	16.5	20.3	16.8	25.4	26.4	23.8	19.8	16.8	14.3	12.3
MAX	12.0	13.9	16.7	25.4	17.9	29.3	27.6	26.4	21.1	17.3	15.1	13.0
(WY)	1994	1993	1994	1994	1994	1993	1993	1993	1993	1993	1993	1993
MIN	10.5	11.9	16.4	15.3	15.6	21.5	25.2	21.2	18.5	16.2	13.4	11.6
(WY)	1993	1994	1993	1993	1993	1994	1994	1994	1994	1994	1994	1994

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1993 - 1994

ANNUAL TOTAL	6740	6436	18.1	
ANNUAL MEAN	18.5	17.6	18.5	1993
HIGHEST ANNUAL MEAN			17.6	1994
LOWEST ANNUAL MEAN			48	Mar 23 1993
HIGHEST DAILY MEAN	48	Mar 23	8.4	Oct 27 1992
LOWEST DAILY MEAN	11	Nov 27	8.6	Oct 22 1992
ANNUAL SEVEN-DAY MINIMUM	11	Nov 24		
ANNUAL RUNOFF (AC-FT)	13370	12770	13080	
10 PERCENT EXCEEDS	28	25	26	
50 PERCENT EXCEEDS	16	17	17	
90 PERCENT EXCEEDS	12	12	12	

## 14138800 BLAZED ALDER CREEK NEAR RHODODENDRON, OR

LOCATION.--Lat 45°27'10", long 121°53'25", in NW 1/4 SE 1/4 sec.25, T.1 S., R.7 E., Clackamas County, Hydrologic Unit 17080001, in Mount Hood National Forest, on right bank 600 ft downstream from the confluence of Bedrock and Hickman Creeks and 8.6 mi north of Rhododendron, and at mile 3.78.

DRAINAGE AREA.--8.17 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1963 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,540 ft above sea level, from topographic map.

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

AVERAGE DISCHARGE.--31 years, 56.9 ft<sup>3</sup>/s, 94.68 in/yr, 41,250 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,610 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 8.25 ft, from rating curve extended above 330 ft<sup>3</sup>/s, on basis of slope-area measurement of peak flow; minimum discharge, 1.2 ft<sup>3</sup>/s Oct. 16, 1991.

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

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 1	1430	711	4.11	Jan. 2	1900	*739	*4.19

Minimum discharge, 2.5 ft<sup>3</sup>/s Oct. 1-6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.5	3.2	474	316	15	134	100	29	20	12	4.2	2.9
2	2.5	2.9	208	406	14	175	73	27	18	17	4.1	2.9
3	2.5	12	143	393	14	188	68	26	16	13	4.0	9.5
4	2.5	5.9	150	319	13	162	62	56	19	11	4.0	5.4
5	2.5	4.2	83	282	27	112	49	45	19	12	4.0	3.7
6	2.9	3.9	53	146	12	72	90	39	29	11	3.9	3.3
7	7.7	3.5	110	89	13	51	109	35	63	10	3.8	3.2
8	3.9	3.5	183	104	25	40	185	31	53	9.5	4.0	3.4
9	3.2	3.5	213	209	30	35	147	28	38	8.8	3.8	3.9
10	2.9	3.1	205	179	19	46	131	25	30	8.0	3.7	4.0
11	2.9	3.1	157	287	12	47	96	23	25	7.5	3.5	3.5
12	2.9	3.1	108	e180	11	41	99	21	22	7.2	3.5	3.3
13	2.9	2.9	71	e150	12	42	81	19	39	7.0	3.5	3.1
14	3.9	2.9	55	102	12	50	63	18	125	6.6	3.5	3.1
15	8.9	3.6	44	77	15	56	52	17	125	6.6	3.5	3.1
16	8.4	4.3	36	58	16	63	56	19	74	6.2	3.3	3.0
17	5.4	5.1	31	45	19	84	65	17	50	6.2	3.3	2.9
18	4.0	6.1	27	38	20	131	66	17	45	5.8	3.3	2.9
19	3.6	5.3	24	33	17	88	63	18	34	5.8	3.3	2.9
20	3.5	4.1	22	28	16	63	51	21	28	5.6	3.3	2.9
21	3.5	14	20	26	16	63	48	21	23	5.4	3.3	2.7
22	3.2	14	19	27	16	44	40	18	21	5.3	4.1	2.7
23	3.2	13	18	32	183	37	36	16	19	5.0	3.5	2.7
24	4.6	23	17	29	237	33	41	15	17	5.0	3.3	2.7
25	3.5	20	16	26	126	30	35	14	15	5.0	3.2	2.7
26	3.5	34	16	23	106	30	31	13	22	4.6	3.1	2.7
27	3.1	34	15	20	122	34	28	13	16	4.6	3.0	2.7
28	3.1	30	14	19	144	50	27	13	14	4.6	2.9	2.7
29	2.9	31	14	17	---	70	27	29	13	4.5	2.9	3.5
30	2.9	76	24	17	---	79	36	24	12	4.5	2.9	3.4
31	3.3	---	86	16	---	119	---	19	---	4.2	2.9	---
TOTAL	116.3	375.2	2656	3693	1282	2269	2055	726	1044	229.5	108.6	101.4
MEAN	3.75	12.5	85.7	119	45.8	73.2	68.5	23.4	34.8	7.40	3.50	3.38
MAX	8.9	76	474	406	237	188	185	56	125	17	4.2	9.5
MIN	2.5	2.9	14	16	11	30	27	13	12	4.2	2.9	2.7
AC-FT	231	744	5270	7330	2540	4500	4080	1440	2070	455	215	201
CFSM	.46	1.53	10.5	14.6	5.60	8.96	8.38	2.87	4.26	.91	.43	.41
IN.	.53	1.71	12.09	16.82	5.84	10.33	9.36	3.31	4.75	1.04	.49	.46

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1964 - 1994, BY WATER YEAR (WY)

	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	1994
MEAN	27.2	85.0	102	104	79.2	67.5	78.4	73.5	39.9	11.0	5.77	11.4																			
MAX	82.5	177	288	207	183	167	150	165	115	35.4	27.6	35.5																			
(WY)	1968	1978	1965	1974	1982	1972	1990	1969	1964	1983	1968	1977																			
MIN	1.57	12.5	22.6	19.2	17.5	17.7	33.1	18.1	4.74	3.95	2.37	1.67																			
(WY)	1988	1994	1977	1985	1969	1992	1983	1992	1992	1992	1967	1991																			

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1964 - 1994
ANNUAL TOTAL	17246.7	14656.0	
ANNUAL MEAN	47.3	40.2	56.9
HIGHEST ANNUAL MEAN			88.1
LOWEST ANNUAL MEAN			33.5
HIGHEST DAILY MEAN	525	Mar 23	474
LOWEST DAILY MEAN	2.5	Sep 22	2.5
ANNUAL SEVEN-DAY MINIMUM	2.5	Sep 22	2.7
ANNUAL RUNOFF (AC-FT)	34210	29070	41250
ANNUAL RUNOFF (CFSM)	5.78	4.91	6.97
ANNUAL RUNOFF (INCHES)	78.53	66.73	94.68
10 PERCENT EXCEEDS	128	111	129
50 PERCENT EXCEEDS	20	17	31
90 PERCENT EXCEEDS	3.1	3.1	3.5

e Estimated

## SANDY RIVER BASIN

14138850 BULL RUN RIVER NEAR MULTNOMAH FALLS, OR

LOCATION.--Lat 45°29'50", long 122°00'50", near center of sec.12, T.1 S., R.6 E., Multnomah County, Hydrologic Unit 17080001, in Mount Hood National Forest, on right bank 1.2 mi upstream from North Fork, 7.0 mi southeast of Multnomah Falls, and at mile 14.8.

DRAINAGE AREA.--47.9 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WDR OR-91-1: 1990.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 1,080 ft above sea level, from topographic map.

REMARKS.--Water-discharge records good except for estimated daily discharges, which are fair. Regulation at times since 1915 by Bull Run Lake, usable capacity, 12,270 acre-ft. No diversion upstream from station.

AVERAGE DISCHARGE.--28 years, 404 ft<sup>3</sup>/s, 114.57 in/yr, 292,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,610 ft<sup>3</sup>/s Jan. 20, 1972, gage height, 13.22 ft; minimum discharge, 30 ft<sup>3</sup>/s Oct. 28-31, 1987.

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

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 1	1430	*4,070	9.55	Jan. 2	1800	3,930	9.42

Minimum discharge, 33 ft<sup>3</sup>/s Sept. 25-28.DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	40	41	2990	1420	120	920	569	203	167	119	e55	43
2	39	40	1210	2060	114	1080	453	189	145	158	e54	43
3	39	95	851	2150	108	1100	415	182	131	125	e54	98
4	39	57	996	1650	101	971	393	342	161	115	e53	65
5	39	48	562	1770	97	672	337	294	160	121	e53	47
6	42	46	379	1060	96	471	550	259	245	114	e52	42
7	56	44	649	620	92	367	705	235	468	107	e52	39
8	45	43	1060	637	e83	304	1080	213	391	100	e51	39
9	42	42	1150	1230	102	268	1010	194	291	95	e51	43
10	40	42	1100	1030	100	346	901	178	235	91	e50	46
11	40	41	891	1560	94	343	628	164	203	87	e50	41
12	40	41	634	1010	90	303	577	152	181	84	e49	39
13	41	41	451	894	109	303	486	140	327	81	e49	38
14	47	41	372	628	124	321	415	129	820	79	e48	38
15	68	44	310	498	142	330	357	126	772	77	e48	37
16	71	48	257	406	175	369	351	138	480	75	47	37
17	53	50	218	337	210	471	361	127	361	72	47	36
18	47	60	192	290	263	809	363	121	349	70	46	36
19	44	55	170	254	218	574	364	129	278	68	46	36
20	43	50	153	226	204	459	320	175	235	66	46	35
21	42	112	139	208	200	553	309	167	206	64	46	35
22	41	115	125	206	191	400	271	141	187	63	50	34
23	42	68	115	241	1390	326	244	127	173	62	48	34
24	49	57	109	230	1770	287	279	118	157	61	46	34
25	43	63	104	207	902	268	242	109	145	60	45	34
26	41	78	99	187	741	270	216	102	197	59	45	34
27	41	62	94	171	925	304	197	97	158	58	44	34
28	40	59	89	157	1080	362	187	97	138	57	44	34
29	40	88	85	147	---	403	183	205	127	56	44	38
30	39	502	113	136	---	416	241	196	119	56	43	39
31	42	---	399	127	---	643	---	159	---	55	43	---
TOTAL	1375	2173	16066	21747	9841	15013	13004	5208	8007	2555	1499	1228
MEAN	44.4	72.4	518	702	351	484	433	168	267	82.4	48.4	40.9
MAX	71	502	2990	2150	1770	1100	1080	342	820	158	55	98
MIN	39	40	85	127	83	268	183	97	119	55	43	34
AC-FT	2730	4310	31870	43140	19520	29780	25790	10330	15880	5070	2970	2440
CFSM	.93	1.51	10.8	14.6	7.34	10.1	9.05	3.51	5.57	1.72	1.01	.85
IN.	1.07	1.69	12.48	16.89	7.64	11.66	10.10	4.04	6.22	1.98	1.16	.95

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1967 - 1994, BY WATER YEAR (WY)

	221	586	691	695	590	505	517	438	287	116	86.3	129
MEAN	535	1050	1434	1238	1215	1120	834	885	699	292	231	294
MAX (WY)	1968	1978	1978	1975	1972	1972	1993	1969	1974	1983	1968	1977
MIN (WY)	36.5	72.4	193	177	167	148	242	150	54.8	54.0	43.7	40.9
(WY)	1988	1994	1977	1985	1993	1992	1967	1992	1992	1977	1967	1994

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1967 - 1994

ANNUAL TOTAL	121402	97716	
ANNUAL MEAN	333	268	404
HIGHEST ANNUAL MEAN			643
LOWEST ANNUAL MEAN			249
HIGHEST DAILY MEAN	3300	2990	7000
LOWEST DAILY MEAN	39	34	30
ANNUAL SEVEN-DAY MINIMUM	39	34	31
ANNUAL RUNOFF (AC-FT)	240800	193800	292600
ANNUAL RUNOFF (CFSM)	6.94	5.59	8.43
ANNUAL RUNOFF (INCHES)	94.28	75.89	114.57
10 PERCENT EXCEEDS	890	685	862
50 PERCENT EXCEEDS	148	127	254
90 PERCENT EXCEEDS	42	41	60

e Estimated

## SANDY RIVER BASIN

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14138850 BULL RUN RIVER NEAR MULTNOMAH FALLS, OR--Continued

## WATER-QUALITY RECORDS

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1977 to current year.

pH: August 1990 to September 1992.

WATER TEMPERATURE: October 1977 to current year.

TURBIDITY: August 1990 to July 1994 (discontinued).

SUSPENDED SEDIMENT DISCHARGE: October 1977 to September 1986.

INSTRUMENTATION.--Water-quality monitor, turbidimeter with data recording interval dependent upon river stage.

REMARKS.--Turbidity values herein are recorded values and may not reflect actual extremes for the day. Turbidity data prior to October 1990 are available in the files of the Portland field office.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum recorded, 44 microsiemens Sept. 17, 1988; minimum recorded, 9 microsiemens

Jan. 23, 1982, Feb. 23, 1986, Dec. 4, 1989.

pH: Maximum recorded, 8.1 units Aug. 30, Sept. 1, 1990; minimum recorded, 5.7 units Jan. 18, 1991.

WATER TEMPERATURE: Maximum, 18.0°C June 22-25, 1992, July 23, 1994; minimum, 0.0°C on many days during winter periods.

TURBIDITY: Maximum recorded, 44 NTU Jan. 15, 1991; minimum recorded, 0.08 NTU Aug. 30, 31, 1992.

SEDIMENT CONCENTRATION: Maximum daily, 290 mg/L Dec. 2, 1977; minimum, 0 mg/L on many days.

SEDIMENT DISCHARGE: Maximum daily, 5,930 tons Dec. 2, 1977; minimum, 0 tons on many days.

## EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum, 32 microsiemens Oct. 2-5; minimum recorded, 12 microsiemens Feb. 23, 24.

WATER TEMPERATURE: Maximum, 18.0°C July 23; minimum, 0.0°C Nov. 24-27, Feb. 8.

TURBIDITY: Maximum recorded, 20 NTU Dec. 1; minimum recorded, 0.14 NTU several days in October and November.

## SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER				NOVEMBER			DECEMBER			JANUARY		
1	31	30	31	29	29	29	18	15	16	18	14	15
2	32	31	31	30	29	29	19	16	18	16	13	15
3	32	31	31	29	27	28	19	17	18	15	13	14
4	32	31	31	29	28	29	17	17	17	15	14	15
5	32	31	31	29	29	29	18	17	18	15	14	14
6	31	31	31	29	29	29	19	18	19	16	15	15
7	31	30	31	29	28	29	19	18	18	17	16	16
8	31	30	31	29	28	29	18	15	17	17	16	17
9	31	30	30	29	28	29	16	15	16	16	14	15
10	31	30	30	29	28	29	17	16	16	15	15	15
11	31	30	30	29	28	28	17	16	16	15	14	14
12	31	30	31	29	29	29	18	16	17	16	15	15
13	31	30	31	29	28	29	18	17	18	16	15	16
14	30	30	30	29	28	28	19	18	19	17	16	16
15	30	29	30	29	28	28	19	19	19	17	17	17
16	30	29	29	28	28	28	20	19	19	18	17	18
17	30	30	30	28	28	28	21	19	20	18	18	18
18	30	30	30	28	27	28	21	20	21	19	18	18
19	31	30	30	27	27	27	22	21	21	19	19	19
20	31	30	30	27	27	27	22	22	22	20	19	20
21	31	30	31	27	23	26	22	22	22	20	20	20
22	31	30	31	24	23	24	22	22	22	21	20	20
23	31	30	30	24	24	24	23	22	22	21	19	20
24	30	30	30	25	24	24	23	23	23	20	19	20
25	30	29	29	24	19	22	23	23	23	20	19	19
26	30	29	29	24	18	20	23	23	23	20	20	20
27	30	29	29	26	23	25	23	23	23	20	20	20
28	30	29	30	25	25	25	24	23	24	21	20	20
29	30	29	30	25	23	25	24	24	24	21	20	21
30	30	29	30	23	17	22	24	20	23	21	21	21
31	30	29	29	---	---	---	20	18	18	21	21	21
MONTH	32	29	30	30	17	27	24	15	20	21	13	18



## SANDY RIVER BASIN

14138850 BULL RUN RIVER NEAR MULTNOMAH FALLS, OR--Continued

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

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

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

## SANDY RIVER BASIN

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14138850 BULL RUN RIVER NEAR MULTNOMAH FALLS, OR--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	11.0	10.5	10.5	7.5	6.5	7.0	5.5	3.5	5.0	5.0	4.5	4.5
2	10.5	10.0	10.5	6.5	6.0	6.0	5.5	5.0	5.5	5.5	5.0	5.0
3	11.0	10.5	10.5	7.5	6.0	7.0	6.0	5.0	5.5	6.0	5.5	5.5
4	11.0	10.5	10.5	7.0	6.0	6.5	5.5	4.5	5.0	6.0	5.0	5.5
5	11.0	10.5	11.0	6.0	5.0	5.5	4.5	4.0	4.5	5.0	4.5	4.5
6	11.0	10.5	11.0	5.0	4.0	4.5	4.5	3.5	4.0	5.0	4.5	4.5
7	10.5	10.0	10.5	4.0	3.5	4.0	5.0	4.5	4.5	4.5	4.0	4.5
8	10.0	9.0	9.5	3.5	3.0	3.5	5.5	4.5	5.0	5.0	4.5	5.0
9	9.5	9.0	9.5	4.5	3.0	3.5	5.5	4.5	5.0	5.0	5.0	5.0
10	9.5	9.0	9.5	4.5	4.0	4.5	6.0	5.5	5.5	5.0	4.5	5.0
11	10.0	9.5	9.5	4.0	3.5	4.0	6.0	5.0	5.5	5.5	5.0	5.5
12	10.0	10.0	10.0	4.5	4.0	4.5	5.0	4.5	5.0	6.0	5.5	5.5
13	10.0	9.5	10.0	5.0	4.5	5.0	5.0	4.5	5.0	6.0	5.5	6.0
14	9.5	9.5	9.5	4.5	3.0	4.0	5.5	5.0	5.0	6.0	5.0	5.0
15	10.0	9.5	10.0	3.5	3.0	3.0	5.5	5.0	5.0	6.0	5.0	5.5
16	10.0	9.0	9.5	4.0	3.5	4.0	5.0	3.5	4.0	5.5	5.0	5.0
17	9.0	8.5	8.5	4.5	4.0	4.5	3.5	3.0	3.0	5.0	4.0	4.0
18	9.0	8.5	8.5	4.5	4.0	4.5	3.0	2.5	2.5	4.5	3.5	4.0
19	9.0	8.5	9.0	4.0	3.0	3.5	2.5	2.0	2.5	4.5	4.0	4.0
20	8.5	8.0	8.5	3.0	3.0	3.0	2.5	2.0	2.0	5.0	4.0	4.5
21	9.0	8.5	8.5	3.5	3.0	3.0	2.5	2.0	2.5	6.0	4.5	5.0
22	8.5	8.0	8.5	3.0	2.5	2.5	2.0	1.5	2.0	6.5	6.0	6.0
23	8.5	8.0	8.0	2.5	.5	1.5	2.0	1.5	2.0	6.5	6.0	6.0
24	9.0	8.0	8.5	.5	.0	.0	2.5	2.0	2.0	6.0	4.5	5.5
25	8.0	7.0	7.5	.0	.0	.0	2.5	2.0	2.5	4.5	3.5	4.0
26	7.5	7.0	7.5	.0	.0	.0	3.0	2.5	2.5	3.5	3.0	3.5
27	7.5	7.5	7.5	.5	.0	.0	3.0	2.5	2.5	3.5	3.0	3.0
28	8.5	7.5	8.0	1.5	.5	1.0	2.5	2.5	2.5	3.5	2.5	3.0
29	8.5	7.5	8.0	2.0	1.5	2.0	2.5	2.0	2.5	3.5	3.0	3.0
30	8.0	7.5	7.5	3.5	2.0	2.5	4.0	2.5	3.0	3.5	3.0	3.0
31	8.0	7.5	7.5	---	---	---	4.5	3.5	4.0	3.0	2.5	2.5
MONTH	11.0	7.0	9.0	7.5	.0	3.5	6.0	1.5	4.0	6.5	2.5	4.5
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	3.0	2.5	2.5	5.5	4.0	4.5	6.0	5.0	5.5	8.0	5.5	6.5
2	3.0	2.0	2.5	5.0	4.0	4.5	6.0	5.0	5.5	7.5	7.0	7.0
3	2.5	2.0	2.0	5.5	4.0	4.5	6.0	5.0	5.5	8.0	6.0	7.0
4	2.5	1.5	2.0	5.0	4.0	4.5	5.5	4.5	5.0	9.0	7.5	8.0
5	2.0	1.0	1.5	4.5	3.5	4.0	5.5	4.5	5.0	10.5	7.0	8.5
6	2.5	1.5	2.0	4.5	3.0	3.5	5.0	4.0	4.5	11.5	8.0	9.5
7	2.5	1.5	2.5	4.5	3.0	3.5	5.5	4.0	4.5	12.0	8.5	10.0
8	1.5	.0	.5	5.0	3.0	4.0	5.5	5.0	5.0	12.0	9.5	10.5
9	2.0	.5	1.0	5.5	3.5	4.5	6.0	5.0	5.5	11.5	9.0	10.0
10	2.5	1.5	2.0	5.5	5.0	5.0	6.0	5.0	5.5	12.0	9.0	10.0
11	2.5	2.0	2.5	5.5	4.0	4.5	7.5	4.5	5.5	12.0	10.0	10.5
12	3.0	2.5	2.5	5.5	3.5	4.5	6.5	5.5	6.0	11.0	10.0	10.5
13	3.0	2.0	2.5	6.0	4.5	5.0	5.5	4.5	5.0	10.5	9.0	9.5
14	3.5	2.0	3.0	6.0	4.0	5.0	6.5	4.5	5.5	10.0	8.0	9.0
15	4.0	3.5	3.5	5.5	4.0	5.0	8.5	4.5	6.5	9.5	9.0	9.0
16	4.0	3.5	3.5	5.5	4.5	5.0	8.5	6.0	7.5	9.5	8.0	8.5
17	4.0	3.5	4.0	5.0	4.0	4.5	9.5	6.5	8.0	9.0	8.0	8.5
18	3.5	2.5	3.5	4.5	3.0	4.0	10.0	7.0	8.5	9.0	8.0	8.5
19	3.5	2.5	3.0	3.5	3.0	3.0	9.0	7.5	8.5	9.0	8.0	8.5
20	4.0	3.0	3.5	4.0	3.5	4.0	9.5	6.5	7.5	9.0	8.5	8.5
21	3.5	3.0	3.5	4.0	3.0	3.5	8.5	7.5	8.0	11.5	8.5	9.5
22	3.5	2.5	3.0	3.5	3.0	3.5	7.5	5.5	7.0	12.0	9.0	10.5
23	3.5	3.0	3.5	4.5	3.0	3.5	7.5	6.0	7.0	12.5	9.5	11.0
24	3.5	2.5	3.0	5.0	3.5	4.0	7.5	6.5	7.0	13.5	10.0	11.5
25	4.0	3.0	3.5	5.5	3.5	4.0	7.5	6.0	6.5	13.0	11.0	12.0
26	4.5	3.5	4.0	6.5	3.5	4.5	7.5	6.5	7.0	12.5	10.0	11.0
27	4.5	3.5	4.0	6.5	4.0	5.0	7.5	6.5	7.0	10.5	9.0	9.5
28	4.5	4.0	4.0	7.0	4.5	5.5	10.0	7.0	8.0	9.5	8.0	8.5
29	---	---	---	7.0	4.5	5.5	9.0	7.5	8.0	8.5	8.0	8.5
30	---	---	---	6.0	5.5	6.0	8.0	7.0	7.5	11.0	7.5	9.0
31	---	---	---	5.5	5.0	5.5	---	---	---	10.5	9.0	9.5
MONTH	4.5	.0	3.0	7.0	3.0	4.5	10.0	4.0	6.5	13.5	5.5	9.5

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

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

TURBIDITY (NTU), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

[illegible]

## SANDY RIVER BASIN

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14138850 BULL RUN RIVER NEAR MULTNOMAH FALLS, OR--Continued

TURBIDITY (NTU), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	---	---	---	---	.29	.22	.28	.21	---	---	---	---
2	---	---	---	---	.23	.21	.35	.21	---	---	---	---
3	---	---	---	---	.23	.22	.21	.21	---	---	---	---
4	---	---	---	---	.30	.22	.21	.21	---	---	---	---
5	---	---	.49	.30	.29	.22	.21	.21	---	---	---	---
6	---	---	.44	.22	.49	.29	.22	.21	---	---	---	---
7	---	---	1.5	.23	1.1	.63	.29	.20	---	---	---	---
8	---	---	.31	.30	.56	.36	.28	.21	---	---	---	---
9	---	---	.65	.23	.36	.22	.28	.21	---	---	---	---
10	---	---	.31	.24	.30	.23	.28	.20	---	---	---	---
11	---	---	.31	.30	.30	.29	.28	.20	---	---	---	---
12	---	---	1.0	.23	.30	.22	.29	.21	---	---	---	---
13	.64	.28	.30	.23	.71	.29	.29	.21	---	---	---	---
14	.28	.28	.30	.23	1.7	.56	.29	.21	---	---	---	---
15	---	---	.30	.23	1.3	.57	.22	.21	---	---	---	---
16	---	---	1.1	.22	.57	.35	.29	.21	---	---	---	---
17	---	---	.29	.21	.42	.35	.29	.21	---	---	---	---
18	---	---	.22	.22	.42	.28	.29	.21	---	---	---	---
19	---	---	.29	.22	.35	.22	.44	.21	---	---	---	---
20	---	---	.36	.29	.29	.22	.29	.22	---	---	---	---
21	---	---	.30	.22	.43	.22	---	---	---	---	---	---
22	---	---	.29	.22	.29	.22	---	---	---	---	---	---
23	---	---	.29	.22	.29	.22	---	---	---	---	---	---
24	---	---	.45	.22	.23	.22	---	---	---	---	---	---
25	---	---	.30	.22	.28	.22	---	---	---	---	---	---
26	---	---	.29	.22	.64	.28	---	---	---	---	---	---
27	---	---	.22	.22	.28	.22	---	---	---	---	---	---
28	---	---	.22	.21	.29	.21	---	---	---	---	---	---
29	---	---	.70	.22	.29	.21	---	---	---	---	---	---
30	---	---	.43	.22	.28	.21	---	---	---	---	---	---
31	---	---	.29	.22	---	---	---	---	---	---	---	---
MONTH	---	---	---	---	1.7	.21	---	---	---	---	---	---

## SANDY RIVER BASIN

14138870 FIR CREEK NEAR BRIGHTWOOD, OR

LOCATION.--Lat 45°28'49", long 122°01'28", in NE 1/4 SE 1/4 sec.14, T.1 S., R.6 E., Multnomah County, Hydrologic Unit 17080001, on right bank, 6.4 mi north of Brightwood and 0.6 mi above Bull Run Reservoir Number One.

DRAINAGE AREA.--5.46 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WDR OR-78-1: 1976. WDR OR-82-2: 1976(P), 1978-79(P), 1981, WDR OR-91-1: 1976.

GAGE.--Water-stage recorder. Elevation of gage is 1,440 ft above sea level, from topographic map.

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

AVERAGE DISCHARGE.--19 years, 34.1 ft<sup>3</sup>/s, 84.96 in/yr, 24,740 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,290 ft<sup>3</sup>/s Dec. 2, 1977, gage height, 5.64 ft; minimum discharge, 1.5 ft<sup>3</sup>/s Oct. 19-21, 1991.

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

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 1	1400	*297	*4.01				

Minimum discharge recorded, 2.3 ft<sup>3</sup>/s Sept. 26-29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.5	3.0	213	100	11	73	53	20	17	12	3.9	2.6
2	2.5	2.9	105	150	11	82	41	19	15	16	3.9	2.5
3	2.5	10	78	186	10	83	38	19	14	13	3.8	7.9
4	2.5	5.0	102	123	9.5	68	37	37	16	12	3.8	4.4
5	2.6	3.8	59	136	9.0	47	32	28	15	12	3.7	3.2
6	3.1	3.5	37	85	8.6	36	56	24	24	12	3.6	2.9
7	6.5	3.3	90	52	8.4	29	70	22	46	11	3.6	2.8
8	3.5	3.2	122	56	7.4	25	122	19	38	9.8	3.8	2.9
9	3.1	3.1	126	94	8.9	22	112	17	28	9.2	3.6	3.6
10	2.9	3.0	116	77	8.3	27	92	16	23	8.6	3.5	3.8
11	2.9	2.9	90	113	8.0	26	65	14	20	8.1	3.4	3.2
12	2.8	2.9	58	83	7.6	22	57	13	18	7.6	3.3	3.0
13	2.8	2.9	40	76	9.1	e22	47	12	37	7.3	3.3	2.8
14	3.4	2.9	31	53	10	e24	39	11	78	7.0	3.2	2.6
15	6.1	3.2	25	42	12	e26	34	11	86	6.7	3.2	2.6
16	7.3	3.7	21	34	14	e30	32	12	53	6.4	3.1	2.6
17	4.4	4.0	19	28	17	e46	31	12	38	6.1	3.1	2.6
18	3.7	4.7	17	24	20	e66	30	11	42	5.9	3.0	2.5
19	3.4	4.0	16	22	18	e50	30	12	32	5.7	3.0	2.5
20	3.3	3.7	15	20	18	e36	26	19	27	5.5	3.0	2.5
21	3.2	10	14	19	18	e46	25	19	23	5.2	2.9	2.5
22	3.1	11	13	18	17	37	22	16	21	5.1	3.2	2.4
23	3.2	6.6	12	21	123	30	21	14	19	4.9	3.1	2.4
24	4.2	5.3	12	19	195	26	28	13	17	4.7	2.9	2.4
25	3.3	4.3	11	18	113	24	24	12	16	4.7	2.9	2.4
26	3.1	4.7	11	17	81	25	21	11	20	4.6	2.7	2.3
27	3.0	4.6	10	15	87	28	19	10	16	4.4	2.7	2.3
28	3.0	5.5	9.3	14	93	32	18	10	15	4.3	2.7	2.3
29	3.0	11	8.8	13	---	33	17	19	13	4.3	2.7	2.7
30	2.9	44	11	13	---	34	24	18	13	4.2	2.6	2.8
31	3.0	---	25	12	---	60	---	16	---	4.0	2.6	---
TOTAL	106.8	182.7	1517.1	1733	952.8	1215	1263	506	840	232.3	99.8	88.0
MEAN	3.45	6.09	48.9	55.9	34.0	39.2	42.1	16.3	28.0	7.49	3.22	2.93
MAX	7.3	44	213	186	195	83	122	37	86	16	3.9	7.9
MIN	2.5	2.9	8.8	12	7.4	22	17	10	13	4.0	2.6	2.3
AC-FT	212	362	3010	3440	1890	2410	2510	1000	1670	461	198	175
CFSM	.63	1.12	8.96	10.2	6.23	7.18	7.71	2.99	5.13	1.37	.59	.54
IN.	.73	1.24	10.34	11.81	6.49	8.28	8.61	3.45	5.72	1.58	.68	.60

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1976 - 1994, BY WATER YEAR (WY)

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
MEAN	16.0	52.4	61.8	52.8	54.5	44.8	48.7	33.3	23.5	9.09	5.44	9.10							
MAX	42.2	88.6	133	96.9	126	81.8	73.2	53.0	58.6	27.3	13.0	27.7							
(WY)	1991	1989	1978	1976	1982	1993	1993	1977	1981	1983	1978	1977							
MIN	1.97	6.09	15.3	16.6	16.9	14.0	28.6	14.6	3.80	3.50	3.01	2.57							
(WY)	1988	1994	1977	1979	1977	1992	1983	1992	1992	1992	1987	1991							

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1976 - 1994

	1993	1994	1976-1994
ANNUAL TOTAL	11292.3	8736.5	
ANNUAL MEAN	30.9	23.9	34.1
HIGHEST ANNUAL MEAN			47.4
LOWEST ANNUAL MEAN			23.4
HIGHEST DAILY MEAN	277	213	616
LOWEST DAILY MEAN	2.5	2.3	1.5
ANNUAL SEVEN-DAY MINIMUM	2.5	2.4	1.6
ANNUAL RUNOFF (AC-FT)	22400	17330	24740
ANNUAL RUNOFF (CFSM)	5.67	4.38	6.25
ANNUAL RUNOFF (INCHES)	76.94	59.52	84.96
10 PERCENT EXCEEDS	78	67	72
50 PERCENT EXCEEDS	17	12	21
90 PERCENT EXCEEDS	3.2	2.9	3.7

e Estimated



## SANDY RIVER BASIN

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14138870 FIR CREEK NEAR BRIGHTWOOD, OR--Continued

## WATER-QUALITY RECORDS

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1977 to current year.

pH: August 1990 to September 1992.

WATER TEMPERATURE: October 1977 to current year.

TURBIDITY: August 1990 to September 1994 (discontinued).

SUSPENDED SEDIMENT DISCHARGE: October 1977 to September 1986.

INSTRUMENTATION.--Water-quality monitor, turbidimeter with data recording interval dependent upon river stage.

REMARKS.--Turbidity values herein are recorded values and may not reflect actual extremes for the day. Turbidity data prior to October 1990 are available in the files of the Portland field office.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum recorded, 49 microsiemens May 6, 1988, Aug. 13, 1990; minimum, 9 microsiemens Dec. 4, 1978, Jan. 6, 1990.

pH: Maximum recorded, 7.7 units Sept. 13, 1990, but may have been higher during periods of missing record; minimum recorded, 6.0 units Sept. 5, 6, 8, 1991, but may have been lower during periods of missing record.

WATER TEMPERATURE: Maximum recorded, 16.0°C Sept. 1, 1987, June 23, 24, July 18, 19, 1992; minimum recorded, 0.0°C on several days in 1978-80, 1983, 1989, 1991, 1993, Nov. 24-26, 1994.

TURBIDITY: Maximum recorded, 11 NTU Nov. 25, 1991; minimum recorded, 0.04 NTU Feb. 15, 16, 1993.

SEDIMENT CONCENTRATION: Maximum, 200 mg/L Jan. 23, Feb. 20, 1982; minimum, 0 mg/L on many days.

SEDIMENT DISCHARGE: Maximum, 345 tons Dec. 2, 1977; minimum, 0 tons on many days.

## EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum, 28 microsiemens Oct. 7-9, Aug. 10; minimum, 13 microsiemens Jan. 2.

WATER TEMPERATURE: Maximum recorded, 15.0°C July 23; minimum, 0.0°C Nov. 24-26.

TURBIDITY: Maximum recorded, 5.7 NTU Nov. 3; minimum recorded, 0.05 NTU on several days in November, March and September.

## SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

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

## SANDY RIVER BASIN

14138870 FIR CREEK NEAR BRIGHTWOOD, OR--Continued

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

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

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

## SANDY RIVER BASIN

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14138870 FIR CREEK NEAR BRIGHTWOOD, OR--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	10.5	9.5	10.0	7.0	6.0	6.5	5.0	3.5	4.5	5.0	4.5	4.5
2	10.5	9.5	10.0	6.5	6.0	6.0	5.0	5.0	5.0	5.5	5.0	5.0
3	10.5	10.0	10.0	7.0	6.0	6.5	5.5	5.0	5.5	6.0	5.5	5.5
4	10.5	10.0	10.5	6.5	5.5	6.0	5.5	4.5	4.5	6.0	5.0	5.5
5	10.5	10.0	10.5	6.0	5.0	5.5	4.5	4.0	4.5	5.0	4.5	5.0
6	10.5	9.5	10.0	5.5	4.5	5.0	4.5	4.0	4.5	5.0	4.5	5.0
7	9.5	9.0	9.5	4.5	4.0	4.5	5.0	4.5	4.5	5.0	4.5	5.0
8	9.0	8.5	8.5	4.0	3.5	4.0	5.0	4.5	5.0	5.0	5.0	5.0
9	9.0	8.5	9.0	4.5	3.5	4.0	5.5	4.5	5.0	5.0	4.5	5.0
10	9.0	8.5	9.0	4.5	4.0	4.5	5.5	5.0	5.5	5.0	4.5	5.0
11	9.5	9.0	9.5	4.5	3.5	4.0	5.5	5.0	5.5	5.5	5.0	5.0
12	9.5	9.5	9.5	4.5	4.5	4.5	5.0	4.5	5.0	5.5	5.5	5.5
13	9.5	9.0	9.5	5.0	4.0	4.5	5.5	5.0	5.0	6.0	5.0	5.5
14	9.5	9.0	9.5	4.5	3.0	4.0	5.5	5.0	5.0	5.5	5.0	5.5
15	9.5	9.0	9.0	3.5	3.0	3.5	5.5	4.5	5.0	6.0	5.5	5.5
16	9.0	8.0	9.0	4.0	3.5	4.0	4.5	4.0	4.0	5.5	4.5	5.0
17	8.5	8.0	8.0	4.5	4.0	4.0	4.0	3.5	3.5	5.0	4.5	4.5
18	8.5	8.0	8.0	4.5	3.5	4.0	3.5	3.0	3.5	4.5	4.5	4.5
19	8.5	8.0	8.5	4.0	3.0	3.5	3.5	3.0	3.5	4.5	4.5	4.5
20	8.0	7.5	8.0	3.5	3.0	3.0	3.5	3.0	3.5	5.0	4.5	5.0
21	8.5	8.0	8.5	3.5	3.0	3.0	3.5	3.0	3.0	6.0	5.0	5.5
22	8.0	8.0	8.0	3.0	2.5	3.0	3.0	3.0	3.0	6.0	5.5	6.0
23	8.5	7.5	8.0	2.5	.5	1.5	3.0	2.5	3.0	6.0	5.5	6.0
24	8.5	7.5	8.0	1.0	.0	.5	3.0	3.0	3.0	5.5	4.5	5.5
25	7.5	7.0	7.0	.0	.0	.0	3.5	3.0	3.0	4.5	4.0	4.5
26	7.5	7.0	7.0	.5	.0	.0	3.5	3.0	3.5	4.0	3.5	4.0
27	8.0	7.0	7.5	1.5	.5	1.0	3.5	3.0	3.5	3.5	3.5	3.5
28	8.5	7.5	8.0	2.0	1.5	1.5	3.5	3.0	3.5	3.5	3.0	3.5
29	8.0	7.5	8.0	2.5	2.0	2.5	3.5	3.0	3.5	3.5	3.0	3.5
30	7.5	7.0	7.5	3.5	2.5	3.0	4.5	3.5	4.0	3.5	3.0	3.5
31	8.0	7.0	7.5	---	---	---	4.5	4.5	4.5	3.5	3.0	3.0
MONTH	10.5	7.0	8.5	7.0	.0	3.5	5.5	2.5	4.0	6.0	3.0	5.0
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	3.5	3.0	3.0	5.0	4.0	4.5	5.0	4.5	4.5	6.5	5.0	6.0
2	3.0	3.0	3.0	4.5	4.0	4.5	5.0	4.5	5.0	6.5	6.0	6.0
3	3.0	2.5	3.0	5.0	4.0	4.5	5.0	4.5	4.5	6.5	5.5	6.0
4	3.0	2.5	2.5	5.5	4.0	4.5	4.5	4.0	4.5	7.0	6.5	7.0
5	3.0	2.5	2.5	4.5	4.0	4.5	4.5	4.0	4.5	8.0	6.0	7.0
6	3.0	2.5	2.5	4.5	3.5	4.0	4.5	3.5	4.0	9.0	7.0	8.0
7	3.0	2.0	3.0	5.0	4.0	4.5	5.0	4.0	4.5	9.5	7.5	8.5
8	2.0	1.0	1.5	5.0	4.0	4.5	4.5	4.0	4.5	9.5	8.0	8.5
9	2.0	1.0	1.5	5.5	4.5	5.0	5.0	4.5	4.5	9.5	8.0	8.5
10	2.5	2.0	2.5	5.5	5.0	5.5	5.0	4.5	5.0	9.5	8.0	9.0
11	2.5	2.5	2.5	5.0	4.5	5.0	6.0	4.5	5.0	9.5	8.5	9.0
12	3.0	2.5	3.0	5.5	4.0	5.0	5.5	5.0	5.0	9.0	8.5	9.0
13	3.0	2.0	2.5	5.0	5.0	---	5.0	4.5	4.5	9.0	7.5	8.0
14	3.5	2.5	3.0	---	---	---	5.0	4.5	4.5	8.5	7.5	8.0
15	3.5	3.5	3.5	---	---	---	6.5	4.5	5.5	8.5	7.5	8.0
16	4.0	3.5	3.5	---	---	---	7.0	5.5	6.5	8.0	7.0	7.5
17	4.0	3.5	4.0	---	---	---	7.5	6.0	6.5	7.5	7.0	7.5
18	3.5	3.0	3.5	---	---	---	7.5	6.5	7.0	7.5	7.0	7.5
19	3.5	3.0	3.5	---	---	---	7.5	6.5	7.0	7.5	7.5	7.5
20	4.0	3.5	4.0	---	---	---	7.5	6.0	6.5	7.5	7.5	7.5
21	4.0	3.5	3.5	3.5	2.0	---	7.0	6.5	7.0	8.5	7.5	8.0
22	3.5	3.0	3.5	3.5	3.0	3.0	6.5	5.5	6.0	9.0	7.5	8.5
23	4.0	3.5	3.5	3.5	3.0	3.5	6.5	5.5	6.0	10.0	8.0	9.0
24	4.0	3.5	4.0	4.0	3.0	3.5	6.0	5.5	6.0	10.5	8.5	10.0
25	4.5	4.0	4.0	4.0	3.0	3.5	6.0	5.5	6.0	10.5	9.0	10.0
26	4.5	4.0	4.5	4.5	3.5	4.0	6.0	5.5	6.0	9.5	8.5	9.0
27	4.5	4.0	4.5	5.0	3.5	4.5	6.5	5.5	6.0	8.5	7.5	8.0
28	4.5	4.0	4.0	5.0	4.0	4.5	7.5	6.0	6.5	8.0	7.5	7.5
29	---	---	---	5.5	4.0	5.0	7.0	6.5	7.0	7.5	7.5	7.5
30	---	---	---	5.0	4.5	5.0	6.5	6.0	6.0	8.5	6.5	8.0
31	---	---	---	5.0	4.5	4.5	---	---	---	8.5	8.0	8.5
MONTH	4.5	1.0	3.0	---	---	---	7.5	3.5	5.5	10.5	5.0	8.0

## SANDY RIVER BASIN

14138870 FIR CREEK NEAR BRIGHTWOOD, OR--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

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	11.5	10.5	11.0
2	9.0	7.5	8.5	9.5	8.5	9.0	13.0	11.5	12.5	10.5	9.5	10.5
3	9.0	8.0	8.5	10.0	8.5	9.0	13.0	12.0	12.5	10.5	10.0	10.5
4	8.5	8.5	8.5	9.5	8.5	9.0	13.0	12.0	12.5	11.0	10.0	10.5
5	8.0	8.0	8.0	8.5	8.0	8.5	12.5	11.5	12.0	11.0	10.0	10.5
6	8.0	7.5	8.0	10.0	8.0	9.0	12.5	11.0	11.5	11.5	10.5	11.0
7	7.5	7.0	7.5	11.5	9.0	10.0	12.0	11.0	11.5	11.5	10.5	11.0
8	8.0	6.5	7.5	12.0	10.0	11.0	11.5	11.0	11.5	11.0	10.5	10.5
9	9.0	7.5	8.0	12.0	10.0	11.0	12.0	11.0	11.5	10.5	10.0	10.5
10	10.0	8.0	9.0	11.5	9.5	10.5	12.5	11.0	12.0	10.5	10.0	10.0
11	9.5	8.5	9.5	12.0	10.0	11.0	12.5	11.5	12.0	10.5	9.5	10.0
12	10.0	9.0	9.5	12.0	10.0	11.0	13.0	11.5	12.5	10.0	9.0	9.5
13	9.0	7.5	8.5	12.0	10.0	11.0	13.0	11.5	12.5	10.0	9.0	9.5
14	7.5	7.0	7.5	12.0	10.5	11.0	12.5	12.0	12.0	10.0	9.5	10.0
15	7.5	7.0	7.0	12.0	10.5	11.5	12.5	11.5	12.0	11.0	10.0	10.5
16	8.0	7.0	7.5	12.5	10.5	11.5	12.5	11.5	12.0	11.5	10.5	11.0
17	8.0	7.0	7.5	13.0	11.0	12.0	12.5	11.5	12.0	11.5	10.0	11.0
18	8.0	7.5	7.5	12.5	11.0	12.0	12.0	11.0	11.5	12.0	11.0	11.5
19	9.0	7.0	8.0	13.5	11.0	12.5	12.0	11.5	12.0	11.5	10.0	11.0
20	10.0	8.0	9.0	14.0	12.0	13.0	12.0	11.5	11.5	11.5	11.0	11.5
21	10.0	8.5	9.0	14.5	12.5	13.5	12.0	11.5	11.5	11.5	11.0	11.5
22	10.5	8.5	9.5	14.5	13.0	14.0	12.0	11.0	11.5	12.0	11.0	11.5
23	9.5	8.5	9.0	15.0	13.5	14.0	11.5	10.5	11.0	12.0	11.0	11.5
24	10.0	8.0	9.0	14.5	13.0	13.5	12.0	11.0	11.5	12.0	11.0	11.5
25	9.0	8.0	8.5	13.5	12.5	13.0	11.5	10.5	11.0	12.0	11.0	11.5
26	8.5	8.0	8.5	13.5	12.0	12.5	11.5	10.5	11.0	11.5	11.0	11.5
27	10.0	7.5	9.0	13.5	11.5	12.5	12.0	10.5	11.5	11.5	10.5	11.0
28	11.0	8.5	9.5	13.5	12.0	12.5	11.5	11.0	11.5	11.5	11.0	11.5
29	11.0	9.0	10.0	13.0	12.0	12.0	12.0	11.0	11.5	11.5	11.0	11.5
30	11.0	9.0	10.0	12.5	11.0	12.0	11.5	10.5	11.0	11.5	11.0	11.0
31	---	---	---	12.5	11.0	12.0	12.0	10.5	11.5	---	---	---
MONTH	11.0	6.5	8.5	15.0	8.0	11.5	13.0	10.5	11.5	12.0	9.0	11.0

## SANDY RIVER BASIN

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14138870 FIR CREEK NEAR BRIGHTWOOD, OR--Continued

TURBIDITY (NTU), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	---	---	.13	.05	---	---	---	---	---	---	---	---
2	---	---	.13	.05	---	---	---	---	---	---	---	---
3	---	---	5.7	.20	---	---	---	---	---	---	---	---
4	---	---	.13	.13	---	---	---	---	---	---	.33	.19
5	---	---	.13	.05	---	---	---	---	---	---	.26	.19
6	---	---	.12	.05	---	---	.40	.26	---	---	.19	.19
7	---	---	.05	.05	---	---	.26	.26	---	---	.19	.12
8	---	---	.12	.05	---	---	.26	.19	---	---	.19	.12
9	---	---	.12	.05	---	---	.54	.26	---	---	.19	.12
10	---	---	.12	.05	---	---	.33	.19	---	---	.26	.12
11	---	---	.05	.05	---	---	.75	.26	---	---	---	---
12	---	---	.05	.05	---	---	.26	.26	---	---	---	---
13	---	---	.12	.05	---	---	.26	.19	---	---	---	---
14	---	---	.19	.05	---	---	.19	.19	---	---	---	---
15	---	---	.12	.12	---	---	.19	.19	---	---	---	---
16	---	---	.12	.12	---	---	.19	.19	---	---	---	---
17	---	---	---	---	---	---	.12	.12	---	---	---	---
18	---	---	---	---	---	---	.12	.12	---	---	---	---
19	---	---	---	---	---	---	.19	.12	---	---	---	---
20	---	---	---	---	---	---	.12	.12	---	---	---	---
21	---	---	---	---	---	---	.19	.12	---	---	.19	.12
22	---	---	---	---	---	---	.20	.12	---	---	.12	.12
23	---	---	---	---	---	---	.20	.12	---	---	.12	.12
24	---	---	---	---	---	---	.12	.12	---	---	.12	.12
25	.49	.20	---	---	---	---	.19	.12	---	---	.12	.12
26	.20	.20	---	---	---	---	.19	.12	---	---	.19	.12
27	.21	.13	---	---	---	---	---	---	---	---	.19	.05
28	.28	.14	---	---	---	---	---	---	---	---	.05	.05
29	.14	.13	---	---	---	---	---	---	---	---	---	---
30	.14	.13	---	---	---	---	---	---	---	---	---	---
31	.13	.13	---	---	---	---	---	---	---	---	---	---
MONTH	---	---	---	---	---	---	---	---	---	---	---	---
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	---	---	---	---	---	---	---	---	.20	.06	.21	.13
2	---	---	---	---	---	---	---	---	.21	.06	.14	.06
3	---	---	---	---	---	---	---	---	.13	.06	1.3	.27
4	---	---	.68	.26	---	---	---	---	.21	.06	.21	.14
5	---	---	.47	.12	---	---	---	---	.13	.06	.20	.13
6	---	---	---	---	---	---	---	---	.13	.06	.14	.06
7	---	---	---	---	---	---	---	---	.21	.06	.14	.06
8	---	---	---	---	---	---	---	---	.13	.06	.14	.06
9	---	---	---	---	.20	.19	---	---	.13	.06	.20	.13
10	---	---	---	---	.26	.06	---	---	.13	.06	.20	.13
11	---	---	---	---	---	---	---	---	.13	.06	.14	.13
12	---	---	---	---	---	---	.20	.20	.13	.06	.20	.06
13	---	---	---	---	---	---	.56	.12	.21	.06	.13	.05
14	---	---	---	---	---	---	.35	.13	.13	.13	.14	.06
15	---	---	---	---	---	---	.28	.06	.13	.06	.06	.06
16	---	---	---	---	---	---	---	---	.13	.06	.13	.06
17	---	---	.33	.19	---	---	---	---	.13	.06	.13	.06
18	---	---	.12	.12	---	---	---	---	.14	.06	.13	.06
19	---	---	.26	.12	---	---	---	---	.13	.13	.13	.06
20	---	---	.26	.19	---	---	---	---	.21	.06	.13	.06
21	---	---	.19	.12	---	---	---	---	.14	.06	.13	.06
22	.26	.12	.13	.12	---	---	---	---	.14	.14	.13	.06
23	.12	.12	.13	.12	---	---	---	---	.21	.06	.13	.06
24	---	---	.13	.12	---	---	---	---	.14	.06	.13	.06
25	---	---	.13	.12	---	---	.35	.21	.14	.13	.13	.06
26	---	---	.13	.12	---	---	.21	.13	.21	.13	.13	.06
27	---	---	.12	.12	---	---	.21	.13	.14	.06	.13	.06
28	---	---	.12	.12	---	---	.21	.06	.21	.14	.13	.06
29	---	---	.54	.12	---	---	.21	.06	.21	.14	.20	.13
30	---	---	.19	.12	---	---	.21	.06	.14	.06	.13	.13
31	---	---	---	---	---	---	.13	.12	.14	.06	---	---
MONTH	---	---	---	---	---	---	---	---	.21	.06	1.3	.05



## SANDY RIVER BASIN

14138900 NORTH FORK BULL RUN RIVER NEAR MULTNOMAH FALLS, OR

LOCATION.--Lat 45°29'40", long 122°02'05", near line between SE 1/4 and SW 1/4 sec.11, T.1 S., R.6 E., Multnomah County, Hydrologic Unit 17080001, Mount Hood National Forest, on left bank 7.0 mi southeast of Multnomah Falls and at mouth.

DRAINAGE AREA.--8.32 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WDR OR-91-1: 1976.

GAGE.--Water-stage recorder. Elevation of gage is 1,060 ft above sea level, from topographic map. Prior to Oct. 1, 1978, and from June 13, 1989 to July 1990 (during bridge construction), at site 700 ft upstream at datum 18.7 ft higher. From Oct. 1, 1978 to June 13, 1989, and July 1990 to present, site located 5 ft upstream from bridge, on left bank wing wall.

REMARKS.--No estimated daily discharges. Water-discharge records good except those above 400 ft<sup>3</sup>/s, which are poor. Regulation at times since 1958 by North Fork Reservoir, capacity, about 1,030 acre-ft. No diversion upstream from station.

AVERAGE DISCHARGE.--29 years, 72.7 ft<sup>3</sup>/s, 118.75 in/yr, 52,680 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,700 ft<sup>3</sup>/s, probably affected by surge from release of water temporarily impounded by landslide upstream from station, Jan. 20, 1972, gage height, 9.89 ft, from floodmark, from rating curve extended above 850 ft<sup>3</sup>/s on basis of estimate of peak flow from slope-area survey; minimum discharge, 8.6 ft<sup>3</sup>/s Oct. 19-29, 1987.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 700 ft<sup>3</sup>/s and maximum (\*), from rating curve extended above 250 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 2	1700	*802	*5.99	No other peak greater than base discharge.			
Minimum discharge, 8.7 ft <sup>3</sup> /s Sept. 1, 2.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	12	415	184	28	173	99	39	31	25	12	8.9
2	11	11	169	341	27	178	81	38	28	29	12	8.7
3	11	24	141	332	26	193	77	36	26	24	12	27
4	11	15	176	258	25	165	70	65	33	22	12	18
5	11	13	94	277	24	115	64	47	30	24	12	14
6	12	12	66	187	24	84	108	42	45	22	12	12
7	14	12	114	112	24	68	126	39	69	21	11	12
8	12	12	163	130	22	58	221	37	53	20	12	13
9	12	12	168	234	25	53	217	35	44	19	12	16
10	11	12	174	178	25	68	187	33	39	18	11	17
11	11	11	159	283	25	59	118	32	35	17	11	14
12	11	11	110	189	24	54	110	31	34	17	11	13
13	11	11	84	159	26	53	87	30	59	17	11	12
14	14	11	76	106	29	53	77	29	121	16	11	12
15	29	12	61	87	33	51	66	29	103	16	11	12
16	23	13	52	72	39	68	61	35	68	16	10	12
17	14	14	45	59	44	82	59	30	55	15	10	12
18	13	15	41	52	51	142	58	29	56	15	10	11
19	12	14	37	47	46	97	58	29	45	15	10	11
20	12	13	35	43	44	81	53	40	40	14	10	11
21	12	27	32	40	42	97	53	34	35	14	10	11
22	11	25	30	41	41	73	48	30	33	14	11	11
23	12	17	28	48	245	61	46	28	31	14	10	11
24	16	14	27	42	285	56	53	27	29	13	9.8	11
25	13	13	26	39	177	53	46	26	28	13	9.6	10
26	12	13	26	36	143	54	42	25	40	13	9.6	10
27	11	14	25	33	210	58	39	25	30	13	9.4	10
28	11	14	23	32	224	62	37	25	27	13	9.4	10
29	11	27	23	31	---	61	36	43	25	13	9.4	11
30	11	84	34	29	---	64	51	33	24	13	9.4	11
31	12	---	73	28	---	121	---	25	---	12	9.2	---
TOTAL	398	508	2727	3729	1978	2655	2448	1050	1316	527	329.8	372.6
MEAN	12.8	16.9	88.0	120	70.6	85.6	81.6	33.9	43.9	17.0	10.6	12.4
MAX	29	84	415	341	285	193	221	65	121	29	12	27
MIN	11	11	23	28	22	51	36	25	24	12	9.2	8.7
AC-FT	789	1010	5410	7400	3920	5270	4860	2080	2610	1050	654	739
CFSM	1.54	2.04	10.6	14.5	8.49	10.3	9.81	4.07	5.27	2.04	1.28	1.49
IN.	1.78	2.27	12.19	16.67	8.84	11.87	10.95	4.69	5.88	2.36	1.47	1.67

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1966 - 1994, 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	1994
MEAN	40.4	103	125	131	105	88.8	88.8	73.8	49.8	25.6	17.9	24.7																	
MAX	88.2	199	285	309	216	200	147	137	111	62.7	35.2	54.4																	
(WY)	1969	1974	1976	1975	1982	1972	1993	1972	1974	1983	1968	1977																	
MIN	9.08	16.9	33.4	32.1	35.2	28.8	49.5	28.3	14.6	12.6	10.6	10.9																	
(WY)	1988	1994	1977	1979	1993	1992	1967	1992	1992	1992	1994	1987																	

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1966 - 1994

ANNUAL TOTAL	20846	18038.4	72.7
ANNUAL MEAN	57.1	49.4	121
HIGHEST ANNUAL MEAN			46.1
LOWEST ANNUAL MEAN			1977
HIGHEST DAILY MEAN	538	415	1910
LOWEST DAILY MEAN	11	8.7	8.6
ANNUAL SEVEN-DAY MINIMUM	11	9.2	8.7
ANNUAL RUNOFF (AC-FT)	41350	35780	52680
ANNUAL RUNOFF (CFSM)	6.86	5.94	8.74
ANNUAL RUNOFF (INCHES)	93.21	80.65	118.75
10 PERCENT EXCEEDS	130	121	150
50 PERCENT EXCEEDS	32	28	47
90 PERCENT EXCEEDS	12	11	15

## SANDY RIVER BASIN

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14138900 NORTH FORK BULL RUN RIVER NEAR MULTNOMAH FALLS, OR--Continued

## WATER-QUALITY RECORDS

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1978 to current year.

pH: October 1980 to September 1981, August 1990 to September 1992.

WATER TEMPERATURE: October 1978 to current year.

TURBIDITY: August 1990 to September 1994 (discontinued).

SUSPENDED SEDIMENT DISCHARGE: October 1978 to September 1986.

INSTRUMENTATION.--Water-quality monitor, turbidimeter with data recording interval dependent upon river stage.

REMARKS.--Turbidity values herein are recorded values and may not reflect actual extremes for the day. Turbidity data prior to October 1990 are available in the files of the Portland field office.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum, 103 microsiemens Jan. 13, 1981 (cement spill); minimum, 9 microsiemens Dec. 25, 1980, Jan. 6, 1983, Feb. 23, 1986.

pH: Maximum recorded, 9.8 units Jan. 13, 1981 (cement spill); minimum recorded, 6.3 units June 19, 1981.

WATER TEMPERATURE: Maximum, 14.5°C several days in 1988, 1992, 1993, 1994; minimum, 0.0°C on several days during winter periods.

TURBIDITY: Maximum recorded, 25 NTU Nov. 24, 1990; minimum recorded, 0.06 NTU Sept. 7, 13, 14, 1992.

SEDIMENT CONCENTRATION: Maximum daily, 205 mg/L Dec. 25, 1980; minimum, 0 mg/L on many days.

SEDIMENT DISCHARGE: Maximum daily, 765 tons Feb. 23, 1986; minimum, 0 tons on many days.

## EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum, 48 microsiemens Oct. 18; minimum, 12 microsiemens Jan. 2, 3.

WATER TEMPERATURE: Maximum recorded, 14.5°C July 21, 23; minimum, 1.0°C Nov. 24-26.

TURBIDITY: Maximum recorded, 11.0 NTU Jan. 2; minimum recorded, 0.14 NTU Nov. 8.

## SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	43	41	42	42	41	41	20	15	17	18	14	15
2	44	41	42	42	42	42	19	16	18	17	12	14
3	44	41	42	42	36	38	21	18	19	14	12	13
4	44	41	43	40	39	40	19	17	18	14	13	13
5	45	41	42	41	40	41	20	19	19	14	13	13
6	45	41	44	41	41	41	21	20	21	16	14	15
7	43	40	41	41	41	41	21	18	20	17	15	16
8	44	42	43	42	41	41	20	17	18	17	15	16
9	45	43	44	42	41	41	19	17	17	15	13	14
10	45	42	44	41	40	41	18	16	17	15	14	15
11	45	43	43	41	40	41	18	17	17	14	13	13
12	45	42	43	41	41	41	19	17	18	15	14	14
13	47	43	44	41	40	41	19	18	19	16	14	15
14	47	41	43	41	40	41	19	19	19	17	16	16
15	44	35	40	41	40	40	21	19	20	18	17	17
16	43	36	39	40	39	39	22	20	21	19	18	18
17	47	40	41	40	39	39	22	21	22	23	19	19
18	48	41	43	39	38	38	23	22	23	23	21	22
19	46	41	42	39	38	39	24	23	24	25	21	23
20	47	41	43	39	39	39	25	24	24	26	21	24
21	47	41	42	39	30	36	26	25	25	28	23	25
22	46	41	42	35	31	33	26	25	26	28	23	25
23	42	40	41	36	35	35	27	26	27	24	22	23
24	40	38	39	37	36	37	28	27	27	24	23	23
25	41	40	41	38	37	37	28	27	28	25	24	24
26	41	41	41	38	37	37	28	28	28	28	25	25
27	42	41	41	37	36	37	29	28	29	29	25	27
28	42	41	42	37	36	36	30	29	29	29	26	26
29	42	41	41	37	28	34	30	29	30	30	26	28
30	42	41	41	28	20	26	30	20	28	29	27	28
31	42	41	41	---	---	---	21	18	20	28	27	28
MONTH	48	35	42	42	20	38	30	15	22	30	12	20

## SANDY RIVER BASIN

14138900 NORTH FORK BULL RUN RIVER NEAR MULTNOMAH FALLS, OR--Continued

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	28	28	28	17	16	17	19	18	19	26	24	25
2	29	28	29	18	16	17	20	19	20	26	25	26
3	29	29	29	16	16	16	20	20	20	26	26	26
4	30	29	30	17	16	17	21	20	20	26	20	22
5	30	30	30	18	17	18	21	20	21	27	23	24
6	31	30	30	20	18	19	20	18	19	26	24	25
7	31	30	30	21	20	20	19	18	18	26	25	26
8	32	31	31	22	21	21	18	15	16	27	26	26
9	31	29	30	25	22	23	16	16	16	28	27	27
10	31	30	30	22	20	21	17	16	16	31	27	28
11	31	30	30	22	21	21	18	17	18	30	28	28
12	31	30	31	22	21	22	18	16	17	30	28	28
13	31	29	30	22	22	22	19	17	18	32	28	30
14	30	29	29	23	22	22	19	18	19	31	29	30
15	29	26	28	23	22	22	20	19	20	32	29	30
16	27	26	26	22	20	21	21	20	20	31	26	27
17	27	23	25	21	18	20	21	21	21	29	28	28
18	23	23	23	18	16	17	21	21	21	30	28	29
19	24	23	23	19	17	18	22	21	21	30	28	29
20	25	23	24	20	19	19	23	21	22	29	25	26
21	25	24	25	20	19	19	22	22	22	28	26	27
22	26	25	25	21	20	20	23	22	23	29	28	28
23	25	16	19	22	21	21	23	23	23	30	28	29
24	17	16	16	22	22	22	23	21	22	30	29	30
25	18	16	18	23	22	23	24	23	23	31	29	30
26	18	18	18	23	22	23	25	24	24	31	30	30
27	18	16	17	23	22	22	25	25	25	31	30	31
28	16	16	16	22	21	22	26	25	26	31	30	31
29	---	---	---	22	21	22	26	25	26	30	25	26
30	---	---	---	22	20	22	25	22	23	30	26	28
31	---	---	---	20	18	19	---	---	---	29	28	29
MONTH	32	16	26	25	16	20	26	15	21	32	20	28

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE			JULY			AUGUST			SEPTEMBER			
1	30	27	28	31	29	30	38	37	38	41	40	41
2	30	28	29	30	28	29	38	37	38	41	40	41
3	30	29	30	31	30	30	39	37	38	41	34	37
4	30	26	28	31	30	31	38	---	---	40	37	39
5	29	28	28	31	30	30	38	37	38	41	40	40
6	28	23	25	32	30	31	38	37	38	41	40	41
7	23	20	21	33	31	32	39	38	38	41	40	41
8	23	21	22	33	32	33	39	38	38	41	40	40
9	25	23	24	34	32	33	39	38	38	40	38	39
10	26	24	25	34	32	33	39	38	39	39	38	38
11	27	25	26	34	33	34	39	38	39	40	39	39
12	27	26	26	34	33	34	40	39	39	41	40	40
13	27	21	24	35	34	34	40	38	39	41	40	40
14	22	18	19	35	34	34	41	39	40	41	40	41
15	20	18	19	35	34	35	40	39	40	41	41	41
16	21	20	21	36	35	35	40	39	40	42	39	40
17	22	21	22	36	35	36	40	39	40	42	40	40
18	23	21	22	36	35	36	41	39	40	42	40	41
19	24	23	23	36	35	36	41	40	40	43	41	42
20	25	24	25	37	36	36	41	40	40	42	41	42
21	27	25	25	37	36	37	41	40	40	42	41	41
22	27	26	26	37	36	37	40	39	40	42	41	41
23	28	26	27	37	36	37	41	39	40	42	41	42
24	30	27	28	37	36	37	41	40	40	42	41	42
25	30	28	29	37	36	37	41	40	41	42	41	42
26	30	25	27	37	36	37	41	40	41	42	41	42
27	29	27	28	38	37	37	41	40	41	43	41	42
28	31	29	29	38	37	37	41	40	41	43	41	42
29	31	29	29	38	37	37	41	40	41	42	40	41
30	31	29	30	38	37	37	41	40	41	41	40	40
31	---	---	---	38	37	38	41	40	41	---	---	---
MONTH	31	18	25	38	28	35	41	---	---	43	34	41

## SANDY RIVER BASIN

169

## NORTH FORK BULL RUN RIVER NEAR MULTNOMAH FALLS, OR--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

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

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





## SANDY RIVER BASIN

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14138900 NORTH FORK BULL RUN RIVER NEAR MULTNOMAH FALLS, OR--Continued

TURBIDITY (NTU), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	.17	.16	.16	.15	3.8	.29	1.9	.58	.30	.22	.51	.37
2	.17	.16	.22	.15	1.3	.58	11	.50	.30	.22	1.0	.44
3	.17	.16	1.7	.22	.72	.58	1.9	.86	.22	.22	.66	.51
4	.17	.16	.22	.15	1.4	.43	.94	.72	.29	.22	.52	.45
5	.16	.16	.15	.15	.43	.36	2.1	.72	.22	.22	.45	.37
6	.23	.16	.15	.15	.36	.28	.79	.51	.22	.22	.38	.30
7	.30	.16	.15	.15	.65	.29	.51	.37	.22	.15	.37	.30
8	.16	.15	.16	.14	.72	.44	.58	.44	.29	.21	.30	.29
9	.16	.15	.16	.15	---	---	1.3	.58	.29	.22	.30	.22
10	.16	.15	.16	.16	---	---	1.2	.44	.22	.22	.37	.30
11	.16	.16	.16	.15	.50	.44	1.7	.58	.29	.22	.30	.22
12	.16	.16	.23	.16	.44	.36	.58	.51	.29	.22	.30	.22
13	.16	.16	.23	.16	.36	.29	.51	.44	.38	.22	.30	.22
14	.30	.16	.22	.15	.37	.29	.44	.37	.30	.22	.30	.22
15	1.4	.30	.22	.15	.36	.29	.44	.37	.45	.22	.30	.22
16	.66	.22	.22	.15	.29	.29	.44	.36	.29	.22	.51	.29
17	.22	.15	.22	.15	.29	.29	.36	.29	.59	.22	.51	.29
18	.16	.15	.22	.22	.29	.22	.30	.29	.37	.29	1.1	.43
19	.22	.16	.22	.15	.29	.21	.30	.22	.37	.30	.36	.29
20	.16	.15	.15	.15	.29	.22	.29	.22	.31	.22	.50	.29
21	.16	.15	1.9	.15	.29	.22	.30	.22	.37	.30	.36	.29
22	.16	.15	.43	.29	.29	.22	.30	.23	.37	.30	.29	.22
23	.37	.15	.29	.21	.30	.22	.30	.30	3.9	1.2	.22	.22
24	.36	.16	---	---	.29	.22	.29	.22	1.7	.66	.22	.22
25	.16	.15	---	---	.22	.21	.22	.22	.66	.44	.22	.22
26	.16	.15	.29	.15	.22	.22	.30	.22	.52	.44	.29	.22
27	.16	.15	.15	.15	.22	.21	.29	.22	.88	.45	.29	.22
28	.16	.16	.15	.15	.22	.22	.30	.22	.74	.51	.29	.22
29	.16	.15	1.1	.15	.22	.22	.30	.22	---	---	.30	.22
30	.16	.15	2.2	.43	1.1	.22	.29	.22	---	---	.44	.22
31	.22	.15	---	---	.79	.44	.29	.22	---	---	.72	.36
MONTH	1.4	.15	---	---	---	---	11	.22	3.9	.15	1.1	.22
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	.37	.29	.30	.23	.23	.16	.24	.16	.18	.16	.17	.17
2	.29	.22	.24	.23	.16	.16	.30	.16	.18	.17	.17	.17
3	.29	.29	.24	.23	.16	.16	.17	.16	.17	.17	1.0	.32
4	.29	.22	.82	.31	.37	.16	.16	.16	.17	.17	.32	.25
5	.29	.22	.31	.23	.23	.23	.23	.16	.17	.17	.25	.16
6	.44	.29	.25	.23	.37	.23	.17	.16	.17	.17	.17	.17
7	.37	.29	.25	.24	.65	.37	.24	.16	.17	.17	.18	.17
8	1.3	.37	.24	.24	.30	.23	.25	.16	.24	.17	.25	.17
9	.65	.44	.24	.24	.24	.23	.24	.16	.17	.17	.25	.17
10	.51	.37	.25	.24	.24	.23	.17	.16	.18	.17	.25	.17
11	.37	.30	.24	.24	.24	.23	.24	.16	.17	.17	.17	.17
12	.44	.30	.24	.24	.24	.23	.17	.16	.18	.17	.17	.16
13	.37	.30	.24	.24	.94	.23	.17	.16	.18	.17	.17	.17
14	.30	.22	.24	.23	1.4	.44	.17	.16	.17	.17	.18	.17
15	.31	.22	.24	.17	.51	.30	.17	.17	.17	.17	.18	.17
16	.31	.22	.46	.23	.30	.23	.18	.16	.17	.17	.16	.16
17	.31	.23	.23	.22	.30	.23	.17	.17	.24	.17	.16	.16
18	.31	.23	.23	.23	.51	.23	.17	.17	.17	.17	.18	.16
19	.31	.31	.37	.23	.24	.23	.25	.17	.17	.17	.18	.17
20	.31	.23	.44	.30	.24	.23	.25	.17	.17	.17	.18	.17
21	.31	.30	.30	.23	.24	.23	.24	.17	.17	.17	.18	.17
22	.24	.23	.24	.16	.24	.23	.24	.17	.24	.17	.18	.17
23	.31	.23	.24	.16	.24	.23	.18	.17	.17	.17	.18	.17
24	.30	.23	.24	.23	.24	.23	.17	.17	.17	.17	.18	.17
25	.23	.23	.24	.23	.24	.16	.17	.17	.24	.17	.24	.17
26	.23	.23	.23	.16	.59	.23	.18	.17	.39	.17	.18	.17
27	.24	.23	.16	.16	.24	.23	.18	.17	.26	.17	.18	.17
28	.24	.23	.23	.16	.24	.16	.18	.17	.17	.17	.17	.17
29	.31	.24	.51	.23	.24	.23	.17	.17	.17	.17	.25	.17
30	.44	.30	.23	.23	.24	.16	.17	.16	.25	.16	.18	.17
31	---	---	.23	.23	---	---	.17	.16	.25	.17	---	---
MONTH	1.3	.22	.82	.16	1.4	.16	.30	.16	.39	.16	1.0	.16

## SANDY RIVER BASIN

14139000 BULL RUN RESERVOIR NUMBER ONE NEAR BULL RUN, OR

LOCATION.--Lat 45°28'50", long 122°04'50", in NW 1/4 SW 1/4 sec.16, T.1 S., R.6 E., Multnomah County, Hydrologic Unit 17080001, in Mount Hood National Forest, in control house of Bear Creek Dam on Bull Run River, 8.2 mi northeast of Bull Run, and at mile 11.2.

DRAINAGE AREA.--74.6 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1928 to current year. Prior to October 1937, published as Bull Run Reservoir. October 1937 to September 1967, published as Lake Ben Morrow. Prior to October 1975, monthend contents only.

REVISED RECORDS.--WSP 814: 1935(M). WSP 1935: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is sea level (levels by Portland Water Bureau). Prior to Oct. 9, 1930, Oct. 1, 1962, to Dec. 31, 1975, nonrecording gage and Oct. 9, 1930, to Sept. 30, 1962, water-stage recorder at present site and datum.

REMARKS.--Midnight readings Dec. 10 to Jan. 4 furnished by Portland General Electric. Lake is formed by concrete dam completed in March 1929 for water supply of city of Portland. Storage began about Apr. 29, 1929; first filling occurred May 15, 1929. Capacity, 26,930 acre-ft at crest of spillway, elevation, 1,036.0 ft; capacity increased in October 1954 to 30,140 acre-ft at elevation 1,044.0 ft by installation of three gates 40 ft wide and 8 ft high. No dead storage. Water is used for power generation by Portland General Electric Co. and municipal supply for city of Portland.

COOPERATION.--Capacity table furnished by Portland Water Bureau.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 31,600 acre-ft Mar. 31, 1931, elevation, 1,047.40 ft; minimum contents observed, 169 acre-ft Jan. 10, 1960, elevation, 887.5 ft.

EXTREMES FOR CURRENT YEAR.--Maximum observed contents, 30,680 acre-ft June 7, July 3, 7, elevation, 1,045.25 ft; minimum contents, 11,650 acre-ft Nov. 27, elevation, 987.00 ft.

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

870	0	970	8,050
890	213	990	12,370
910	1,130	1,010	17,950
930	2,680	1,030	24,680
950	4,900	1,048	31,860

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1013.18	996.09	1017.08	1034.56	1034.53	1035.92	1034.58	1038.10	1045.01	1044.79	1023.11	1001.99
2	1010.86	996.51	1027.22	1039.23	1034.47	1035.93	1035.18	1039.48	1044.70	1045.03	1021.92	1000.45
3	1011.24	997.75	1033.89	1037.45	1034.48	1035.89	1034.93	1039.62	1044.79	1045.00	1021.42	1001.48
4	1008.79	995.53	1034.42	1037.14	1034.45	1035.86	1035.03	1042.01	1044.72	1045.18	1021.84	999.76
5	1009.14	996.13	1033.93	1037.08	1034.47	1034.75	1035.25	1042.41	1044.80	1044.94	1020.27	1000.24
6	1007.82	996.66	1034.02	1037.67	1034.42	1034.73	1034.54	1043.26	1044.61	1044.77	1019.16	998.09
7	1008.46	996.42	1034.59	1035.08	1034.42	1034.99	1035.06	1043.61	1044.17	1044.52	1019.57	998.53
8	1006.81	995.52	1034.83	1034.49	1032.98	1034.97	1035.82	1043.70	1044.17	1043.96	1018.20	996.54
9	1007.23	993.37	1036.50	1035.55	1033.93	1035.28	1035.94	1043.71	1044.89	1043.75	1018.62	995.80
10	1005.57	993.86	1035.68	1035.87	1034.19	1034.97	1035.92	1043.55	1044.78	1044.32	1017.33	996.37
11	1005.18	994.31	1035.87	1036.23	1034.11	1034.97	1034.74	1043.21	1044.73	1043.15	1016.22	996.85
12	1005.57	991.22	1034.78	1035.92	1034.10	1034.98	1034.52	1043.03	1044.83	1042.21	1016.63	995.62
13	1006.00	991.73	1035.11	1035.82	1034.07	1035.39	1034.76	1043.17	1043.95	1041.42	1015.19	996.04
14	1006.53	992.21	1034.83	1034.83	1034.21	1035.15	1034.82	1043.13	1044.66	1041.94	1015.58	995.31
15	1007.46	990.09	1034.93	1034.57	1034.26	1034.97	1034.91	1043.16	1043.95	1041.17	1013.67	995.76
16	1008.32	990.73	1035.13	1034.06	1034.24	1035.18	1035.07	1043.44	1044.66	1040.34	1012.59	995.31
17	1008.88	988.76	1035.00	1034.32	1034.25	1034.60	1034.94	1043.52	1044.03	1040.83	1012.96	995.74
18	1006.87	989.59	1034.35	1035.08	1034.35	1034.57	1034.94	1043.77	1043.86	1038.46	1011.11	995.27
19	1003.19	988.02	1034.97	1035.08	1034.45	1034.42	1034.75	1043.99	1044.81	1038.94	1011.47	995.69
20	1002.29	988.70	1034.81	1035.20	1034.92	1034.50	1034.78	1044.30	1045.04	1036.38	1009.52	995.29
21	1001.35	990.08	1034.97	1034.76	1034.79	1034.27	1034.76	1044.26	1044.80	1035.07	1009.91	995.69
22	1000.12	989.10	1034.69	1034.56	1034.82	1034.70	1034.75	1044.77	1044.87	1034.10	1008.78	995.29
23	1000.62	990.11	1034.66	1034.67	1038.07	1035.05	1034.82	1044.35	1044.95	1032.96	1009.20	995.69
24	999.72	988.05	1034.54	1034.79	1039.49	1034.89	1034.77	1043.77	1044.91	1031.79	1009.60	996.05
25	998.79	988.75	1034.64	1034.70	1035.51	1035.29	1034.86	1043.33	1045.09	1030.59	1009.96	996.44
26	999.22	987.22	1034.68	1034.73	1035.95	1035.29	1034.78	1044.08	1044.87	1029.64	1007.66	996.72
27	999.68	988.03	1034.48	1034.74	1035.93	1035.08	1034.67	1043.65	1045.01	1028.66	1005.04	996.64
28	1000.11	988.85	1034.02	1035.05	1035.83	1035.12	1034.69	1044.37	1044.92	1027.37	1005.43	995.20
29	997.78	988.13	1033.53	1034.91	---	1034.97	1034.81	1044.60	1044.95	1027.80	1003.18	995.68
30	998.21	991.81	1034.66	1034.78	---	1035.22	1036.66	1044.77	1044.80	1025.66	1003.53	995.30
31	998.71	---	1034.34	1034.57	---	1034.77	---	1044.67	---	1024.64	1001.61	---
MAX	1013.18	997.75	1036.50	1039.23	1039.49	1035.93	1036.66	1044.77	1045.09	1045.18	1023.11	1001.99
MIN	997.78	987.22	1017.08	1034.06	1032.98	1034.27	1034.52	1038.10	1043.86	1024.64	1001.61	995.20
(+)	14640	12820	26300	26390	26870	26460	27190	30430	30480	22770	15460	13720
(+)	-4190	-1820	+13480	+90	+480	-410	+730	+3240	+50	-7710	-7310	-1740

CAL YR 1993 MAX --- MIN --- AC-FT† -230  
WTR YR 1994 MAX 1045.18 MIN 987.22 AC-FT† -5110

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

## SANDY RIVER BASIN

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14139700 CEDAR CREEK NEAR BRIGHTWOOD, OR

LOCATION.--Lat 45°27'30", long 122°01'50", in NE 1/4 sec.26, T.1 S., R.6 E., Clackamas County, Hydrologic Unit 17080001, in Mount Hood National Forest, on right bank 5.8 mi north of Brightwood and at mile 2.5.

DRAINAGE AREA.--7.93 mi<sup>2</sup>.

PERIOD OF RECORD.--July to November 1964, June 1965 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,960 ft above sea level, from topographic map.

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

AVERAGE DISCHARGE.--29 years, 65.2 ft<sup>3</sup>/s, 111.70 in/yr, 47,230 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,990 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 7.20 ft, from rating curve extended above 320 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; minimum discharge, 4.7 ft<sup>3</sup>/s Oct. 28, 29, 1987.

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

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 1	1630	508	3.64	Feb. 23	2130	*791	*4.07
Jan. 2	2030	579	3.76				

Minimum discharge, 6.2 ft<sup>3</sup>/s Sept. 24-29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.6	7.8	370	233	22	152	86	33	37	23	10	7.4
2	7.6	7.5	198	312	21	175	69	31	31	31	10	7.2
3	7.5	25	153	353	20	179	66	30	28	24	10	21
4	7.3	13	200	266	19	154	63	66	35	22	10	14
5	7.3	11	110	305	19	105	54	46	33	22	10	9.7
6	8.3	9.6	71	199	18	76	111	39	59	21	9.8	8.7
7	18	9.1	159	115	18	60	130	35	107	20	9.9	8.2
8	11	8.7	214	116	18	50	202	32	78	19	10	8.7
9	8.9	8.4	217	208	22	44	176	30	57	18	9.8	10
10	8.3	8.2	198	175	21	63	151	28	46	17	9.5	10
11	8.0	7.9	159	274	20	57	102	26	39	16	9.4	9.0
12	8.1	7.9	110	187	19	48	99	25	35	16	9.3	8.3
13	8.4	7.9	77	156	23	46	79	24	76	15	9.2	7.9
14	9.5	7.6	65	102	25	46	66	23	157	15	9.1	7.9
15	15	8.9	53	80	28	45	55	23	153	15	9.1	7.6
16	18	11	43	63	32	52	51	27	91	14	9.0	7.5
17	12	13	36	51	43	64	47	25	68	14	8.8	7.2
18	10	17	33	43	51	97	44	25	77	14	8.7	7.2
19	9.4	14	30	38	42	74	42	26	54	13	8.7	6.9
20	8.9	11	27	34	40	68	37	39	45	13	8.7	6.9
21	8.6	25	25	31	39	98	36	35	39	13	8.7	6.8
22	8.3	24	23	32	36	66	33	29	35	12	9.7	6.6
23	8.4	16	21	45	382	55	32	27	32	12	9.3	6.6
24	11	e11	20	39	428	51	47	25	29	12	8.6	6.5
25	9.1	e11	19	34	241	48	37	24	28	11	8.5	6.5
26	8.4	12	19	31	179	48	33	23	41	11	8.3	6.2
27	7.9	12	18	28	204	54	31	22	30	11	7.8	6.2
28	7.9	15	17	26	192	63	29	23	26	11	7.7	6.2
29	7.6	28	16	25	---	64	28	48	24	11	7.7	7.9
30	7.5	96	25	24	---	65	40	41	23	11	7.6	7.8
31	8.1	---	85	22	---	102	---	33	---	10	7.5	---
TOTAL	291.9	464.5	2811	3647	2222	2369	2076	963	1613	487	280.4	248.6
MEAN	9.42	15.5	90.7	118	79.4	76.4	69.2	31.1	53.8	15.7	9.05	8.29
MAX	18	96	370	353	428	179	202	66	157	31	10	21
MIN	7.3	7.5	16	22	18	44	28	22	23	10	7.5	6.2
AC-FT	579	921	5580	7230	4410	4700	4120	1910	3200	966	556	493
CFSM	1.19	1.95	11.4	14.8	10.0	9.64	8.73	3.92	6.78	1.98	1.14	1.04
IN.	1.37	2.18	13.19	17.11	10.42	11.11	9.74	4.52	7.57	2.28	1.32	1.17

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1966 - 1994, BY WATER YEAR (WY)

	36.3	91.6	108	114	96.1	84.3	85.9	64.6	44.0	22.0	15.9	22.1
MEAN	36.3	91.6	108	114	96.1	84.3	85.9	64.6	44.0	22.0	15.9	22.1
MAX	86.5	166	232	218	196	181	130	136	115	53.9	38.1	51.4
(WY)	1968	1978	1978	1975	1982	1972	1974	1969	1981	1983	1968	1977
MIN	5.43	15.5	29.4	31.8	29.8	22.6	46.5	30.6	12.8	10.9	8.68	7.86
(WY)	1988	1994	1977	1981	1993	1992	1967	1992	1992	1992	1970	1987

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1966 - 1994
ANNUAL TOTAL	19253.9	17473.4	
ANNUAL MEAN	52.8	47.9	65.2
HIGHEST ANNUAL MEAN			105
LOWEST ANNUAL MEAN			41.8
HIGHEST DAILY MEAN	398	Mar 18	1020
LOWEST DAILY MEAN	7.3	Oct 4	4.8
ANNUAL SEVEN-DAY MINIMUM	7.5	Sep 29	4.9
ANNUAL RUNOFF (AC-FT)	38190		47230
ANNUAL RUNOFF (CFSM)	6.65		8.22
ANNUAL RUNOFF (INCHES)	90.32		111.70
10 PERCENT EXCEEDS	135		139
50 PERCENT EXCEEDS	30		40
90 PERCENT EXCEEDS	8.7		12

e Estimated

## SANDY RIVER BASIN

14139800 SOUTH FORK BULL RUN RIVER NEAR BULL RUN, OR

LOCATION.--Lat 45°26'38", long 122°06'20", in NE 1/4 NE 1/4 sec.31, T.1 S., R.6 E., Clackamas County, Hydrologic Unit 17080001, in Mount Hood National Forest, on right bank 6.2 mi northeast of Bull Run, and at mile 0.6.

DRAINAGE AREA.--15.4 mi<sup>2</sup>

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1974 to current year.

REVISED RECORDS.--WDR OR-91-1: 1989.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 990 ft above sea level, from topographic map.

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

AVERAGE DISCHARGE.--20 years, 107 ft<sup>3</sup>/s, 94.25 in/yr, 77,390 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,480 ft<sup>3</sup>/s Jan. 9, 1989, gage height, 8.85 ft, from rating curve extended above 1,200 ft<sup>3</sup>/s; minimum discharge, 6.0 ft<sup>3</sup>/s Sept. 28, 1994.

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

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 23	2130	*1,370	*6.57				

Minimum discharge, 6.0 ft<sup>3</sup>/s Sept. 28.DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	12	532	307	41	257	176	61	63	41	15	8.2
2	18	11	329	483	39	264	143	58	54	53	15	8.0
3	17	37	249	622	37	270	129	57	50	43	15	25
4	17	21	311	421	36	243	123	101	58	39	14	19
5	17	17	215	492	35	188	107	84	56	40	15	12
6	20	15	148	351	34	146	178	75	87	38	14	9.6
7	37	14	227	236	33	115	225	68	158	35	14	8.9
8	23	14	322	216	31	96	312	62	144	33	14	9.5
9	19	13	334	313	38	86	293	56	111	32	14	12
10	18	13	309	286	36	104	258	51	90	31	13	12
11	17	13	269	423	34	102	200	47	77	29	13	9.9
12	16	12	208	309	33	90	182	44	67	28	12	8.9
13	16	12	156	284	38	85	152	42	112	27	12	8.2
14	18	12	129	212	44	84	129	39	201	26	12	7.9
15	22	13	105	166	48	82	108	39	251	25	12	7.8
16	26	16	88	130	56	90	97	44	174	25	11	7.5
17	31	18	75	106	71	101	89	41	133	24	11	7.3
18	21	25	66	91	95	144	83	40	142	23	11	7.1
19	17	22	59	79	86	126	80	41	109	22	11	7.0
20	15	18	53	70	82	116	71	61	92	22	10	6.9
21	14	32	48	63	80	169	68	59	80	21	10	6.8
22	13	43	45	63	74	130	61	51	71	20	11	6.7
23	13	28	41	80	628	109	57	47	63	20	11	6.6
24	16	23	39	73	905	98	81	44	57	19	9.9	6.5
25	13	21	37	66	457	91	70	42	52	19	9.6	6.5
26	12	20	35	60	319	87	64	40	69	18	9.3	6.4
27	12	21	33	55	339	92	59	38	54	18	8.8	6.2
28	12	24	32	52	317	103	55	38	48	17	8.7	6.2
29	11	38	31	48	---	110	52	68	45	17	8.8	8.1
30	11	122	34	46	---	e115	71	66	42	17	8.4	8.5
31	12	---	115	43	---	e195	---	54	---	16	8.3	---
TOTAL	542	700	4674	6246	4066	4088	3773	1658	2810	838	361.8	271.2
MEAN	17.5	23.3	151	201	145	132	126	53.5	93.7	27.0	11.7	9.04
MAX	37	122	532	622	905	270	312	101	251	53	15	25
MIN	11	11	31	43	31	82	52	38	42	16	8.3	6.2
AC-FT	1080	1390	9270	12390	8060	8110	7480	3290	5570	1660	718	538
CFSM	1.14	1.52	9.79	13.1	9.43	8.56	8.17	3.47	6.08	1.76	.76	.59
IN.	1.31	1.69	11.29	15.09	9.82	9.87	9.11	4.01	6.79	2.02	.87	.66

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 1994, BY WATER YEAR (WY)

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
MEAN	51.5	156	182	175	170	143	146	99.9	73.5	33.2	22.9	32.9								
MAX	136	253	379	315	302	235	215	162	180	91.2	53.2	93.4								
(WY)	1976	1989	1978	1975	1982	1989	1976	1977	1981	1983	1978	1977								
MIN	8.31	23.3	50.4	58.3	54.7	53.8	89.6	47.1	15.4	14.8	11.7	9.04								
(WY)	1988	1994	1977	1979	1977	1992	1983	1992	1992	1992	1994	1994								

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1975 - 1994

	1993	1994	1975-1994
ANNUAL TOTAL	34369	30028.0	
ANNUAL MEAN	94.2	82.3	107
HIGHEST ANNUAL MEAN			150
LOWEST ANNUAL MEAN			75.4
HIGHEST DAILY MEAN	714	905	1610
LOWEST DAILY MEAN	11	6.2	6.2
ANNUAL SEVEN-DAY MINIMUM	12	6.4	6.4
ANNUAL RUNOFF (AC-FT)	68170	59560	77390
ANNUAL RUNOFF (CFSM)	6.11	5.34	6.94
ANNUAL RUNOFF (INCHES)	83.02	72.54	94.25
10 PERCENT EXCEEDS	223	220	224
50 PERCENT EXCEEDS	59	43	71
90 PERCENT EXCEEDS	18	11	16

e Estimated

## SANDY RIVER BASIN

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14139800 SOUTH FORK BULL RUN RIVER NEAR BULL RUN, OR--Continued

## WATER-QUALITY RECORDS

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1978 to current year.

pH: November 1980 to September 1981, June 1990 to September 1992.

WATER TEMPERATURE: October 1978 to current year.

TURBIDITY: June 1990 to September 1994 (discontinued).

SUSPENDED SEDIMENT DISCHARGE: October 1978 to September 1986.

INSTRUMENTATION.--Water-quality monitor, turbidimeter with data recording interval dependent upon river stage.

REMARKS.--Turbidity values herein are recorded values and may not reflect extremes for the day. Turbidity data prior to October 1990 are available in the files of the Portland field office.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum recorded, 56 microsiemens Oct. 31, 1988; minimum, 9 microsiemens Jan. 4, 1983.

pH: Maximum recorded, 8.0 units Aug. 17, Oct. 2, 1990, but may have been higher in water year 1990, 1992 during period of missing record; minimum recorded, 6.4 units Dec. 6, 1991, but may have been lower during period of missing record.

WATER TEMPERATURE: Maximum, 18.0°C June 23, 24, July 18, 19, 1992; minimum, 0.0°C on many days during winter periods.

TURBIDITY: Maximum recorded, 16 NTU Oct. 16, 1993; minimum recorded, 0.08 NTU Sept. 2, 1994.

SEDIMENT CONCENTRATION: Maximum daily, 212 mg/L Nov. 7, 1985; minimum, 0 mg/L on many days.

SEDIMENT DISCHARGE: Maximum daily, 794 tons Nov. 7, 1985; minimum, 0 tons on many days.

## EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum, 45 microsiemens Sept. 28, 29; minimum, 12 microsiemens Jan. 2.

WATER TEMPERATURE: Maximum, 17.0°C July 21-23; minimum, 0.0°C Nov. 24-26.

TURBIDITY: Maximum recorded, 16 NTU Oct. 16; minimum recorded, 0.08 NTU Sept. 2.

## SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER				NOVEMBER			DECEMBER			JANUARY		
1	38	38	38	37	35	37	21	14	17	20	16	18
2	39	38	38	37	35	37	17	14	16	18	12	16
3	39	38	38	37	31	33	17	16	17	18	14	17
4	39	38	38	32	31	32	17	16	17	18	17	18
5	39	38	38	33	32	33	18	17	17	18	17	17
6	39	38	38	33	32	33	19	17	18	19	17	19
7	38	35	36	33	33	33	19	16	18	20	19	20
8	37	36	36	33	33	33	17	16	16	20	20	20
9	37	37	37	34	33	33	17	16	16	20	18	19
10	38	37	37	34	33	34	17	16	16	19	18	19
11	38	37	38	34	33	34	17	16	17	20	16	17
12	38	37	38	34	34	34	18	17	17	18	17	18
13	38	37	38	34	34	34	19	17	18	19	18	18
14	39	37	38	34	33	34	19	18	19	21	19	20
15	38	35	37	34	33	34	20	19	19	21	20	21
16	38	34	36	34	33	33	20	19	20	22	21	22
17	34	33	34	34	32	33	20	20	20	23	21	22
18	34	33	34	32	30	32	21	20	20	23	22	23
19	35	34	35	31	30	31	21	20	21	24	23	24
20	36	35	35	31	30	31	21	21	21	25	24	24
21	36	35	36	31	27	30	22	21	21	26	24	25
22	36	35	36	27	26	27	22	21	22	26	25	26
23	37	36	36	27	27	27	22	22	22	26	24	25
24	36	35	35	28	27	28	23	22	23	25	24	24
25	36	35	35	28	27	28	23	22	23	25	24	24
26	36	35	35	29	28	28	23	23	23	25	24	25
27	36	35	36	29	28	29	23	23	23	26	25	25
28	36	36	36	29	28	28	24	23	24	26	25	26
29	36	36	36	28	26	28	24	24	24	26	25	26
30	37	36	36	26	21	25	26	23	25	27	26	26
31	38	36	37	---	---	---	24	20	21	27	26	27
MONTH	39	33	36	37	21	32	26	14	20	27	12	22



## SANDY RIVER BASIN

14139800 SOUTH FORK BULL RUN RIVER NEAR BULL RUN, OR--Continued

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

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

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE			JULY			AUGUST			SEPTEMBER			
1	28	26	27	31	30	30	41	39	40	43	42	42
2	33	27	30	30	28	29	42	39	41	43	42	42
3	35	28	30	31	29	30	42	39	41	43	38	41
4	35	30	31	32	30	31	42	40	41	39	38	38
5	32	29	31	32	30	31	42	40	41	41	39	40
6	34	27	29	33	31	32	42	40	41	42	40	41
7	28	21	24	34	32	33	42	40	41	42	41	42
8	31	21	25	35	32	33	42	40	41	42	41	41
9	32	24	26	35	32	33	42	40	41	41	40	41
10	32	25	29	34	32	33	42	41	42	41	40	41
11	32	28	30	36	33	34	44	41	42	41	40	41
12	33	27	30	36	33	34	43	41	42	42	40	41
13	33	25	28	36	33	35	43	41	42	43	40	42
14	31	19	24	36	34	35	43	41	42	43	41	43
15	28	19	23	37	34	35	43	41	42	44	42	43
16	27	21	24	39	36	37	43	41	42	44	42	43
17	31	24	26	39	36	37	43	41	42	44	42	43
18	28	23	26	40	37	38	43	41	42	44	43	44
19	33	23	26	39	38	38	44	41	43	44	43	44
20	31	26	27	40	38	39	44	41	43	44	43	44
21	35	27	30	41	39	40	44	41	43	44	43	44
22	36	27	30	42	38	41	44	41	43	44	43	44
23	34	28	30	43	39	41	43	41	42	44	43	44
24	34	28	30	43	39	41	43	42	42	44	43	44
25	40	27	29	42	39	41	43	41	42	44	43	44
26	28	26	27	42	40	41	44	42	43	44	43	44
27	29	27	28	42	39	41	44	42	43	44	43	44
28	30	28	29	41	39	40	44	42	43	45	43	44
29	30	28	29	41	39	40	44	42	43	45	43	44
30	31	29	30	41	39	40	44	42	43	44	43	44
31	---	---	---	41	39	40	44	42	43	---	---	---
MONTH	40	19	28	43	28	36	44	39	42	45	38	43

## SANDY RIVER BASIN

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14139800 SOUTH FORK BULL RUN RIVER NEAR BULL RUN, OR--Continued  
 TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	10.5	10.0	10.0	7.5	6.5	7.0	5.5	2.5	4.0	4.0	3.5	4.0
2	10.5	9.5	10.0	7.0	6.0	6.5	4.5	3.0	4.5	6.0	4.0	4.5
3	10.5	9.5	10.0	7.0	6.0	7.0	5.0	4.0	4.5	6.5	5.5	6.0
4	10.5	9.5	10.0	7.0	6.0	6.5	5.0	3.5	4.0	6.5	5.5	6.5
5	10.5	10.0	10.5	6.0	5.0	5.5	4.0	3.0	3.5	6.0	5.0	5.5
6	10.5	10.0	10.5	5.5	4.5	5.0	3.5	3.0	3.5	5.5	5.0	5.5
7	10.5	9.5	10.0	4.5	3.5	4.0	4.0	3.5	4.0	5.5	5.0	5.0
8	9.5	9.0	9.5	4.0	3.5	3.5	4.5	4.0	4.0	6.0	5.5	5.5
9	9.5	9.0	9.0	4.5	3.5	4.0	4.5	4.0	4.5	6.0	5.5	5.5
10	10.0	8.5	9.5	4.0	3.5	4.0	5.5	4.5	5.0	6.0	5.0	5.5
11	10.0	9.0	9.5	4.0	3.5	4.0	5.5	4.5	5.0	6.0	5.5	6.0
12	10.5	9.5	10.0	4.5	4.0	4.5	4.5	4.0	4.5	6.5	6.0	6.0
13	10.0	9.5	10.0	5.0	4.0	4.5	5.0	4.5	4.5	6.5	6.0	6.5
14	10.0	9.5	10.0	4.5	3.5	4.0	5.0	4.5	5.0	6.0	5.5	5.5
15	10.5	9.5	10.0	4.0	3.0	3.5	5.0	4.0	4.5	6.0	5.5	6.0
16	10.5	9.5	10.0	4.0	3.5	4.0	4.0	3.0	3.5	5.5	5.0	5.5
17	10.0	9.0	9.5	4.5	4.0	4.0	3.0	2.0	2.5	5.0	4.0	4.5
18	9.0	8.5	9.0	4.5	4.0	4.0	2.5	2.0	2.0	4.5	4.0	4.0
19	9.0	8.5	9.0	4.0	3.0	3.5	2.0	1.5	2.0	4.0	3.5	4.0
20	9.0	8.5	9.0	3.5	3.0	3.0	2.0	1.5	2.0	4.5	3.5	4.0
21	9.0	8.0	8.5	3.5	2.5	3.0	1.5	1.5	1.5	5.5	4.0	5.0
22	8.5	8.0	8.5	3.0	2.5	3.0	1.5	1.0	1.5	6.0	5.5	6.0
23	8.5	7.5	8.5	2.5	1.0	2.0	1.0	.5	1.0	6.5	5.5	6.0
24	8.5	8.0	8.5	1.0	.0	.5	1.0	1.0	1.0	6.0	4.5	5.5
25	8.0	7.0	7.5	.5	.0	.5	1.5	1.0	1.5	5.0	3.5	4.0
26	7.5	7.0	7.5	1.0	.0	.5	2.0	1.5	1.5	3.5	3.0	3.5
27	7.5	7.0	7.5	2.0	.5	1.5	1.5	1.5	1.5	3.5	3.0	3.0
28	8.5	7.0	8.0	2.5	1.5	2.0	2.0	1.5	1.5	3.0	2.5	3.0
29	8.0	7.5	7.5	3.5	2.0	3.0	2.5	1.5	2.0	3.0	2.5	2.5
30	7.5	7.0	7.5	4.0	3.0	3.5	3.0	2.0	2.5	3.0	2.5	2.5
31	8.0	7.0	7.5	---	---	---	3.5	3.0	3.5	2.5	2.0	2.5
MONTH	10.5	7.0	9.0	7.5	.0	3.5	5.5	.5	3.0	6.5	2.0	5.0

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



## SANDY RIVER BASIN

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14139800 SOUTH FORK BULL RUN RIVER NEAR BULL RUN, OR--Continued

TURBIDITY (NTU), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	.54	.54	.15	.15	---	---	---	---	.24	.23	.79	.65
2	.32	.32	---	---	---	---	---	---	.24	.23	1.3	.72
3	---	---	---	---	---	---	---	---	.24	.23	.81	.64
4	---	---	.59	.45	---	---	---	---	.24	.23	.81	.59
5	---	---	.59	.30	---	---	---	---	.38	.23	.66	.52
6	---	---	.44	.30	---	---	---	---	.24	.23	.52	.51
7	---	---	.44	.37	---	---	---	---	.24	.23	.51	.44
8	---	---	.51	.30	---	---	---	---	---	---	.45	.37
9	---	---	.59	.37	---	---	---	---	---	---	.45	.37
10	---	---	.37	.30	---	---	---	---	---	---	.74	.38
11	---	---	.44	.31	---	---	---	---	---	---	.45	.37
12	---	---	.81	.30	---	---	---	---	---	---	.38	.30
13	---	---	.38	.23	---	---	---	---	---	---	.38	.37
14	.85	.85	.30	.23	---	---	1.9	.30	.44	.31	.38	.31
15	1.1	1.1	1.7	.30	---	---	.59	.59	.51	.30	.38	.31
16	16	3.7	.44	.30	---	---	---	---	.37	.30	.45	.37
17	---	---	1.0	.30	---	---	---	---	1.1	.30	.52	.37
18	---	---	1.1	.37	---	---	---	---	.73	.37	1.7	.45
19	---	---	.51	.51	---	---	.45	.37	.37	.37	.52	.37
20	---	---	---	---	.73	.73	.38	.37	.37	.30	.74	.38
21	---	---	---	---	---	---	.38	.38	.30	.30	1.3	.37
22	---	---	---	---	---	---	.46	.38	.30	.30	.37	.30
23	---	---	---	---	---	---	.53	.45	14	1.2	---	---
24	---	---	---	---	---	---	.38	.38	6.3	2.5	---	---
25	---	---	---	---	---	---	.31	.31	2.7	1.4	---	---
26	---	---	---	---	---	---	.31	.31	1.4	1.0	.38	.37
27	---	---	---	---	---	---	.31	.24	1.1	.86	.45	.30
28	---	---	---	---	---	---	.31	.23	.94	.79	.92	.37
29	---	---	---	---	---	---	.24	.23	---	---	1.0	.37
30	---	---	---	---	---	---	.24	.23	---	---	.80	.37
31	---	---	---	---	---	---	.24	.23	---	---	.80	.65
MONTH	---	---	---	---	---	---	---	---	---	---	---	---
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	---	---	---	---	---	---	---	---	.28	.22	.16	.15
2	---	---	---	---	---	---	---	---	.22	.21	.16	.08
3	---	---	---	---	---	---	---	---	.22	.22	3.3	.28
4	---	---	---	---	---	---	---	---	.22	.21	.55	.28
5	---	---	---	---	---	---	---	---	.21	.21	.21	.15
6	---	---	---	---	---	---	---	---	.21	.20	.15	.14
7	---	---	---	---	---	---	---	---	.21	.19	.15	.14
8	---	---	---	---	---	---	---	---	.20	.19	.21	.14
9	---	---	---	---	---	---	---	---	.20	.19	.34	.13
10	---	---	---	---	---	---	---	---	.20	.19	.19	.12
11	---	---	---	---	---	---	---	---	.20	.19	.12	.12
12	---	---	---	---	---	---	---	---	.20	.19	.12	.12
13	---	---	---	---	---	---	---	---	.19	.19	---	---
14	---	---	---	---	---	---	---	---	.19	.19	.25	.17
15	---	---	---	---	---	---	---	---	.19	.19	.18	.17
16	---	---	---	---	---	---	---	---	.19	.12	.32	.17
17	---	---	---	---	---	---	---	---	.19	.12	.25	.17
18	---	---	---	---	---	---	.60	.46	.19	.17	.25	.17
19	---	---	---	---	---	---	.46	.39	.18	.18	.25	.17
20	---	---	---	---	---	---	.39	.32	.18	.18	.25	.17
21	---	---	---	---	---	---	.32	.31	.18	.18	.25	.17
22	---	---	---	---	---	---	.32	.31	.25	.17	.25	.17
23	---	---	---	---	---	---	.31	.31	.18	.17	.25	.17
24	---	---	---	---	---	---	.31	.31	.24	.10	.25	.17
25	---	---	---	---	---	---	.31	.30	.17	.16	.18	.17
26	---	---	---	---	---	---	.31	.30	.17	.10	.25	.17
27	---	---	---	---	---	---	.30	.22	.17	.16	.25	.17
28	---	---	---	---	---	---	.35	.29	.17	.16	.25	.17
29	---	---	---	---	---	---	.30	.23	.17	.16	.31	.25
30	---	---	---	---	---	---	.30	.22	.36	.15	---	---
31	---	---	---	---	---	---	.23	.22	.16	.15	---	---
MONTH	---	---	---	---	---	---	---	---	.36	.10	---	---

## SANDY RIVER BASIN

## 14139900 BULL RUN RESERVOIR NUMBER TWO NEAR BULL RUN, OR

LOCATION.--Lat 45°26'55", long 122°08'45", on line between secs.25 and 26, T.1 S., R.5 E., Clackamas County, Hydrologic Unit 17080001, in Mount Hood National Forest, on headworks dam on Bull Run River, 4.4 mi northeast of Bull Run, and at mile 6.5.

DRAINAGE AREA.--102 mi<sup>2</sup>.

PERIOD OF RECORD.--December 1961 to current year. Prior to October 1975, monthend contents only.

GAGE.--Water-stage recorder. Datum of gage is sea level (levels by Portland Water Bureau). Prior to Dec. 31, 1975, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by earth and rockfill dam with concrete spillway built by Portland Water Bureau. Storage began about Dec. 20, 1961; first filling occurred Dec. 24, 1961. Capacity, 20,990 acre-ft at crest of spillway, elevation, 860.0 ft. Dead storage negligible. Water is used as municipal supply for city of Portland and for power generation by Portland General Electric Co.

COOPERATION.--Capacity table furnished by Portland Water Bureau.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 23,660 acre-ft Dec. 22, 1964, elevation, 866.00 ft; no contents at times during low-flow periods.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 21,790 acre-ft Jan. 3, Feb. 24, elevation, 861.79 ft; minimum contents, 16,090 acre-ft Sept. 30, elevation, 848.02 ft.

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

752	0	830	10,000
770	234	850	16,800
790	1,860	870	25,500
810	5,070		

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	858.76	858.81	859.15	860.49	859.12	860.01	859.47	859.18	859.49	860.00	858.20	857.80
2	859.69	858.11	858.54	861.76	858.86	860.52	858.92	858.78	859.65	859.94	858.90	858.20
3	858.78	857.64	858.02	861.22	858.68	860.26	859.23	859.40	859.33	859.95	858.70	857.70
4	859.76	858.83	858.81	861.02	858.65	859.83	858.82	859.03	859.47	859.80	857.90	858.70
5	858.97	858.29	859.19	861.08	858.48	859.52	858.82	859.58	859.41	859.95	858.50	858.00
6	859.57	857.66	859.56	859.67	858.40	859.18	859.62	859.38	860.15	859.97	858.80	858.60
7	859.05	857.43	858.56	859.73	858.24	859.16	858.94	859.36	859.30	859.86	858.00	857.80
8	859.82	857.63	859.54	858.81	859.31	859.13	859.90	859.39	859.92	859.95	858.80	858.60
9	859.11	858.57	860.32	860.35	858.94	859.22	860.26	859.33	859.73	859.75	858.20	---
10	859.69	858.04	860.51	860.21	858.62	859.32	859.83	859.34	859.64	858.66	858.50	---
11	859.46	857.43	859.91	860.81	858.59	858.87	859.01	859.48	859.85	859.17	858.70	---
12	858.83	858.78	858.80	860.47	858.45	859.34	859.43	859.59	859.76	859.41	858.00	---
13	858.17	858.15	858.31	860.02	858.57	859.25	859.30	859.54	858.85	859.56	858.60	---
14	857.53	857.56	859.13	859.40	858.48	858.84	859.16	859.59	859.35	858.42	857.70	---
15	856.93	858.37	859.43	859.31	858.65	859.12	859.24	859.62	859.77	858.45	858.50	856.60
16	856.37	857.74	859.74	859.38	858.74	858.94	859.30	859.50	859.79	858.62	858.80	856.40
17	855.75	858.58	859.67	859.59	859.06	859.42	859.23	859.57	859.74	857.40	858.00	855.50
18	856.78	858.00	859.88	859.04	859.24	858.74	859.28	859.56	859.61	858.64	858.80	855.20
19	858.97	858.71	859.42	859.25	859.06	859.27	859.30	859.58	859.85	857.34	858.00	854.40
20	859.17	858.20	859.63	858.94	858.72	859.42	859.37	859.67	859.65	858.67	858.70	854.10
21	859.35	857.80	859.42	858.91	858.87	859.43	859.02	859.83	859.84	858.85	858.00	853.48
22	859.80	858.76	859.50	858.79	858.86	859.51	859.21	859.19	859.85	858.67	858.60	852.89
23	859.24	858.09	859.34	858.85	861.54	859.04	859.20	859.18	859.80	858.64	858.00	851.87
24	859.50	858.87	859.17	858.73	861.22	859.34	859.19	859.46	859.92	858.62	857.20	850.89
25	859.73	858.30	858.78	859.03	860.63	859.27	859.17	859.80	859.83	858.90	856.40	850.02
26	859.17	858.86	858.37	859.27	860.14	859.17	859.11	859.08	859.81	858.91	857.40	849.20
27	858.56	858.39	858.23	859.40	860.44	859.44	859.40	859.56	859.95	858.74	858.60	848.62
28	857.93	857.89	858.51	859.23	860.41	859.20	859.47	859.03	859.99	858.92	857.90	848.97
29	858.93	858.55	858.93	859.37	---	859.44	859.79	859.70	859.93	857.79	858.80	848.32
30	858.28	859.18	858.56	859.34	---	859.16	859.54	859.82	859.96	858.62	858.00	848.32
31	857.64	---	859.41	859.36	---	858.88	---	859.81	---	858.58	858.75	---
MAX	859.82	859.18	860.51	861.76	861.54	860.52	860.26	859.83	860.15	860.00	858.90	---
MIN	855.75	857.43	858.02	858.73	858.24	858.74	858.82	858.78	858.85	857.34	856.40	---
(†)	19960	20640	20740	20720	21180	20510	20800	20920	20980	20380	20450	16200
(‡)	-870	+680	+100	-20	+460	-670	+290	+120	+60	-600	+70	-4250

CAL YR 1993 MAX --- MIN --- AC-FT† +90  
WTR YR 1994 MAX --- MIN --- AC-FT‡ -4630

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



## SANDY RIVER BASIN

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## 14140001 BULL RUN RIVER NEAR BULL RUN, OR

LOCATION.--Lat 45°26'15", long 122°10'40", in NE 1/4 SW 1/4 sec.34, T.1 S., R.5 E., Clackamas County, Hydrologic Unit 17080001, in Mount Hood National Forest, on left bank 1.8 mi downstream from Bull Run Reservoir Number Two, 2.7 mi northeast of Bull Run, and at mile 4.7.

DRAINAGE AREA.--107 mi<sup>2</sup>.

PERIOD OF RECORD.--September 1907 to current year. Records for January 1895 to August 1907, published in WSP 370, have been found to be unreliable and should not be used.

REVISED RECORDS.--WSP 1288: 1910-11, 1913, 1920-23, 1926, 1929. WSP 1318: 1919(M). WSP 1568: 1952. See also PERIOD OF RECORD.

GAGE.--Water-stage recorder. Datum of gage is 567.90 ft above sea level (levels by Portland Water Bureau). Prior to July 27, 1909, nonrecording gage at site 1.5 mi upstream at different datum. July 27, 1909, to Sept. 30, 1959, water-stage recorder at site 2.5 mi upstream at different datums.

REMARKS.--No estimated daily discharges. Records good except those below 10 ft<sup>3</sup>/s, which are fair. Flow regulated since 1915 by Bull Run Lake capacity, 12,270 acre-ft, since 1929 by Bull Run Reservoir Number One (station 14139000), since 1958 by North Fork Reservoir, capacity, 1,030 acre-ft, and since 1961 by Bull Run Reservoir Number Two (station 14139900). All records given herein include flow diverted from Bull Run Reservoir Number Two for city of Portland, and that used by Portland General Electric Co. for power generation, which returns to Bull Run River downstream from station. Total diversion, 178,200 acre-ft of which 50,500 acre-ft were used for power generation and returned to Bull Run River.

COOPERATION.--Records of daily diversion furnished by Portland Water Bureau.

AVERAGE DISCHARGE.--87 years, 771 ft<sup>3</sup>/s, 97.85 in/yr, 558,600 acre-ft/yr, adjusted for storage in Bull Run Reservoir Number One since 1929 and Bull Run Reservoir Number Two since 1961.

EXTREMES FOR PERIOD OF RECORD.--River only, maximum discharge, 24,800 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 17.21 ft, from rating curve extended above 8,800 ft<sup>3</sup>/s on basis of computation of peak flow over dam; minimum discharge, 1.1 ft<sup>3</sup>/s Oct. 4, 1974.

Combined flow, maximum discharge, 25,100 ft<sup>3</sup>/s Dec. 22, 1964; minimum daily, 11 ft<sup>3</sup>/s Nov. 16, 1987.

EXTREMES FOR CURRENT YEAR.--River only, maximum discharge, 5,400 ft<sup>3</sup>/s Feb. 24, gage height, 10.07 ft; minimum discharge, 2.9 ft<sup>3</sup>/s Sept. 27-29.

Combined flow, maximum discharge, 5,680 ft<sup>3</sup>/s Feb. 24; minimum daily, 116 ft<sup>3</sup>/s Sept. 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	215	169	640	1890	318	1980	1080	179	308	244	328	201
2	229	178	633	2610	323	1940	896	193	297	245	259	205
3	228	187	453	4850	275	2140	799	192	298	246	213	173
4	231	147	1740	3330	236	1900	841	226	300	229	222	131
5	202	155	1210	3530	233	1590	678	324	294	237	204	171
6	167	166	745	2620	236	1080	1060	331	300	256	219	239
7	169	167	1450	1980	239	763	1430	346	1130	285	198	189
8	172	165	1810	1780	216	649	1870	359	553	294	133	156
9	183	150	1920	1810	182	496	2010	363	450	270	164	157
10	186	139	2170	2010	235	745	1990	360	458	298	238	156
11	194	154	1960	2790	232	773	1750	342	374	297	203	147
12	163	166	1810	2310	233	463	1200	288	338	307	184	135
13	163	168	1090	2050	249	504	1070	252	982	275	188	146
14	178	151	722	1730	268	719	900	244	1180	308	209	163
15	174	161	599	1200	262	561	724	246	1520	303	210	167
16	166	182	460	1010	324	673	663	238	805	274	186	183
17	160	169	530	671	387	802	730	222	884	308	178	196
18	160	171	506	617	512	1450	674	188	840	329	190	196
19	156	156	368	526	577	1030	667	190	330	329	207	195
20	165	152	325	541	496	859	565	264	489	340	212	183
21	166	152	325	541	504	1160	631	293	447	342	159	186
22	155	165	314	526	496	786	453	308	365	344	136	231
23	156	200	322	490	1830	755	454	345	358	345	139	225
24	164	186	307	484	4590	595	561	301	304	336	191	209
25	164	176	311	396	3770	521	448	245	295	285	194	189
26	152	168	310	324	2070	589	450	230	444	271	196	183
27	152	145	290	322	2200	588	356	197	258	321	179	195
28	155	144	223	313	2370	739	338	187	288	298	176	182
29	161	148	193	309	---	710	264	192	268	287	186	148
30	162	171	178	312	---	801	176	280	260	286	189	116
31	166	---	561	315	---	1300	---	321	---	290	192	---
TOTAL	5414	4908	24475	44187	23863	29661	25728	8246	15417	9079	6082	5353
MEAN	175	164	790	1425	852	957	858	266	514	293	196	178
MAX	231	200	2170	4850	4590	2140	2010	363	1520	345	328	239
MIN	152	139	178	309	182	463	176	179	258	229	133	116
AC-FT	10740	9740	48550	87640	47330	58830	51030	16360	30580	18010	12060	10620
MEAN†	92	145	1010	1426	869	939	875	321	516	158	78	78
CFSM†	0.86	1.35	9.44	13.33	8.12	8.78	8.18	3.00	4.82	1.47	0.73	0.73
IN.†	1.00	1.51	10.89	15.37	8.46	10.12	9.12	3.46	5.38	1.70	0.84	0.81
AC-FT†	5680	8600	62130	87710	48270	57750	52050	19720	30690	9700	4820	4630

CAL YR 1993 TOTAL 233162 MEAN 639 MAX 5030 MIN 139 AC-FT 462500 MEAN† 639 CFSM† 5.97 IN.† 81.03 AC-FT† 462400  
WTR YR 1994 TOTAL 202413 MEAN 555 MAX 4850 MIN 116 AC-FT 401500 MEAN† 541 CFSM† 5.06 IN.† 68.66 AC-FT† 391800

† Adjusted for change in contents in Bull Run Reservoir Number One and Bull Run Reservoir Number Two.



## SANDY RIVER BASIN

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14142500 SANDY RIVER BELOW BULL RUN RIVER, NEAR BULL RUN, OR

LOCATION.--Lat 45°26'57", long 122°14'38", in SW 1/4 sec.30, T.1 S., R.5 E., Clackamas County, Hydrologic Unit 17080001, on left bank 0.1 mi downstream from Bull Run River, 0.2 mi downstream from Dodge Park, 400 ft below city of Portland water conduit crossing Sandy River, and at mile 18.4.

DRAINAGE AREA.--436 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1910 to September 1914, October 1929 to September 1966, May 1984 to current year.  
Monthly discharge only for some periods, published in WSP 1318.

GAGE.--Water-stage recorder. Elevation of gage is 240 ft above sea level, from topographic map. April 1910 to September 1914, staff gage at present site at different datum. October 1929 to September 1966, water-stage recorder at site 0.8 mi downstream at different datum.

REMARKS.--Records fair. Flow regulated since 1915 by Bull Run Lake, since 1929 by Bull Run Reservoir Number One (station 14139000), and since 1961 by Bull Run Reservoir Number Two (station 14139900). Some fluctuation caused by Bull Run overplant of Portland General Electric Company. Portland Water Bureau diverted 178,200 acre-ft from Bull Run River during the 1994 water year, of which 50,500 acre-ft were used for power generation by Portland General Electric Company and returned to Bull Run River.

AVERAGE DISCHARGE.--51 years (water years 1911-14, 1930-66, 1985-94) 2,270 ft<sup>3</sup>/s, 1,645,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 84,400 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 22.3 ft, site and datum then in use; minimum discharge, 45 ft<sup>3</sup>/s Sept. 26, 1962, minimum daily, 63 ft<sup>3</sup>/s Oct. 12, Nov. 9, 1952.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 15,400 ft<sup>3</sup>/s Feb. 24, gage height, 14.92 ft; minimum discharge, 149 ft<sup>3</sup>/s Oct. 6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

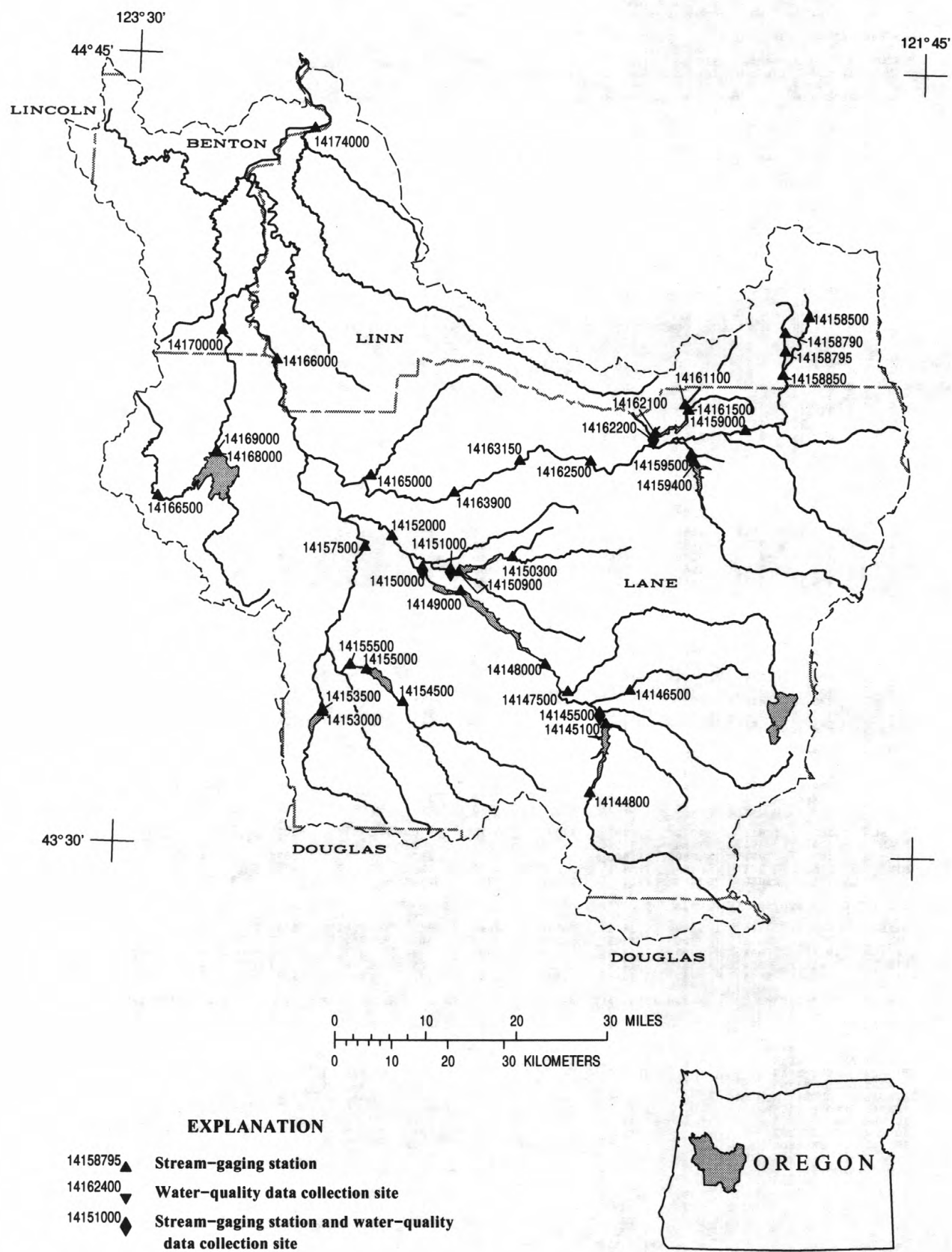
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	281	309	4040	4000	935	5250	3170	1240	1000	713	417	331
2	314	291	3660	5770	896	5200	2680	1160	937	883	419	323
3	318	471	2270	11600	796	5470	2460	1100	934	742	446	416
4	312	467	3680	8320	779	5120	2440	1400	924	696	441	449
5	327	360	2760	9010	755	4180	2110	1560	931	714	434	337
6	298	296	1810	6900	743	3210	2810	1470	1130	745	414	324
7	448	281	2390	4750	734	2480	3660	1440	2390	668	416	320
8	403	325	3600	4190	699	2140	4530	1430	1790	672	412	317
9	322	299	4400	4820	645	1850	4560	1370	1550	641	387	351
10	305	270	4580	5320	711	2080	4670	1290	1300	605	392	341
11	295	261	4420	6740	705	2070	4110	1260	1170	596	374	312
12	311	315	3660	5710	685	1650	e3500	1190	1020	575	391	307
13	326	271	2570	5440	725	1630	e3000	1020	1840	570	397	297
14	324	258	1960	4450	914	1880	2680	956	2980	565	396	263
15	450	273	1610	3550	799	1730	2330	945	3670	561	390	275
16	483	335	1310	3060	892	1850	2220	974	2380	551	373	294
17	350	351	1310	2420	986	1930	2280	955	2140	556	370	298
18	370	352	1180	2140	1370	3030	2280	894	2190	520	362	302
19	309	387	968	1880	1360	2480	2350	945	1480	546	330	290
20	346	301	862	1800	1270	2190	2150	1260	1410	503	335	293
21	294	349	824	1620	1320	e2700	2100	1130	1320	513	334	292
22	281	548	784	1600	1240	e2200	1870	1020	1160	539	350	283
23	275	414	716	1650	4410	e2000	1710	967	1150	519	376	276
24	375	288	717	1680	12900	e1800	2080	908	979	528	346	261
25	288	256	718	1400	9060	1650	1820	849	906	522	341	287
26	294	335	727	1230	5560	1640	1670	790	1150	476	342	248
27	291	358	670	1170	5450	1700	1480	754	883	444	319	262
28	289	404	567	1100	5760	1940	1370	737	785	422	331	297
29	295	419	513	999	---	1990	1300	922	779	419	325	320
30	292	771	466	984	---	2160	1310	1060	741	422	327	319
31	301	---	1260	993	---	3310	---	938	---	419	319	---
TOTAL	10167	10615	61002	116296	63099	80510	76700	33934	43019	17845	11606	9285
MEAN	328	354	1968	3751	2254	2597	2557	1095	1434	576	374	309
MAX	483	771	4580	11600	12900	5470	4670	1560	3670	883	446	449
MIN	275	256	466	984	645	1630	1300	737	741	419	319	248
AC-FT	20170	21050	121000	230700	125200	159700	152100	67310	85330	35400	23020	18420

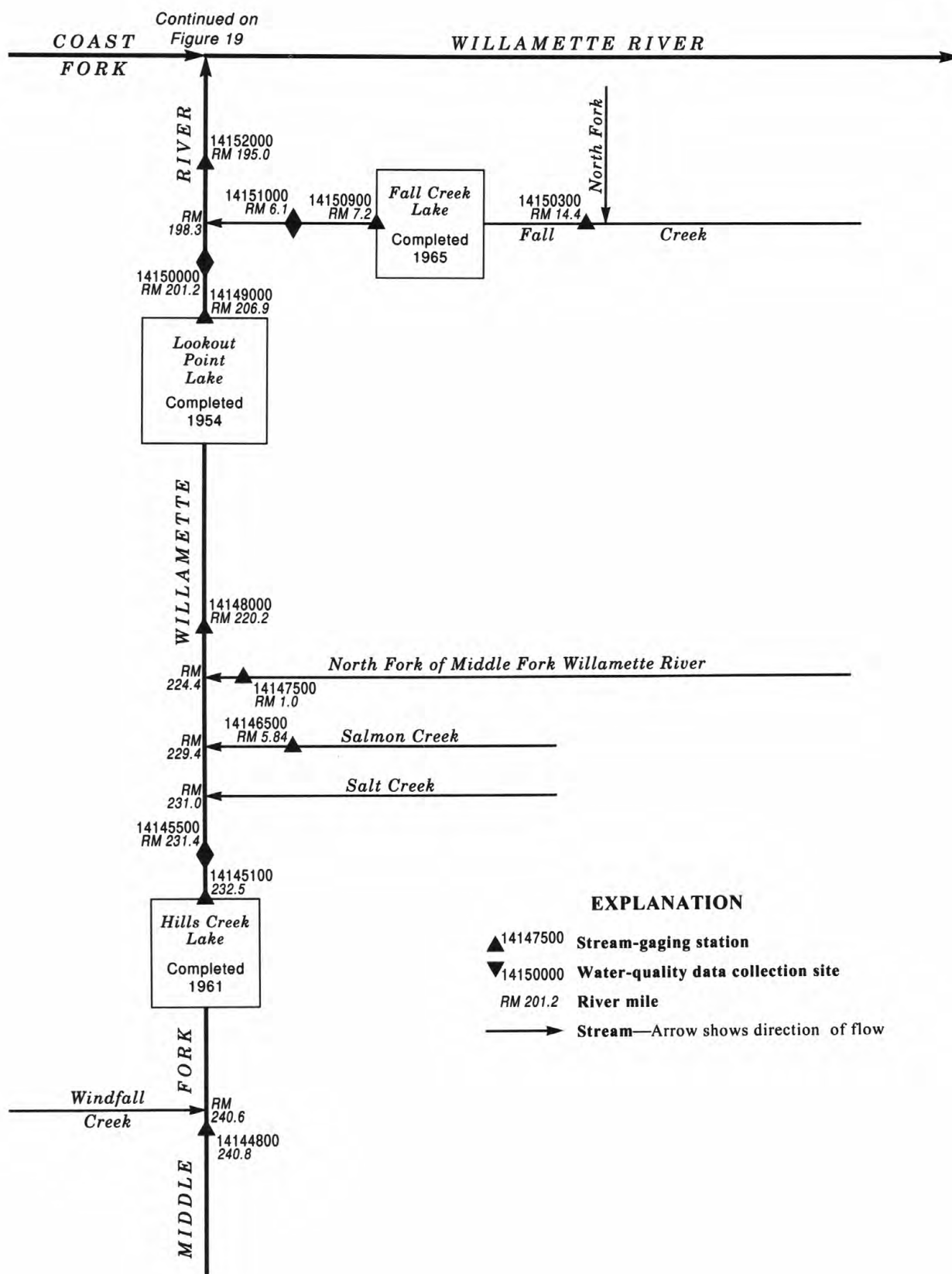
## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1985 - 1994, BY WATER YEAR (WY)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
MEAN	659	2886	2602	2872	3098	2815	3177	2082	1470	655
MAX	1378	4611	4300	4265	6207	4200	4010	2920	2465	1212
(WY)	1986	1985	1992	1989	1986	1993	1988	1993	1985	1993
MIN	242	354	1568	1204	1196	1183	2155	998	479	390
(WY)	1988	1994	1987	1985	1993	1992	1986	1992	1992	1992

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1985 - 1994
ANNUAL TOTAL	638051	534078	1920
ANNUAL MEAN	1748	1463	2206
HIGHEST ANNUAL MEAN			1991
LOWEST ANNUAL MEAN			1994
HIGHEST DAILY MEAN	11400	Mar 23	12900
LOWEST DAILY MEAN	256	Nov 25	248
ANNUAL SEVEN-DAY MINIMUM	278	Nov 9	273
ANNUAL RUNOFF (AC-FT)	1266000		1059000
10 PERCENT EXCEEDS	4270		3660
50 PERCENT EXCEEDS	1130		883
90 PERCENT EXCEEDS	320		298

e Estimated





**Figure 21.** Schematic diagram showing gaging stations in the Middle Fork Willamette River Basin..



## WILLAMETTE RIVER BASIN

14144800 MIDDLE FORK WILLAMETTE RIVER NEAR OAKRIDGE, OR

LOCATION.--Lat 43°35'50", long 122°27'20", in NW 1/4 NE 1/4 sec.9, T.23 S., R.3 E., Lane County, Hydrologic Unit 17090001, in Willamette National Forest, on right bank 0.2 mi upstream from Windfall Creek, 8.3 mi upstream from Hills Creek Dam, 10.2 mi south of Oakridge, and at mile 240.8.

DRAINAGE AREA.--258 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1958 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 1,556.83 ft above sea level (levels by Corps of Engineers). Prior to June 21, 1967, at site 0.5 mi upstream at different datums. June 22, 1967, to June 23, 1971, water-stage recorder at same site at datum 5.00 ft higher.

REMARKS.--No estimated daily discharges. Records fair. No regulation or diversion upstream from station. Continuous water-quality records for the period October 1956 to September 1987 have been collected at this location.

AVERAGE DISCHARGE.--36 years, 788 ft<sup>3</sup>/s, 41.49 in/yr, 570,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 39,800 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 16.96 ft, from floodmark, site and datum then in use, from rating curve extended above 5,100 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; minimum discharge, 164 ft<sup>3</sup>/s Aug. 25, 26, 1992.

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

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 3	0130	*2,210	*6.97				

Minimum discharge, 180 ft<sup>3</sup>/s several days in September.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	273	253	562	513	416	1080	801	612	452	304	220	194
2	271	253	537	962	402	1130	761	589	416	303	218	193
3	269	252	376	1750	389	1160	721	583	399	298	216	202
4	269	259	425	1440	380	1290	679	676	397	293	216	205
5	270	254	364	1580	369	1120	645	702	426	293	214	194
6	277	253	332	1210	372	950	717	700	685	290	211	189
7	285	253	514	929	371	839	770	721	804	284	212	188
8	273	250	1230	889	360	761	813	729	679	280	212	191
9	270	250	893	1110	365	706	1090	715	590	273	209	198
10	271	253	702	1020	383	690	1090	677	537	268	206	211
11	271	254	742	909	364	651	970	646	505	267	205	210
12	312	253	686	823	355	611	912	615	477	263	206	210
13	288	253	567	750	367	591	859	569	468	261	204	202
14	280	253	509	729	396	584	803	532	492	258	201	196
15	295	250	461	695	414	589	765	534	478	256	203	194
16	333	252	422	641	423	610	783	562	452	251	202	190
17	290	256	395	590	525	581	833	538	437	248	201	188
18	277	256	374	559	560	584	885	512	427	246	199	187
19	273	251	358	537	514	561	945	575	407	244	199	187
20	265	250	347	517	481	533	933	633	388	238	200	189
21	262	252	337	511	474	573	907	617	378	235	200	188
22	262	274	328	549	453	550	840	596	368	235	200	185
23	261	256	320	622	527	523	775	554	361	245	197	184
24	259	248	316	630	979	510	744	531	352	240	195	185
25	259	254	311	588	918	513	694	518	346	234	194	187
26	253	253	309	550	965	503	676	502	340	231	191	187
27	254	267	304	515	1110	510	656	479	334	225	190	186
28	256	279	300	489	1040	520	632	471	324	221	191	195
29	254	356	297	465	---	544	618	450	316	223	190	256
30	255	347	305	448	---	682	641	428	310	224	190	218
31	253	---	322	430	---	824	---	419	---	221	191	---
TOTAL	8440	7844	14245	23950	14672	21873	23958	17985	13345	7952	6283	5889
MEAN	272	261	460	773	524	706	799	580	445	257	203	196
MAX	333	356	1230	1750	1110	1290	1090	729	804	304	220	256
MIN	253	248	297	430	355	503	618	419	310	221	190	184
AC-FT	16740	15560	28250	47500	29100	43390	47520	35670	26470	15770	12460	11680
CFSM	1.06	1.01	1.78	2.99	2.03	2.73	3.10	2.25	1.72	.99	.79	.76
IN.	1.22	1.13	2.05	3.45	2.12	3.15	3.45	2.59	1.92	1.15	.91	.85

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 1994, BY WATER YEAR (WY)

	330	775	1142	1171	1105	1058	1052	1090	778	401	294	278
MEAN	330	775	1142	1171	1105	1058	1052	1090	778	401	294	278
MAX	636	1805	3922	2730	2509	2842	1839	1898	1538	740	415	377
(WY)	1963	1974	1965	1970	1986	1972	1993	1993	1974	1971	1976	1971
MIN	210	261	271	273	271	432	518	407	262	234	183	196
(WY)	1988	1994	1977	1977	1977	1977	1968	1992	1992	1992	1992	1994

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1959 - 1994
ANNUAL TOTAL	343253	166436	788
ANNUAL MEAN	940	456	1197
HIGHEST ANNUAL MEAN			360
LOWEST ANNUAL MEAN			23700
HIGHEST DAILY MEAN	6340	Mar 18	Dec 22 1964
LOWEST DAILY MEAN	248	Nov 24	Aug 26 1992
ANNUAL SEVEN-DAY MINIMUM	252	Nov 6	Aug 24 1992
ANNUAL RUNOFF (AC-FT)	680800	330100	570800
ANNUAL RUNOFF (CFSM)	3.65	1.77	3.05
ANNUAL RUNOFF (INCHES)	49.49	24.00	41.49
10 PERCENT EXCEEDS	1990	823	1490
50 PERCENT EXCEEDS	558	369	585
90 PERCENT EXCEEDS	264	201	253

## WILLAMETTE RIVER BASIN

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## 14145100 HILLS CREEK LAKE NEAR OAKRIDGE, OR

LOCATION.--Lat 43°42'30", long 122°25'25", in NW 1/4 sec.35, T.21 S., R.3 E., Lane County, Hydrologic Unit 17090001, in Willamette National Forest, near right end of Hills Creek Dam on Middle Fork Willamette River, 600 ft downstream from Hills Creek, 3.5 mi southeast of Oakridge, and at mile 232.5.

DRAINAGE AREA.--389 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1961 to current year. Prior to October 1971, published as Hills Creek Reservoir near Oakridge.

GAGE.--Water-stage recorder. Datum of gage is sea level (levels by Corps of Engineers).

REMARKS.--Data for period Aug. 20 to Sept. 7 furnished by Corps of Engineers. Reservoir is formed by earthfill dam with concrete spillway completed in 1961 by the Corps of Engineers; storage began August 1961. Total capacity is 355,600 acre-ft at elevation 1,543.0 ft, top of spillway gates, and usable capacity is 248,900 acre-ft between elevations 1,414.0 ft, minimum power pool, and 1,543.0 ft. Reservoir used for flood control and power generation. Figures given herein represent total contents.

COOPERATION.--Capacity table furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 354,200 acre-ft June 25, 1971, elevation, 1,542.52 ft; minimum contents, 104,800 acre-ft Jan. 2, 1969, elevation, 1,412.52 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 313,800 acre-ft July 8-11, elevation, 1,526.88 ft; minimum contents, 154,900 acre-ft Dec. 13, elevation, 1,447.67 ft.

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

1,410	101,500	1,460	174,900	1,520	297,200
1,420	114,600	1,480	211,000	1,540	347,300
1,440	143,000	1,500	251,900	1,544	358,500

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1515.36	1476.23	1452.99	1450.08	1457.33	1471.32	1490.84	1511.02	1521.55	1526.77	1525.93	1522.32
2	1514.28	1475.07	1452.81	1451.35	1457.30	1472.66	1491.56	1511.42	1521.73	1526.79	1525.86	1522.15
3	1513.20	1473.53	1452.15	1452.90	1457.30	1474.13	1492.17	1511.81	1521.86	1526.81	1525.78	1522.00
4	1512.08	1472.01	1451.62	1453.60	1457.47	1475.73	1492.73	1512.30	1522.00	1526.82	1525.73	1521.84
5	1510.98	1470.21	1450.94	1454.40	1457.62	1477.04	1493.26	1512.80	1522.25	1526.83	1525.67	1521.68
6	1509.87	1469.13	1450.26	1454.51	1457.82	1478.09	1493.89	1513.29	1522.76	1526.84	1525.59	1521.30
7	1508.74	1468.05	1450.08	1454.00	1457.97	1478.94	1494.54	1513.80	1523.35	1526.86	1525.52	1520.43
8	1507.60	1466.96	1450.92	1453.41	1458.12	1479.65	1495.32	1514.29	1523.80	1526.88	1525.43	1519.34
9	1506.43	1465.87	1450.53	1453.28	1458.29	1480.29	1496.45	1514.78	1524.14	1526.88	1525.35	1518.24
10	1505.26	1464.80	1449.67	1453.04	1458.52	1480.85	1497.68	1515.22	1524.40	1526.88	1525.27	1517.16
11	1504.10	1463.71	1448.91	1452.55	1458.68	1481.38	1498.73	1515.60	1524.63	1526.87	1525.20	1516.05
12	1502.99	1462.77	1448.04	1451.94	1458.84	1481.86	1499.63	1515.97	1524.84	1526.83	1525.12	1514.92
13	1501.82	1461.94	1447.92	1451.69	1459.04	1482.29	1500.42	1516.26	1525.04	1526.80	1525.05	1513.78
14	1500.65	1461.10	1448.16	1451.82	1459.27	1482.73	1501.10	1516.54	1525.27	1526.77	1524.97	1512.64
15	1499.48	1460.25	1448.29	1451.94	1459.56	1483.15	1501.72	1516.85	1525.48	1526.74	1524.86	1511.49
16	1498.31	1459.42	1448.34	1451.97	1459.85	1483.63	1502.34	1517.18	1525.67	1526.70	1524.78	1510.33
17	1497.07	1458.59	1448.41	1451.90	1460.33	1484.03	1503.01	1517.46	1525.82	1526.67	1524.70	1509.17
18	1495.80	1457.76	1448.48	1452.11	1460.92	1484.47	1503.72	1517.70	1525.99	1526.63	1524.61	1508.01
19	1494.51	1457.13	1448.51	1452.51	1461.40	1484.87	1504.48	1518.10	1526.12	1526.59	1524.44	1506.84
20	1493.22	1456.75	1448.60	1452.89	1461.79	1485.26	1505.21	1518.53	1526.23	1526.55	1524.34	1505.67
21	1491.89	1456.39	1448.72	1453.26	1462.21	1485.72	1505.90	1518.94	1526.32	1526.50	1524.16	1504.45
22	1490.54	1456.08	1448.82	1453.69	1462.55	1486.13	1506.55	1519.30	1526.40	1526.46	1524.00	1503.19
23	1489.17	1455.20	1448.92	1454.20	1463.07	1486.50	1507.14	1519.62	1526.48	1526.44	1523.83	1501.93
24	1488.02	1454.09	1449.01	1454.76	1464.43	1486.85	1507.70	1519.95	1526.54	1526.40	1523.66	1500.66
25	1486.62	1453.27	1449.09	1455.25	1465.72	1487.22	1508.21	1520.21	1526.60	1526.35	1523.48	1499.39
26	1485.21	1452.92	1449.17	1455.66	1467.05	1487.57	1508.70	1520.43	1526.66	1526.29	1523.32	1498.12
27	1483.74	1452.78	1449.25	1456.02	1468.56	1487.93	1509.19	1520.64	1526.69	1526.25	1523.15	1496.83
28	1482.27	1452.68	1449.31	1456.33	1469.93	1488.29	1509.67	1520.85	1526.72	1526.18	1522.98	1495.54
29	1480.79	1452.69	1449.37	1456.61	---	1488.67	1510.14	1521.03	1526.75	1526.12	1522.82	1494.27
30	1479.29	1452.73	1449.47	1456.86	---	1489.25	1510.60	1521.18	1526.76	1526.06	1522.65	1492.95
31	1477.72	---	1449.61	1457.10	---	1490.07	---	1521.37	---	1525.99	1522.48	---
MAX	1515.36	1476.23	1452.99	1457.10	1469.93	1490.07	1510.60	1521.37	1526.76	1526.88	1525.93	1522.32
MIN	1477.72	1452.68	1447.92	1450.08	1457.30	1471.32	1490.84	1511.02	1521.55	1525.99	1522.48	1492.95
(†)	206600	162900	157900	170100	192200	231000	275400	300500	313600	311700	303100	236900
(‡)	-82200	-43700	-5000	+12200	+22100	+38800	+44400	+25100	+13100	-1900	-8600	-66200
CAL YR 1993	MAX 1541.93	MIN 1447.92	AC-FT†	-9600								
WTR YR 1994	MAX 1526.88	MIN 1447.92	AC-FT†	-51900								

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

‡ Change in contents, in acre-feet.

## WILLAMETTE RIVER BASIN

14145500 MIDDLE FORK WILLAMETTE RIVER ABOVE SALT CREEK, NEAR OAKRIDGE, OR

LOCATION.--Lat 43°43'20", long 122°26'15", in NW 1/4 NE 1/4 sec.27, T.21 S., R.3 E., Lane County, Hydrologic Unit 17090001, in Willamette National Forest, on right bank 90 ft upstream from highway bridge, 0.4 mi upstream from Salt Creek, 1.1 mi downstream from Hills Creek Dam, 2.3 mi southeast of Oakridge, and at mile 231.4.

DRAINAGE AREA.--392 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1913 to September 1914, September 1935 to current year. Monthly discharge only September 1935, published in WSP 1318.

REVISED RECORDS.--WSP 1248: 1914.

GAGE.--Water-stage recorder. Datum of gage is 1,208.01 ft above sea level (levels by Corps of Engineers). Oct. 3, 1913, to Sept. 30, 1914, nonrecording gage and Sept. 1, 1935, to Aug. 18, 1960, water-stage recorder at sites 400 ft and 1,000 ft downstream, respectively, at different datum.

REMARKS.--No estimated daily discharges. Water-discharge records good. Flow regulated since 1961 by Hills Creek Lake (station 14145100). No diversions upstream from station.

AVERAGE DISCHARGE.--60 years, 1,132 ft<sup>3</sup>/s, 39.22 in/yr, 820,100 acre-ft/yr, adjusted for storage.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 34,000 ft<sup>3</sup>/s Dec. 28, 1945, gage height, 12.06 ft, site and datum then in use, from rating curve extended above 13,000 ft<sup>3</sup>/s; minimum observed discharge, 0.70 ft<sup>3</sup>/s Sept. 8-11, 13, 1961.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,790 ft<sup>3</sup>/s Jan. 4, gage height, 4.48 ft; minimum discharge, 129 ft<sup>3</sup>/s Feb. 3.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1540	1730	525	300	284	278	297	288	295	308	298	393
2	1560	1720	830	307	474	284	279	288	292	297	301	395
3	1550	1720	989	1260	421	282	278	292	292	289	303	396
4	1550	1710	987	1520	288	281	278	275	291	289	302	397
5	1570	1480	984	1750	281	282	310	281	291	289	301	398
6	1580	1250	932	1750	280	281	284	281	291	288	301	642
7	1590	1250	917	1750	280	284	340	279	317	289	300	1260
8	1600	1250	1270	1740	282	285	286	278	304	291	300	1590
9	1600	1230	1720	1740	281	283	289	282	308	290	304	1610
10	1610	1220	1710	1690	281	282	293	276	306	290	299	1630
11	1600	1220	1700	1670	284	278	294	274	304	290	299	1630
12	1610	1100	1700	1630	284	271	296	279	306	293	297	1640
13	1610	992	913	1190	282	269	294	281	310	299	297	1630
14	1610	993	503	838	283	269	299	281	311	296	297	1630
15	1630	992	506	783	275	266	297	285	316	296	298	1620
16	1640	992	508	783	276	270	294	276	301	297	297	1610
17	1640	986	446	785	275	272	294	287	300	298	296	1600
18	1660	986	408	500	273	287	296	306	300	297	306	1590
19	1670	809	411	300	272	278	295	304	302	298	359	1580
20	1660	588	351	300	275	277	302	303	299	295	399	1590
21	1690	592	310	301	293	284	296	304	302	305	400	1610
22	1720	600	311	301	295	291	279	315	297	290	400	1650
23	1720	991	302	304	279	289	286	290	297	297	401	1640
24	1490	1170	300	302	280	288	287	306	300	294	401	1640
25	1720	945	299	295	276	289	291	303	298	297	403	1630
26	1730	560	300	294	273	287	292	312	297	296	392	1630
27	1760	407	297	294	279	285	287	300	311	293	394	1640
28	1760	408	300	299	275	291	287	301	306	299	393	1680
29	1760	410	300	299	---	299	288	304	307	297	393	1680
30	1750	412	297	284	---	302	287	300	307	298	395	1670
31	1750	---	297	285	---	304	---	300	---	299	394	---
TOTAL	50930	30713	21623	25844	8181	8768	8775	9031	9058	9144	10520	41301
MEAN	1643	1024	698	834	292	283	292	291	302	295	339	1377
MAX	1760	1730	1720	1750	474	304	340	315	317	308	403	1680
MIN	1490	407	297	284	272	266	278	274	291	288	296	393
AC-FT	101000	60920	42890	51260	16230	17390	17410	17910	17970	18140	20870	81920
MEAN†	306	289	616	1032	690	914	1039	699	522	264	200	264
CFSM†	0.78	0.74	1.57	2.63	1.76	2.33	2.65	1.78	1.33	0.67	0.51	0.67
IN.†	0.90	0.82	1.81	3.04	1.83	2.69	2.96	2.06	1.49	0.78	0.59	0.75
AC-FT†	18800	17220	37890	63460	38330	56190	61810	43010	31070	16240	12270	15720

CAL YR 1993 TOTAL 471388 MEAN 1291 MAX 6120 MIN 295 AC-FT 935000 MEAN† 1278 CFSM† 3.26 IN.† 44.26 AC-FT† 925400  
WTR YR 1994 TOTAL 233888 MEAN 641 MAX 1760 MIN 266 AC-FT 463900 MEAN† 569 CFSM† 1.45 IN.† 19.71 AC-FT† 412000

† Adjusted for change in contents in Hills Creek Lake.

## WILLAMETTE RIVER BASIN

189

14145500 MIDDLE FORK WILLAMETTE RIVER ABOVE SALT CREEK, NEAR OAKRIDGE, OR--Continued

## WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: October 1960 to current year.

INSTRUMENTATION.--Temperature recorder since October 1960.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum, 25.0°C Sept. 4, 1960; minimum, 1.5°C Jan. 4, 1961.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 16.0°C Sept. 27-30; minimum, 4.5°C several days in February.

## TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

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

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

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994



## WILLAMETTE RIVER BASIN

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## 14146500 SALMON CREEK NEAR OAKRIDGE, OR

LOCATION.--Lat 43°45'45", long 122°22'18", in NE 1/4 sec.7, T.21 S., R.4 E., Lane County, Hydrologic Unit 17090001, in Willamette National Forest, on right bank 190 ft upstream from Salmon Creek Falls, 0.1 mi upstream from Needle Creek, 4.6 mi east of Oakridge, and at mile 5.84.

DRAINAGE AREA.--117 mi<sup>2</sup>, at measuring cable 0.25 mi downstream from gage.

PERIOD OF RECORD.--October to November 1909 (gage heights and one discharge measurement only), February 1913 to October 1919, October 1933 to September 1985, October 1986 to June 1994 (discontinued). Monthly discharge only for some periods, published in WSP 1318. Published as Kelsey River near Hazeldell and Salmon Creek near Hazeldell, 1909.

REVISED RECORDS.--WSP 794: 1934(M). WSP 814: Drainage area. WSP 1124: 1935, 1942(M), 1943, 1946(M). WSP 1248: 1915, 1918. WDR OR-71-1: 1968, 1969(M,P).

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 1,462.36 ft above sea level. Prior to Oct. 1, 1914, nonrecording gage at several sites within 4 mi of present site at various datums. Oct. 1, 1914, to Oct. 14, 1919, water-stage recorder at site 1.8 mi downstream at different datum. Nov. 5, 1933, to Oct. 27, 1964, water-stage recorder at site 0.8 mi downstream at datum 40.53 ft lower. Oct. 28, 1964, to Aug. 27, 1965, nonrecording gage at site 0.6 mi downstream at different datum.

REMARKS.--Records good. No regulation or diversion upstream from station. All records given herein are for measuring cable site.

AVERAGE DISCHARGE.--65 years (water years 1914-19, 1934-85, 1987-93), 423 ft<sup>3</sup>/s, 49.08 in/yr, 306,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,700 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 9.15 ft, from floodmark, site and datum then in use, from rating curve extended above 2,100 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; minimum discharge, 63 ft<sup>3</sup>/s Jan. 8, 1937.

EXTREMES FOR PERIOD OCTOBER 1993 TO JUNE 1994.--Peak discharges greater than base discharge of 1,700 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 3	0500	*1,070	*3.11				

Minimum discharge, 114 ft<sup>3</sup>/s Nov. 19-21, 24, 25.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	130	121	285	202	203	611	379	322	227	---	---	---
2	130	119	267	384	198	662	375	308	210	---	---	---
3	130	124	200	915	192	714	363	303	202	---	---	---
4	128	125	224	751	187	795	341	328	198	---	---	---
5	128	123	198	791	183	705	324	341	210	---	---	---
6	129	123	177	705	180	591	369	345	335	---	---	---
7	135	123	206	535	180	504	408	350	387	---	---	---
8	133	123	399	485	173	445	430	355	347	---	---	---
9	130	121	361	659	175	407	471	350	309	---	---	---
10	128	118	319	646	181	388	572	332	283	---	---	---
11	128	116	334	628	175	362	563	317	263	---	---	---
12	144	116	327	574	171	339	545	304	247	---	---	---
13	137	116	282	508	173	325	508	282	257	---	---	---
14	135	116	254	490	180	317	463	264	---	---	---	---
15	141	116	230	464	182	314	434	264	---	---	---	---
16	151	117	211	413	182	320	437	267	---	---	---	---
17	139	122	195	369	199	309	459	259	---	---	---	---
18	134	122	185	339	210	312	484	252	---	---	---	---
19	131	116	178	317	204	301	507	267	---	---	---	---
20	130	114	170	300	200	287	482	296	---	---	---	---
21	130	116	163	291	199	308	472	287	---	---	---	---
22	128	133	159	298	196	291	434	275	---	---	---	---
23	126	123	154	312	229	280	395	259	---	---	---	---
24	126	115	151	307	528	272	391	251	---	---	---	---
25	126	114	148	289	519	272	360	247	---	---	---	---
26	123	116	147	269	514	269	358	241	---	---	---	---
27	123	121	144	253	573	272	340	228	---	---	---	---
28	123	128	141	240	577	280	330	225	---	---	---	---
29	122	145	140	229	---	290	324	219	---	---	---	---
30	121	160	141	218	---	328	339	208	---	---	---	---
31	121	---	148	211	---	379	---	206	---	---	---	---
TOTAL	4040	3662	6638	13392	7063	12249	12657	8752	---	---	---	---
MEAN	130	122	214	432	252	395	422	282	---	---	---	---
MAX	151	160	399	915	577	795	572	355	---	---	---	---
MIN	121	114	140	202	171	269	324	206	---	---	---	---
AC-FT	8010	7260	13170	26560	14010	24300	25110	17360	---	---	---	---
CFSM	1.11	1.04	1.83	3.69	2.16	3.38	3.61	2.41	---	---	---	---
IN.	1.28	1.16	2.11	4.26	2.25	3.89	4.02	2.78	---	---	---	---

CAL YR 1993 TOTAL 166469 MEAN 456 MAX 2840 MIN 114 AC-FT 330200 CFSM 3.90 IN. 52.93

## WILLAMETTE RIVER BASIN

14147500 NORTH FORK OF MIDDLE FORK WILLAMETTE RIVER NEAR OAKRIDGE, OR

LOCATION.--Lat 43°45'25", long 122°30'15", in SW 1/4 sec.7, T.21 S., R.3 E., Lane County, Hydrologic Unit 17090001, on left bank 2.5 mi northwest of Oakridge, and at mile 1.0.

DRAINAGE AREA.--246 mi<sup>2</sup>, at measuring section 0.5 mi downstream.

PERIOD OF RECORD.--October 1909 to March 1916, September 1935 to September 1985, October 1986 to September 1994 (discontinued). Monthly discharge only for some periods, published in WSP 1318. Prior to October 1912, published as "near Hazeldell."

REVISED RECORDS.--WSP 1248: 1914-16.

GAGE.--Water-stage recorder. Datum of gage is 1,029.6 ft above sea level (river profile survey). Oct. 1, 1909, to Mar. 31, 1916, water-stage recorder or nonrecording gage at several sites within 0.8 mi of present site at various datums. Sept. 10, 1935, to Oct. 3, 1938, nonrecording gage at present site and datum.

REMARKS.--Records fair. Slight regulation by Waldo Lake; occasional fluctuations during low-water periods caused by log-ponds upstream from station. No diversions upstream from station. All records given herein are for measuring site.

AVERAGE DISCHARGE.--64 years (water years 1910-15, 1936-85, 1987-94), 778 ft<sup>3</sup>/s, 42.94 in/yr, 563,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,400 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 19.14 ft, from floodmark, from rating curve extended above 7,100 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; minimum discharge, 22 ft<sup>3</sup>/s Aug. 20, 1966, probably due to temporary storage by log ponds upstream.

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

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 3	1230	*2,490	*5.10				

Minimum discharge, 120 ft<sup>3</sup>/s Sept. 20-24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	140	124	640	289	358	1360	701	526	346	251	154	127
2	140	124	591	541	345	1420	683	503	322	250	152	129
3	140	130	325	2110	335	1550	658	486	307	244	151	133
4	139	135	373	1650	324	1810	619	537	301	237	151	144
5	139	129	319	1710	313	1570	592	556	305	234	151	134
6	139	126	262	1610	306	1270	719	534	439	234	149	129
7	147	124	298	1170	306	1070	840	524	521	225	148	127
8	149	123	749	986	296	933	876	523	483	219	147	126
9	142	122	726	1290	298	843	962	519	436	213	146	134
10	140	122	605	1450	314	794	1180	503	405	207	144	147
11	139	122	663	1380	302	739	1120	479	377	203	142	145
12	155	122	663	1310	292	683	1050	456	358	199	142	144
13	158	122	526	1110	295	643	992	434	364	196	141	136
14	147	123	456	1020	316	625	903	415	473	193	141	131
15	155	122	396	956	318	611	824	410	491	191	140	129
16	170	123	352	862	317	618	794	470	465	189	138	127
17	157	129	317	765	351	599	789	457	437	186	137	125
18	148	132	293	691	398	618	792	434	420	182	137	123
19	143	126	274	634	383	609	796	437	395	179	136	122
20	140	124	256	593	368	572	767	486	373	175	135	122
21	138	126	244	560	368	626	750	466	355	173	134	122
22	136	162	e235	549	363	596	713	447	341	171	135	120
23	135	140	e225	570	449	562	661	422	327	174	133	121
24	136	129	e218	567	1320	540	662	401	313	170	133	121
25	134	128	e210	543	1290	536	623	383	301	167	133	123
26	131	128	e203	495	1240	524	620	369	297	164	131	124
27	129	133	e198	458	1340	524	598	354	284	162	129	124
28	129	147	194	432	1310	536	571	347	273	160	128	126
29	129	179	190	410	---	553	546	347	264	158	128	163
30	128	231	187	389	---	600	555	333	257	158	127	151
31	126	---	202	372	---	723	---	319	---	156	127	---
TOTAL	4378	4007	11390	27472	14215	25257	22956	13877	11030	6020	4320	3929
MEAN	141	134	367	886	508	815	765	448	368	194	139	131
MAX	170	231	749	2110	1340	1810	1180	556	521	251	154	163
MIN	126	122	187	289	292	524	546	319	257	156	127	120
AC-FT	8680	7950	22590	54490	28200	50100	45530	27530	21880	11940	8570	7790
CFSM	.57	.54	1.49	3.60	2.06	3.31	3.11	1.82	1.49	.79	.57	.53
IN.	.66	.61	1.72	4.15	2.15	3.82	3.47	2.10	1.67	.91	.65	.59

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1910 - 1994, BY WATER YEAR (WY)

	MEAN	254	840	1230	1229	1196	1134	1165	1025	659	293	181	164
MAX	904	2287	4242	2708	2543	2970	2072	1895	1394	650	298	307	
(WY)	1951	1910	1965	1912	1982	1972	1937	1949	1950	1913	1976	1978	
MIN	103	119	163	182	163	330	373	373	193	124	97.5	110	
(WY)	1988	1937	1977	1977	1977	1941	1941	1992	1992	1940	1940	1992	

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1910 - 1994

ANNUAL TOTAL	289988	148851	
ANNUAL MEAN	794	408	
HIGHEST ANNUAL MEAN			778
LOWEST ANNUAL MEAN			1201
HIGHEST DAILY MEAN	6340	Mar 18	19300
LOWEST DAILY MEAN	122	Nov 9	84
ANNUAL SEVEN-DAY MINIMUM	122	Nov 9	93
ANNUAL RUNOFF (AC-FT)	575200	295200	563300
ANNUAL RUNOFF (CFSM)	3.23	1.66	3.16
ANNUAL RUNOFF (INCHES)	43.85	22.51	42.94
10 PERCENT EXCEEDS	1710	830	1610
50 PERCENT EXCEEDS	454	305	556
90 PERCENT EXCEEDS	139	128	148

e Estimated

## 14148000 MIDDLE FORK WILLAMETTE RIVER BELOW NORTH FORK, NEAR OAKRIDGE, OR

LOCATION.--Lat 43°48'05", long 122°33'35", in SW 1/4 sec.27, T.20 S., R.2 E., Lane County, Hydrologic Unit 17090001, on left bank 0.5 mi downstream from Whitehead Creek, 4.2 mi downstream from North Fork of Middle Fork Willamette River, 7.0 mi northwest of Oakridge, and at mile 220.2.

DRAINAGE AREA.--924 mi<sup>2</sup>.

PERIOD OF RECORD.--March 1911 to September 1912, July 1923 to current year. Monthly discharge only for some periods, published in WSP 1318. Published as "near Hazeldell" 1911-12 and as "at Eula" 1923-50.

REVISED RECORDS.--WSP 694: 1925-28. WSP 814: Drainage area at Eula. WSP 1248: 1924, 1925(M), 1926-28, 1929(M), 1930, 1933, 1946(M). WSP 1398: 1927(M). WSP 1638: 1936(M).

GAGE.--Water-stage recorder. Datum of gage is 934.76 ft above sea level. Mar. 22, 1911, to Sept. 30, 1912, nonrecording gage at site 4.0 mi upstream, just downstream from North Fork at different datum. July 1, 1923, to Aug. 11, 1935, nonrecording gage and Aug. 12, 1935, to Sept. 30, 1950, water-stage recorder at site 4.0 mi downstream at different datum.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since 1961 by Hills Creek Lake (station 14145100); slight regulation at times by logponds upstream from station. No diversion upstream from station. Continuous water-quality records for the period September 1950 to September 1987 have been collected at this location.

AVERAGE DISCHARGE.--72 years (water years 1912, 1924-94), 2,746 ft<sup>3</sup>/s, 1,989,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 81,800 ft<sup>3</sup>/s Dec. 28, 1945, gage height, 18.8 ft, from floodmark, site and datum then in use, from rating curve extended above 39,000 ft<sup>3</sup>/s; minimum discharge, 322 ft<sup>3</sup>/s Aug. 30, 1961, caused by closing outlet gates at Hills Creek Dam.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1861 and prior to March 1911, 17.0 ft in February 1890 at site used 1923-50, from information by local resident, discharge, about 55,000 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,780 ft<sup>3</sup>/s Jan. 3, gage height, 4.50 ft; minimum discharge, 574 ft<sup>3</sup>/s Aug. 16-18.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1960	2130	1640	1010	1030	2880	1870	1530	1120	844	617	662
2	1980	2120	2060	1650	1130	2960	1800	1460	1040	837	617	667
3	1970	2130	1780	4990	1190	3140	1740	1440	990	811	617	679
4	1970	2130	1900	4590	962	3560	1650	1530	973	792	613	697
5	1990	1930	1790	5290	930	3210	1610	1600	993	787	611	677
6	2010	1640	1620	4940	915	2740	1830	1570	1420	786	607	867
7	2040	1640	1680	4120	919	2390	2180	1570	1660	763	606	1440
8	2040	1630	2920	3850	890	2140	2150	1580	1510	754	604	1860
9	2030	1610	3400	4540	902	1960	2320	1570	1380	738	605	1890
10	2030	1590	3120	4530	951	1860	2800	1510	1270	724	596	1940
11	2030	1590	3210	4430	920	1750	2680	1450	1200	715	594	1940
12	2090	1500	3240	4150	893	1630	2520	1400	1150	709	587	1950
13	2090	1350	2270	3420	904	1560	2400	1330	1160	710	584	1930
14	2060	1350	1570	2870	954	1520	2220	1260	1400	701	585	1910
15	2100	1350	1440	2670	955	1490	2060	1260	1440	695	584	1900
16	2160	1350	1350	2480	956	1530	2000	1340	1340	690	580	1880
17	2120	1360	1220	2300	1040	1480	2020	1320	1270	683	577	1880
18	2110	1360	1110	1930	1150	1530	2070	1310	1230	677	585	1870
19	2120	1210	1070	1560	1110	1510	2130	1340	1170	671	632	1860
20	2100	918	975	1480	1070	1440	2080	1470	1120	660	688	1870
21	2120	925	881	1430	1100	1600	2050	1430	1080	665	688	1880
22	2140	1030	856	1430	1100	1560	1940	1390	1040	646	689	1930
23	2140	1320	823	1480	1250	1470	1810	1280	1010	663	687	1920
24	1900	1560	803	1480	2900	1420	1820	1250	980	652	682	1920
25	2140	1360	786	1410	2850	1420	1720	1220	949	649	682	1910
26	2130	958	780	1320	2710	1390	1710	1190	939	638	664	1910
27	2160	756	765	1250	2910	1390	1660	1130	926	629	667	1910
28	2160	792	757	1200	2860	1410	1610	1110	894	630	665	1980
29	2150	859	746	1160	--	1450	1560	1110	873	628	665	2070
30	2150	985	743	1100	--	1570	1610	1060	856	628	664	2020
31	2150	--	771	1060	--	1910	--	1030	--	622	663	--
TOTAL	64340	42433	48076	81120	37451	58870	59620	42040	34383	21797	19505	49819
MEAN	2075	1414	1551	2617	1338	1899	1987	1356	1146	703	629	1661
MAX	2160	2130	3400	5290	2910	3560	2800	1600	1660	844	689	2070
MIN	1900	756	743	1010	890	1390	1560	1030	856	622	577	662
AC-FT	127600	84170	95360	160900	74280	116800	118300	83390	68200	43230	38690	98820

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 1994, BY WATER YEAR (WY)

	1961	3350	4685	4331	3226	2987	3107	3167	2392	1268	1221	1675
MEAN	1861	3350	4685	4331	3226	2987	3107	3167	2392	1268	1221	1675
MAX	2929	7306	13540	10120	8093	7802	5606	5524	4969	1901	1753	2639
(WY)	1963	1985	1965	1972	1972	1993	1993	1974	1971	1982	1982	1966
MIN	625	1414	1073	874	710	1167	1464	1113	811	703	629	1117
(WY)	1962	1994	1977	1977	1977	1992	1968	1992	1992	1994	1994	1992

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1962 - 1994

ANNUAL TOTAL	1115253	559454	
ANNUAL MEAN	3055	1533	
HIGHEST ANNUAL MEAN			2771
LOWEST ANNUAL MEAN			4301
HIGHEST DAILY MEAN	16900	Mar 18	5290
LOWEST DAILY MEAN	743	Dec 30	577
ANNUAL SEVEN-DAY MINIMUM	764	Dec 25	583
ANNUAL RUNOFF (AC-FT)	2212000		1110000
10 PERCENT EXCEEDS	5980		2310
50 PERCENT EXCEEDS	2120		1430
90 PERCENT EXCEEDS	1150		665
			2007000
			5280
			2050
			1020

## WILLAMETTE RIVER BASIN

14149000 LOOKOUT POINT LAKE NEAR LOWELL, OR

LOCATION.--Lat 43°54'50", long 122°45'00", in SE 1/4 sec.13, T.19 S., R.1 W., Lane County, Hydrologic Unit 17090001, in elevator house at right end of spillway section of dam on Middle Fork Willamette River, 1.5 mi east of Lowell, and at mile 206.9.

DRAINAGE AREA.--991 mi<sup>2</sup>.

PERIOD OF RECORD.--November 1953 to current year. Prior to October 1971, published as Lookout Point Reservoir near Lowell.

GAGE.--Water-stage recorder. Datum of gage is sea level (levels by Corps of Engineers). Nov. 7, 1953, to Dec. 4, 1954, approximate elevations obtained from reference marks and Dec. 5, 1954, to Feb. 4, 1955, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by earthfill dam with concrete gate and spillway section, completed in 1954 by Corps of Engineers. Planned storage began in November 1953. Total capacity is 455,800 acre-ft at elevation 929 ft, and usable capacity is 349,200 acre-ft between elevations 819 ft and 929 ft, top of spillway gates. Reservoir used for flood control, improvement of navigation, power generation, pollution abatement, and other purposes. Figures given herein represent total contents.

COOPERATION.--Capacity table furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 464,900 acre-ft Dec. 26, 1964, elevation, 931.09 ft; minimum contents observed since first filling, 91,450 acre-ft Dec. 1, 1954, elevation, 811.00 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 336,200 acre-ft June 21, 22, elevation, 899.29 ft; minimum contents, 112,400 acre-ft Dec. 31, elevation, 821.91 ft.

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

820	108,600	860	205,500	900	338,900
830	129,500	870	235,500	910	377,400
840	152,500	880	267,800	920	417,800
850	177,700	890	302,300	930	460,200

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	875.04	869.35	828.75	822.36	834.78	846.01	869.79	891.02	897.84	896.88	875.58	833.96
2	874.80	868.27	829.33	823.17	834.89	847.66	870.48	891.38	897.76	896.53	874.52	832.39
3	874.55	867.11	828.60	827.09	835.04	849.53	871.06	891.72	897.68	896.14	873.44	830.70
4	874.26	865.94	827.77	829.88	834.97	851.78	871.61	892.17	897.58	895.73	872.34	829.09
5	873.99	864.68	826.97	832.34	834.86	853.66	872.14	892.61	897.52	895.35	871.20	827.42
6	873.76	863.10	825.87	833.34	834.81	855.13	872.87	893.03	897.69	894.93	869.96	826.24
7	873.56	861.53	825.46	833.58	834.70	856.26	873.81	893.42	897.96	894.52	868.73	825.76
8	873.39	859.92	825.41	833.54	834.60	857.21	874.74	893.85	898.14	894.13	867.52	825.06
9	873.17	858.40	825.04	834.13	834.51	858.02	875.77	894.24	898.26	893.66	866.30	826.23
10	872.99	856.88	824.47	834.71	834.48	858.74	877.03	894.60	898.31	893.16	865.02	826.18
11	872.80	855.34	824.29	835.19	834.45	859.38	878.22	894.91	898.33	892.66	863.75	826.31
12	872.67	853.66	824.06	835.41	834.37	859.92	879.30	895.18	898.30	892.09	862.49	826.43
13	872.52	851.79	823.93	835.10	834.36	860.39	880.24	895.43	898.36	891.56	861.21	826.50
14	872.34	849.91	823.74	834.15	834.32	860.87	881.09	895.66	898.55	891.04	859.90	826.55
15	872.25	847.93	824.05	833.72	834.31	861.31	881.81	895.97	898.68	890.51	858.58	826.64
16	872.12	846.02	824.39	833.08	834.31	861.84	882.45	896.27	898.81	889.72	857.26	826.73
17	871.99	844.10	824.66	832.25	834.43	862.28	883.17	896.58	898.71	888.91	855.90	826.81
18	871.83	842.09	824.75	831.64	834.66	862.79	883.89	896.84	898.76	888.11	854.50	826.90
19	871.67	839.90	824.78	831.58	834.76	863.23	884.66	897.03	898.94	887.05	853.14	826.97
20	871.51	838.36	824.71	831.93	834.88	863.67	885.37	897.35	898.92	886.25	851.81	827.07
21	871.31	836.80	824.61	832.30	835.07	864.26	886.04	897.59	898.92	885.79	850.45	827.19
22	871.17	835.31	824.46	832.74	835.24	864.81	886.65	897.85	898.82	884.68	849.06	827.30
23	871.06	832.96	824.28	833.18	835.59	865.30	887.22	897.99	898.64	883.79	847.63	827.39
24	870.83	830.87	824.06	833.67	837.55	865.72	887.80	897.95	898.45	882.92	846.20	827.49
25	870.68	829.66	823.79	833.99	839.41	866.10	888.32	897.99	898.33	882.07	844.71	827.57
26	870.55	828.83	823.57	834.21	841.03	866.49	888.82	898.01	898.22	881.18	843.20	827.59
27	870.44	828.57	823.38	834.45	842.82	866.86	889.31	898.02	898.10	880.27	841.70	827.67
28	870.34	828.33	823.10	834.52	844.43	867.23	889.74	898.02	897.82	879.36	840.23	827.86
29	870.23	828.19	822.73	834.66	---	867.62	890.18	897.97	897.57	878.46	838.71	828.17
30	870.06	828.17	822.54	834.71	---	868.21	890.63	897.91	897.20	877.53	837.16	828.40
31	869.92	---	822.33	834.76	---	869.04	---	897.86	---	876.57	835.55	---
MAX	875.04	869.35	829.33	835.41	844.43	869.04	890.63	898.02	898.94	896.88	875.58	833.96
MIN	869.92	828.17	822.33	822.36	834.31	846.01	869.79	891.02	897.20	876.57	835.55	825.76
(†)	235300	125500	113300	140100	163400	232600	304600	330900	328400	256500	142000	126000
(‡)	-17100	-109800	-12200	+26800	+23300	+69200	+72000	+26300	-2500	-71900	-114500	-16000

CAL YR 1993 MAX 928.15 MIN 822.33 AC-FT† -10400  
WTR YR 1994 MAX 898.94 MIN 822.33 AC-FT† -126400

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



## WILLAMETTE RIVER BASIN

195

14150000 MIDDLE FORK WILLAMETTE RIVER NEAR DEXTER, OR

LOCATION.--Lat 43°56'45", long 122°50'10", in SE 1/4 NW 1/4 sec.5, T.19 S., R.1 W., Lane County, Hydrologic Unit 17090001, on right bank 0.6 mi upstream from Lost Creek, 2.0 mi northwest of Dexter, 2.6 mi downstream from Dexter Dam, and at mile 201.2.

DRAINAGE AREA.--1,001 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1946 to current year. Prior to October 1954, published as "at Lowell".

REVISED RECORDS.--WSP 1638; 1948(P).

GAGE.--Water-stage recorder. Datum of gage is 592.30 ft above sea level (levels by Corps of Engineers). Prior to Aug. 23, 1950, nonrecording gage and Aug. 23, 1950, to Sept. 30, 1954, at site 4.0 mi upstream at different datum, and June 9, 1955, to Feb. 18, 1977, at datum 3.00 ft higher.

REMARKS.--No estimated daily discharges. Water-discharge records good. Flow regulated since 1953 by Lookout Point Lake (station 14149000), since 1955 by Dexter Lake (re-regulating), and since 1961 by Hills Creek Lake (station 14145100).

AVERAGE DISCHARGE.--48 years (water years 1947-94), 3,073 ft<sup>3</sup>/s, 2,226,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 62,600 ft<sup>3</sup>/s Jan. 18, 1953, gage height, 12.46 ft, site and datum then in use, from rating curve extended above 33,000 ft<sup>3</sup>/s; minimum daily discharge, 100 ft<sup>3</sup>/s Nov. 25, 1960.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage, 13.9 ft Dec. 28, 1945, former site and datum.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,420 ft<sup>3</sup>/s Dec. 8, gage height, 5.95 ft; minimum discharge, 677 ft<sup>3</sup>/s Apr. 6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2520	3280	1110	1060	1080	1030	865	869	1240	1640	2380	2670
2	2520	3880	1550	1060	1070	1030	855	871	1240	1630	2560	2680
3	2520	4160	2740	1050	1070	984	861	863	1240	1630	2580	2680
4	2530	4050	2870	1710	1070	879	802	867	1240	1630	2590	2680
5	2530	4090	2860	2870	1070	888	785	860	1240	1630	2580	2670
6	2540	4090	2870	4060	1070	892	771	857	1240	1640	2730	2280
7	2500	4120	2360	4070	1070	899	790	852	1250	1640	2670	2060
8	2490	4110	3250	4060	1090	893	815	854	1240	1630	2690	1780
9	2490	3980	4110	4050	1070	887	772	885	1240	1670	2680	1780
10	2480	3940	4080	4060	1060	896	816	884	1230	1760	2720	1880
11	2490	3940	3770	4040	1060	888	833	886	1230	1800	2690	1910
12	2490	3970	3790	4030	1060	873	856	880	1230	1800	2680	1950
13	2480	4000	2720	4050	1050	873	861	869	1240	1800	2690	1870
14	2480	4030	1930	4050	1050	873	842	863	1240	1770	2690	1850
15	2500	4030	1180	3350	1050	871	850	865	1250	1780	2690	1860
16	2500	4010	1080	3340	1050	867	850	875	1220	2170	2700	1850
17	2510	3990	1090	3320	1050	875	847	938	1220	2340	2690	1850
18	2520	4020	1090	2760	1050	891	846	1010	1230	2350	2700	1850
19	2520	4060	1090	1770	1050	898	846	1010	1220	2180	2690	1840
20	2540	2990	1090	1140	1050	883	853	1010	1210	2190	2680	1840
21	2530	2900	1090	1070	1050	872	852	1010	1200	2200	2700	1840
22	2490	2910	1090	1040	1050	876	854	1010	1300	2210	2730	1850
23	2490	4030	1100	1020	1040	876	859	1020	1420	2280	2740	1850
24	2480	4080	1100	1050	1040	875	861	1230	1420	2430	2740	1860
25	2500	2940	1090	1070	1040	875	861	1240	1250	2360	2730	1850
26	2510	2000	1070	1080	1050	883	862	1240	1220	2330	2730	1840
27	2510	1190	1070	1080	1040	879	863	1240	1240	2320	2690	1840
28	2510	1110	1080	1080	1040	871	861	1240	1440	2310	2690	1840
29	2500	1110	1080	1090	---	872	861	1240	1450	2320	2690	1840
30	2500	1110	1070	1090	---	879	864	1250	1560	2360	2690	1840
31	2490	---	1070	1090	---	885	---	1250	---	2370	2680	---
TOTAL	77660	102120	58540	71660	29590	27713	25214	30838	38190	62170	82890	60280
MEAN	2505	3404	1888	2312	1057	894	840	995	1273	2005	2674	2009
MAX	2540	4160	4110	4070	1090	1030	865	1250	1560	2430	2740	2680
MIN	2480	1110	1070	1020	1040	867	771	852	1200	1630	2380	1780
AC-FT	154000	202600	116100	142100	58690	54970	50010	61170	75750	123300	164400	119600

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 1994, BY WATER YEAR (WY)

MEAN	3105	4702	5328	4535	2466	2111	1969	2529	2322	1598	1968	2651
MAX	5266	8779	11300	13510	7634	7363	4854	5414	5072	2189	2981	3932
(WY)	1963	1985	1965	1965	1972	1972	1993	1993	1984	1993	1993	1972
MIN	1051	1843	1231	1050	668	525	437	526	816	1088	1083	1366
(WY)	1993	1988	1977	1977	1977	1977	1977	1977	1977	1978	1966	1992

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1962 - 1994

ANNUAL TOTAL	1194250	666865	
ANNUAL MEAN	3272	1827	
HIGHEST ANNUAL MEAN			2944
LOWEST ANNUAL MEAN			4586
HIGHEST DAILY MEAN	10300	Jun 4	4160
LOWEST DAILY MEAN	1070	Dec 26	771
ANNUAL SEVEN-DAY MINIMUM	1080	Dec 25	793
ANNUAL RUNOFF (AC-FT)	2369000		1323000
10 PERCENT EXCEEDS	5670		3300
50 PERCENT EXCEEDS	2950		1420
90 PERCENT EXCEEDS	1320		865



## WILLAMETTE RIVER BASIN

14150000 MIDDLE FORK WILLAMETTE RIVER NEAR DEXTER, OR--Continued

## WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: August 1955 to current year.

INSTRUMENTATION.--Temperature recorder since August 1955.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum, 20.5°C several days in September, 1992; minimum recorded, 2.5°C Feb. 6-8, 1989, but may have been lower during period of missing record Feb. 9 to Mar. 30, 1989.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 20.0°C several days in August and September; minimum, 4.5°C Feb. 8.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

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

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



## WILLAMETTE RIVER BASIN

14150300 FALL CREEK NEAR LOWELL, OR

LOCATION.--Lat 43°58'15", long 122°38'15", in SW 1/4 sec.25, T.18 S., R.1 E., Lane County, Hydrologic Unit 17090001, on right bank 0.1 mi downstream from North Fork, 8.0 mi northeast of Lowell, and at mile 14.4.

DRAINAGE AREA.--118 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1963 to current year.

GAGE.--Water-stage recorder. Datum of gage is 844.42 ft above sea level.

REMARKS.--No estimated daily discharges. Records good. No regulation or diversion upstream from station. Continuous water-quality records for the period August 1963 to September 1987 have been collected at this location.

AVERAGE DISCHARGE.--31 years, 399 ft<sup>3</sup>/s, 45.89 in/yr, 288,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,400 ft<sup>3</sup>/s Apr. 27, 1990, gage height, 12.28 ft; minimum discharge, 15 ft<sup>3</sup>/s Aug. 30, 31, Sept. 1, 1992.

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

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 24	1230	*3,840	*6.67	No other peak greater than base discharge.			

Minimum discharge, 17 ft<sup>3</sup>/s several days in September.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26	24	853	207	104	841	402	182	125	79	32	20
2	26	24	416	708	100	671	338	167	105	84	31	20
3	25	32	181	1510	96	779	292	159	97	77	30	24
4	25	39	352	867	92	1200	254	213	97	72	30	32
5	26	28	262	1460	88	934	235	227	98	70	30	25
6	27	26	171	1400	85	676	437	193	265	70	30	22
7	34	25	218	777	86	514	704	169	479	65	29	21
8	33	24	986	594	81	415	668	153	313	63	29	20
9	29	24	641	1190	96	352	717	141	226	59	29	25
10	28	24	428	1080	133	307	1150	130	182	57	28	36
11	28	23	513	1140	114	266	863	121	155	54	27	30
12	34	23	617	882	108	236	635	114	137	52	27	31
13	38	23	386	612	116	216	500	108	171	51	26	25
14	32	23	284	470	174	203	414	103	381	49	26	23
15	45	23	223	373	160	191	352	121	436	48	26	21
16	70	25	182	307	153	200	308	167	345	48	25	21
17	44	34	155	261	204	189	274	189	270	47	24	20
18	34	43	135	228	311	227	247	177	232	45	24	19
19	31	31	120	204	287	242	232	178	197	44	24	19
20	30	28	110	185	247	228	211	271	170	43	24	19
21	29	31	100	170	268	407	199	241	153	41	24	18
22	28	125	91	161	288	380	184	198	142	40	24	17
23	27	60	84	179	641	320	176	167	131	41	23	17
24	31	41	80	189	3090	306	225	146	120	39	22	17
25	30	34	76	181	1830	320	209	132	112	39	21	17
26	28	35	74	155	1290	292	218	121	112	37	20	17
27	26	51	71	141	1280	272	218	111	102	35	21	17
28	25	96	67	132	1030	250	205	113	94	34	20	17
29	25	135	64	123	---	225	187	125	87	34	21	60
30	24	178	64	115	---	258	203	113	---	35	20	40
31	24	---	74	108	---	449	---	103	---	33	20	---
TOTAL	962	1332	8078	16109	12552	12366	11257	4853	5617	1585	787	710
MEAN	31.0	44.4	261	520	448	399	375	157	187	51.1	25.4	23.7
MAX	70	178	986	1510	3090	1200	1150	271	479	84	32	60
MIN	24	23	64	108	81	189	176	103	83	33	20	17
AC-FT	1910	2640	16020	31950	24900	24530	22330	9630	11140	3140	1560	1410
CFSM	.26	.38	2.21	4.40	3.80	3.38	3.18	1.33	1.59	.43	.22	.20
IN.	.30	.42	2.55	5.08	3.96	3.90	3.55	1.53	1.77	.50	.25	.22

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1964 - 1994, BY WATER YEAR (WY)

	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	1994
MEAN	116	540	775	854	652	612	541	331	202	72.4	46.2	55.5																			
MAX	312	1389	2282	1849	1691	1326	1002	707	662	163	99.8	188																			
(WY)	1983	1974	1965	1972	1986	1972	1993	1991	1984	1983	1968	1986																			
MIN	18.8	44.4	60.6	102	91.8	108	220	98.6	53.8	45.7	21.1	23.7																			
(WY)	1988	1994	1977	1977	1977	1992	1987	1966	1966	1979	1992	1994																			

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1964 - 1994

ANNUAL TOTAL	141622	76208	399
ANNUAL MEAN	388	209	644
HIGHEST ANNUAL MEAN			183
LOWEST ANNUAL MEAN			183
HIGHEST DAILY MEAN	3180	Mar 18	9900
LOWEST DAILY MEAN	23	Nov 11	15
ANNUAL SEVEN-DAY MINIMUM	23	Nov 9	16
ANNUAL RUNOFF (AC-FT)	280900	151200	288700
ANNUAL RUNOFF (CFSM)	3.29	1.77	3.38
ANNUAL RUNOFF (INCHES)	44.65	24.02	45.89
10 PERCENT EXCEEDS	992	505	946
50 PERCENT EXCEEDS	216	108	205
90 PERCENT EXCEEDS	28	24	33

## WILLAMETTE RIVER BASIN

199

14150900 FALL CREEK LAKE NEAR LOWELL, OR

LOCATION.--Lat 43°56'40", long 122°45'20", in SW 1/4 sec.1, T.19 S., R.1 W., Lane County, Hydrologic Unit 17090001, in regulating tower near the center of Fall Creek Dam on Fall Creek, 2.2 mi northeast of Lowell, and at mile 7.2.

DRAINAGE AREA.--184 mi<sup>2</sup>.

PERIOD OF RECORD.--January 1966 to current year. Prior to October 1971, published as Fall Creek Reservoir near Lowell.

GAGE.--Water-stage recorder. Datum of gage is sea level. Levels by U.S. Army Corps of Engineers (USACE).

REMARKS.--Water levels for December 3-15 and September 9 obtained through USACE Columbia River Operational Hydromet System (CROHMS) data base. Reservoir is formed by earthfill dam with concrete gate and spillway section, completed in 1965 by Corps of Engineers; storage began January 1966. Total capacity is 125,100 acre-ft at elevation 834 ft and usable capacity is 115,500 acre-ft between elevation 728 ft and 834 ft. Reservoir used for flood control, conservation, and recreation. Figures given herein represent total contents.

COOPERATION.--Capacity table furnished by USACE.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 123,200 acre-ft May 30, 31, 1972, May 19, 1991; maximum elevation, 832.98 ft May 31, 1972; minimum contents, no contents Nov. 7 to Dec. 6, 1969, Nov. 14-16, 1970, Nov. 18-25, 1972.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 119,200 acre-ft June 16, elevation, 830.79 ft; minimum contents, 1,270 acre-ft Dec. 1 elevation, 693.98.

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

670.4	0	725	8,340	785	53,120
679	59	735	13,270	795	64,590
685	366	745	19,480	805	77,880
695	1,400	755	26,130	815	92,750
705	2,850	765	33,770	825	109,200
715	5,200	775	42,580	833	123,200

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	766.26	704.65	701.54	724.50	740.70	781.09	805.33	822.39	827.92	830.28	825.23	815.55
2	763.24	704.06	702.08	727.23	741.04	782.76	805.91	822.60	828.04	830.23	825.01	815.19
3	760.16	703.60	701.51	729.24	741.39	784.79	806.42	822.85	828.13	830.14	824.80	814.84
4	756.98	703.25	702.40	728.33	741.67	787.57	806.78	823.25	828.09	830.09	824.59	814.44
5	753.80	702.72	702.62	730.18	741.97	789.78	807.30	823.59	828.15	830.08	824.37	814.14
6	750.30	702.23	702.31	731.74	742.27	791.27	808.20	823.86	828.45	829.98	824.15	813.80
7	746.74	701.63	702.61	731.21	742.51	792.46	809.44	823.93	829.09	829.91	823.93	813.77
8	743.05	701.08	706.91	731.88	742.78	793.34	810.58	824.07	829.47	829.80	823.72	811.05
9	739.14	700.47	708.64	732.46	743.08	794.04	811.68	824.18	829.81	829.64	823.49	809.52
10	734.84	699.86	709.31	731.50	743.63	794.65	813.43	824.39	829.95	829.46	823.23	807.98
11	730.02	699.27	710.40	731.73	744.02	795.17	814.78	824.53	830.02	829.29	823.04	806.35
12	725.96	698.56	711.86	731.50	744.35	795.60	815.87	824.67	830.03	829.11	822.77	804.64
13	723.07	697.92	712.45	731.68	744.81	795.99	816.75	824.73	830.19	828.97	822.44	802.96
14	720.99	697.26	713.19	731.64	745.46	796.32	817.41	824.74	830.54	828.78	822.09	801.17
15	718.92	696.44	713.98	731.53	746.00	796.65	817.95	824.82	830.74	828.60	821.76	799.40
16	716.91	695.46	715.83	731.82	746.58	797.03	818.29	825.02	830.72	828.41	821.39	797.58
17	714.42	694.87	717.53	731.80	747.44	797.32	818.60	825.30	830.68	828.22	821.03	795.73
18	712.40	694.60	718.43	732.05	748.72	797.69	818.94	825.56	830.62	828.05	820.69	793.87
19	710.74	694.19	719.19	732.60	749.83	798.04	819.26	825.85	830.50	827.85	820.32	791.98
20	710.44	694.14	719.79	733.19	750.83	798.35	819.58	826.21	830.40	827.66	819.93	790.05
21	710.17	694.34	720.30	733.89	751.93	799.05	819.86	826.43	830.44	827.47	819.56	788.03
22	709.71	694.74	720.81	734.62	753.07	799.77	820.03	826.63	830.39	827.27	819.25	785.86
23	709.26	694.44	721.19	735.35	755.17	800.41	820.15	826.82	830.40	827.07	818.89	783.67
24	708.80	694.72	721.56	736.27	764.18	800.92	820.39	827.03	830.39	826.88	818.48	781.43
25	708.38	694.67	721.91	737.02	769.29	801.46	820.70	827.19	830.38	826.69	818.12	779.08
26	707.90	694.37	722.20	737.67	772.93	801.76	821.03	827.34	830.39	826.46	817.79	776.63
27	707.42	694.34	722.50	738.23	776.47	802.08	821.40	827.43	830.37	826.24	817.39	774.19
28	706.88	694.65	722.78	738.79	779.08	802.39	821.76	827.48	830.39	826.06	817.05	771.68
29	706.35	694.90	723.03	739.35	--	802.83	822.00	827.52	830.37	825.85	816.65	769.25
30	705.82	694.15	723.28	739.84	--	803.36	822.19	827.59	830.29	825.63	816.29	766.74
31	705.23	--	723.55	740.31	--	804.49	--	827.72	--	825.40	815.95	--
MAX	766.26	704.65	723.55	740.31	779.08	804.49	822.19	827.72	830.74	830.28	825.23	815.55
MIN	705.23	694.14	701.51	724.50	740.70	781.09	805.33	822.39	827.92	825.40	815.95	766.74
(†)	2900	1290	7790	16480	46700	77160	104400	113800	118300	109900	94250	35210
(‡)	-34280	-1610	+6500	+8690	+30220	+30460	+27240	+9400	+4500	-8400	-15650	-59040

CAL YR 1993 MAX 831.31 MIN 694.14 AC-FT† -2260

WTR YR 1994 MAX 830.74 MIN 694.14 AC-FT† -1970

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

‡ Change in contents, in acre-feet.

## WILLAMETTE RIVER BASIN

14151000 FALL CREEK BELOW WINBERRY CREEK, NEAR FALL CREEK, OR

LOCATION.--Lat 43°56'40", long 122°46'25", in NW 1/4 SE 1/4 sec.2, T.19 S., R.1 W., Lane County, Hydrologic Unit 17090001, on right bank 10 ft upstream from highway bridge, 1.1 mi downstream from Fall Creek Dam, 2.3 mi southeast of town of Fall Creek, and at mile 6.1.

DRAINAGE AREA.--186 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October to December 1911 (published as Big Fall Creek near Fall Creek; gage heights and discharge measurements only), September 1935 to current year.

REVISED RECORDS.--WSP 1094: 1946(M). WSP 1248: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 637.81 ft above sea level (Corps of Engineers bench mark). Oct. 1 to Dec. 31, 1911, nonrecording gage at site 0.25 mi downstream at different datum. Sept. 9, 1935, to Aug. 3, 1950, nonrecording gage on left bank at present site and datum. Aug. 4, 1950 to Aug. 27, 1982 water-stage recorder. Aug. 27, 1982 gage moved to right bank at present site and datum.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since 1966 by Fall Creek Lake (station 14150900). No diversion upstream from station.

AVERAGE DISCHARGE.--59 years, 571 ft<sup>3</sup>/s, 41.69 in/yr, 413,700 acre-ft/yr, adjusted for storage in Fall Creek Lake since January 1965.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,700 ft<sup>3</sup>/s Dec. 11, 1956, gage height, 18.80 ft, from rating curve extended above 9,700 ft<sup>3</sup>/s; minimum discharge, 1.5 ft<sup>3</sup>/s Oct. 7, 8, 1965.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,760 ft<sup>3</sup>/s Jan. 9, gage height, 5.19 ft; minimum discharge, 24 ft<sup>3</sup>/s Feb. 1.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1200	92	295	47	38	140	94	128	46	133	191	274
2	1210	94	454	128	49	93	130	78	46	132	191	276
3	1190	96	378	1190	47	66	129	44	73	131	191	276
4	1170	96	411	1180	47	67	87	44	131	130	191	277
5	1150	96	412	1180	47	65	53	45	132	130	191	277
6	1180	92	398	1260	47	64	53	74	90	130	191	335
7	1170	89	320	1060	47	64	54	126	47	130	191	789
8	1150	88	441	573	47	64	102	128	47	165	191	1100
9	1160	86	498	1090	47	64	132	82	47	190	191	1090
10	1200	84	507	1450	47	64	132	45	100	192	191	1040
11	1210	82	480	1230	47	63	108	45	132	191	191	1110
12	992	81	481	1100	47	62	52	45	134	191	216	1120
13	676	79	430	711	48	62	52	72	135	191	275	1120
14	480	78	190	597	48	62	52	126	187	192	274	1110
15	476	87	44	493	48	62	78	127	378	193	274	1100
16	472	90	44	324	48	62	134	77	445	193	277	1100
17	472	82	45	320	49	62	134	45	394	193	277	1090
18	382	74	45	235	50	79	92	45	341	191	277	1080
19	298	69	45	145	50	117	50	45	341	191	277	1070
20	87	46	45	100	50	136	51	81	294	191	277	1060
21	79	43	45	72	51	113	50	128	198	191	277	1100
22	96	131	45	50	52	81	97	128	196	193	277	1110
23	96	111	46	50	52	75	132	78	162	194	277	1100
24	94	50	46	51	56	68	133	46	134	194	277	1090
25	94	55	46	52	58	101	91	46	132	193	277	1080
26	94	71	46	52	61	182	47	46	132	193	277	1110
27	94	65	46	52	66	182	44	74	132	193	277	1090
28	92	100	46	39	106	116	44	132	133	193	277	1080
29	92	143	46	30	---	55	87	132	134	192	277	1060
30	94	254	46	30	---	49	126	106	134	191	275	1050
31	94	---	46	30	---	57	---	46	---	191	274	---
TOTAL	18344	2704	6467	14921	1450	2597	2620	2464	5027	5498	7567	27564
MEAN	592	90.1	209	481	51.8	83.8	87.3	79.5	168	177	244	919
MAX	1210	254	507	1450	106	182	134	132	445	194	277	1120
MIN	79	43	44	30	38	49	44	44	46	130	191	274
AC-FT	36390	5360	12830	29600	2880	5150	5200	4890	9970	10910	15010	54670
MEAN†	34.3	63.0	314	623	596	579	545	232	243	40.8	-10.4	-73.4
CFSM†	0.18	0.34	1.69	3.35	3.21	3.11	2.93	1.25	1.31	0.22	-0.06	-0.39
IN.†	0.21	0.38	1.95	3.86	3.34	3.59	3.27	1.44	1.46	0.25	-0.06	-0.44
AC-FT†	2110	3750	19330	38290	33100	35610	32440	14290	14470	2510	-640	-4370

CAL YR 1993 TOTAL 199297 MEAN 546 AX 2140 MIN 43 AC-FT 395300 MEAN† 543 CFSM† 2.92 IN.† 39.62 AC-FT† 393000  
WTR YR 1994 TOTAL 97223 MEAN 266 MAX 1450 MIN 30 AC-FT 192800 MEAN† 263 CFSM† 1.42 IN.† 19.23 AC-FT† 190800

† Adjusted for change in contents in Fall Creek Lake.

Note--Negative adjusted values indicate that evaporation and undetermined losses exceeded inflow for month.



## WILLAMETTE RIVER BASIN

201

14151000 FALL CREEK BELOW WINBERRY CREEK, NEAR FALL CREEK, OR--Continued

## WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: August 1950 to current year.

INSTRUMENTATION.--Temperature recorder since August 1950.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum, 26.0°C July 28, 1958; minimum, 0.0°C Dec. 23, 24, 1990.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 19.5°C several days in August; minimum, 2.5°C Nov. 24-28.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER				NOVEMBER			DECEMBER			JANUARY		
1	18.0	18.0	18.0	13.5	11.5	12.5	6.5	5.5	6.0	5.0	4.5	4.5
2	18.0	18.0	18.0	13.0	11.0	12.0	7.0	6.5	7.0	5.0	4.5	4.5
3	18.5	18.0	18.5	12.5	10.5	11.5	7.5	7.0	7.0	6.5	4.5	5.5
4	18.5	18.5	18.5	11.5	10.0	10.5	7.5	7.0	7.0	6.5	5.0	6.0
5	18.5	18.5	18.5	11.5	9.5	10.5	7.0	6.5	6.5	7.0	5.5	6.5
6	18.5	18.5	18.5	11.0	9.0	10.0	6.5	6.0	6.0	7.0	6.5	7.0
7	18.5	18.5	18.5	10.5	8.5	9.5	6.5	6.0	6.0	7.0	7.0	7.0
8	18.5	18.0	18.0	10.0	8.0	9.0	7.0	6.5	6.5	7.0	7.0	7.0
9	18.0	18.0	18.0	9.5	8.0	9.0	7.5	7.0	7.0	7.0	7.0	7.0
10	18.0	17.5	18.0	9.5	8.0	8.5	7.5	7.5	7.5	7.0	7.0	7.0
11	18.0	17.5	17.5	9.0	8.0	8.5	8.0	7.5	8.0	7.5	7.0	7.5
12	18.0	17.5	17.5	8.5	7.5	8.0	8.0	7.5	7.5	7.5	7.5	7.5
13	17.5	17.0	17.5	8.5	7.5	8.0	7.5	7.0	7.5	7.5	7.5	7.5
14	17.5	17.0	17.0	8.0	7.0	7.5	8.0	7.0	7.5	7.5	7.0	7.5
15	17.0	17.0	17.0	7.5	7.0	7.0	7.5	7.0	7.0	7.5	7.0	7.5
16	17.0	16.0	16.5	7.5	7.0	7.5	7.5	6.5	7.0	7.5	7.0	7.0
17	16.5	16.0	16.0	7.5	7.0	7.0	7.0	6.5	6.5	7.0	6.0	7.0
18	16.5	15.5	16.0	7.5	6.5	7.0	6.5	5.5	6.0	7.0	6.0	6.5
19	16.0	14.5	15.5	7.0	6.0	6.5	5.5	5.0	5.5	6.5	6.0	6.0
20	15.5	13.5	14.5	6.5	5.5	6.0	5.5	5.0	5.0	6.5	6.0	6.0
21	15.0	13.0	14.0	6.0	5.5	5.5	5.0	5.0	5.0	6.5	5.5	6.0
22	15.0	13.5	14.0	5.5	4.0	4.5	5.5	5.0	5.0	6.5	5.5	6.0
23	15.0	13.5	14.0	4.0	3.5	3.5	5.0	4.5	5.0	6.5	5.5	6.0
24	14.5	13.5	14.0	3.5	2.5	3.0	5.5	4.5	4.5	6.0	5.5	5.5
25	14.5	13.5	14.0	3.5	2.5	3.0	5.0	4.0	4.5	7.0	5.5	6.0
26	14.5	13.0	13.5	3.0	2.5	2.5	5.0	4.0	4.5	6.5	5.5	6.0
27	14.0	12.5	13.5	3.0	2.5	2.5	5.0	3.5	4.0	6.0	6.0	6.0
28	14.0	12.5	13.0	3.0	2.5	3.0	4.5	3.5	4.0	7.0	5.0	6.0
29	14.0	12.5	13.0	4.0	3.0	3.5	4.5	4.0	4.0	6.5	5.0	5.5
30	14.0	12.5	13.0	5.5	4.0	4.5	5.0	4.0	4.5	7.0	5.0	5.5
31	13.5	12.5	13.0	---	---	---	4.5	4.0	4.5	7.0	5.0	5.5
MONTH	18.5	12.5	16.0	13.5	2.5	7.0	8.0	3.5	6.0	7.5	4.5	6.5

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

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

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE				JULY			AUGUST			SEPTEMBER		
1	16.0	12.0	13.5	15.0	13.5	14.0	18.5	17.5	18.0	9.0	8.5	8.5
2	14.5	12.0	13.0	15.0	13.5	14.0	18.5	17.5	18.0	9.0	8.5	8.5
3	14.5	12.0	13.0	14.5	14.0	14.0	18.5	17.5	18.5	9.0	8.5	8.5
4	13.5	12.5	13.0	14.5	14.0	14.5	19.0	17.5	18.5	9.0	8.5	9.0
5	14.0	12.0	13.0	14.5	14.0	14.5	19.0	17.5	18.5	9.0	8.5	9.0
6	13.5	12.0	13.0	15.0	14.0	14.5	19.5	18.0	18.5	9.0	8.5	8.5
7	15.0	12.0	13.0	15.0	14.5	14.5	19.5	17.0	18.5	8.5	7.5	8.0
8	16.0	12.0	13.5	15.0	14.0	14.5	19.5	18.0	18.5	8.0	7.5	8.0
9	16.0	12.0	13.5	15.0	14.5	14.5	19.5	18.0	19.0	8.0	8.0	8.0
10	13.5	12.5	13.0	15.0	14.5	15.0	19.5	18.5	19.0	8.5	8.0	8.0
11	13.5	12.5	13.0	15.5	14.5	15.0	19.5	18.5	19.0	8.5	8.5	8.5
12	14.0	12.5	13.0	15.5	15.0	15.0	19.5	15.0	18.0	9.0	8.5	9.0
13	13.0	12.0	12.5	15.5	15.0	15.0	16.0	15.0	15.5	9.5	9.0	9.0
14	13.5	11.0	12.5	16.0	15.0	15.5	16.0	15.5	15.5	9.5	9.5	9.5
15	11.5	9.0	10.5	16.0	15.0	15.5	16.0	8.0	13.0	10.0	9.5	9.5
16	10.0	9.5	9.5	16.0	15.0	15.5	9.0	8.0	8.5	10.0	10.0	10.0
17	10.5	9.5	10.0	16.0	15.5	16.0	8.5	8.0	8.5	10.0	10.0	10.0
18	11.0	10.0	10.5	16.5	15.5	16.0	8.5	8.0	8.5	10.5	10.0	10.0
19	11.0	10.5	10.5	16.5	16.0	16.0	8.5	8.0	8.5	10.5	10.0	10.5
20	13.5	10.5	11.5	16.5	16.0	16.0	8.5	8.0	8.5	10.5	10.5	10.5
21	13.5	13.0	13.5	17.0	16.0	16.5	8.5	8.0	8.5	11.0	10.5	10.5
22	13.5	13.0	13.5	17.0	16.0	16.5	9.0	8.0	8.5	11.0	10.5	11.0
23	14.5	13.0	13.5	17.0	16.0	16.5	9.0	8.0	8.5	11.0	9.5	10.5
24	14.5	13.0	13.5	17.0	16.0	16.5	9.0	8.0	8.5	10.5	9.5	10.0
25	14.0	13.0	13.5	17.5	16.5	17.0	8.5	8.0	8.5	11.5	10.5	11.0
26	15.0	13.0	14.0	18.0	16.5	17.0	9.0	8.0	8.5	12.5	11.5	12.0
27	14.5	13.5	14.0	18.0	16.5	17.5	9.0	8.0	8.5	13.5	12.5	13.0
28	14.5	13.5	14.0	18.0	16.5	17.0	9.0	8.0	8.5	15.0	13.5	14.5
29	14.5	13.5	14.0	18.0	17.0	17.5	9.0	8.0	8.5	16.5	15.0	15.5
30	14.5	13.5	14.0	18.0	17.0	17.5	9.0	8.0	8.5	17.5	16.5	17.0
31	---	---	---	18.5	17.5	18.0	9.0	8.5	8.5	---	---	---
MONTH	16.0	9.0	13.0	18.5	13.5	15.5	19.5	8.0	13.0	17.5	7.5	10.0
YEAR	19.5	2.5	10.0									

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LOCATION.--Lat 43°59'54", long 122°54'17", in SW 1/4 SW 1/4 sec.14, T.18 S., R.2 W., Lane County, Hydrologic Unit 17090001, on right bank 25 ft downstream from highway bridge at Jasper, 0.1 mi downstream from Hills Creek, and at mile 195.0.

PERIOD OF RECORD.--September 1905 to February 1912, July 1913 to March 1917, October 1952 to current year.  
Monthly discharge only for some periods, published in WSP 1318.

GAGE.--Water-stage recorder. Datum of gage is 513.45 ft above sea level. September 1905 to February 1912 and July 1913 to March 1917, nonrecording gage at approximately same site at datum about 1.5 ft higher Oct. 22, 1952, to Sept. 30, 1953, nonrecording gage at site 25 ft upstream at same datum.

REMARKS.--No estimated daily discharges. Records good. Discharges for the period Nov. 30 to Jan. 4 computed from data obtained through U.S. Army Corps of Engineers Columbia River Operational Hydromet System (CROHMS) database. Flow regulated since 1953 by Lookout Point Lake (station 14149000), since 1961 by Hills Creek Lake (station 14145100), and since 1966 by Fall Creek Lake (station 14150900). Continuous water-quality records for the period October 1953 to September 1987 have been collected at this location.

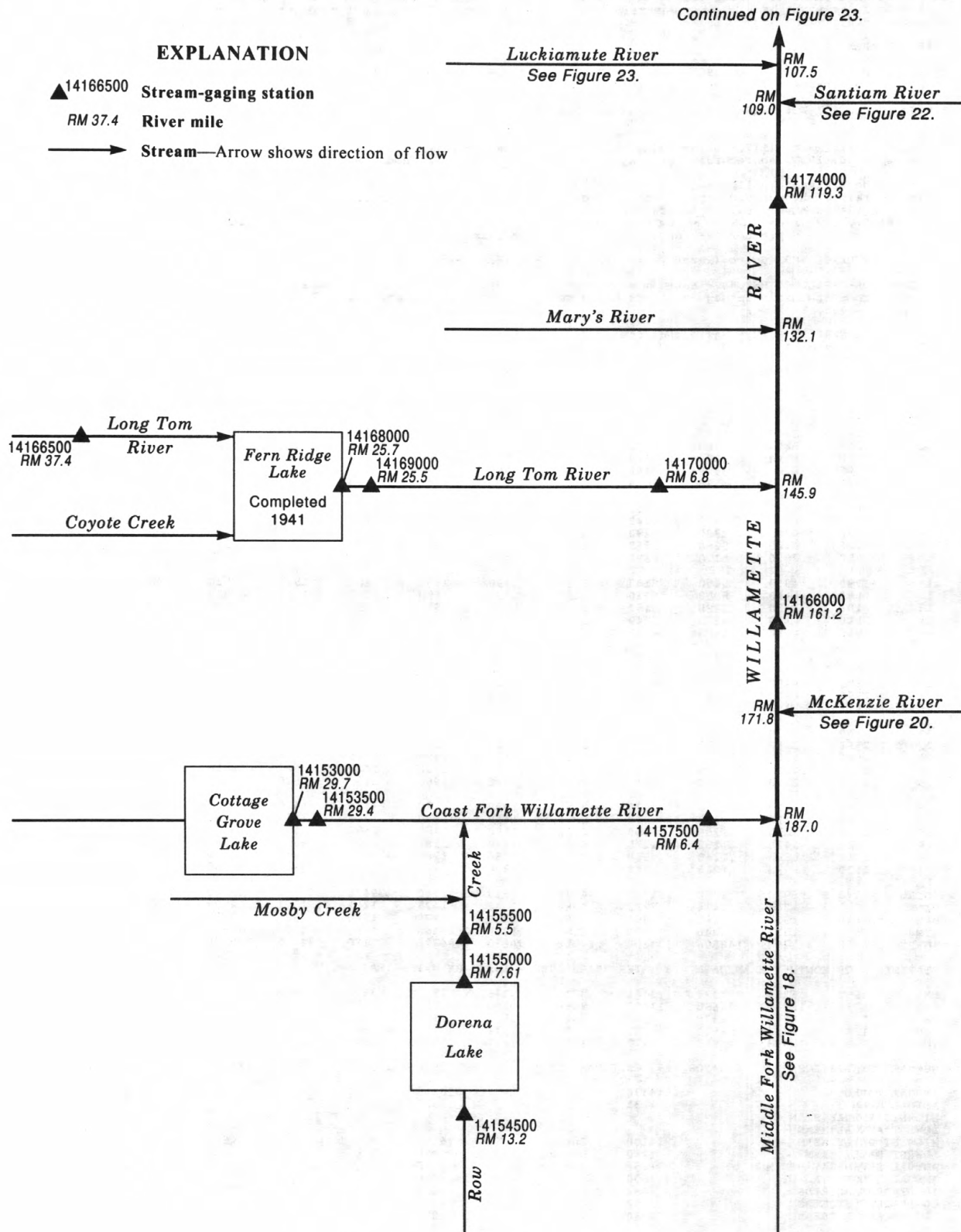
EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 94,000 ft<sup>3</sup>/s Nov. 23, 1909, gage height, 17.4 ft, datum then in use, from graph based on gage readings, from rating curve extended above 42,000 ft<sup>3</sup>/s; minimum discharge, 366 ft<sup>3</sup>/s Dec. 5, 1954.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,690 ft<sup>3</sup>/s Jan. 9, gage height, 5.46 ft; minimum discharge, 1,040 ft<sup>3</sup>/s May 12.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3790	3240	1760	1290	1300	2120	1750	1260	1440	1840	2530	2930
2	3820	3870	2360	1430	1300	1920	1630	1220	1420	1830	2680	2930
3	3810	4320	3270	3200	1290	2120	1540	1150	1430	1830	2720	2950
4	3790	4190	3650	3580	1290	2250	1430	1160	1520	1830	2730	2960
5	3770	4220	3590	5030	1290	1970	1340	1180	1510	1830	2720	2950
6	3810	4230	3530	6260	1280	1780	1490	1160	1530	1820	2840	2650
7	3760	4270	2980	5940	1280	1650	1640	1220	1520	1820	2790	2840
8	3730	4260	4380	5290	1290	1550	1720	1210	1480	1840	2810	3000
9	3720	4120	5280	5810	1290	1490	1820	1190	1440	1900	2800	2980
10	3750	4070	5190	6390	1330	1450	1900	1110	1460	1980	2830	3090
11	3790	4070	5050	6180	1310	1390	1750	1100	1510	2030	2820	3150
12	3560	4110	5050	6010	1290	1330	1590	1090	1510	2030	2810	3210
13	3190	4130	3820	5460	1300	1300	1510	1090	1520	2030	2910	3120
14	2940	4170	2570	5240	1380	1280	1410	1170	1590	1990	2910	3090
15	2940	4180	1620	4370	1350	1250	1380	1190	1850	1990	2910	3090
16	2950	4170	1400	4070	1330	1270	1430	1220	1920	2330	2920	3080
17	2950	4160	1380	4000	1380	1250	1390	1200	1850	2020	2920	3070
18	2890	4180	1350	3390	1540	1310	1320	1270	1770	2540	2930	3060
19	2790	4200	1340	2290	1480	1410	1230	1260	1740	2400	2930	3050
20	2610	3170	1320	1560	1440	1400	1210	1280	1700	2380	2920	3040
21	2560	3010	1310	1420	1490	1600	1200	1340	1550	2390	2930	3070
22	2550	3150	1300	1330	1540	1560	1330	1340	1610	2390	2960	3090
23	2540	4200	1300	1350	1610	1480	1290	1280	1720	2450	2970	3090
24	2540	4220	1290	1390	3050	1410	1300	1410	1660	2590	2970	3090
25	2550	3120	1270	1410	2650	1390	1260	1430	1520	2550	2970	3080
26	2560	2220	1260	1390	2350	1480	1190	1420	1470	2500	2970	3100
27	2550	1420	1250	1370	2590	1450	1170	1430	1470	2490	2940	3090
28	2550	1330	1250	1350	2320	1360	1160	1530	1630	2470	2940	3080
29	2540	1410	1250	1330	---	1250	1180	1540	1660	2480	2940	3130
30	2540	1560	1240	1320	---	1350	1280	1530	1740	2520	2940	3090
31	2530	---	1240	1310	---	1990	---	1430	---	2530	2930	---
TOTAL	96370	106970	74850	101760	44340	47810	42740	39410	47740	68120	88890	91150
MEAN	3109	3566	2415	3283	1584	1542	1425	1271	1591	2197	2867	3038
MAX	3820	4320	5280	6390	3050	2250	1900	1540	1920	2590	2970	

MEAN	3952	6254	7327	6181	3719	3376	2973	3117	2878	1942	2415	3527
MAX	5392	12730	14630	11480	9460	10550	6834	6675	6746	2562	3395	4823
(WY)	1985	1985	1978	1976	1972	1972	1993	1993	1984	1969	1993	1984
MIN	1586	2618	1517	1327	787	1111	729	844	1187	1248	1766	1830
(WY)	1993	1988	1977	1977	1977	1977	1977	1973	1977	1978	1984	1968

ANNUAL TOTAL	1544330		850150			
ANNUAL MEAN	4231		2329		3974	
HIGHEST ANNUAL MEAN					6215	1972
LOWEST ANNUAL MEAN					1877	1977
HIGHEST DAILY MEAN	14100		6390	Jan 10	20900	Feb 27 1986
LOWEST DAILY MEAN	1240	Jun 4	1090	May 12	536	Apr 30 1977
ANNUAL SEVEN-DAY MINIMUM	1250	Dec 25	1130	May 9	555	Apr 24 1977
ANNUAL RUNOFF (AC-FT)	3063000		1686000		2879000	
10 PERCENT EXCEEDS	7480		4030		7790	
50 PERCENT EXCEEDS	3590		1900		2990	
90 PERCENT EXCEEDS	2080		1270		1510	



**Figure 22.** Schematic diagram showing gaging stations in the Long Tom, Coast Fork Willamette and upper Willamette River Basins.

## WILLAMETTE RIVER BASIN

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## 14153000 COTTAGE GROVE LAKE NEAR COTTAGE GROVE, OR

LOCATION.--Lat 43°43'00", long 123°02'55", in NE 1/4 sec.28, T.21 S., R.3 W., Lane County, Hydrologic Unit 17090002, in east abutment of dam on Coast Fork Willamette River 5.8 mi south of Cottage Grove, and at mile 29.7.

DRAINAGE AREA.--104 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1942 to current year. Prior to October 1971, published as Cottage Grove Reservoir near Cottage Grove.

REVISED RECORDS.--WSP 1218: 1950.

GAGE.--Water-stage recorder. Datum of gage is sea level (levels by Corps of Engineers).

REMARKS.--Lake is formed by earthfill dam with concrete spillway completed by Corps of Engineers in 1942; storage began Oct. 31, 1942. Capacity, 32,930 acre-ft between elevation 719.0 ft, outlet conduit, and 791.0 ft, crest of spillway. Dead storage negligible. Reservoir used for flood control and improvement of navigation. Figures given herein represent total contents.

COOPERATION.--Capacity table furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 36,750 acre-ft Dec. 24, 1964, elevation, 794.23 ft; minimum contents since first filling, no contents Sept. 26 to Oct. 19, 1966, and Nov. 14, 15, Nov. 20 to Dec. 8, 1969.

EXTREMES FOR CURRENT YEAR.-- Maximum contents, 29,680 acre-ft June 20-24, elevation, 788.11 ft; minimum contents, 1,990 acre-ft Nov. 29, elevation, 745.64 ft.

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

710.9	0	755	4,860	780	21,460
730	151	760	7,150	785	26,370
740	926	765	9,970	790	31,780
745	1,840	770	13,260	793	35,270
750	3,140	775	17,070		

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	775.15	750.70	746.63	751.93	755.88	768.10	779.23	785.00	787.48	787.90	785.88	783.21
2	774.61	750.45	747.52	751.90	755.95	768.68	779.82	785.13	787.49	787.86	785.80	783.12
3	774.01	750.21	747.79	752.04	756.00	769.54	780.24	785.26	787.50	787.82	785.72	783.06
4	773.33	749.98	748.44	751.69	756.04	769.98	780.47	785.42	787.52	787.77	785.64	782.97
5	772.60	749.73	748.89	752.44	756.06	770.35	780.63	785.56	787.54	787.73	785.55	782.87
6	771.83	749.47	749.09	751.67	756.08	770.85	781.06	785.66	787.62	787.68	785.47	782.77
7	771.04	749.21	749.86	751.57	756.11	771.28	781.35	785.75	787.68	787.63	785.39	782.67
8	770.04	748.95	750.99	752.04	756.12	771.70	781.47	785.83	787.72	787.58	785.31	782.57
9	768.91	748.68	748.66	752.59	756.14	772.04	781.66	785.88	787.74	787.52	785.23	782.50
10	767.77	748.43	750.14	752.92	756.25	772.31	781.80	785.93	787.75	787.45	785.14	782.42
11	766.61	748.23	751.19	752.75	756.32	772.51	781.81	785.97	787.75	787.39	785.06	782.34
12	765.45	748.02	750.06	752.77	756.38	772.66	781.90	786.00	787.76	787.33	784.98	782.25
13	764.23	747.82	749.91	752.67	756.60	772.78	781.93	786.02	787.78	787.26	784.90	782.16
14	762.99	747.61	750.01	752.63	757.15	772.87	782.12	786.04	787.83	787.19	784.81	782.06
15	761.71	747.39	749.84	752.57	757.52	772.95	782.41	786.20	787.94	787.12	784.73	781.96
16	760.43	747.20	750.01	752.51	757.80	773.09	782.66	786.40	788.00	787.06	784.64	781.87
17	758.95	747.03	750.52	752.50	758.40	773.18	782.86	786.58	788.06	786.99	784.55	781.77
18	757.37	746.89	750.90	752.58	759.35	773.38	783.03	786.75	788.09	786.91	784.46	781.67
19	755.70	746.70	751.19	752.80	760.05	773.64	783.17	786.88	788.10	786.85	784.38	781.36
20	754.74	746.50	751.39	753.11	760.68	773.91	783.29	786.99	788.11	786.78	784.29	780.82
21	754.32	746.32	751.56	753.39	761.51	774.37	783.42	787.09	788.11	786.71	784.21	780.28
22	753.91	746.38	751.67	753.69	762.37	774.88	783.51	787.16	788.11	786.63	784.12	779.74
23	753.49	746.37	751.76	754.13	763.40	775.26	783.61	787.21	788.11	786.56	784.03	779.19
24	753.06	746.23	751.82	754.63	765.18	775.56	783.72	787.26	788.09	786.49	783.93	778.64
25	752.62	746.07	751.86	754.94	765.47	775.80	783.85	787.29	788.07	786.42	783.85	778.08
26	752.19	745.88	751.90	755.11	766.28	776.00	784.04	787.30	788.06	786.35	783.76	777.52
27	751.85	745.73	751.93	755.20	766.99	776.17	784.26	787.32	788.03	786.27	783.66	776.95
28	751.63	745.65	751.94	755.35	767.54	776.31	784.46	787.35	788.00	786.19	783.57	776.42
29	751.40	745.74	751.94	755.54	---	776.46	784.65	787.38	787.96	786.11	783.48	775.89
30	751.17	746.00	751.96	755.68	---	777.12	784.84	787.40	787.93	786.04	783.39	775.33
31	750.94	---	751.99	755.79	---	778.32	---	787.46	---	785.96	783.30	---
MAX	775.15	750.70	751.99	755.79	767.54	778.32	784.84	787.46	788.11	787.90	785.88	783.21
MIN	750.94	745.65	746.63	751.57	755.88	768.10	779.23	785.00	787.48	785.96	783.30	775.33
(†)	3420	2080	3760	5190	11580	19930	26210	28970	29480	27370	24650	17350
(‡)	-14230	-1340	+1680	+1430	+6390	+8350	+6280	+2760	+510	-2110	-2720	-7300

CAL YR 1993 MAX 790.29 MIN 745.65 AC-FT‡ +120  
WTR YR 1994 MAX 788.11 MIN 745.65 AC-FT‡ -300

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



## WILLAMETTE RIVER BASIN

14153500 COAST FORK WILLAMETTE RIVER BELOW COTTAGE GROVE DAM, OR

LOCATION.--Lat 43°43'15", long 123°02'55", in NE 1/4 sec.28, T.21 S., R.3 W., Lane County, Hydrologic Unit 17090002, on right bank at bridge 0.3 mi downstream from Cottage Grove Dam, 5.5 mi south of Cottage Grove, and at mile 29.4.

DRAINAGE AREA.--104 mi<sup>2</sup>.

PERIOD OF RECORD.--January 1939 to current year. Prior to October 1944, published as "near Cottage Grove."

REVISED RECORDS.--WSP 1448: 1949(M).

GAGE.--Water-stage recorder. Datum of gage is 711.00 ft above sea level (Corps of Engineers bench mark). Jan. 1 to Oct. 12, 1939, nonrecording gage and Oct. 13, 1939, to Sept. 30, 1944, water-stage recorder at several sites and datums 0.8 mi downstream.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since 1942 by Cottage Grove Lake (station 14153000). Small diversions for irrigation upstream from station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--55 years, 263 ft<sup>3</sup>/s, 34.34 in/yr, 190,500 acre-ft/yr, adjusted for storage.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,910 ft<sup>3</sup>/s Dec. 24, 1964, gage height, 11.83 ft; no flow July 5-7, 1945, and for part of Aug. 24, 1947.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 786 ft<sup>3</sup>/s Jan. 5, 6, gage height, 5.24 ft; minimum discharge, 40 ft<sup>3</sup>/s Nov. 25 to Dec. 1.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	244	57	41	130	71	227	91	52	51	52	50	49
2	243	57	41	195	71	163	88	52	51	52	50	49
3	259	55	42	357	70	249	88	52	52	52	50	49
4	285	55	42	369	70	413	124	53	52	52	50	57
5	298	55	43	511	70	314	150	54	52	52	50	57
6	314	55	43	678	70	187	151	53	52	52	50	57
7	314	54	43	386	70	142	242	53	52	52	50	57
8	370	54	441	254	69	102	327	54	52	52	50	57
9	403	54	684	334	68	100	380	54	52	52	49	57
10	398	48	286	357	70	100	413	54	52	52	49	57
11	394	41	552	382	70	100	408	54	52	52	49	57
12	390	41	713	300	70	100	309	54	52	52	49	57
13	385	41	342	273	71	100	272	54	52	51	49	56
14	380	41	214	224	72	101	151	54	52	51	49	55
15	375	41	205	198	73	97	70	55	52	50	49	55
16	370	41	132	175	75	90	70	55	51	50	49	55
17	390	41	55	147	74	90	70	56	52	50	49	55
18	383	41	55	121	75	90	70	53	51	50	49	55
19	376	41	55	81	75	81	70	50	51	50	49	156
20	228	41	55	50	75	60	70	50	51	50	49	266
21	108	41	55	49	77	61	70	50	52	50	49	266
22	108	41	55	49	78	62	70	50	51	50	49	263
23	108	41	55	50	80	75	70	51	51	50	49	263
24	107	41	55	81	299	86	71	52	51	50	49	261
25	106	41	57	112	611	89	61	51	51	50	49	261
26	105	40	57	112	359	88	54	50	51	50	49	259
27	81	40	51	112	366	88	54	52	52	50	49	258
28	57	40	52	87	314	89	53	52	52	50	49	256
29	57	40	52	70	---	83	52	52	52	50	49	255
30	56	40	52	71	---	85	52	52	52	50	49	253
31	56	---	55	72	---	92	---	52	---	50	49	---
TOTAL	7748	1359	4680	6387	3613	3804	4221	1630	1549	1576	1527	4008
MEAN	250	45.3	151	206	129	123	141	52.6	51.6	50.8	49.3	134
MAX	403	57	713	678	611	413	413	56	52	52	50	266
MIN	56	40	41	49	68	60	52	50	51	50	49	49
AC-FT	15370	2700	9280	12670	7170	7550	8370	3230	3070	3130	3030	7950
MEAN†	18.5	22.9	124	229	244	259	246	97.4	60.2	16.6	5.04	10.9
CFSM†	0.18	0.22	1.19	2.20	2.35	2.49	2.37	0.94	0.58	0.16	0.05	0.11
IN.†	0.21	0.25	1.37	2.54	2.44	2.87	2.64	1.08	0.65	0.18	0.06	0.12
AC-FT†	1140	1360	7600	14100	13560	15900	14650	5990	3580	1020	310	650

CAL YR 1993 TOTAL 89163 MEAN 244 MAX 1490 MIN 40 AC-FT 176900 MEAN† 245 CFSM† 2.36 IN.† 31.91 AC-FT† 177020  
WTR YR 1994 TOTAL 42102 MEAN 115 MAX 713 MIN 40 AC-FT 83510 MEAN† 115 CFSM† 1.11 IN.† 15.00 AC-FT† 83210

† Adjusted for change in contents, in Cottage Grove Lake.



## WILLAMETTE RIVER BASIN

14155000 DORENA LAKE NEAR COTTAGE GROVE, OR

LOCATION.--Lat 43°47'10", long 122°57'15", in SE 1/4 sec.32, T.20 S., R.2 W., Lane County, Hydrologic Unit 17090002, on left end of Dorena Dam on Row River, 5.0 mi east of Cottage Grove, and at mile 7.61.

DRAINAGE AREA.--265 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1949 to current year. Prior to October 1971, published as Dorena Reservoir near Cottage Grove.

REVISED RECORDS.--WRD OR-78-1: 1969.

GAGE.--Water-stage recorder. Datum of gage is sea level (levels by Corps of Engineers).

REMARKS.--Reservoir is formed by earthfill dam with concrete outlet and spillway, completed in 1949 by Corps of Engineers; controlled storage began Oct. 11, 1949. Capacity, 77,580 acre-ft between elevations 739.0 ft, sill of outlet gates, and 835.0 ft, crest of spillway. Dead storage, 18 acre-ft below elevation 739.0 ft. Reservoir used for flood control and improvement of navigation. Figures given herein represent total contents.

COOPERATION.--Capacity table furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 95,550 acre-ft Dec. 23, 1964, elevation, 844.03 ft; minimum contents observed since first filling, 159 acre-ft Dec. 14, 1970, elevation, 743.60 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 72,510 acre-ft June 16, elevation, 832.25 ft; minimum contents, 5,070 acre-ft Nov. 16-18, elevation, 766.23 ft.

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

760	2,810	785	15,850	810	39,380	835	77,600
765	4,560	790	19,580	815	45,620	840	87,320
770	6,840	795	23,780	820	52,480		
775	9,540	800	28,490	825	60,060		
780	12,530	805	33,700	830	68,470		

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	810.88	768.92	770.59	773.13	777.34	798.43	815.76	825.90	831.70	832.13	830.72	828.12
2	810.01	768.64	770.56	773.39	777.29	798.97	816.85	826.16	831.75	832.14	830.65	828.04
3	809.09	768.40	770.43	774.25	777.20	799.77	817.56	826.38	831.77	832.14	830.57	827.97
4	808.10	768.18	770.84	771.70	777.08	800.26	817.97	826.66	831.78	832.14	830.50	827.90
5	806.90	767.94	770.59	773.27	776.94	800.59	818.19	826.94	831.79	832.13	830.43	827.82
6	805.71	767.65	770.53	773.38	776.78	801.12	818.79	827.21	831.95	832.11	830.34	827.61
7	804.45	767.36	770.83	773.10	776.65	801.63	819.50	827.47	831.97	832.10	830.27	827.29
8	802.88	767.07	771.57	773.64	776.47	802.18	819.81	827.71	831.94	832.08	830.18	826.92
9	801.09	766.75	768.16	774.74	776.35	802.73	820.26	827.89	831.92	832.04	830.09	826.57
10	799.23	766.47	769.36	774.37	776.37	803.22	821.08	828.04	832.00	832.01	830.03	826.27
11	797.36	766.38	770.20	774.11	776.39	803.58	821.19	828.18	832.06	831.96	829.95	825.92
12	795.46	766.36	769.61	773.94	776.38	803.86	821.17	828.29	832.11	831.94	829.87	825.41
13	793.46	766.33	769.40	773.92	776.44	804.08	821.15	828.39	832.13	831.87	829.79	824.70
14	791.30	766.29	769.82	773.85	777.00	804.24	821.30	828.47	832.15	831.84	829.71	823.96
15	789.12	766.25	770.30	773.76	777.46	804.42	821.41	828.66	832.24	831.80	829.62	823.25
16	786.98	766.23	770.44	773.76	777.86	804.65	821.71	828.91	832.15	831.75	829.53	822.51
17	784.62	766.23	770.88	773.79	778.66	804.82	821.92	829.20	832.14	831.67	829.45	821.76
18	782.12	766.29	771.24	773.81	780.10	805.14	822.19	829.48	832.15	831.64	829.37	821.02
19	779.49	766.31	771.44	773.96	781.15	805.53	822.46	829.75	832.12	831.59	829.28	820.23
20	777.60	766.31	771.72	774.18	781.93	805.95	822.68	830.03	832.10	831.53	829.20	819.46
21	776.42	766.33	772.01	774.58	782.83	806.82	822.88	830.30	832.10	831.45	829.11	818.68
22	775.15	766.73	772.23	775.15	783.76	807.66	823.01	830.54	832.10	831.37	829.02	817.91
23	773.83	767.01	772.40	775.90	785.07	808.30	823.14	830.73	832.07	831.32	828.93	817.09
24	772.42	767.11	772.51	776.57	790.06	808.84	823.32	830.89	832.07	831.26	828.85	816.25
25	771.35	767.14	772.60	776.96	793.82	809.41	823.53	831.01	832.05	831.22	828.76	815.43
26	770.62	767.17	772.68	777.12	796.56	809.94	823.89	831.13	832.04	831.16	828.67	814.56
27	770.36	767.24	772.73	777.15	797.35	810.44	824.37	831.20	832.07	831.08	828.56	813.71
28	770.09	767.47	772.75	777.23	797.79	810.90	824.82	831.30	832.10	831.01	828.48	812.89
29	769.83	767.94	772.76	777.33	---	811.29	825.18	831.40	832.11	830.94	828.40	812.08
30	769.53	769.01	772.75	777.37	---	812.02	825.59	831.48	832.12	830.85	828.31	811.25
31	769.24	---	772.80	777.38	---	814.11	---	831.58	---	830.78	828.21	---
MAX	810.88	769.01	772.80	777.38	797.79	814.11	825.59	831.58	832.24	832.14	830.72	828.12
MIN	769.24	766.23	768.16	771.70	776.35	798.43	815.76	825.90	831.70	830.78	828.21	811.25
(†)	6460	6340	8320	10930	26340	44460	61010	71300	72270	69860	65630	40880
(‡)	-35080	-120	+1980	+2610	+15410	+18120	+16550	+10290	+970	-2410	-4500	-24480

CAL YR 1993 MAX 832.21 MIN 766.23 AC-FT† +850  
WTR YR 1994 MAX 832.24 MIN 766.23 AC-FT† -660

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

## WILLAMETTE RIVER BASIN

209

## 14155500 ROW RIVER NEAR COTTAGE GROVE, OR

LOCATION.--Lat 43°47'35", long 122°59'25", in NE 1/4 sec.36, T.20 S., R.3 W., Lane County, Hydrologic Unit 17090002, on right bank 1.7 mi upstream from Mosby Creek, 2.1 mi downstream from Dorena Dam, 3.5 mi east of Cottage Grove, and at mile 5.5.

DRAINAGE AREA.--270 mi<sup>2</sup>.

PERIOD OF RECORD.--January 1939 to current year. Prior to October 1947, published as "near Dorena."

GAGE.--Water-stage recorder. Datum of gage is 685.24 ft above sea level (levels by Corps of Engineers). Jan. 5 to Oct. 12, 1939, nonrecording gage at site 180 ft upstream at datum 1.00 ft higher.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since October 1949 by Dorena Lake (station 14155000). No diversion upstream from station.

AVERAGE DISCHARGE.--55 years, 733 ft<sup>3</sup>/s, 36.87 in/yr, 531,100 acre-ft/yr, adjusted for storage.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 21,400 ft<sup>3</sup>/s Dec. 28, 1945, gage height, 18.20 ft; minimum discharge, 0.20 ft<sup>3</sup>/s Sept. 25 to Oct. 7, 1958.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,550 ft<sup>3</sup>/s Jan. 3, gage height, 5.85 ft; minimum discharge, 40 ft<sup>3</sup>/s several days in November.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	563	96	44	197	185	1070	177	175	93	93	88	88
2	559	96	496	617	185	909	174	175	122	91	88	88
3	570	96	245	1810	185	889	187	175	143	91	88	88
4	624	94	272	1790	185	1290	274	176	143	91	88	88
5	720	93	377	1480	185	1030	342	176	143	91	88	88
6	714	93	220	1700	185	638	345	131	146	91	88	162
7	732	92	355	1090	183	458	582	93	470	91	88	274
8	878	91	1750	698	181	305	903	92	394	91	88	311
9	976	91	1940	1120	181	223	1090	91	280	88	88	311
10	961	87	756	1520	182	198	1180	91	147	88	86	311
11	945	58	1110	1280	181	198	1330	91	137	88	86	311
12	928	40	1430	1090	181	197	1100	91	140	88	86	439
13	930	40	741	810	183	193	841	91	188	88	86	579
14	968	40	427	707	185	204	554	91	278	88	86	576
15	947	40	317	595	185	195	484	92	447	88	88	573
16	925	40	311	461	185	195	295	91	554	88	88	571
17	951	41	204	379	187	195	299	91	365	88	88	567
18	927	40	168	325	189	195	221	91	316	88	88	565
19	899	40	168	262	192	190	185	91	290	88	88	562
20	629	40	135	220	195	165	185	91	239	88	88	559
21	382	40	109	155	198	162	185	91	213	88	88	556
22	386	41	109	104	198	167	185	91	206	88	88	554
23	378	40	109	106	202	165	185	91	202	88	88	568
24	371	40	109	166	212	158	185	91	158	88	88	573
25	282	40	109	242	221	158	180	91	158	88	88	571
26	202	40	109	242	371	158	174	91	149	88	88	566
27	100	41	109	242	1390	158	175	91	96	88	88	565
28	96	40	109	210	1300	158	175	91	93	88	88	560
29	96	41	109	185	---	159	175	93	93	88	88	556
30	96	42	109	185	---	166	175	91	93	88	88	552
31	96	---	111	185	---	182	---	92	---	88	88	---
TOTAL	18831	1753	12667	20173	7792	10728	12542	3290	6496	2754	2718	12732
MEAN	607	58.4	409	651	278	346	418	106	217	88.8	87.7	424
MAX	976	96	1940	1810	1390	1290	1330	176	554	93	88	579
MIN	96	40	44	104	181	158	174	91	93	88	86	88
AC-FT	37350	3480	25120	40010	15460	21280	24880	6530	12880	5460	5390	25250
MEAN†	36.9	56.5	441	693	556	641	696	274	233	49.6	14.5	13.1
CFSM†	0.14	0.21	1.63	2.57	2.06	2.37	2.58	1.01	0.86	0.18	0.05	0.05
IN.†	0.16	0.23	1.88	2.96	2.14	2.74	2.88	1.17	0.96	0.21	0.06	0.05
AC-FT†	2270	3360	27100	42620	30870	39400	41430	16820	13850	3050	890	780

CAL YR 1993 TOTAL 260590 MEAN 714 MAX 4110 MIN 40 AC-FT 516900 MEAN† 715 CFSM† 2.65 IN.† 35.96 AC-FT† 517750  
WTR YR 1994 TOTAL 112476 MEAN 308 MAX 1940 MIN 40 AC-FT 223100 MEAN† 307 CFSM† 1.14 IN.† 15.45 AC-FT† 222440

† Adjusted for change in contents in Dorena Lake.

LOCATION.--Lat 43°58'50", long 122°57'55", in NW 1/4 sec.29, T.18 S., R.2 W., Lane County, Hydrologic Unit 17090002, on right bank at downstream side of bridge on State Highway 58, 2.5 mi southeast of Goshen, and at mile 6.4.

PERIOD OF RECORD.--August 1905 to February 1912, October 1950 to current year. Monthly discharge only for some periods, published in WSP 1318.

GAGE.--Water-stage recorder. Datum of gage is 473.80 ft above sea level. Aug. 23, 1905, to Feb. 7, 1912, nonrecording gage at site 600 ft upstream at different datum.

AVERAGE DISCHARGE.--50 years (water years 1906-11, 1951-94), 1,578 ft<sup>3</sup>/s, 1,143,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 58,500 ft<sup>3</sup>/s Nov. 22, 1909, gage height, 19.5 ft, site and datum then in use, from rating curve extended above 15,000 ft<sup>3</sup>/s; minimum discharge, 36 ft<sup>3</sup>/s Sept. 29, 30, Oct. 11, 12, 1908.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,140 ft<sup>3</sup>/s Dec. 9, gage height, 6.61 ft; minimum discharge, 109 ft<sup>3</sup>/s Nov. 15-17.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	922	176	180	326	395	2180	1580	450	214	165	116	113
2	922	174	595	925	386	1800	1100	426	217	167	116	113
3	925	172	487	2660	378	2360	904	410	246	165	116	112
4	964	172	348	2940	371	3330	830	414	250	163	118	114
5	1150	172	666	2990	365	2500	908	440	251	158	120	121
6	1160	171	411	3660	357	1720	1010	408	279	154	123	120
7	1190	169	363	2370	354	1250	1330	312	533	151	126	234
8	1310	167	2730	1600	352	981	1830	292	599	149	129	313
9	1590	165	3610	1910	351	786	2390	274	483	145	126	323
10	1580	163	2170	2500	395	784	2480	261	334	143	128	330
11	1570	151	2790	2270	405	672	2450	250	265	141	129	339
12	1560	120	3470	1950	387	611	2130	241	255	138	130	365
13	1520	116	1920	1530	407	574	1660	233	272	135	132	617
14	1570	114	1180	1300	589	555	1280	228	374	128	132	623
15	1550	112	855	1110	550	532	941	234	559	128	134	623
16	1530	109	788	943	502	524	765	319	731	128	134	623
17	1550	112	554	773	610	518	669	318	601	130	135	622
18	1540	118	426	703	880	524	596	320	470	127	136	615
19	1490	116	395	586	739	606	493	301	453	122	137	624
20	1290	114	366	458	656	528	468	285	372	121	137	803
21	585	111	297	420	833	785	454	273	330	121	138	808
22	572	124	282	318	944	849	441	260	308	120	137	809
23	557	147	270	428	887	774	427	245	308	116	133	811
24	546	132	261	510	1710	690	426	235	273	118	130	822
25	503	123	255	682	2170	622	425	225	245	121	128	822
26	339	118	251	621	1980	576	424	218	243	120	126	820
27	277	116	245	581	2960	541	456	213	204	116	121	813
28	192	114	239	538	2730	512	492	213	177	115	121	810
29	183	126	237	439	---	484	451	218	169	115	120	837
30	181	161	236	420	---	724	473	214	169	116	115	815
31	181	---	236	405	---	2250	---	206	---	116	116	---
TOTAL	30999	4155	27113	38866	23643	32142	30283	8936	10184	4152	3939	15914
MEAN	1000	138	875	1254	844	1037	1009	288	339	134	127	530
MAX	1590	176	3610	3660	2960	3330	2480	450	731	167	138	837
MIN	181	109	180	318	351	484	424	206	169	115	115	112
AC - FT	61490	8240	53780	77090	46900	63750	60070	17720	20200	8240	7810	31570

MEAN	819	1925	3358	3386	2666	2265	1572	998	578	269	432	588
MAX	3119	6305	9820	7239	6891	5716	4020	3285	2424	588	1115	1057
(WY)	1951	1974	1965	1956	1961	1957	1963	1963	1993	1957	1955	1978
MIN	204	121	196	200	203	385	459	247	129	134	127	171
(WY)	1959	1953	1977	1977	1977	1992	1987	1987	1989	1994	1974	1957

ANNUAL TOTAL	532869		230326				
ANNUAL MEAN	1460		631			1568	
HIGHEST ANNUAL MEAN						2701	1956
LOWEST ANNUAL MEAN						512	1977
HIGHEST DAILY MEAN	8470	Jan 22	3660	Jan 6		31500	Dec 24 1964
LOWEST DAILY MEAN	109	Nov 16	109	Nov 16		86	Nov 28 1952
ANNUAL SEVEN-DAY MINIMUM	113	Nov 15	113	Nov 15		90	Nov 24 1952
ANNUAL RUNOFF (AC-FT)	1057000		456900			1136000	
10 PERCENT EXCEEDS	3510		1580			4190	
50 PERCENT EXCEEDS	908		387			730	
90 PERCENT EXCEEDS	223		121			198	



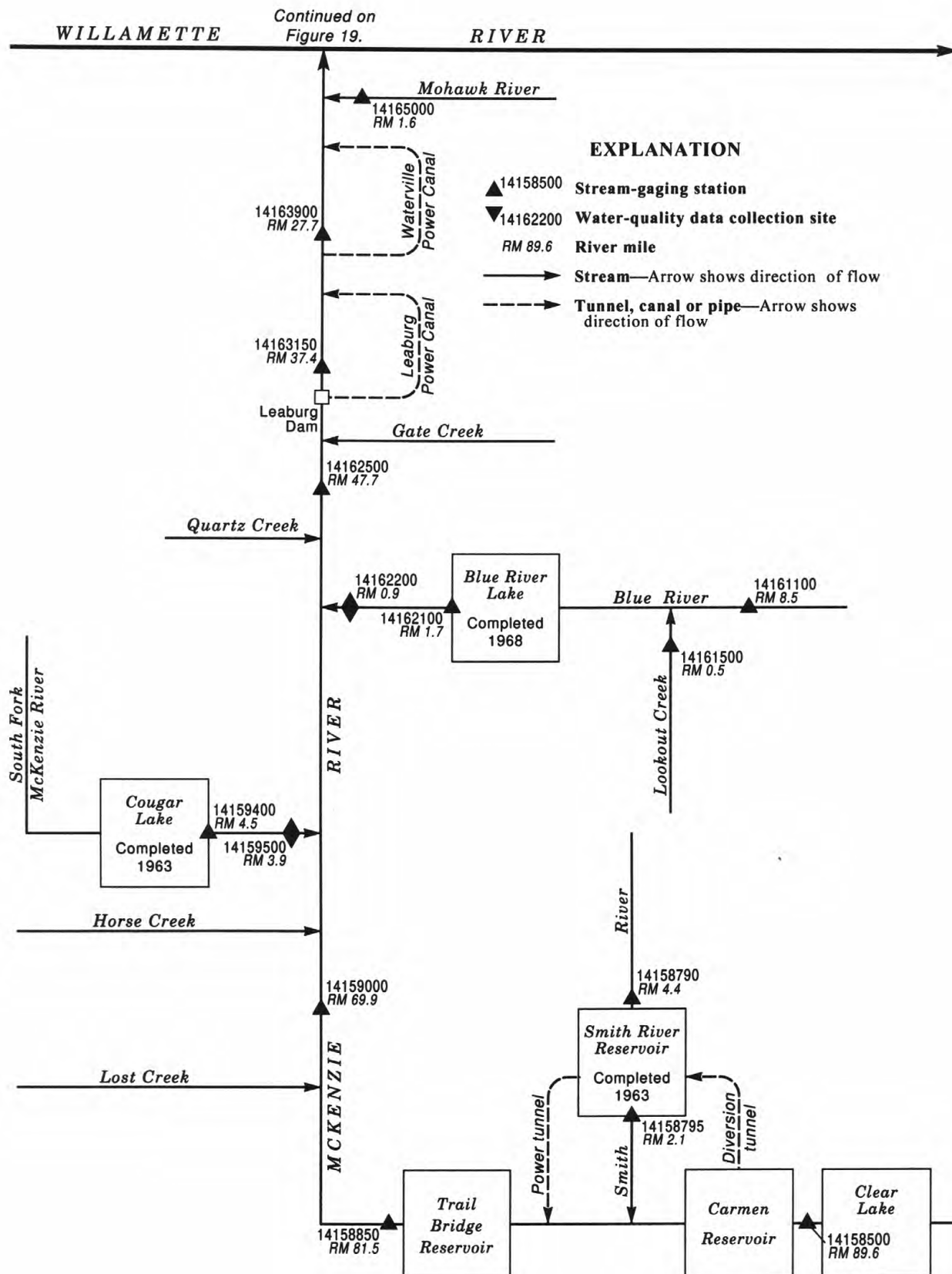


Figure 23. Schematic diagram showing gaging stations and diversions in the McKenzie River Basin.

## WILLAMETTE RIVER BASIN

14158500 MCKENZIE RIVER AT OUTLET OF CLEAR LAKE, OR

LOCATION.--Lat 44°21'40", long 121°59'40", in SE 1/4 sec.8, T.14 S., R.7 E., Linn County, Hydrologic Unit 17090004, Willamette National Forest, on west bank of Clear Lake in narrow channel, 150 ft upstream from outlet and at mile 89.6.

DRAINAGE AREA.--92.4 mi<sup>2</sup>, hydrologic drainage boundary uncertain owing to ground-water exchange.

PERIOD OF RECORD.--June 1912 to September 1915, October 1947 to current year. Monthly discharge only for some periods, published in WSP 1318.

REVISED RECORDS.--WSP 1288: 1949. WSP 1318: 1915(M). WSP 1738: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 3,015.32 ft above sea level (levels by Eugene Water and Electric Board). June 20, 1912, to July 31, 1915, nonrecording gage at site 1.0 mi north at different datum.

REMARKS.--No estimated daily discharges. Records good. Flow regulated by natural storage in lake. At high stages an undetermined flow enters numerous sinkholes in lava rock along south edge of lake upstream from station.

AVERAGE DISCHARGE.--50 years, 451 ft<sup>3</sup>/s, 66.25 in/yr, 326,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,300 ft<sup>3</sup>/s Dec. 23, 1964, gage height, 8.15 ft; minimum discharge, 116 ft<sup>3</sup>/s Oct. 27, 28, 1992.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 580 ft<sup>3</sup>/s Jan. 12, gage height, 2.91 ft; minimum discharge, 141 ft<sup>3</sup>/s Sept. 28-30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	230	194	184	220	352	278	386	438	306	278	185	158
2	229	193	189	231	345	296	386	426	299	273	183	157
3	228	194	195	270	337	338	390	415	295	267	182	159
4	226	192	212	320	328	382	391	411	292	260	181	157
5	226	190	213	384	318	447	395	402	291	255	180	156
6	224	189	214	410	310	517	412	397	294	251	179	155
7	225	188	223	433	298	519	418	394	293	245	178	154
8	222	188	238	465	285	512	434	393	290	240	177	154
9	220	186	242	486	277	512	454	393	294	235	177	155
10	220	186	253	526	265	520	483	392	299	232	176	155
11	219	183	267	567	253	524	507	390	303	229	175	153
12	219	183	282	575	243	515	517	387	306	226	175	152
13	218	182	290	564	237	503	526	383	310	223	174	151
14	217	182	295	553	231	492	522	378	314	221	173	151
15	217	181	297	542	224	481	513	378	313	218	172	150
16	216	180	290	523	219	476	513	380	312	214	170	149
17	214	180	283	501	218	472	525	370	315	212	169	149
18	212	178	276	483	218	467	548	362	319	209	168	148
19	210	176	268	470	211	455	565	359	321	205	167	148
20	210	176	261	451	208	438	561	354	324	203	167	147
21	208	175	253	432	209	436	552	349	325	202	166	145
22	207	178	247	419	206	423	539	347	323	200	166	146
23	206	175	240	413	208	413	520	343	322	199	165	145
24	205	172	234	407	221	403	510	340	319	197	164	144
25	204	171	229	401	221	396	501	337	315	196	163	143
26	202	170	224	393	229	390	490	334	312	194	163	143
27	201	169	220	387	246	387	480	330	306	192	162	142
28	200	167	216	381	263	384	472	327	299	191	161	142
29	199	168	211	375	---	381	461	323	292	189	161	144
30	197	169	209	368	---	383	451	317	283	188	159	142
31	196	---	210	360	---	388	---	310	---	187	158	---
TOTAL	6627	5415	7465	13310	7180	13528	14422	11459	9186	6831	5296	4494
MEAN	214	180	241	429	256	436	481	370	306	220	171	150
MAX	230	194	297	575	352	524	565	438	325	278	185	159
MIN	196	167	184	220	206	278	386	310	283	187	158	142
AC-FT	13140	10740	14810	26400	14240	26830	28610	22730	18220	13550	10500	8910
CFSM	2.31	1.95	2.61	4.65	2.78	4.72	5.20	4.00	3.31	2.38	1.85	1.62
IN.	2.67	2.18	3.01	5.36	2.89	5.45	5.81	4.61	3.70	2.75	2.13	1.81

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1913 - 1994, BY WATER YEAR (WY)

	MEAN	249	368	529	503	508	495	582	676	565	386	299	251
MAX	428	828	1209	999	986	1205	872	1178	1202	737	499	392	
(WY)	1951	1951	1965	1974	1961	1972	1993	1949	1974	1950	1974	1974	
MIN	122	141	209	191	180	224	341	319	203	173	149	132	
(WY)	1993	1988	1977	1977	1977	1977	1955	1992	1992	1977	1992	1992	

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1913 - 1994

ANNUAL TOTAL	151019	105213	
ANNUAL MEAN	414	288	451
HIGHEST ANNUAL MEAN			683
LOWEST ANNUAL MEAN			241
HIGHEST DAILY MEAN	1360	Mar 24	3100
LOWEST DAILY MEAN	167	Nov 28	116
ANNUAL SEVEN-DAY MINIMUM	169	Nov 24	117
ANNUAL RUNOFF (AC-FT)	299500	208700	326400
ANNUAL RUNOFF (CFSM)	4.48	3.12	4.88
ANNUAL RUNOFF (INCHES)	60.80	42.36	66.25
10 PERCENT EXCEEDS	867	482	782
50 PERCENT EXCEEDS	273	246	389
90 PERCENT EXCEEDS	191	163	208

14158790 SMITH RIVER ABOVE SMITH RIVER RESERVOIR, NEAR BELKNAP SPRINGS, OR

LOCATION.--Lat 44°20'05", long 122°02'45", in SW 1/4 SW 1/4 sec.24, T.14 S., R.6 E., Linn County, Hydrologic Unit 17090004, in Willamette National Forest, on right bank 200 ft upstream from Smith River Reservoir, 0.7 mi downstream from Browder Creek, 10 mi north of town of Belknap Springs, and at mile 4.4.

DRAINAGE AREA.--16.2 mi<sup>2</sup>.

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

REVISED RECORDS.--WDR OR 80-2: 1978(P).

GAGE.--Water-stage recorder. Datum of gage is 2,610.00 ft above sea level (levels by Eugene Water and Electric Board). Prior to Sept. 10, 1964, at datum 1.56 ft higher.

REMARKS.--Records fair. No regulation or diversion upstream from station. Discharges for periods November 19 to December 14, December 21 to May 10 computed from data provided by Eugene Water and Electric Board.

AVERAGE DISCHARGE.--34 years, 87.9 ft<sup>3</sup>/s, 73.71 in/yr, 63,670 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,160 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 11.9 ft, from floodmark, from rating curve extended above 560 ft<sup>3</sup>/s, on basis of slope-area measurement of peak flow; minimum discharge, 1.2 ft<sup>3</sup>/s Oct. 13, 1991, result of log jam.

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

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 30	1940	*705	*7.41				

Minimum discharge, 3.1 ft<sup>3</sup>/s Sept. 24-28.DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.4	4.2	155	126	35	200	130	54	31	18	5.7	3.6
2	4.3	4.0	81	294	32	239	127	50	28	17	5.5	3.6
3	4.1	5.6	39	546	30	487	118	48	26	16	5.5	6.5
4	4.1	4.9	52	494	28	500	104	60	28	15	5.3	5.4
5	4.1	4.3	35	349	27	306	94	61	31	15	5.2	4.1
6	4.3	4.1	28	221	25	206	105	63	68	14	5.1	3.8
7	6.4	4.1	66	159	25	154	107	63	99	13	5.0	3.7
8	5.1	3.9	180	172	24	125	148	62	82	13	5.0	e3.5
9	4.5	3.9	147	218	23	111	193	57	66	12	5.0	e4.5
10	4.4	3.9	159	191	22	108	192	52	55	11	4.8	e6.0
11	4.4	3.9	147	207	20	98	166	48	48	11	4.8	e5.0
12	5.6	3.9	110	180	20	90	157	43	43	10	4.6	e4.6
13	5.3	4.0	84	160	20	90	140	38	52	9.5	4.6	e3.9
14	5.1	3.9	68	159	19	93	121	35	79	9.2	4.6	e3.6
15	7.6	3.8	56	148	19	93	112	40	84	8.8	4.5	3.6
16	6.9	4.3	47	126	20	95	121	53	72	8.6	4.4	3.6
17	5.3	5.9	42	106	24	92	140	49	63	8.3	4.3	3.4
18	4.8	5.0	37	93	23	110	152	46	57	8.0	4.3	3.4
19	4.6	4.2	33	84	22	98	151	51	49	7.7	4.2	3.3
20	4.5	4.1	30	78	21	88	135	62	43	7.3	4.1	3.3
21	4.3	4.5	27	76	21	92	128	54	39	7.0	4.1	3.4
22	4.3	5.3	25	83	20	78	107	50	36	6.8	4.1	3.2
23	4.2	4.4	23	98	28	70	93	44	33	6.9	4.0	3.2
24	4.6	4.0	22	90	113	65	92	41	30	6.9	3.9	3.2
25	4.3	3.9	22	76	111	63	82	38	27	6.7	3.8	3.1
26	4.1	4.1	21	65	112	64	73	35	27	6.5	3.8	3.1
27	4.0	4.1	20	58	131	75	67	32	24	6.3	3.8	3.1
28	3.9	4.2	19	51	157	96	62	31	22	6.2	3.7	3.1
29	3.9	4.8	19	46	---	111	60	34	21	6.1	3.7	5.3
30	3.9	8.8	22	41	---	130	59	33	19	6.0	3.6	4.2
31	4.1	---	34	37	---	136	---	30	---	5.8	3.6	---
TOTAL	145.4	134.0	1850	4832	1172	4363	3536	1457	1382	303.6	138.6	117.3
MEAN	4.69	4.47	59.7	156	41.9	141	118	47.0	46.1	9.79	4.47	3.91
MAX	7.6	8.8	180	546	157	500	193	63	99	18	5.7	6.5
MIN	3.9	3.8	19	37	19	63	59	30	19	5.8	3.6	3.1
AC-FT	288	266	3670	9580	2320	8650	7010	2890	2740	602	275	233
CFSM	.29	.28	3.68	9.62	2.58	8.69	7.28	2.90	2.84	.60	.28	.24
IN.	.33	.31	4.25	11.10	2.69	10.02	8.12	3.35	3.17	.70	.32	.27

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 1994, BY WATER YEAR (WY)

	MEAN	22.0	112	146	131	129	117	144	151	75.2	16.9	6.79	7.45
MAX	75.9	218	404	293	309	321	270	318	260	51.5	11.7	23.5	
(WY)	1969	1985	1965	1970	1961	1993	1971	1974	1971	1968	1978		
MIN	3.33	4.47	9.88	13.5	12.8	41.2	50.3	28.1	8.63	5.23	3.22	3.74	
(WY)	1988	1994	1977	1977	1977	1992	1967	1992	1992	1992	1992	1992	

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1961 - 1994

ANNUAL TOTAL	34028.4												
ANNUAL MEAN	93.2												
HIGHEST ANNUAL MEAN													1974
LOWEST ANNUAL MEAN													1977
HIGHEST DAILY MEAN	938	Mar 18											1964
LOWEST DAILY MEAN	3.8	Nov 15											1981
ANNUAL SEVEN-DAY MINIMUM	3.9	Nov 9											1981
ANNUAL RUNOFF (AC-FT)	67500												
ANNUAL RUNOFF (CFSM)	5.75												
ANNUAL RUNOFF (INCHES)	78.14												
10 PERCENT EXCEEDS	253												
50 PERCENT EXCEEDS	35												
90 PERCENT EXCEEDS	4.4												

e Estimated

## WILLAMETTE RIVER BASIN

## 14158795 SMITH RIVER RESERVOIR NEAR BELKNAP SPRINGS, OR

LOCATION.--Lat 44°18'20", long 122°02'40", in SW 1/4 SW 1/4 sec.36, T.14 S., R.6 E., Linn County, Hydrologic Unit 17090004, Willamette National Forest, in intake tower near left end of Smith River Dam on Smith River, 800 ft upstream from Bunchgrass Creek, 8 mi north of town of Belknap Springs, and at mile 2.1.

DRAINAGE AREA.--18.2 mi<sup>2</sup>.

PERIOD OF RECORD.--March 1963 to current year.

REVISED RECORDS.--WDR OR-86-2: 1985.

GAGE.--Water-stage recorder. Datum of gage is sea level (levels by Eugene Water and Electric Board).

REMARKS.--Reservoir is formed by earthfill dam with concrete spillway completed in 1963 by Eugene Water and Electric Board; storage began Mar. 18, 1963. Total capacity is 15,000 acre-ft at elevation 2,605.0 ft, top of spillway gates, and usable capacity is 9,900 acre-ft between elevations 2,525.0 ft, minimum power pool, and 2,605.0 ft. Storage of 5,100 acre-ft, below elevation 2,525.0 ft, not normally available for release. Water used for power generation. Figures herein represent total contents and are furnished by Eugene Water and Electric Board.

COOPERATION.--Elevations and area-volume curves furnished by Eugene Water and Electric Board.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 15,200 acre-ft Dec. 22, 1964, elevation, 2,606.5 ft; minimum contents, 5,700 acre-ft Apr. 11, 14, 1964, elevation, 2,532.90 ft.

EXTREMES FOR CURRENT YEAR.--(based only on monthend readings) Maximum contents, 14,300 acre-ft Sept. 30, elevation, 2,601.19 ft; minimum contents, 13,470 acre-ft Nov. 30, elevation, 2,596.03 ft.

## MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept.30.....	2,599.34	13,990	--
Oct. 31.....	2,598.14	13,800	-190
Nov. 30.....	2,956.03	13,470	-330
Dec. 31.....	2,598.91	13,930	+460
CAL YR 1993.....	--	--	+920
Jan. 31.....	2,597.70	13,730	-200
Feb. 28.....	2,596.31	13,510	-220
Mar. 31.....	2,597.51	13,700	+190
Apr. 30.....	2,600.36	14,160	+460
May 31.....	2,600.07	14,110	-50
June 30.....	2,600.56	14,200	+90
July 31.....	2,601.07	14,280	+80
Aug. 31.....	2,600.80	14,240	-40
Sept.30.....	2,601.19	14,300	+60
WTR YR 1994.....	--	--	+310

## WILLAMETTE RIVER BASIN

215

14158850 MCKENZIE RIVER BELOW TRAIL BRIDGE DAM, NEAR BELKNAP SPRINGS, OR

LOCATION.--Lat 44°16'05", long 122°02'55", in T.15 S., R.6 E., (unsurveyed), Linn County, Hydrologic Unit 17090004, in Willamette National Forest, on left bank 0.4 mi downstream from Trail Bridge Dam, 0.5 mi upstream from Anderson Creek, 5 mi north of town of Belknap Springs, and at mile 81.5.

DRAINAGE AREA.--184 mi<sup>2</sup>.

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

GAGE.--Water-stage recorder. Datum of gage is 1,980.00 ft above sea level (levels by Eugene Water and Electric Board). Prior to Oct. 11, 1963, at datum 5.60 ft higher.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since 1963 by Smith River Reservoir (station 14158795). Diurnal fluctuations by powerplants and by Trail Bridge re-regulating reservoir upstream. Water is diverted from McKenzie River in SW 1/4 sec.20, T.14 S., R.7 E., to Smith River Reservoir and returned to river upstream from station. Continuous water-quality records for the period November 1976 to September 1985, July 1992 September 1993 have been collected at this location.

AVERAGE DISCHARGE.--35 years, 996 ft<sup>3</sup>/s, 73.51 in/yr, 721,600 acre-ft/yr, adjusted for storage.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,200 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 12.45 ft, from rating curve extended above 3,700 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; minimum discharge, 185 ft<sup>3</sup>/s Feb. 3, 1963; minimum daily, 423 ft<sup>3</sup>/s Nov. 22, 1993.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,470 ft<sup>3</sup>/s Mar. 3, gage height, 7.43 ft; minimum discharge, 423 ft<sup>3</sup>/s Nov. 22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	619	603	789	767	795	957	894	880	708	684	566	539
2	610	598	691	975	781	996	871	870	690	674	566	523
3	615	596	628	1350	782	1280	864	855	692	664	566	529
4	616	580	648	1200	780	1390	881	842	695	662	566	538
5	616	580	646	1250	754	1230	896	846	713	654	564	545
6	617	580	637	1090	738	1160	867	853	764	647	562	532
7	617	576	736	992	734	1160	942	845	813	634	567	531
8	617	575	862	1100	697	1050	1040	843	778	634	562	533
9	617	572	825	1200	688	1070	1110	834	748	635	561	533
10	610	573	819	1180	696	1070	1070	813	724	635	565	542
11	602	576	834	1200	693	1070	1070	808	723	634	563	545
12	607	576	829	1210	651	1030	1100	803	733	619	562	545
13	618	574	769	1150	654	1010	1090	799	739	612	562	543
14	622	565	723	1190	657	1010	1040	810	832	612	562	534
15	624	561	790	1150	656	1010	1030	802	786	610	556	526
16	622	559	791	1090	651	1010	1010	831	754	595	551	524
17	606	577	745	1030	632	982	1010	816	755	595	554	522
18	584	576	719	1060	648	1000	1030	785	755	593	560	524
19	595	567	679	1020	644	999	1080	789	756	593	545	522
20	597	559	671	952	625	946	1060	780	758	594	538	526
21	607	558	669	930	624	955	1050	781	756	594	538	527
22	613	551	667	925	633	960	1040	781	756	597	537	527
23	622	571	672	930	642	907	991	778	740	596	548	525
24	649	563	649	919	851	893	988	780	727	590	556	521
25	642	561	638	898	886	894	992	753	717	580	556	517
26	640	564	626	858	809	863	955	740	717	580	556	517
27	609	564	624	863	831	889	901	738	720	582	551	516
28	593	562	624	868	939	912	908	739	715	577	544	519
29	589	570	615	843	--	923	908	742	695	573	542	530
30	593	581	614	821	--	921	900	741	693	572	536	532
31	603	--	636	819	--	958	--	731	--	570	536	--
TOTAL	18991	17168	21865	31830	20171	31505	29588	24808	22152	18991	17198	15887
MEAN	613	572	705	1027	720	1016	986	800	738	613	555	530
MAX	649	603	862	1350	939	1390	1110	880	832	684	567	545
MIN	584	551	614	767	624	863	864	731	690	570	536	516
AC-FT	37670	34050	43370	63130	40010	62490	58690	49210	43940	37670	34110	31510
MEAN†	610	567	713	1023	716	1019	994	799	740	614	554	531
CFSM†	3.32	3.08	3.88	5.56	3.89	5.54	5.40	4.34	4.02	3.34	3.01	2.89
IN.†	3.82	3.44	4.47	6.41	4.06	6.39	6.03	5.01	4.49	3.85	3.47	3.22
AC-FT†	37480	33720	43830	62930	39790	62680	59150	49160	44030	37750	34070	31570

CAL YR 1993 TOTAL 356591 MEAN 977 MAX 2770 MIN 551 AC-FT 707300 MEAN† 978 CFSM† 5.32 IN.† 72.19 AC-FT† 708200  
WTR YR 1994 TOTAL 270154 MEAN 740 MAX 1390 MIN 516 AC-FT 535900 MEAN† 741 CFSM† 4.03 IN.† 54.65 AC-FT† 536200

† Adjusted for change in contents in Smith River Reservoir.



## WILLAMETTE RIVER BASIN

## 14159000 MCKENZIE RIVER AT MCKENZIE BRIDGE, OR

LOCATION.--Lat 44°10'45", long 122°07'45", on line between NE 1/4 and NW 1/4 sec.18, T.16 S., R.6 E., Lane County, Hydrologic Unit 17090004, Willamette National Forest, on left bank 1.0 mi upstream from Glen Creek, 1.7 mi east of town of McKenzie Bridge, and at mile 69.9.

DRAINAGE AREA.--348 mi<sup>2</sup> at cableway 1.2 mi upstream, where all discharge measurements are made.

PERIOD OF RECORD.--August 1910 to September 1994 (discontinued). Monthly discharge only for some periods, published in WSP 1318. Published as "near McKenzie Bridge" August 1910 to September 1911 and October 1914 to September 1916.

REVISED RECORDS.--WSP 1248: 1911-16, 1920-25. WSP 1448: 1919. WSP 1638: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,419.04 ft above sea level. Prior to June 2, 1932, nonrecording gage at several sites within 2 mi of present site at various datums.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since March 1963 by Smith River Reservoir (Carmen-Smith Project) 12 mi upstream (station 14158795). No diversion upstream from station. All records given herein are for measuring site. Continuous water-quality records for the period November 1976 to September 1985, July 1992 to September 1993 have been collected at this location.

AVERAGE DISCHARGE.--84 years (water years 1911-94), 1,670 ft<sup>3</sup>/s, 1,210,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 19,100 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 10.36 ft, from rating curve extended above 7,100 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; minimum discharge, 758 ft<sup>3</sup>/s Oct. 13, 1992.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,290 ft<sup>3</sup>/s Jan. 3, gage height, 2.84 ft; minimum discharge, 845 ft<sup>3</sup>/s Nov. 22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1070	1000	1410	1390	1320	1900	1570	1460	1240	1200	1010	920
2	1060	995	1310	1870	1290	1930	1540	1440	1200	1190	1000	903
3	1070	1000	1130	2990	1290	2490	1520	1420	1200	1180	1000	918
4	1070	978	1200	2390	1280	2910	1510	1430	1210	1170	1000	921
5	1070	972	1160	2420	1250	2410	1520	1430	1240	1170	996	929
6	1070	971	1120	2070	1230	2130	1540	1420	1360	1150	988	908
7	1070	966	1270	1820	1220	2020	1640	1400	1470	1140	994	905
8	1070	962	1580	1930	1180	1850	1790	1390	1410	1140	990	914
9	1070	961	1520	2240	1170	1820	1960	1370	1350	1130	988	925
10	1070	959	1470	2190	1170	1800	1940	1340	1310	1130	988	932
11	1060	961	1490	2220	1170	1770	1890	1330	1290	1130	986	929
12	1070	961	1460	2180	1120	1710	1910	1310	1290	1100	982	926
13	1070	960	1360	2020	1130	1660	1870	1300	1320	1090	977	921
14	1090	953	1280	2030	1130	1660	1770	1310	1450	1100	979	911
15	1100	948	1320	1940	1120	1650	1740	1320	1410	1110	970	897
16	1090	949	1310	1830	1120	1660	1710	1390	1360	1080	963	891
17	1080	970	1250	1730	1110	1630	1720	1360	1350	1080	960	886
18	1040	973	1220	1720	1140	1670	1750	1320	1340	1070	970	885
19	1030	957	1170	1680	1130	1660	1790	1330	1330	1070	953	883
20	1000	951	1150	1580	1100	1590	1750	1340	1320	1070	939	884
21	1010	969	1150	1550	1110	1630	1720	1330	1320	1070	937	882
22	1020	972	1140	1540	1110	1610	1690	1320	1310	1070	934	874
23	1020	977	1130	1550	1190	1540	1630	1300	1290	1070	941	874
24	1060	974	1110	1530	1880	1510	1620	1300	1270	1060	951	870
25	1060	969	1090	1500	1880	1510	1610	1280	1260	1040	949	862
26	1050	976	1070	1440	1710	1480	1570	1260	1260	1040	949	863
27	1020	974	1060	1430	1740	1510	1490	1250	1250	1040	947	861
28	990	978	1050	1420	1860	1550	1490	1260	1250	1030	933	867
29	983	1010	1040	1390	---	1580	1490	1270	1220	1030	927	890
30	987	1030	1040	1350	---	1610	1480	1260	1210	1020	918	889
31	998	---	1090	1350	---	1660	---	1250	---	1020	914	---
TOTAL	32518	29176	38150	56290	36150	55110	50220	41490	39090	33990	29933	26920
MEAN	1049	973	1231	1816	1291	1778	1674	1338	1303	1096	966	897
MAX	1100	1030	1580	2990	1880	2910	1960	1460	1470	1200	1010	932
MIN	983	948	1040	1350	1100	1480	1480	1250	1200	1020	914	861
AC-FT	64500	57870	75670	111700	71700	109300	99610	82300	77530	67420	59370	53400

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1964 - 1994, BY WATER YEAR (WY)

	1108	1575	2099	2121	2012	1966	1972	2005	1710	1376	1194	1105
MEAN	1108	1575	2099	2121	2012	1966	1972	2005	1710	1376	1194	1105
MAX	1395	2720	4367	3370	3382	3973	3004	3041	3033	2053	1670	1449
(WY)	1983	1985	1965	1970	1982	1972	1993	1972	1974	1974	1972	1972
MIN	810	973	1082	1052	1027	1303	1403	1288	1032	927	859	837
(WY)	1993	1994	1977	1977	1977	1992	1967	1992	1992	1992	1992	1992

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1964 - 1994

ANNUAL TOTAL	615704	469037	
ANNUAL MEAN	1687	1285	1686
HIGHEST ANNUAL MEAN			2377
LOWEST ANNUAL MEAN			1203
HIGHEST DAILY MEAN	5750	2990	13800
LOWEST DAILY MEAN	948	861	769
ANNUAL SEVEN-DAY MINIMUM	956	867	781
ANNUAL RUNOFF (AC-FT)	1221000	930300	1221000
10 PERCENT EXCEEDS	2920	1770	2530
50 PERCENT EXCEEDS	1380	1190	1510
90 PERCENT EXCEEDS	1020	938	1020

## WILLAMETTE RIVER BASIN

217

14159400 COUGAR LAKE NEAR RAINBOW, OR

LOCATION.--Lat 44°07'40", long 122°14'25", in SE 1/4 SE 1/4 sec.31, T.16 S., R.5 E., Lane County, Hydrologic Unit 17090004, Willamette National Forest, in intake tower near left end of Cougar Dam on South Fork McKenzie River, 2.7 mi south of Rainbow, and at mile 4.5.

DRAINAGE AREA.--207 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1963 to current year. Prior to October 1971, published as Cougar Reservoir near Rainbow.

GAGE.--Water-stage recorder. Datum gage is sea level (levels by Corps of Engineers).

REMARKS.--Lake is formed by earthfill dam with concrete spillway completed in 1963 by the Corps of Engineers; storage began September 1963. Total capacity is 219,100 acre-ft at elevation 1,699 ft, maximum pool, and usable capacity is 164,800 acre-ft between elevations 1,516 ft, minimum power pool, and 1,699 ft. Lake used for flood control and power generation. Figures given herein represent total contents. Midnight readings for period Dec. 5-12 furnished by U.S. Army Corps of Engineers.

COOPERATION.--Capacity table furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 215,900 acre-ft Apr. 28, 1990, elevation, 1,696.51 ft; minimum contents, 33,690 acre-ft Oct. 31 to Nov. 2, 1965, elevation, 1,475.40 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 205,400 acre-ft July 1, elevation, 1,688.05 ft; minimum contents, 64,110 acre-ft Dec. 13, 14, but may have been lower during period of missing record Dec. 5-12, elevation, 1,532.32 ft.

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

1,510	50,920	1,650	162,300
1,550	75,940	1,696	215,300
1,600	114,800		

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1620.69	1570.44	1536.93	1535.72	1556.13	1580.68	1626.25	1663.44	1677.02	1687.97	1660.64	1614.96
2	1619.06	1568.19	1536.28	1539.38	1556.46	1583.91	1627.55	1663.98	1677.20	1687.74	1659.53	1613.11
3	1617.41	1565.92	1534.24	1544.84	1556.76	1587.84	1628.70	1664.52	1677.35	1687.49	1658.43	1611.32
4	1615.69	1563.62	1533.66	1547.44	1557.03	1592.55	1629.75	1665.19	1677.52	1687.21	1657.32	1609.50
5	1613.99	1561.61	1533.35	1550.27	1557.28	1596.15	1630.76	1665.88	1677.80	1686.72	1656.26	1607.64
6	1612.29	1559.85	1532.92	1551.55	1557.51	1598.75	1632.09	1666.51	1678.47	1686.02	1655.23	1606.17
7	1610.57	1558.07	1532.88	1551.64	1557.76	1600.77	1633.57	1667.11	1679.33	1685.31	1654.20	1604.76
8	1608.82	1556.78	1534.40	1551.78	1557.97	1602.40	1635.18	1667.69	1679.99	1684.59	1653.03	1603.52
9	1607.03	1555.84	1533.80	1553.35	1558.25	1603.81	1637.04	1668.25	1680.46	1683.86	1651.63	1602.34
10	1605.23	1554.89	1533.30	1554.55	1558.51	1605.12	1639.24	1668.81	1680.90	1683.10	1650.21	1601.16
11	1603.42	1553.93	1532.70	1555.72	1558.71	1606.29	1641.21	1669.29	1681.25	1682.34	1648.90	1599.96
12	1601.60	1552.96	1532.35	1556.34	1558.88	1607.29	1643.05	1669.72	1681.58	1681.37	1647.46	1598.73
13	1599.73	1551.97	1532.33	1556.46	1559.13	1608.22	1644.66	1670.08	1682.11	1680.27	1646.01	1597.50
14	1597.85	1551.00	1532.61	1556.50	1559.36	1609.16	1646.06	1670.38	1682.94	1679.37	1644.54	1596.25
15	1596.03	1549.96	1532.95	1556.31	1559.57	1610.05	1647.29	1670.79	1683.75	1678.55	1643.06	1594.99
16	1594.17	1548.98	1533.15	1555.74	1559.80	1611.00	1648.55	1671.32	1684.42	1677.73	1641.50	1593.72
17	1592.22	1547.93	1533.35	1554.87	1560.21	1611.87	1649.87	1671.77	1684.99	1676.91	1639.98	1592.43
18	1590.91	1546.91	1533.65	1553.82	1560.61	1612.91	1651.33	1672.17	1685.49	1675.98	1638.44	1591.13
19	1589.74	1545.91	1533.88	1552.62	1560.94	1613.80	1652.70	1672.63	1685.91	1674.98	1636.91	1589.81
20	1587.68	1544.83	1534.06	1551.29	1561.29	1614.64	1654.00	1673.23	1686.27	1673.98	1635.36	1588.50
21	1586.04	1543.84	1534.19	1550.94	1561.67	1615.73	1655.23	1673.77	1686.58	1672.98	1633.78	1587.19
22	1584.62	1542.99	1534.30	1551.27	1562.04	1616.59	1656.30	1674.26	1686.85	1671.96	1632.17	1585.87
23	1583.20	1540.94	1534.38	1551.63	1562.99	1617.36	1657.27	1674.68	1687.07	1670.93	1630.53	1584.53
24	1581.83	1538.21	1534.43	1551.92	1566.64	1618.09	1658.27	1675.04	1687.25	1669.87	1628.89	1583.16
25	1580.69	1536.82	1534.46	1552.50	1569.54	1618.83	1659.14	1675.36	1687.41	1668.79	1627.22	1581.80
26	1579.95	1536.21	1534.48	1553.23	1572.12	1619.56	1659.96	1675.63	1687.58	1667.74	1625.54	1580.44
27	1579.19	1535.67	1534.50	1553.87	1574.82	1620.35	1660.73	1675.86	1687.71	1666.61	1623.82	1579.07
28	1578.37	1535.23	1534.48	1554.42	1577.60	1621.24	1661.44	1676.11	1687.83	1665.43	1622.09	1577.70
29	1576.97	1535.19	1534.46	1554.92	--	1622.19	1662.13	1676.36	1687.92	1664.22	1620.35	1576.44
30	1574.86	1535.40	1534.50	1555.38	--	1623.53	1662.83	1676.56	1688.01	1663.01	1618.57	1575.08
31	1572.63	--	1534.63	1555.76	--	1624.93	--	1676.79	--	1661.78	1616.77	--
MAX	1620.69	1570.44	1536.93	1556.50	1577.60	1624.93	1662.83	1676.79	1688.01	1687.97	1660.64	1614.96
MIN	1572.63	1535.19	1532.33	1535.72	1556.13	1580.68	1626.25	1663.44	1677.02	1661.78	1616.77	1575.08
(†)	92480	66090	65590	80000	96330	137300	176100	191900	205300	174900	129700	94370
(‡)	-42320	-26390	-500	+14410	+16330	+40970	+38800	+15800	+13400	-30400	-45200	-35330

CAL YR 1993 MAX 1690.75 MIN 1531.25 AC-FT# -1920  
WTR YR 1994 MAX 1688.01 MIN 1532.33 AC-FT# -40430

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

## WILLAMETTE RIVER BASIN

14159500 SOUTH FORK MCKENZIE RIVER NEAR RAINBOW, OR

LOCATION.--Lat 44°08'10", long 122°14'50", in NE 1/4 sec.31, T.16 S., R.5 E., Lane County, Hydrologic Unit 17090004, in Willamette National Forest, on right bank 0.2 mi upstream from Cougar Creek, 0.6 mi downstream from Cougar Dam, 2.1 mi south of Rainbow, and at mile 3.9.

DRAINAGE AREA.--208 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1947 to current year.

REVISED RECORDS.--WSP 1638: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,236.42 ft above sea level (Federal Highway Administration bench mark). Oct. 1 to Nov. 4, 1947, nonrecording gage at site 40 ft upstream at datum 0.80 ft higher.

REMARKS.--Water-discharge records good except for flows below 300 ft<sup>3</sup>/s, which are fair. Discharges for periods Dec. 9-16, Mar. 9 to June 13, July 13-20 and July 23 to Sept. 30 computed from data obtained through U.S. Army Corps of Engineers Columbia River Operational Hydromet System (CROHMS) database. Flow regulated since 1963 by Cougar Lake (station 14159400), usable capacity, 165,000 acre-ft. No diversion upstream from station.

AVERAGE DISCHARGE.--47 years, 838 ft<sup>3</sup>/s, 54.71 in/yr, 607,100 acre-ft/yr, adjusted for storage.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 17,600 ft<sup>3</sup>/s Dec. 11, 1956, gage height, 8.66 ft, from rating curve extended above 8,100 ft<sup>3</sup>/s; maximum gage height, 8.90 ft Dec. 22, 1955 (backwater from debris); minimum discharge, 17 ft<sup>3</sup>/s Nov. 18, 1965; minimum daily, 85 ft<sup>3</sup>/s Apr. 26-28, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge, 24,500 ft<sup>3</sup>/s Dec. 28, 1945, gage height, 8.8 ft, from floodmarks, at Corps of Engineers gage at site 40 ft upstream at datum 0.80 ft higher; gage height at present site and datum, about 9.3 ft, computed by Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,160 ft<sup>3</sup>/s Jan. 4, gage height, 2.45 ft; minimum discharge, 118 ft<sup>3</sup>/s Apr. 19.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	943	1010	440	306	258	273	262	258	262	345	833	1010
2	941	1020	825	330	256	256	261	259	260	439	800	1010
3	945	1030	1030	796	255	259	256	262	256	443	801	1010
4	951	1030	723	1130	258	259	260	262	256	442	800	1000
5	948	925	516	1120	261	255	255	262	258	580	772	1000
6	968	830	486	1090	258	251	258	262	258	700	753	823
7	970	830	483	1080	261	248	267	262	258	695	751	716
8	969	663	797	1080	267	247	282	265	258	701	818	722
9	977	536	1000	1070	259	244	295	259	258	699	939	707
10	980	546	998	1070	253	245	266	252	259	704	940	702
11	986	552	992	1070	251	244	270	250	260	702	886	702
12	1000	552	865	1070	246	246	264	254	258	827	943	705
13	1010	558	614	1070	249	248	259	258	258	898	943	696
14	1010	563	473	1070	250	250	262	258	260	771	946	696
15	1010	559	391	1060	253	252	259	261	257	727	949	702
16	1000	557	402	1050	255	252	257	262	257	718	929	701
17	1010	560	368	1050	255	252	257	262	256	719	953	703
18	759	562	323	1050	259	255	257	256	258	767	957	700
19	687	547	315	1040	264	258	255	258	255	796	955	704
20	1030	565	323	1050	260	257	256	260	256	799	957	700
21	858	565	319	717	264	258	257	258	258	e800	965	695
22	767	556	319	466	270	256	256	258	258	e800	977	695
23	765	867	312	462	276	257	254	256	259	797	981	698
24	749	1060	315	471	296	253	254	256	262	812	976	708
25	657	658	320	347	293	255	254	256	262	810	981	702
26	518	424	327	254	291	259	256	257	261	799	979	698
27	520	423	334	258	277	263	256	258	259	844	986	698
28	523	408	338	257	294	261	256	262	256	874	990	701
29	744	369	341	255	---	253	256	261	257	880	992	705
30	990	309	319	258	---	258	258	258	256	882	997	707
31	1010	---	297	258	---	263	---	261	---	878	1000	---
TOTAL	27195	19634	15905	23655	7389	7887	7815	8023	7746	22648	28449	22716
MEAN	877	654	513	763	264	254	260	259	258	731	918	757
MAX	1030	1060	1030	1130	296	273	295	265	262	898	1000	1010
MIN	518	309	297	254	246	244	254	250	255	345	751	695
AC-FT	53940	38940	31550	46920	14660	15640	15500	15910	15360	44920	56430	45060
MEAN†	189	211	505	997	558	921	913	516	483	236	183	164
CFSM†	0.91	1.01	2.43	4.79	2.68	4.43	4.39	2.48	2.32	1.13	0.88	0.79
IN.†	1.05	1.13	2.80	5.53	2.79	5.10	4.90	2.86	2.59	1.31	1.01	0.88
AC-FT†	11620	12550	31050	61330	30990	56610	54300	31710	28760	14520	11230	9730

CAL YR 1993 TOTAL 308132 MEAN 844 MAX 4620 MIN 226 AC-FT 611200 MEAN† 842 CFSM† 4.05 IN.† 54.95 AC-FT† 609300  
WTR YR 1994 TOTAL 199062 MEAN 545 MAX 1130 MIN 244 AC-FT 394800 MEAN† 490 CFSM† 2.36 IN.† 31.96 AC-FT† 354400

e Estimated

† Adjusted for change in contents in Cougar Lake.

## WILLAMETTE RIVER BASIN

219

14159500 SOUTH FORK MCKENZIE RIVER NEAR RAINBOW, OR--Continued

## WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: July 1955 to current year.

INSTRUMENTATION.--Temperature recorder since July 1955.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum, 20.0°C July 28, 1958; minimum, 0.5°C Jan. 20-23, 1962.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 15.5°C several days in September; minimum, 4.5°C several days in February.

## TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

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





## 14161100 BLUE RIVER BELOW TIDBITS CREEK, NEAR BLUE RIVER, OR

LOCATION.--Lat 44°13'05", long 122°15'50", in SE 1/4 NE 1/4 sec.36, T.15 S., R.4 E., Lane County, Hydrologic Unit 17090004, in Willamette National Forest, on left bank 0.2 mi downstream from Tidbits Creek, 5.5 mi northeast of town of Blue River, and at mile 8.5.

DRAINAGE AREA.--45.8 mi<sup>2</sup>.

PERIOD OF RECORD.--September 1963 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 1,386.90 ft above sea level (Corps of Engineers bench mark).

REMARKS.--Records good except for estimated daily discharges, which are fair. No regulation or diversion upstream from station. Continuous water-quality records for the period September 1963 to September 1987 have been collected at this location.

AVERAGE DISCHARGE.--31 years, 245 ft<sup>3</sup>/s, 72.77 in/yr, 177,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,400 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 15.32 ft, from floodmarks, from rating curve extended above 2,800 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; minimum daily discharge, 6.0 ft<sup>3</sup>/s Oct. 27-29, 1987.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 2	2130	*1,800	*6.68				

Minimum discharge, 8.4 ft<sup>3</sup>/s Sept. 26-28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	13	539	363	87	703	282	87	102	e50	17	10
2	13	13	273	860	84	633	250	82	96	e45	17	10
3	13	20	132	1390	80	1100	222	76	90	e45	16	17
4	13	20	183	963	76	1050	194	77	95	42	16	17
5	13	16	130	978	74	649	174	77	98	42	16	12
6	13	14	97	641	71	430	260	74	171	41	15	11
7	15	14	311	413	70	325	356	72	333	39	15	11
8	15	14	861	473	65	e260	584	69	251	36	15	10
9	14	14	534	787	69	e225	727	68	e170	34	15	13
10	14	14	407	637	69	214	664	67	e145	33	14	19
11	14	14	389	658	67	192	475	64	e130	31	14	19
12	18	13	348	524	64	172	378	62	e120	30	14	15
13	19	13	255	406	73	160	312	59	e120	29	14	13
14	16	13	201	358	81	155	262	56	174	28	14	12
15	20	13	162	302	82	148	225	66	e210	27	13	11
16	25	14	139	251	86	148	210	106	e165	26	13	11
17	19	21	121	214	124	147	203	92	e145	26	13	10
18	16	21	110	188	144	191	193	84	e130	25	12	9.6
19	16	17	100	169	129	190	183	97	e115	24	12	9.6
20	15	16	91	154	120	172	162	160	e105	23	12	9.6
21	14	17	84	144	123	248	150	129	e90	22	12	9.5
22	14	32	78	141	120	205	134	108	e80	22	12	9.2
23	14	20	73	152	282	178	122	94	e75	22	12	9.2
24	15	15	68	151	1280	171	120	84	e70	21	11	9.2
25	14	16	66	140	786	184	114	80	e65	20	11	9.2
26	14	15	65	127	766	192	108	84	e60	20	11	8.9
27	14	17	61	117	873	222	100	88	e60	19	10	8.4
28	13	29	59	109	758	240	95	92	e55	18	10	8.4
29	13	74	57	102	---	226	91	96	e50	18	10	14
30	13	88	60	97	---	250	94	98	e50	18	10	16
31	13	---	92	91	---	303	---	97	---	18	9.8	---
TOTAL	465	630	6146	12100	6703	9683	7444	2645	3620	894	405.8	351.8
MEAN	15.0	21.0	198	390	239	312	248	85.3	121	28.8	13.1	11.7
MAX	25	88	861	1390	1280	1100	727	160	333	50	17	19
MIN	13	13	57	91	64	147	91	56	50	18	9.8	8.4
AC-FT	922	1250	12190	24000	13300	19210	14770	5250	7180	1770	805	698
CFSM	.33	.46	4.33	8.52	5.23	6.82	5.42	1.86	2.63	.63	.29	.26
IN.	.38	.51	4.99	9.83	5.44	7.86	6.05	2.15	2.94	.73	.33	.29

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1964 - 1994, BY WATER YEAR (WY)

	MEAN	64.7	325	481	481	413	379	347	250	126	39.2	21.3	25.8
MAX	180	731	1471	1033	934	995	597	521	320	90.9	51.9	82.2	
(WY)	1969	1974	1965	1970	1986	1972	1993	1971	1974	1983	1968	1978	
MIN	6.42	21.0	33.0	48.3	65.0	84.6	147	70.7	27.3	17.7	9.51	8.62	
(WY)	1988	1994	1977	1977	1977	1992	1968	1992	1992	1992	1992	1987	

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1964 - 1994

	ANNUAL TOTAL	86105	51087.6	245	1974
	ANNUAL MEAN	236	140	404	1977
	HIGHEST ANNUAL MEAN			106	1977
	LOWEST ANNUAL MEAN			10000	Dec 22 1964
	HIGHEST DAILY MEAN	2650	1390	Jan 3	Oct 27 1987
	LOWEST DAILY MEAN	13	8.4	Sep 27	Oct 23 1987
	ANNUAL SEVEN-DAY MINIMUM	13	8.9	Sep 22	
	ANNUAL RUNOFF (AC-FT)	170800	101300		
	ANNUAL RUNOFF (CFSM)	5.15	3.06		5.35
	ANNUAL RUNOFF (INCHES)	69.94	41.49		72.77
	10 PERCENT EXCEEDS	578	351		560
	50 PERCENT EXCEEDS	111	73		136
	90 PERCENT EXCEEDS	14	13		16

e Estimated



## WILLAMETTE RIVER BASIN

223

14162100 BLUE RIVER LAKE NEAR BLUE RIVER, OR

LOCATION.--Lat 44°10'20", long 122°19'40", in SE 1/4 SE 1/4 sec.16, T.16 S., R.4 E., Lane County, Hydrologic Unit 17090004, in intake tower near left end of Blue River Dam on Blue River, 1.4 mi north of town of Blue River, and at mile 1.7.

DRAINAGE AREA.--87.3 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1968 to current year. Prior to October 1971, published as Blue River Reservoir near Blue River.

REVISED RECORDS.--WDR OR-92-1: 1975-77.

GAGE.--Water-stage recorder. Datum of gage is sea level (levels by Corps of Engineers).

REMARKS.--Reservoir is formed by earthfill dam with concrete gate and spillway section, completed in 1968 by Corps of Engineers (COE); storage began October 1968. Total capacity is 89,520 acre-ft at elevation 1,357 ft, maximum pool, and usable capacity is 85,550 acre-ft between elevations 1,180 ft, minimum flood control pool, and 1,357 ft, maximum pool. Reservoir used for flood control. Figures given herein represent total contents. Midnight values for period Oct. 19 to Dec. 12 provided by COE. Midnight values for period Jan. 24 to Mar. 9 interpolated from 0700 hr values provided by COE.

COOPERATION.--Capacity table furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 86,260 acre-ft Apr. 28, 1990, elevation, 1,353.63 ft; minimum contents observed since first filling in 1968, 305 acre-ft Dec. 7, 1973, elevation, 1,125.47 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents recorded, 85,400 acre-ft July 5, elevation, 1,352.72 ft; minimum contents recorded, 4,070 acre-ft Dec. 14, elevation, 1,180.73 ft, but may have been less during period Dec. 10-12.

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

1,120	136	1,160	1,880	1,250	19,260
1,130	437	1,180	3,970	1,290	36,960
1,140	764	1,200	7,030	1,340	73,710
1,150	1,210	1,220	11,040	1,354	86,620

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1298.22	1204.52	1202.73	1196.12	1217.36	1286.82	1323.85	1342.33	1350.06	1352.54	1327.49	1265.09
2	1296.62	1202.92	1199.29	1205.88	1218.23	1290.81	1324.97	1342.56	1350.11	1352.60	1326.45	1261.34
3	1295.01	1202.65	1190.69	1214.85	1219.03	1296.81	1325.90	1342.80	1350.12	1352.66	1325.39	1257.62
4	1293.36	1202.26	1189.44	1205.28	1219.80	1301.60	1326.59	1343.21	1350.14	1352.69	1324.28	1253.78
5	1291.65	1201.77	1188.36	1199.05	1220.40	1302.37	1327.23	1343.55	1350.25	1352.36	1323.20	1249.82
6	1289.89	1201.25	1186.49	1193.17	1221.10	1302.61	1328.48	1343.88	1350.67	1351.68	1322.12	1247.01
7	1288.13	1200.71	1191.36	1192.70	1221.60	1303.25	1329.50	1344.20	1351.07	1350.99	1321.07	1244.84
8	1286.32	1200.16	1197.53	1195.70	1222.20	1304.38	1330.51	1344.35	1351.10	1350.29	1320.01	1243.83
9	1284.47	1199.60	1185.96	1196.74	1222.80	1305.20	1331.50	1344.56	1351.04	1349.58	1318.93	1243.47
10	1282.59	1199.02	1181.66	1195.15	1223.40	1305.80	1332.02	1344.75	1350.92	1348.86	1317.82	1243.15
11	1280.69	1198.45	1184.11	1196.82	1224.00	1306.28	1332.16	1344.91	1350.96	1348.12	1316.75	1242.83
12	1278.83	1197.87	1185.32	1194.61	1224.50	1306.60	1332.32	1345.07	1350.99	1347.41	1315.35	1242.41
13	1276.90	1197.31	1182.58	1192.07	1225.20	1306.86	1332.54	1345.18	1351.09	1346.69	1313.70	1242.03
14	1274.97	1196.72	1182.02	1192.83	1226.00	1307.10	1333.30	1345.30	1351.38	1345.87	1312.02	1241.59
15	1273.06	1196.14	1182.94	1193.27	1226.90	1307.29	1334.15	1345.53	1351.36	1344.91	1310.35	1241.13
16	1271.12	1195.63	1182.80	1193.63	1227.70	1307.80	1335.03	1345.99	1351.36	1344.18	1308.53	1240.74
17	1269.09	1195.12	1182.54	1194.23	1229.00	1308.53	1335.87	1346.20	1351.11	1343.42	1306.45	1240.26
18	1266.15	1194.58	1183.74	1194.82	1230.70	1309.51	1336.69	1346.49	1351.05	1342.57	1304.23	1239.88
19	1262.53	1194.53	1184.81	1195.75	1232.20	1310.40	1337.44	1346.89	1351.09	1341.67	1302.07	1239.16
20	1260.05	1193.98	1186.29	1196.03	1233.50	1311.26	1338.07	1347.38	1351.19	1340.61	1299.64	1238.39
21	1256.76	1193.56	1187.82	1197.68	1234.90	1312.57	1338.65	1347.89	1351.42	1339.61	1297.17	1237.61
22	1252.95	1193.20	1189.09	1200.37	1236.60	1313.57	1339.16	1348.16	1351.61	1338.62	1294.74	1236.81
23	1249.49	1192.08	1190.17	1203.31	1242.00	1314.42	1339.60	1348.45	1351.78	1337.62	1292.21	1235.98
24	1244.85	1191.22	1191.07	1205.47	1253.70	1315.27	1340.05	1348.70	1351.93	1336.60	1289.62	1235.15
25	1239.96	1190.76	1191.88	1207.71	1263.00	1316.11	1340.46	1348.90	1352.06	1335.58	1286.97	1234.27
26	1233.79	1190.26	1192.63	1209.37	1269.80	1316.96	1340.83	1349.08	1352.19	1334.52	1284.26	1233.37
27	1226.38	1189.85	1193.28	1211.08	1275.63	1317.93	1341.16	1349.25	1352.29	1333.51	1281.40	1232.43
28	1218.11	1189.72	1193.84	1212.57	1282.26	1318.98	1341.46	1349.48	1352.38	1332.46	1278.45	1231.54
29	1212.52	1190.76	1194.34	1214.03	---	1319.97	1341.76	1349.57	1352.45	1331.26	1275.35	1230.75
30	1209.50	1192.30	1194.53	1215.31	---	1321.19	1342.07	1349.74	1352.52	1329.97	1272.17	1229.91
31	1207.03	---	1193.95	1216.42	---	1322.60	---	1349.89	---	1328.66	1268.71	---
MAX	1298.22	1204.52	1202.73	1216.42	1282.26	1322.60	1342.07	1349.89	1352.52	1352.69	1327.49	1265.09
MIN	1207.03	1189.72	1181.66	1192.07	1217.36	1286.82	1323.85	1342.33	1350.06	1328.66	1268.71	1229.91
(†)	8320	5760	6020	10240	32710	59250	75550	82720	85200	64080	26260	13440
(†)	-34650	-2560	+260	+4220	+22470	+26540	+16300	+7170	+2480	-21120	-37820	-12820

CAL YR 1993 MAX --- MIN --- AC-FT# +1950  
WTR YR 1994 MAX 1352.69 MIN 1181.66 AC-FT# -29530

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

## WILLAMETTE RIVER BASIN

14162200 BLUE RIVER AT BLUE RIVER, OR

LOCATION.--Lat 44°09'45", long 122°19'55", in NW 1/4 SE 1/4 sec.21, T.16 S., R.4 E., Lane County, Hydrologic Unit 17090004, on right bank 0.3 mi upstream from Simmonds Creek, 0.7 mi north of town of Blue River, 0.8 mi downstream from Blue River Dam, and at mile 0.9.

DRAINAGE AREA.--87.7 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 1,056.53 ft above sea level (Corps of Engineers bench mark). Prior to Aug. 25, 1966, nonrecording gage at datum 0.80 ft higher.

REMARKS.--No estimated daily discharges. Water-discharge records good. Discharges for period Apr. 20 to May 11 computed from data obtained through U.S. Army Corps of Engineers Columbia River Operational Hydromet System (CROHMS) database. Flow regulated since October 1968 by Blue River Lake (station 14162100). No diversion upstream from station. Discharge not adjusted for storage or release from Blue River Lake as losses from reservoir at times exceed natural flow.

AVERAGE DISCHARGE.--28 years (water years 1967-94), 444 ft<sup>3</sup>/s, 321,700 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,270 ft<sup>3</sup>/s Feb. 23, 1968, gage height, 8.93 ft; minimum discharge, 0.80 ft<sup>3</sup>/s Oct. 8, 10, 11, 1968; minimum daily, 3.7 ft<sup>3</sup>/s Oct. 8, 1968.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,510 ft<sup>3</sup>/s Jan. 3, gage height, 7.13 ft; minimum discharge, 36 ft<sup>3</sup>/s Jan. 28, 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	509	207	279	482	46	68	51	67	62	65	470	764
2	506	134	750	909	46	68	51	68	98	65	436	752
3	505	53	750	1940	46	70	51	67	116	65	433	742
4	502	60	410	2410	46	517	88	68	116	65	443	730
5	510	60	284	2300	46	1150	119	69	116	229	429	717
6	516	59	278	1630	46	713	119	68	116	378	416	490
7	513	59	278	834	47	304	346	69	274	378	416	373
8	509	59	1090	664	47	213	640	69	350	378	412	189
9	506	59	1560	1370	47	213	875	67	295	378	412	90
10	505	58	849	1320	47	213	1020	66	280	377	411	90
11	502	58	551	1130	47	213	840	66	203	375	404	90
12	499	58	566	1130	48	213	684	66	170	375	511	89
13	494	58	559	913	48	213	522	66	171	375	585	88
14	489	57	359	623	48	213	251	66	238	400	584	88
15	485	57	231	538	48	214	77	66	323	452	580	87
16	481	57	232	438	49	122	71	66	324	372	616	87
17	478	57	205	343	49	48	67	66	324	372	693	87
18	635	56	121	289	51	48	67	66	264	405	712	87
19	781	56	106	248	51	48	67	66	175	462	708	111
20	519	56	69	248	51	49	69	67	138	461	730	129
21	655	56	47	144	52	50	70	67	64	461	736	129
22	728	90	48	62	53	51	68	67	65	459	731	129
23	729	108	48	64	57	50	68	65	65	456	724	129
24	733	74	49	66	77	50	69	62	65	456	713	128
25	797	52	49	67	67	50	68	62	65	453	707	127
26	888	52	50	68	65	50	67	62	65	452	702	127
27	890	51	50	69	69	50	67	62	65	452	706	126
28	871	51	50	50	69	50	67	62	65	452	713	126
29	564	52	50	36	---	50	68	62	65	506	719	126
30	214	53	79	37	---	50	67	62	65	538	717	124
31	210	---	172	42	---	51	---	62	---	535	748	---
TOTAL	17723	2017	10219	20464	1463	5462	6754	2034	4802	11647	18317	7151
MEAN	572	67.2	330	660	52.2	176	225	65.6	160	376	591	238
MAX	890	207	1560	2410	77	1150	1020	69	350	538	748	764
MIN	210	51	47	36	46	48	51	62	62	65	404	87
AC-FT	35150	4000	20270	40590	2900	10830	13400	4030	9520	23100	36330	14180

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1969 - 1994, BY WATER YEAR (WY)

	MEAN	259	640	932	791	392	387	330	329	255	350	464	237
MAX	611	1459	2189	1371	1166	1766	853	676	549	626	765	536	
(WY)	1985	1974	1978	1972	1982	1972	1993	1971	1984	1979	1971	1972	
MIN	45.7	39.4	63.1	68.1	32.6	12.0	12.0	35.0	63.9	89.1	191	47.9	
(WY)	1993	1988	1977	1977	1977	1977	1977	1973	1973	1984	1993	1992	

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1969 - 1994

ANNUAL TOTAL	156838	108053	
ANNUAL MEAN	430	296	
HIGHEST ANNUAL MEAN			449
LOWEST ANNUAL MEAN			727
HIGHEST DAILY MEAN	3010	2410	192
LOWEST DAILY MEAN	40	36	1977
ANNUAL SEVEN-DAY MINIMUM	44	43	3900
ANNUAL RUNOFF (AC-FT)	311100	214300	3700
10 PERCENT EXCEEDS	878	726	3.7
50 PERCENT EXCEEDS	314	124	7.0
90 PERCENT EXCEEDS	53	50	7.0

## WILLAMETTE RIVER BASIN

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14162200 BLUE RIVER AT BLUE RIVER, OR--Continued

## WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: August 1966 to current year.

INSTRUMENTATION.--Temperature recorder since August 1966.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum, 26.0°C July 6, 1968; minimum, 0.0°C Jan. 5-9, 1974, Dec. 23, 24, 1983.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 20.5°C Sept. 3-7; minimum, 4.0°C several days in December and January.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	14.5	14.0	14.5	15.0	14.5	14.5	6.5	5.5	6.0	4.0	4.0	4.0
2	14.5	14.5	14.5	15.0	13.5	14.0	6.5	6.0	6.5	5.5	4.0	4.5
3	15.0	14.5	15.0	13.5	13.0	13.5	7.0	6.5	6.5	7.5	5.5	7.0
4	15.5	15.0	15.0	13.5	12.5	13.0	6.5	6.5	6.5	8.0	7.5	8.0
5	15.5	15.5	15.5	13.0	12.0	12.5	7.0	6.5	6.5	7.5	7.0	7.5
6	16.0	15.5	15.5	13.0	12.0	12.0	6.5	6.5	6.5	7.0	6.0	6.5
7	16.0	16.0	16.0	12.5	11.5	12.0	6.5	6.0	6.0	7.0	6.5	6.5
8	16.5	16.0	16.0	12.0	11.0	11.5	6.5	6.0	6.0	6.5	6.5	6.5
9	16.5	16.5	16.5	11.5	11.0	11.0	7.0	6.5	7.0	7.0	6.5	6.5
10	17.0	16.5	16.5	11.5	10.5	11.0	7.5	7.0	7.5	7.5	5.5	7.0
11	17.0	17.0	17.0	10.5	10.0	10.5	7.5	7.0	7.5	8.0	7.0	7.0
12	17.0	17.0	17.0	10.5	10.0	10.0	7.5	7.0	7.0	8.0	5.5	7.5
13	17.0	17.0	17.0	10.0	10.0	10.0	7.0	6.5	7.0	7.5	7.0	7.5
14	17.0	17.0	17.0	10.0	9.5	10.0	6.5	6.0	6.5	7.5	5.0	7.0
15	17.0	16.5	16.5	10.0	9.5	9.5	6.5	6.5	6.5	7.0	6.5	7.0
16	17.0	16.5	17.0	9.5	9.0	9.5	6.5	6.0	6.5	7.0	6.5	6.5
17	17.0	16.5	17.0	9.0	9.0	9.0	6.5	5.5	6.0	6.5	6.5	6.5
18	17.0	16.5	16.5	9.5	8.5	9.0	6.0	5.0	5.5	6.5	5.5	6.0
19	17.0	16.5	16.5	9.0	8.0	8.5	5.5	5.0	5.0	6.0	5.5	6.0
20	16.5	16.5	16.5	8.5	8.0	8.0	5.0	4.0	4.5	6.0	5.5	5.5
21	16.5	16.0	16.5	8.0	7.5	8.0	4.5	4.0	4.5	6.0	5.5	5.5
22	16.5	16.0	16.0	8.0	7.5	8.0	4.5	4.0	4.5	6.0	5.5	5.5
23	16.5	16.0	16.0	8.0	7.0	7.5	4.5	4.0	4.5	6.0	5.5	5.5
24	16.5	16.0	16.0	7.5	6.5	7.0	5.0	4.0	4.5	5.5	5.0	5.5
25	16.0	16.0	16.0	7.5	6.5	6.5	4.5	4.0	4.5	6.0	5.0	5.5
26	16.0	15.5	16.0	7.0	6.5	6.5	4.5	4.0	4.5	6.0	5.0	5.5
27	16.0	15.5	15.5	7.0	6.0	6.5	4.5	4.0	4.5	6.0	5.5	5.5
28	16.0	15.5	16.0	6.5	6.0	6.0	4.5	4.0	4.5	6.5	5.5	5.5
29	16.0	15.0	15.5	6.0	5.5	6.0	4.5	4.0	4.0	6.5	5.5	6.0
30	15.5	15.0	15.0	6.0	5.5	5.5	4.5	4.0	4.0	6.5	5.5	6.0
31	15.0	15.0	15.0	---	---	---	4.0	4.0	4.0	6.5	5.5	5.5
MONTH	17.0	14.0	16.0	15.0	5.5	9.5	7.5	4.0	5.5	8.0	4.0	6.0
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	6.5	5.0	5.5	6.5	5.5	6.0	7.5	6.5	6.5	7.5	7.0	7.0
2	6.0	5.0	5.5	6.0	5.5	5.5	7.0	6.5	6.5	7.5	6.5	7.0
3	6.0	5.0	5.5	6.5	5.5	6.0	7.0	6.0	6.5	7.5	6.5	7.0
4	6.0	5.0	5.5	6.0	5.5	5.5	6.5	6.0	6.5	7.5	7.0	7.0
5	6.0	5.0	5.5	5.5	5.5	5.5	6.5	6.0	6.0	8.0	6.0	7.5
6	5.5	5.0	5.5	5.5	5.0	5.5	6.5	6.5	6.5	8.5	6.5	7.5
7	5.5	5.0	5.0	6.0	5.0	5.5	6.5	6.5	6.5	8.5	7.0	7.5
8	5.5	4.5	5.0	6.0	5.5	5.5	6.5	6.5	6.5	8.5	6.5	7.5
9	5.0	5.0	5.0	6.0	5.5	5.5	6.5	6.5	6.5	8.0	7.0	7.5
10	5.5	5.0	5.0	6.0	5.5	5.5	6.5	6.5	6.5	8.5	6.5	7.5
11	5.5	5.0	5.0	6.0	5.0	5.5	6.5	6.5	6.5	8.0	7.0	7.5
12	5.5	4.5	5.0	6.0	5.5	5.5	6.5	6.5	6.5	8.0	7.0	7.5
13	5.5	5.0	5.0	6.0	5.0	5.5	6.5	6.5	6.5	8.0	7.0	7.5
14	5.5	5.0	5.5	6.0	5.0	5.5	7.5	6.5	6.5	8.0	7.0	7.5
15	5.5	5.0	5.0	6.5	5.0	5.5	8.0	6.5	7.0	8.0	7.0	7.0
16	5.5	5.0	5.0	6.5	6.0	6.0	7.5	6.5	7.0	7.5	7.0	7.5
17	5.0	5.0	5.0	6.5	6.0	6.0	7.5	6.5	7.0	7.5	7.0	7.0
18	5.5	5.0	5.0	6.0	5.5	6.0	8.0	6.0	7.0	8.0	7.0	7.5
19	5.5	5.0	5.5	6.5	5.5	6.0	7.5	6.0	7.0	8.0	7.0	7.5
20	5.5	5.0	5.0	6.0	6.0	6.0	8.0	6.5	7.0	8.0	7.0	7.5
21	5.5	5.0	5.5	6.5	6.0	6.0	7.5	6.5	7.0	8.0	7.0	7.5
22	5.5	5.0	5.5	6.5	6.0	6.0	7.5	6.5	7.0	8.5	7.0	7.5
23	6.0	5.0	5.5	7.0	6.0	6.5	7.5	6.5	7.0	8.5	7.0	7.5
24	6.5	6.0	6.5	7.5	6.0	6.5	7.5	6.5	7.0	8.5	7.0	7.5
25	6.5	5.5	6.0	7.5	6.0	6.5	7.5	7.0	7.0	8.5	6.5	7.5
26	6.0	5.5	6.0	7.5	6.0	6.5	7.0	5.5	7.0	8.5	6.5	7.5
27	6.0	5.5	6.0	7.0	5.5	6.5	7.5	6.5	7.0	8.5	7.0	7.5
28	6.5	5.5	6.0	7.5	5.5	6.5	8.0	6.5	7.0	7.5	7.0	7.0
29	---	---	---	7.5	6.0	6.5	7.5	6.5	7.0	7.5	7.0	7.5
30	---	---	---	6.5	6.0	6.5	7.5	6.5	7.0	8.5	7.0	7.5
31	---	---	---	6.5	6.0	6.5	---	---	---	8.0	7.0	7.5
MONTH	6.5	4.5	5.5	7.5	5.0	6.0	8.0	5.5	7.0	8.5	6.0	7.5





## WILLAMETTE RIVER BASIN

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## 14162500 MCKENZIE RIVER NEAR VIDA, OR

LOCATION.--Lat 44°07'30", long 122°28'10", in NE 1/4 NE 1/4 sec.5, T.17 S., R.3 E., Lane County, Hydrologic Unit 17090004, on right bank 0.4 mi downstream from Mason Creek, 5.4 mi east of Vida, and at mile 47.7.

DRAINAGE AREA.--930 mi<sup>2</sup> at cableway 0.4 mi downstream, where all discharge measurement are made.

PERIOD OF RECORD.--July 1910 to March 1911 (published as "at Martins Rapids, near Vida"), September 1924 to current year. Monthly discharge only for some periods, published in WSP 1318.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 855.71 ft above sea level (levels by Eugene Water and Electric Board). July 1, 1910, to Mar. 31, 1911, nonrecording gage at site 3 mi downstream at different datum. Sept. 1, 1924, to Nov. 16, 1928, nonrecording gage at site 20 ft upstream at datum 0.15 ft lower. Nov. 17, 1928, to Sept. 23, 1968, water-stage recorder at present site on left bank at datum 0.15 ft lower.

REMARKS.--No estimated daily discharges. Records excellent. Flow regulated since 1963 by Smith River Reservoir (station 14158795) and Cougar Lake (station 14159400), and since 1968 by Blue River Lake (station 14162100). No diversion upstream from station. All records given herein are for measuring site. Continuous water-quality records for the period June 1961 to September 1985 have been collected at this location.

AVERAGE DISCHARGE.--70 years (water years 1925-94), 3,997 ft<sup>3</sup>/s, 2,896,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 64,400 ft<sup>3</sup>/s Dec. 28, 1945, gage height, 17.70 ft, site and datum then in use, from rating curve extended above 32,000 ft<sup>3</sup>/s; minimum discharge, 1,260 ft<sup>3</sup>/s Nov. 7, 1930, Sept. 17, Oct. 4, 8, 9, 1931.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in January 1923 reached a stage of 17.2 ft, from floodmarks, discharge, 62,000 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 9,300 ft<sup>3</sup>/s Jan. 3, gage height, 4.31 ft; minimum discharge, 1,600 ft<sup>3</sup>/s Nov. 19.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2840	2510	3130	2690	2130	4000	2970	2520	2130	1960	2630	3060
2	2820	2470	3740	4330	2090	3900	2830	2460	2090	2090	2530	3050
3	2810	2390	3520	8500	2070	4620	2750	2430	2080	2080	2530	3040
4	2830	2390	3130	7970	2050	6340	2700	2510	2080	2040	2530	3060
5	2820	2300	2520	8530	2020	6040	2700	2550	2110	2260	2510	3040
6	2840	2160	2340	7040	1990	4890	2960	2500	2530	2630	2460	2660
7	2860	2150	2610	5300	1960	4020	3720	2490	3010	2600	2450	2310
8	2870	2020	4850	5050	1920	3590	4180	2480	2950	2570	2470	2160
9	2860	1820	5330	6620	1910	3380	4740	2450	2680	2560	2620	2020
10	2860	1810	4310	6510	1930	3330	5190	2400	2530	2560	2620	2020
11	2850	1810	3980	6290	1910	3220	4640	2330	2380	2550	2610	2020
12	2880	1810	3930	6050	1870	3110	4280	2280	2280	2610	2670	2020
13	2890	1800	3360	5440	1880	3010	3990	2260	2330	2710	2810	2000
14	2890	1810	2860	5030	1930	2970	3500	2230	2800	2610	2810	1970
15	2930	1810	2490	4700	1910	2940	3170	2240	3020	2620	2810	1960
16	2950	1800	2460	4400	1880	2890	3080	2420	2820	2510	2800	1960
17	2900	1840	2320	4070	1940	2740	3070	2400	2700	2470	2890	1930
18	2780	1880	2070	3930	2090	2810	3090	2310	2590	2510	2960	1930
19	2750	1820	1960	3810	2050	2890	3130	2290	2420	2650	2950	1940
20	2880	1820	1890	3660	1980	2740	3080	2550	2320	2640	2970	1980
21	2880	1830	1830	3270	2030	3070	3050	2470	2200	2620	2970	1980
22	2880	1940	1800	2830	2080	2990	2970	2400	2170	2610	2970	1960
23	2870	2160	1790	2890	2480	2780	2850	2310	2140	2620	2970	1940
24	2880	2400	1760	2870	5660	2700	2910	2250	2100	2630	2970	1940
25	2880	2060	1730	2700	4760	2710	2850	2220	2050	2620	2970	1930
26	2780	1670	1720	2440	3990	2640	2790	2180	2060	2580	2980	1930
27	2770	1680	1690	2380	4150	2640	2670	2150	2020	2590	2980	1930
28	2730	1710	1690	2330	4040	2690	2620	2130	2000	2630	2990	1920
29	2630	1780	1670	2260	---	2700	2580	2140	1950	2680	2980	2040
30	2490	1820	1680	2200	---	2810	2580	2130	1930	2740	2990	2030
31	2500	---	1840	2170	---	3130	---	2090	---	2710	3020	---
TOTAL	87400	59270	82000	138260	68700	104290	97640	72570	70470	78260	86420	65730
MEAN	2819	1976	2645	4460	2454	3364	3255	2341	2349	2525	2788	2191
MAX	2950	2510	5330	8530	5660	6340	5190	2550	3020	2740	3020	3060
MIN	2490	1670	1670	2170	1870	2640	2580	2090	1930	1960	2450	1920
AC-FT	173400	117600	162600	274200	136300	206900	193700	143900	139800	155200	171400	130400

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1969 - 1994, BY WATER YEAR (WY)

	MEAN	2762	4541	6026	5755	4551	4446	4229	4354	3586	2702	2794	2595
MAX	3696	8718	12370	9295	8772	11210	7097	6567	6604	3529	3510	3358	
(WY)	1985	1985	1978	1971	1982	1972	1993	1969	1974	1974	1971	1972	
MIN	1640	1925	1865	1752	1542	2351	2671	2268	2180	2138	1907	2019	
(WY)	1993	1988	1977	1977	1977	1992	1977	1992	1973	1991	1992	1992	

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1969 - 1994

ANNUAL TOTAL	1428230	1011010		
ANNUAL MEAN	3913	2770		
HIGHEST ANNUAL MEAN			4028	
LOWEST ANNUAL MEAN			5823	1972
HIGHEST DAILY MEAN	14000	Mar 18	2447	1977
LOWEST DAILY MEAN	1670	Nov 26	23600	Feb 23 1986
ANNUAL SEVEN-DAY MINIMUM	1710	Dec 24	1330	Feb 19 1977
ANNUAL RUNOFF (AC-FT)	2833000		1350	Oct 23 1992
10 PERCENT EXCEEDS	7010		2918000	
50 PERCENT EXCEEDS	2830		6890	
90 PERCENT EXCEEDS	2020		3180	
			2260	

## WILLAMETTE RIVER BASIN

## 14163150 MCKENZIE RIVER BELOW LEABURG DAM, NEAR LEABURG, OR

LOCATION.--Lat 44°07'26", long 122°37'35", in NE 1/4 NE 1/4 sec.1, T.17 S., R.1 E., Lane County, Hydrologic Unit 17090004, on right bank 1.4 mi downstream from Leaburg Dam, 3.0 mi northeast of Leaburg, and at mile 37.4.

DRAINAGE AREA.--1,030 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1989 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 710 ft above sea level, from topographic map.

REMARKS.-- Records good. Flow regulated since 1963 by Smith River Reservoir (station 14158795) and Cougar Lake (station 14159400), and since 1968 by Blue River Lake (station 14162100). Diversion upstream from station through the Leaburg Power canal. Continuous water temperature records for the period June 1992 to September 1993 have been collected at this location.

AVERAGE DISCHARGE.--5 years, 2,002 ft<sup>3</sup>/s, 1,450,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 29,300 ft<sup>3</sup>/s Apr. 27, 1990, gage height, 14.40 ft; minimum discharge, 457 ft<sup>3</sup>/s Aug. 29, 1990.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 9,670 ft<sup>3</sup>/s Jan. 6, gage height, 8.60 ft; minimum discharge, 962 ft<sup>3</sup>/s Sept. 12.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1050	1070	1990	1300	1050	2630	1230	1040	1080	1030	1030	1040
2	1190	1080	1920	2560	1040	2380	1080	1050	1050	1040	1030	1040
3	1050	1230	1590	7240	1050	3280	1050	1050	1040	1030	1210	1040
4	1050	1190	1420	6320	1040	5200	1050	1080	1050	1030	1300	1040
5	1040	1130	1040	7410	1040	4700	1050	1080	1050	1040	1260	1030
6	1040	1050	1050	5840	1040	3410	1280	1040	1140	1040	1220	1040
7	1050	1040	1210	3800	1030	2430	2310	1040	1170	1030	1210	1040
8	1040	1040	3390	3360	1040	1920	2880	1050	1100	1030	1220	1040
9	1040	1050	3770	5110	1040	1630	3590	1050	1030	1040	1390	1040
10	1040	1060	2570	5120	1040	1530	4100	1030	1040	1040	1370	1030
11	1040	1060	2230	4870	1040	1360	3340	1180	1050	1030	1360	1030
12	1040	1060	2270	4510	1030	1230	2880	1200	1140	1030	1200	995
13	1040	1060	1540	3780	1040	1110	2600	1170	1960	1040	1050	1030
14	1040	1050	1160	3270	1040	1060	1880	1130	2810	1030	1040	1090
15	1040	1050	1040	2880	1030	1050	1450	1170	3060	1050	1040	1080
16	1040	1050	1030	2570	1030	1050	1320	1150	2810	1030	1040	1070
17	1040	1070	1030	2190	1060	1040	1240	1040	2010	1030	1050	1050
18	1050	1060	1040	2030	1150	1070	1210	1120	1480	1020	1050	1050
19	1090	1050	1030	1870	1090	1090	1230	1220	1280	1030	1040	1060
20	1060	1060	1050	1720	1060	1040	1200	1170	1210	1030	1040	1090
21	1070	1050	1090	1410	1070	1390	1160	1040	1070	1030	1050	1080
22	1050	1060	1070	1050	1080	1280	1100	1030	1030	1030	1050	1060
23	1040	1100	1060	1060	1260	1090	1040	1070	1030	1030	1050	1050
24	1040	1200	1050	1050	5670	1050	1050	1170	1030	1020	1040	1060
25	1040	1130	1050	1050	4020	1050	1030	1170	1020	1020	1040	1070
26	1040	1060	1050	1040	2900	1040	1030	1140	1030	1020	1030	1060
27	1050	1050	1050	1050	3310	1050	1050	e1100	1020	1040	1030	1070
28	1130	1060	1050	1040	2910	1050	1040	e1100	1030	1040	1040	1060
29	1060	1100	1050	1060	---	1050	1040	1080	1030	1040	1040	1070
30	1060	1120	e1050	1070	---	1100	1030	1070	1030	1050	1040	1040
31	1060	---	e1050	1060	---	1470	---	1050	---	1030	1040	---
TOTAL	32710	32440	44990	89690	43200	52830	48540	34080	39880	32020	34600	31545
MEAN	1055	1081	1451	2893	1543	1704	1618	1099	1329	1033	1116	1051
MAX	1190	1230	3770	7410	5670	5200	4100	1220	3060	1050	1390	1090
MIN	1040	1040	1030	1040	1030	1040	1030	1030	1020	1020	1030	995
AC-FT	64880	64340	89240	177900	85690	104800	96280	67600	79100	63510	68630	62570

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1990 - 1994, BY WATER YEAR (WY)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
MEAN	812	2129	2738	2935	1902	2630	3154	2700	2143	1043	977	860	
MAX	1055	3840	4455	4044	2523	6149	6042	5410	3393	1151	1116	1051	
(WY)	1994	1992	1992	1990	1991	1993	1993	1993	1993	1992	1994	1994	
MIN	610	741	1269	1380	1329	897	1618	1099	1161	946	907	525	
(WY)	1990	1990	1990	1992	1993	1992	1994	1994	1992	1993	1991	1990	

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1990 - 1994

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
ANNUAL TOTAL	954225	516525								
ANNUAL MEAN	2614	1415								
HIGHEST ANNUAL MEAN										
LOWEST ANNUAL MEAN										
HIGHEST DAILY MEAN	15100	7410	Jan 5							
LOWEST DAILY MEAN	766	995	Sep 12							
ANNUAL SEVEN-DAY MINIMUM	822	1030	Jul 20							
ANNUAL RUNOFF (AC-FT)	1893000	1025000								
10 PERCENT EXCEEDS	5980	2560								
50 PERCENT EXCEEDS	1070	1050								
90 PERCENT EXCEEDS	926	1030								

e Estimated

## WILLAMETTE RIVER BASIN

229

## 14163900 MCKENZIE RIVER NEAR WALTERVILLE, OR

LOCATION.--Lat 44°04'13", long 122°46'12", in NW 1/4 NE 1/4 sec.26, T.17 S., R.1 W., Lane County, Hydrologic Unit 17090004, on right bank 0.8 mi downstream from Walterville Power Canal Diversion, 1.7 mi east of Walterville, and at mile 27.7.

DRAINAGE AREA.--1,081 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1989 to current year.

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

REMARKS.--No estimated daily discharges. Records good. Flow regulated since 1963 by Smith River Reservoir (station 14158795) and Cougar Lake (station 14159400), and since 1968 by Blue River Lake (station 14162100). Diversion upstream from station through the Walterville Power Canal. Continuous water-quality records for period June 1992 to September 1993 have been collected at this location.

AVERAGE DISCHARGE.--5 years, 2,147 ft<sup>3</sup>/s, 1,556,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 23,600 ft<sup>3</sup>/s Apr. 28, 1990, gage height, 11.68 ft; minimum discharge, 420 ft<sup>3</sup>/s Nov. 8, 1989.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 8,540 ft<sup>3</sup>/s Jan. 5, gage height, 6.27 ft; minimum discharge, 994 ft<sup>3</sup>/s Oct. 2, Sept. 6

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1050	1370	1900	1230	1080	3420	1400	1390	1150	1110	1130	1110
2	1080	1380	1870	2000	1080	4320	1360	1400	1100	1120	1110	1110
3	1050	1380	1490	7350	1080	5680	1360	1420	1100	1110	1120	1110
4	1050	1380	1330	6620	1080	7990	1360	1680	1110	1110	1110	1110
5	1040	1370	1070	7970	1090	7550	1390	1580	1110	1130	1110	1110
6	1040	1370	1070	6640	1090	5750	1490	1400	1140	1110	1110	1110
7	1040	1370	1180	4270	1090	3170	2220	1410	1160	1110	1110	1110
8	1030	1400	3170	3560	1090	2120	3010	1410	1110	1100	1110	1110
9	1030	1390	3940	5120	1640	1640	3850	1400	1100	1110	1110	1130
10	1040	1410	2710	5480	2190	1520	5050	1400	1100	1110	1110	1120
11	1030	1400	2200	5180	2150	1420	5570	1410	1100	1110	1110	1130
12	1050	1420	2360	4880	2100	1450	5490	1400	1110	1120	1130	1110
13	1030	1410	1570	4110	1790	1390	5090	1400	1220	1110	1110	1120
14	1200	1430	1200	3530	1390	1360	4490	1400	1140	1110	1110	1110
15	1380	1420	1070	3050	1360	1360	3980	1410	1120	1120	1120	1110
16	1370	1420	1080	2700	1360	1370	3800	1410	1110	1110	1110	1100
17	1370	1380	1080	2250	1380	1360	3690	1400	1130	1110	1110	1110
18	1380	1380	1070	2050	1370	1390	3620	1410	1110	1110	1110	1110
19	1390	1390	1080	1830	1370	1370	3510	1410	1110	1110	1110	1110
20	1390	1390	1080	1640	1370	1360	2660	1430	1100	1120	1110	1110
21	1380	1380	1080	1410	1380	1500	1650	1400	1100	1110	1110	1110
22	1370	1380	1080	1080	1370	1400	1390	1400	1110	1110	1110	1110
23	1370	1380	1080	1090	1470	1360	1400	1400	1110	1110	1110	1110
24	1370	1360	1080	1080	5840	1360	1400	1400	1110	1110	1110	1110
25	1370	1430	1130	1070	4700	1370	1390	1400	1110	1110	1110	1110
26	1370	1370	1060	1080	3290	1370	1400	1420	1110	1110	1110	1110
27	1370	1370	1070	1090	3770	1370	1420	1400	1100	1110	1110	1110
28	1400	1380	1080	1080	3270	1370	1400	1410	1110	1110	1110	1110
29	1370	1380	1080	1080	---	1370	1400	1410	1110	1110	1110	1120
30	1370	1390	1090	1080	---	1410	1400	1400	1110	1190	1110	1110
31	1370	---	1090	1080	---	1710	---	1400	---	1170	1110	---
TOTAL	38150	41680	45440	93680	53240	72580	78640	44010	33510	34630	34470	33360
MEAN	1231	1389	1466	3022	1901	2341	2621	1420	1117	1117	1112	1112
MAX	1400	1430	3940	7970	5840	7990	5570	1680	1220	1190	1130	1130
MIN	1030	1360	1060	1070	1080	1360	1360	1390	1100	1100	1110	1100
AC-FT	75670	82670	90130	185800	105600	144000	156000	87290	66470	68690	68370	66170

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1990 - 1994, BY WATER YEAR (WY)

	1990	1991	1992	1993	1994
MEAN	1127	2584	2630	2830	1853
MAX	1312	4450	4698	3893	2480
(WY)	1992	1992	1992	1990	1993
MIN	683	1363	1249	1181	1216
(WY)	1990	1990	1990	1992	1993

## SUMMARY STATISTICS FOR 1993 CALENDAR YEAR FOR 1994 WATER YEAR WATER YEARS 1990 - 1994

	1993 CALENDAR YEAR	1994 WATER YEAR	1990 - 1994
ANNUAL TOTAL	1003148	603390	2147
ANNUAL MEAN	2748	1653	3029
HIGHEST ANNUAL MEAN			1653
LOWEST ANNUAL MEAN			20200
HIGHEST DAILY MEAN	16300	Mar 18	7990
LOWEST DAILY MEAN	841	Feb 24	1030
ANNUAL SEVEN-DAY MINIMUM	852	Feb 21	1040
ANNUAL RUNOFF (AC-FT)	1990000	1197000	1556000
10 PERCENT EXCEEDS	6880	3170	4360
50 PERCENT EXCEEDS	1370	1360	1400
90 PERCENT EXCEEDS	1030	1080	883





## WILLAMETTE RIVER BASIN

231

14166000 WILLAMETTE RIVER AT HARRISBURG, OR

LOCATION.--Lat 44°16'14", long 123°10'21", in NW 1/4 NE 1/4 sec.16, T.15 S., R.4 W., Linn County, Hydrologic Unit 17090003, on right bank 75 ft north of intersection of First Street and Kesling Street in Harrisburg and at mile 161.0.

DRAINAGE AREA.--3,420 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--October 1944 to current year. Gage-height records collected at same site in 1927-28, 1931, 1934, are contained in reports of National Weather Service.

GAGE.--Water-stage recorder. Datum of gage is 288.39 ft above sea level. Oct 1 to Nov. 14, 1944, nonrecording gage at bridge 1,110 ft upstream at different datum. Nov. 15, 1944, to Aug. 15, 1973, at site 1,100 ft upstream at datum 2.00 ft higher.

REMARKS.--No estimated daily discharges. Records good. Flow regulated by 8 reservoirs upstream from station. Many small diversions upstream from station for irrigation. Continuous water-quality records for the period June 1961 to September 1987 have been collected at this location.

AVERAGE DISCHARGE.--50 years, 11,740 ft<sup>3</sup>/s, 8,506,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 210,000 ft<sup>3</sup>/s Dec. 29, 1945, gage height, 19.69 ft, from rating curve extended above 115,000 ft<sup>3</sup>/s; minimum discharge, 1,990 ft<sup>3</sup>/s Oct. 30, 1944.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood stage of 20.5 ft was reached in December 1861, and 20.1 ft in February 1890 (information from Corps of Engineers). Flood of Jan. 1, 1943, reached a stage of 19.1 ft from National Weather Service.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 21,900 ft<sup>3</sup>/s Jan. 6, gage height, 6.90 ft; minimum discharge, 3,280 ft<sup>3</sup>/s Dec. 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6850	5300	4060	3990	4300	11000	8610	4590	3780	3820	4810	5370
2	6820	5750	6940	5780	4220	9820	7170	4440	3780	3920	4750	5390
3	6870	6420	7070	12800	4150	10300	6460	4310	3730	3960	4760	5430
4	6870	6350	7470	16400	4120	14900	6020	4340	3820	3900	4790	5500
5	6980	6280	7120	18600	4020	14100	5860	4570	3850	3860	4850	5450
6	7090	6180	6470	21300	4000	11700	6260	4380	4120	4190	4810	5200
7	7180	6140	6060	17100	4000	9340	7540	4260	4650	4240	4840	4640
8	7150	6130	9360	13900	3970	8010	9120	4150	5150	4190	4840	5090
9	7430	5860	16300	14500	3890	7090	11000	4130	4730	4200	4930	4900
10	7390	5730	13600	17900	4050	6810	12200	3980	4340	4210	4970	5000
11	7460	5690	13200	16800	4060	6390	11500	3880	4170	4280	4980	5080
12	7560	5720	14600	16500	3970	6020	10300	3820	4010	4260	4930	5100
13	7190	5740	11800	14600	3950	5730	9290	3760	3990	4360	5200	5170
14	6860	5750	8290	13100	4300	5560	8020	3750	4410	4350	5270	5170
15	6910	5770	6260	11600	4290	5410	6880	3810	5180	4340	5230	5140
16	6970	5820	5400	10400	4240	5410	6480	4140	5440	4350	5230	5110
17	6880	5850	5010	9570	4260	5260	6100	4150	5230	4570	5260	5070
18	6810	5900	4580	8920	5170	5180	5910	4100	4920	4610	5330	5060
19	6520	5870	4300	7590	5080	5730	5560	4000	4670	4660	5330	5030
20	6450	5310	4110	6530	4850	5450	5530	4110	4460	4600	5310	5190
21	5860	4840	3980	5980	4990	6030	5410	4210	4180	4600	5340	5210
22	5690	5080	3840	5250	5470	6780	5230	4060	4060	4580	5380	5220
23	5630	5730	3810	5290	5600	6350	5090	3940	4120	4670	5380	5230
24	5630	6310	3730	5410	11000	5900	5030	3850	4000	4760	5380	5290
25	5630	5690	3690	5570	15600	5660	5060	3880	3870	4820	5360	5270
26	5450	4470	3630	5180	11900	5550	4900	3810	3780	4670	5370	5270
27	5340	3780	3600	4940	12700	5390	4730	3760	3740	4630	5340	5250
28	5290	3390	3580	4810	12300	5300	4620	3800	3680	4630	5350	5240
29	5110	3530	3540	4590	---	5110	4460	3870	3720	4650	5380	5670
30	5000	3820	3500	4460	---	5310	4680	3900	3700	4770	5330	5590
31	4990	---	3520	4360	---	8830	---	3700	---	4830	5330	---
TOTAL	199860	164200	202420	313720	164450	225420	205020	125450	127280	136480	159360	156330
MEAN	6447	5473	6530	10120	5873	7272	6834	4047	4243	4403	5141	5211
MAX	7560	6420	16300	21300	15600	14900	12200	4590	5440	4830	5380	5670
MIN	4990	3390	3500	3990	3890	5110	4460	3700	3680	3820	4750	4640
AC-FT	396400	325700	401500	622300	326200	447100	406700	248800	252500	270700	316100	310100

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1969 - 1994, BY WATER YEAR (WY)

	MEAN	7848	14370	20660	19490	13960	13000	10930	9559	7664	4844	5294	6828
MAX	10970	30850	42980	36750	26870	36070	21680	16680	16150	6283	7117	8986	
(WY)	1985	1985	1978	1971	1986	1972	1993	1993	1984	1969	1971	1972	
MIN	4203	4924	3848	3695	2859	5168	4823	4009	3658	3883	4249	4305	
(WY)	1993	1988	1977	1977	1977	1992	1977	1987	1987	1978	1987	1992	

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1969 - 1994
ANNUAL TOTAL	4021770	2179990	
ANNUAL MEAN	11020	5973	11200
HIGHEST ANNUAL MEAN			17800
LOWEST ANNUAL MEAN			5233
HIGHEST DAILY MEAN	41300	Mar 19	71800
LOWEST DAILY MEAN	3390	Nov 28	2340
ANNUAL SEVEN-DAY MINIMUM	3580	Dec 25	2410
ANNUAL RUNOFF (AC-FT)	7977000		8111000
10 PERCENT EXCEEDS	21600		23500
50 PERCENT EXCEEDS	6990		7830
90 PERCENT EXCEEDS	5060		4480

## WILLAMETTE RIVER BASIN

14166500 LONG TOM RIVER NEAR NOTI, OR

LOCATION: Lat 44°03'00", long 123°25'30", in SE 1/4 NW 1/4 sec.33, T.17 S., R.6 W., Lane County, Hydrologic Unit 17090003, on left bank 0.2 mi upstream from Southern Pacific Railroad bridge, 0.8 mi downstream from Noti Creek, 1.3 mi southeast of Noti, and at mile 37.4.

DRAINAGE AREA. - - 89.3 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1935 to current year.

REVISED RECORDS.--WSP 1318: 1936 (M). WSP 1738: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 389.05 ft above sea level (levels by National Weather Service). Prior to Nov. 6, 1940, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Records good. Slight regulation caused by logpond upstream from Noti. No diversion upstream from station.

AVERAGE DISCHARGE.--59 years, 224 ft<sup>3</sup>/s, 34.04 in/yr, 162,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,990 ft<sup>3</sup>/s Dec. 22, 1955, gage height, 20.17 ft; minimum discharge, 0.04 ft<sup>3</sup>/s Aug. 13, 1977.

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

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 11	1430	*1,310	*10.35				
Minimum discharge, 3.5 ft <sup>3</sup> /s Aug. 29.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	20	193	121	125	310	323	106	59	33	13	11
2	16	20	230	177	121	280	284	102	57	33	10	7.4
3	16	22	103	351	117	299	235	102	56	32	9.9	9.6
4	19	29	133	410	114	325	209	110	56	31	8.8	17
5	21	30	129	623	110	294	194	104	52	31	8.7	14
6	18	25	91	569	107	261	225	96	63	30	8.3	11
7	20	22	138	383	107	237	244	90	70	28	9.3	8.8
8	21	23	394	324	105	218	277	85	66	26	13	7.7
9	20	24	477	328	102	204	361	83	56	25	8.4	14
10	19	24	356	306	108	198	379	80	51	23	7.1	20
11	19	31	1140	312	104	181	327	78	47	22	7.9	25
12	36	33	770	286	98	168	286	77	46	21	8.5	22
13	34	28	381	254	124	158	253	75	48	20	8.4	18
14	27	28	279	230	208	152	221	73	59	20	9.2	14
15	27	27	232	209	174	151	200	76	61	19	10	12
16	33	27	190	188	154	150	188	95	59	19	9.6	10
17	31	36	163	174	177	150	176	86	52	20	7.5	8.6
18	29	45	143	166	237	167	165	79	49	18	7.0	8.9
19	29	37	130	153	245	184	156	75	46	16	7.7	9.4
20	23	33	119	145	233	162	149	74	44	16	7.7	6.9
21	23	31	111	138	354	224	143	73	42	15	7.6	5.0
22	24	42	102	145	467	259	138	70	42	15	8.5	5.0
23	24	58	96	193	488	251	134	66	43	16	7.0	4.9
24	24	44	91	220	888	273	130	63	41	16	7.8	4.9
25	24	35	87	209	894	253	131	61	39	15	6.4	6.5
26	21	44	85	188	599	217	133	60	39	15	5.9	6.4
27	21	34	82	170	430	195	123	58	37	15	6.2	5.3
28	22	35	79	157	353	179	115	58	34	13	7.5	5.7
29	22	39	75	147	---	165	113	61	34	12	5.6	22
30	22	46	76	137	---	200	111	63	33	13	5.5	36
31	21	---	97	131	---	335	---	58	---	14	6.4	---
TOTAL	722	972	6772	7544	7343	6800	6123	2437	1481	642	254.4	357.0
MEAN	23.3	32.4	218	243	262	219	204	78.6	49.4	20.7	8.21	11.9
MAX	36	58	1140	623	894	335	379	110	70	33	13	36
MIN	16	20	75	121	98	150	111	58	33	12	5.5	4.9
AC - FT	1430	1930	13430	14960	14560	13490	12140	4830	2940	1270	505	708
CFSM	.26	.36	2.45	2.73	2.94	2.46	2.29	.88	.55	.23	.09	.13
IN.	.30	.40	2.82	3.14	3.06	2.83	2.55	1.02	.62	.27	.11	.15

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1936 - 1994, BY WATER YEAR (WY)

MEAN	39.8	198	447	561	539	408	253	126	65.5	30.2	16.8	17.3
MAX	300	708	1425	1260	1093	923	684	340	164	65.2	35.5	31.4
(WY)	1948	1974	1956	1956	1949	1938	1937	1963	1937	1937	1993	1978
MIN	8.00	16.6	23.8	25.2	62.5	131	57.2	54.6	24.7	6.20	3.61	7.42
(WY)	1988	1937	1977	1977	1977	1992	1977	1977	1977	1977	1977	1967

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1936 - 1994
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ANNUAL TOTAL	69396		41447.4				
ANNUAL MEAN	190		114			224	
HIGHEST ANNUAL MEAN						424	1974
LOWEST ANNUAL MEAN						45.5	1977
HIGHEST DAILY MEAN	1430	Jan 22	1140	Dec 11		5850	Dec 22 1964
LOWEST DAILY MEAN	16	Sep 30	4.9	Sep 23		.04	Aug 13 1977
ANNUAL SEVEN-DAY MINIMUM	17	Sep 27	5.4	Sep 21		.06	Aug 8 1977
ANNUAL RUNOFF (AC-FT)	137600		82210			162100	
ANNUAL RUNOFF (CFSM)	2.13		1.27			2.51	
ANNUAL RUNOFF (INCHES)	28.91		17.27			34.04	
10 PERCENT EXCEEDS	440		279			567	
50 PERCENT EXCEEDS	127		60			91	
90 PERCENT EXCEEDS	21		8.9			15	

## WILLAMETTE RIVER BASIN

233

14168000 FERN RIDGE LAKE NEAR ELMIRA, OR

LOCATION.--Lat 44°07'15", long 123°18'00", near center of sec.4, T.17 S., R.5 W., Lane County, Hydrologic Unit 17090003, in control house at spillway section of dam across Long Tom River and Coyote Creek, 4.5 mi northeast of Elmira, and at mile 25.7.

DRAINAGE AREA.--252 mi<sup>2</sup>, not including Amazon Creek basin (see REMARKS).

PERIOD OF RECORD.--October 1941 to current year. Prior to October 1971, published as Fern Ridge Reservoir near Elmira.

GAGE.--Water-stage recorder. Datum of gage is sea level (levels by Corps of Engineers).

REMARKS.--Lake is formed by earth-fill dam with concrete outlet and spillway, completed in 1941 by Corps of Engineers; storage began Nov. 13, 1941. Total capacity (new capacity table put into use Oct. 1, 1992 based on Dec. 1992 resurvey), 107,400 acre-ft at elevation 375.1 ft, maximum pool elevation. Usable capacity, 93,350 acre-ft between elevations 340.0 ft, sill of outlet gate, and 373.5 ft, normal maximum operating pool level. Reservoir used for flood control and improvement of navigation. Since November 1951, most of flow of Amazon Creek has been diverted in SE 1/4 sec.29, T.17 S., R.4 W., and discharged into Fern Ridge Lake; drainage area at point of diversion, 21.3 mi<sup>2</sup>.

COOPERATION.--Capacity table furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 124,500 acre-ft Dec. 27, 1955, elevation, 375.83 ft; minimum contents since first filling in 1942, 163 acre-ft Nov. 11, 1950, elevation, 344.00 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 93,520 acre-ft May 15, elevation, 373.52 ft; minimum contents, 3,280 acre-ft Dec. 14, 16, 17, elevation, 353.32 ft.

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

349	439	356	6,810	364	30,560	372	81,180
350	835	358	10,680	366	40,480	374	97,590
352	2,090	360	15,830	368	52,350	375	106,400
354	4,030	362	22,410	370	65,980		

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	371.18	359.19	355.18	355.40	358.59	366.14	371.11	373.47	373.39	373.15	372.19	371.19
2	371.15	358.78	355.21	355.46	358.72	366.40	371.30	373.47	373.38	373.12	372.17	371.16
3	371.13	358.31	354.94	355.56	358.83	366.79	371.44	373.48	373.39	373.10	372.12	371.14
4	371.03	357.82	354.84	355.52	358.94	367.03	371.56	373.48	373.38	373.08	372.09	371.11
5	370.76	357.47	354.53	355.36	359.03	367.24	371.70	373.45	373.40	373.06	372.06	371.09
6	370.43	357.30	354.14	355.04	359.13	367.45	371.85	373.46	373.41	373.03	372.03	371.07
7	370.11	357.13	354.23	355.01	359.19	367.61	372.00	373.48	373.41	373.01	371.99	371.03
8	369.74	357.01	354.43	355.27	359.30	367.75	372.17	373.47	373.41	372.98	371.96	371.04
9	369.37	356.93	354.24	355.44	359.40	367.91	372.36	373.48	373.40	372.95	371.94	371.03
10	369.00	356.86	354.67	355.51	359.52	368.03	372.54	373.48	373.39	372.92	371.91	371.06
11	368.67	356.78	355.03	355.56	359.62	368.13	372.69	373.47	373.39	372.89	371.88	371.04
12	368.31	356.72	353.86	355.62	359.72	368.22	372.81	373.47	373.38	372.85	371.85	371.01
13	367.92	356.66	353.34	355.62	359.96	368.30	372.91	373.46	373.37	372.83	371.82	370.99
14	367.51	356.59	353.50	355.60	360.21	368.38	372.98	373.46	373.38	372.79	371.78	370.97
15	367.09	356.51	353.39	355.54	360.41	368.45	373.05	373.50	373.38	372.75	371.75	370.95
16	366.62	356.46	353.32	355.51	360.59	368.56	373.11	373.45	373.37	372.72	371.72	370.94
17	366.14	356.45	353.44	355.51	360.92	368.63	373.16	373.44	373.37	372.69	371.69	370.91
18	365.64	356.39	353.73	355.57	361.32	368.73	373.20	373.44	373.37	372.65	371.65	370.88
19	365.13	356.32	353.95	355.67	361.64	368.82	373.24	373.45	373.36	372.63	371.61	370.86
20	364.60	356.20	354.17	355.75	361.94	368.93	373.27	373.45	373.35	372.59	371.58	370.84
21	364.06	356.10	354.38	355.89	362.44	369.10	373.31	373.45	373.34	372.56	371.55	370.81
22	363.49	356.10	354.55	356.23	362.97	369.29	373.34	373.45	373.33	372.51	371.51	370.79
23	362.88	355.98	354.70	356.73	363.52	369.44	373.36	373.45	373.31	372.49	371.48	370.77
24	362.24	355.84	354.83	357.19	364.24	369.59	373.40	373.44	373.30	372.44	371.45	370.74
25	361.76	355.64	354.94	357.47	364.91	369.72	373.44	373.43	373.28	372.42	371.42	370.71
26	361.42	355.44	355.04	357.64	365.35	369.83	373.46	373.41	373.25	372.39	371.38	370.69
27	361.09	355.26	355.13	357.76	365.66	369.92	373.46	373.40	373.24	372.36	371.36	370.67
28	360.73	355.07	355.21	357.94	365.92	370.00	373.47	373.41	373.23	372.32	371.32	370.64
29	360.37	354.94	355.29	358.14	--	370.07	373.48	373.40	373.20	372.29	371.28	370.70
30	360.01	354.82	355.39	358.29	--	370.35	373.48	373.40	373.18	372.25	371.26	370.69
31	359.60	--	355.48	358.46	--	370.81	--	373.40	--	372.22	371.22	--
MAX	371.18	359.19	355.48	358.46	365.92	370.81	373.48	373.50	373.41	373.15	372.19	371.19
MIN	359.60	354.82	353.32	355.01	358.59	366.14	371.11	373.40	373.18	372.22	371.22	370.64
(†)	14690	5060	5990	11740	40040	71990	93180	92510	90680	82910	75120	71080
(‡)	-60280	-9630	+930	+5750	+28300	+31950	+21190	-670	-1830	-7770	-7790	-4040

CAL YR 1993 MAX 373.55 MIN 353.21 AC-FT# +2330

WTR YR 1994 MAX 373.50 MIN 353.32 AC-FT# -3890

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

‡ Change in contents, in acre-feet.

## WILLAMETTE RIVER BASIN

## 14169000 LONG TOM RIVER NEAR ALVADORE, OR

LOCATION.--Lat 44°07'25", long 123°17'55", in SW 1/4 NE 1/4 sec.4, T.17 S., R.5 W., Lane County, Hydrologic Unit 17090003, on left bank 0.2 mi downstream from Fern Ridge Dam, 1.7 mi west of Alvadore, and at mile 25.5.

DRAINAGE AREA.--252 mi<sup>2</sup>, not including Amazon Creek basin.

PERIOD OF RECORD.--August 1939 to current year. Prior to October 1943, published as "at Smithfield," and October 1943 to September 1959, as "below Fern Ridge Dam, near Smithfield." Prior to October 1985, published figures included diversion from Fern Ridge Reservoir into Coyote Creek channel (station 14169001).

REVISED RECORDS.--WSP 1248: 1940-41, 1948.

GAGE.--Water-stage recorder and masonry control. Datum of gage is 332.00 ft above sea level (levels by Corps of Engineers). Prior to Sept. 21, 1939, nonrecording gage and Sept. 21, 1939, to Sept. 30, 1943, water-stage recorder at site 2.5 mi downstream at datum 11.09 ft lower.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since 1941 by Fern Ridge Lake (station 14168000). Several small diversions for irrigation upstream from station. Approximately 7 ft<sup>3</sup>/s diverted from Fern Ridge Reservoir into Coyote Creek channel. Discharge not adjusted for storage or release from Fern Ridge Lake as evaporation from reservoir at times exceeds natural flow and diversions, and beginning in November 1951, most of flow of Amazon Creek has been diverted into Fern Ridge Lake.

AVERAGE DISCHARGE.--51 years (water years 1944-94), 506 ft<sup>3</sup>/s, 366,600 acre-ft/yr (river only).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,500 ft<sup>3</sup>/s Jan. 1, 1943, gage height, 15.12 ft, site and datum then in use; minimum daily discharge, 2 ft<sup>3</sup>/s Aug. 7, 1941.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,990 ft<sup>3</sup>/s Dec. 12, gage height, 6.33 ft; minimum discharge, 25 ft<sup>3</sup>/s several days in March and June.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	71	601	157	331	50	61	30	150	49	78	68	70
2	71	591	328	439	50	48	30	150	49	50	68	70
3	71	658	428	636	50	58	30	150	49	45	68	64
4	336	630	426	979	50	205	30	189	48	55	68	53
5	990	432	417	1430	51	230	30	175	48	70	63	53
6	1150	215	409	1350	51	57	30	69	48	70	62	53
7	1150	214	405	810	51	40	30	66	48	70	62	53
8	1240	150	728	605	51	27	29	67	48	70	61	53
9	1290	99	943	597	51	27	30	50	48	70	63	52
10	1270	98	975	595	51	27	30	50	48	60	68	51
11	1240	97	2170	595	51	27	30	50	47	60	69	51
12	1230	97	2840	501	51	27	48	50	47	66	64	55
13	1240	96	1290	483	51	27	60	50	47	69	62	53
14	1290	96	619	462	52	27	60	50	47	74	62	51
15	1270	96	544	440	52	27	60	116	47	74	68	51
16	1320	96	419	365	53	26	60	273	36	72	70	51
17	1310	96	250	302	53	25	60	155	25	70	70	51
18	1280	96	106	224	55	26	60	68	26	67	78	50
19	1260	112	106	171	55	25	60	50	27	73	78	50
20	1240	154	76	163	55	26	60	50	26	75	71	50
21	1220	152	54	98	57	26	54	50	28	76	68	50
22	1200	151	55	52	57	26	47	50	42	76	76	50
23	1230	149	55	53	58	25	49	51	50	76	76	49
24	1210	184	55	128	60	26	50	56	50	76	75	50
25	881	214	55	218	60	27	53	48	48	69	72	50
26	611	214	55	218	221	27	123	48	44	62	70	50
27	607	211	55	218	178	27	149	48	45	63	69	50
28	599	211	57	119	97	27	150	48	45	68	70	49
29	591	187	57	50	---	27	150	48	48	68	70	49
30	589	155	57	50	---	27	149	48	70	68	70	48
31	602	---	76	50	---	29	---	49	---	68	70	---
TOTAL	29659	6552	14267	12732	1822	1337	1831	2572	1328	2108	2129	1580
MEAN	957	218	460	411	65.1	43.1	61.0	83.0	44.3	68.0	68.7	52.7
MAX	1320	658	2840	1430	221	230	150	273	70	78	78	70
MIN	71	96	54	50	50	25	29	48	25	45	61	48
AC-FT	58830	13000	28300	25250	3610	2650	3630	5100	2630	4180	4220	3130

CAL YR 1993 TOTAL 162281 MEAN 445 MAX 2840 MIN 50 AC-FT 321900  
WTR YR 1994 TOTAL 77917 MEAN 213 MAX 2840 MIN 25 AC-FT 154500

## WILLAMETTE RIVER BASIN

235

## 14170000 LONG TOM RIVER AT MONROE, OR

LOCATION.--Lat 44°18'47", long 123°17'43", in NE 1/4 sec.33, T.14 S., R.5 W., Benton County, Hydrologic Unit 17090003, on left bank in canalized river channel at Monroe, 110 ft upstream from bridge on State Highway 99W, 0.1 mi downstream from Shafer Creek, and at mile 6.8.

DRAINAGE AREA.--391 mi<sup>2</sup>.

PERIOD OF RECORD.--November 1920 to July 1921, October 1921 to April 1926, November 1926 to May 1927, October 1927 to current year. Prior to October 1930, published as "near Monroe."

REVISED RECORDS.--WSP 654: Drainage area. WSP 1248: 1923, 1927, 1928(M). WSP 1288: 1952.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 270.57 ft above sea level. Prior to Nov. 24, 1944, nonrecording gage at various sites ranging from present site to 1.5 mi downstream at different datums.

REMARKS.--No estimated daily discharges. Records good except for flows below 100 ft<sup>3</sup>/s, which are fair. Flow regulated since 1941 by Fern Ridge Lake (station 14168000). Several small diversions upstream from station.

AVERAGE DISCHARGE.--71 years (water years 1922-25, 1928-94), 741 ft<sup>3</sup>/s, 536,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 19,300 ft<sup>3</sup>/s Jan. 2, 1943, gage height, 17.14 ft, site and datum then in use, from graph based on gage readings, includes some overflow from Willamette River near Junction City; no flow Oct. 20-22, 1944 (water filling pool at gage); minimum discharge observed prior to regulation, 7 ft<sup>3</sup>/s Sept. 29, Oct. 1, 1939.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,730 ft<sup>3</sup>/s Dec. 11, gage height, 7.52 ft; minimum discharge, 20 ft<sup>3</sup>/s June 21, 22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	68	570	212	322	146	393	441	220	69	43	41	35
2	69	561	312	565	145	355	288	213	64	50	39	37
3	71	610	440	1060	146	581	235	204	60	38	42	44
4	111	614	451	1310	141	632	209	225	61	32	41	45
5	779	538	458	2340	135	622	194	255	64	35	39	35
6	1120	210	420	2140	131	348	252	161	74	38	36	34
7	1120	202	451	1340	130	280	273	90	87	37	34	33
8	1160	187	787	988	127	235	317	103	76	37	33	35
9	1260	104	1410	964	126	217	375	96	71	38	34	38
10	1260	103	1250	879	132	217	318	87	66	39	34	46
11	1230	104	3150	854	141	200	255	74	62	34	34	49
12	1230	106	3440	744	133	180	228	74	62	29	36	49
13	1220	102	2220	660	187	171	237	75	59	30	33	50
14	1300	99	1060	627	389	165	221	76	55	33	33	55
15	1290	99	838	569	254	160	210	89	59	35	33	60
16	1330	99	650	517	208	154	206	298	56	38	34	46
17	1330	106	446	407	286	156	194	216	47	40	34	44
18	1300	108	251	359	447	161	186	141	40	36	32	43
19	1280	105	201	274	396	175	178	90	40	32	36	40
20	1240	141	186	253	317	159	174	86	33	36	37	40
21	1220	147	141	233	641	234	172	88	24	37	38	41
22	1200	150	134	177	663	261	157	87	22	37	36	40
23	1210	154	127	380	655	253	153	78	30	39	36	34
24	1210	159	122	446	1240	253	148	68	37	41	37	34
25	1040	204	119	505	973	211	143	68	39	43	38	39
26	565	204	118	418	770	189	175	62	43	37	35	37
27	560	205	116	376	685	168	222	64	36	34	36	35
28	553	205	112	323	509	154	217	68	31	34	40	35
29	551	203	110	173	---	146	218	73	30	37	38	46
30	550	164	109	159	---	213	220	73	29	40	36	52
31	555	---	124	153	---	789	---	71	---	41	36	---
TOTAL	28982	6563	19965	20515	10253	8432	6816	3673	1526	1150	1121	1251
MEAN	935	219	644	662	366	272	227	118	50.9	37.1	36.2	41.7
MAX	1330	614	3440	2340	1240	789	441	298	87	50	42	60
MIN	68	99	109	153	126	146	143	62	22	29	32	33
AC-FT	57490	13020	39600	40690	20340	16720	13520	7290	3030	2280	2220	2480

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1942 - 1994, BY WATER YEAR (WY)

	MEAN	760	933	1725	2092	1582	904	477	242	95.4	44.3	76.1	203
MAX	1895	3437	5355	6222	4032	2761	2277	1193	697	148	524	960	
(WY)	1948	1951	1956	1956	1961	1957	1963	1963	1993	1993	1951	1955	
MIN	27.1	91.5	55.5	43.5	44.1	136	54.5	50.3	28.6	23.0	20.0	12.4	
(WY)	1942	1953	1977	1977	1977	1978	1977	1987	1987	1965	1944	1943	

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1942 - 1994

ANNUAL TOTAL	230243	110247	
ANNUAL MEAN	631	302	759
HIGHEST ANNUAL MEAN			1517
LOWEST ANNUAL MEAN			177
HIGHEST DAILY MEAN	3950	Jan 22	3440
LOWEST DAILY MEAN	48	Aug 11	22
ANNUAL SEVEN-DAY MINIMUM	53	Aug 8	32
ANNUAL RUNOFF (AC-FT)	456700	218700	549600
10 PERCENT EXCEEDS	1580	864	2320
50 PERCENT EXCEEDS	278	145	228
90 PERCENT EXCEEDS	64	35	36



## WILLAMETTE RIVER BASIN

## 14174000 WILLAMETTE RIVER AT ALBANY, OR

LOCATION.--Lat 44°38'20", long 123°06'20", in SW 1/4 sec.6, T.11 S., R.3 W., Linn County, Hydrologic Unit 17090003, on right bank 5 ft upstream from bridge on U.S. Highway 20 (Ellsworth Street) in Albany, 0.2 mi downstream from Calapooia River, and at mile 119.31.

DRAINAGE AREA.--4,840 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--November 1878 to April 1888 (fragmentary), January to June 1892, November 1892 to September 1894, December 1894 to current year. Monthly discharge only for some periods, published in WSP 1318.

REVISED RECORDS.--WSP 694: Drainage area. WSP 904: 1939. WSP 964: 1881, 1890, 1894, 1897, 1901, 1903, 1908, 1910, 1916, 1923, 1927, 1932(M). WSP 984: 1916. WSP 1248: 1895, 1902, 1907, 1915(M), 1917(M), 1918-19, 1934(M). WSP 1318 (monthly and annual figures only): 1894, 1897, 1901-3, 1907-8, 1910, 1916, 1918-19, 1923, 1927.

GAGE.--Water-stage recorder. Datum of gage is 167.18 ft above sea level. Prior to Sept. 27, 1906, nonrecording gage at site 0.2 mi upstream at datum 5.00 ft higher. Sept. 27, 1906, to Nov. 12, 1934, nonrecording gage at site 300 ft upstream at datum 5.00 ft higher. Nov. 14, 1934, to Sept. 30, 1962, at datum 5.00 ft higher.

REMARKS.--No estimated daily discharges. Records excellent. Flow regulated by nine reservoirs upstream from station. Albany power canal diverts water from South Santiam River at Lebanon and discharges into Calapooia River near mouth; small diversions for irrigation and municipal water supply.

AVERAGE DISCHARGE.--100 years (water years 1894, 1896-94), 14,300 ft<sup>3</sup>/s, 40.12 in/yr, 10,360,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 266,000 ft<sup>3</sup>/s Jan. 14, 1881, gage height, 37.8 ft, present datum; minimum discharge, 1,840 ft<sup>3</sup>/s Sept. 1, 2, 1940.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Dec. 4, 1861, reached a stage of 41.0 ft, discharge, 340,000 ft<sup>3</sup>/s, from rating curve extended above 220,000 ft<sup>3</sup>/s. Flood of Feb. 4, 1890, reached a stage of 38.9 ft, discharge, 291,000 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 29,300 ft<sup>3</sup>/s Jan. 6, gage height, 12.02 ft; minimum discharge, 3,790 ft<sup>3</sup>/s Nov. 29.

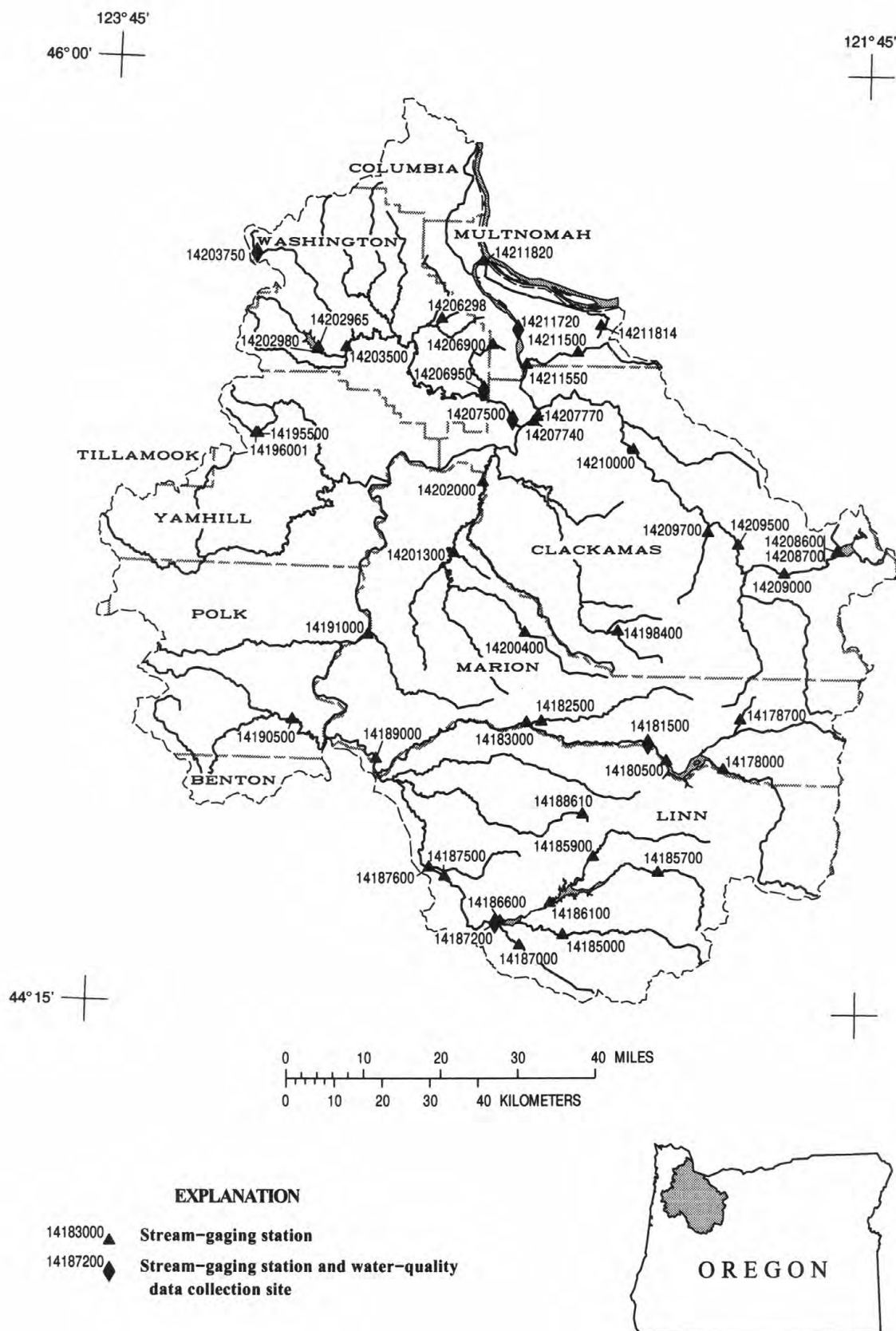
DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7150	5870	4490	4510	5610	16900	14700	5850	4380	4180	5360	5650
2	7100	6160	6250	6220	5470	14800	11600	5690	4420	4300	5240	5690
3	7090	6710	7980	11100	5300	14600	9560	5530	4350	4450	5290	5750
4	7130	7300	8320	20600	5190	18000	8490	5450	4340	4490	5270	5850
5	7300	7220	8610	23100	5130	19800	7880	5590	4450	4390	5330	5870
6	8050	7060	7920	28600	5000	17000	8000	5700	4560	4380	5300	5760
7	8440	6720	7490	25900	4970	13900	9440	5370	4990	4730	5360	5290
8	8480	6660	8600	20300	4930	11600	11200	5150	5760	4760	5320	5290
9	8620	6570	16500	18100	4840	10200	14100	5060	5950	4700	5230	5430
10	8880	6280	18700	20300	4850	9420	15700	4930	5510	4720	5270	5380
11	8900	6130	20900	20800	5030	8990	15700	4740	5130	4780	5280	5530
12	9030	6100	24000	20200	4960	8300	14200	4590	4890	4810	5270	5560
13	9010	6090	21200	18800	5000	7810	12800	4470	4730	4790	5310	5590
14	8670	6080	14900	16800	5860	7400	11300	4400	4730	4870	5520	5620
15	8520	6100	11400	15400	6230	7130	9820	4410	5270	4830	5500	5610
16	8570	6110	8970	13600	5960	6930	8740	4620	6210	4820	5470	5570
17	8640	6180	7770	12400	6110	6930	8170	5160	6220	4890	5470	5510
18	8520	6240	6780	11400	8300	6810	7730	5080	5940	5090	5540	5510
19	8350	6270	5980	10300	9070	7340	7350	4930	5650	5130	5620	5460
20	8110	6230	5570	8900	8250	7500	6990	4780	5350	5140	5620	5500
21	7880	5660	5260	7860	8440	7600	6860	4950	5070	5100	5650	5610
22	7360	5350	4980	7490	10300	9370	6660	4990	4770	5100	5690	5630
23	7160	5530	4800	7720	10500	9400	6440	4770	4700	5070	5680	5610
24	7120	6270	4670	9150	15600	8980	6270	4610	4730	5140	5680	5660
25	7080	6710	4570	9260	26600	8350	6320	4500	4640	5300	5700	5700
26	6870	5970	4440	8270	23000	7880	6250	4470	4450	5280	5670	5690
27	6400	4850	4360	7310	19200	7490	6090	4400	4360	5190	5650	5660
28	6250	4110	4220	6880	19200	7150	5930	4350	4240	5130	5640	5680
29	6150	3810	4170	6450	---	6880	5780	4450	4180	5160	5690	5880
30	6010	3890	4100	6020	---	6740	5710	4560	4170	5220	5650	6150
31	5890	---	4190	5800	---	9780	---	4530	---	5320	5630	---
TOTAL	238730	180230	272090	409540	248900	310980	275780	152080	148140	151260	169900	168690
MEAN	7701	6008	8777	13210	8889	10030	9193	4906	4938	4879	5481	5623
MAX	9030	7300	24000	28600	26600	19800	15700	5850	6220	5320	5700	6150
MIN	5890	3810	4100	4510	4840	6740	5710	4350	4170	4180	5230	5290
AC-FT	473500	357500	539700	812300	493700	616800	547000	301700	293800	300000	337000	334600
CFSM	1.59	1.24	1.81	2.73	1.84	2.07	1.90	1.01	1.02	1.01	1.13	1.16
IN.	1.83	1.39	2.09	3.15	1.91	2.39	2.12	1.17	1.14	1.16	1.31	1.30

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1969 - 1994, BY WATER YEAR (WY)

	MEAN	8835	16820	27040	25960	19760	17250	13780	10850	8540	5274	5547	7056
MAX	11780	40850	55390	45070	38630	43270	26860	18930	18460	7333	7313	8985	
(WY)	1985	1985	1982	1971	1986	1972	1993	1993	1993	1969	1971	1972	
MIN	4915	5425	4150	3901	3208	6808	5630	4733	4091	4084	4375	4347	
(WY)	1993	1988	1977	1977	1977	1978	1977	1973	1987	1978	1992	1992	

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1969 - 1994
ANNUAL TOTAL	4900830	2726320	
ANNUAL MEAN	13430	7469	13870
HIGHEST ANNUAL MEAN			22550
LOWEST ANNUAL MEAN			5831
HIGHEST DAILY MEAN	49400	Mar 19	114000
LOWEST DAILY MEAN	3810	Nov 29	2570
ANNUAL SEVEN-DAY MINIMUM	4290	Dec 25	2680
ANNUAL RUNOFF (AC-FT)	9721000	5408000	10050000
ANNUAL RUNOFF (CFSM)	2.77	1.54	2.87
ANNUAL RUNOFF (INCHES)	37.67	20.95	38.95
10 PERCENT EXCEEDS	27000	13100	31600
50 PERCENT EXCEEDS	8880	5850	9010
90 PERCENT EXCEEDS	5940	4550	4900



**Figure 24.** Location of surface-water and water-quality stations in the Willamette River Basin, downstream from the Luckiamute River.

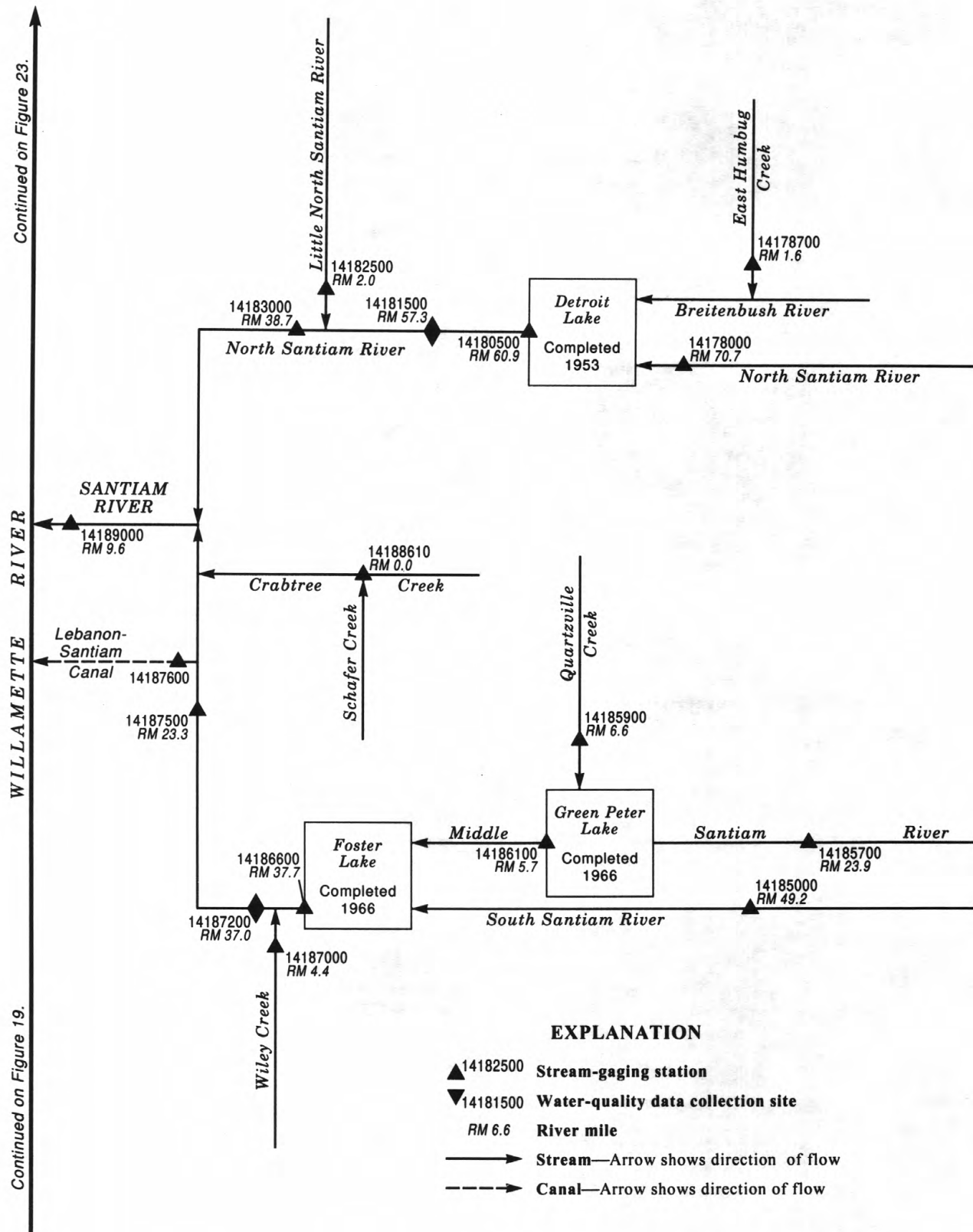


Figure 25. Schematic diagram showing gaging stations and diversions in the Santiam River Basin.

## 14178000 NORTH SANTIAM RIVER BELOW BOULDER CREEK, NEAR DETROIT, OR

LOCATION.--Lat 44°42'25", long 122°06'00", in SE 1/4 NW 1/4 sec.17, T.10 S., R.6 E., Marion County, Hydrologic Unit 17090005, on right bank 0.5 mi downstream from Boulder Creek, 3.0 mi southeast of Detroit, and at mile 70.7.

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

PERIOD OF RECORD.--January 1907 to October 1909, October 1928 to current year. Monthly discharge only January 1907, published in WSP 1318. Prior to October 1952, published as "at Detroit."

REVISED RECORDS.--WSP 814: Drainage area at former site. WSP 1248: 1931. WRD OR-85-2: 1982-82(P).

GAGE.--Water-stage recorder. Datum of gage is 1,590.07 ft above sea level. See WSP 1738 for history of changes prior to Oct. 1, 1952.

REMARKS.--No estimated daily discharges. Records good except for flows above 3,000 ft<sup>3</sup>/s, which are fair. No regulation or diversion upstream from station. Continuous water-quality records for the period April 1951 to September 1987 have been collected at this location.

AVERAGE DISCHARGE.--68 years, 992 ft<sup>3</sup>/s, 62.38 in/yr, 718,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,700 ft<sup>3</sup>/s Dec. 22, 1964, slope-area measurement of peak flow, gage height, 13.76 ft, temporary backwater from debris; minimum discharge, 250 ft<sup>3</sup>/s Sept. 13, 1909.

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

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 3	0130	*3,040	*5.84				

Minimum discharge, 295 ft<sup>3</sup>/s Sept. 27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	363	334	973	849	575	1450	1090	775	625	510	366	322
2	359	331	836	1360	560	1490	1100	745	596	521	370	321
3	359	359	588	2760	546	2050	1080	728	574	497	372	349
4	358	346	611	2480	532	2550	1010	859	581	479	369	355
5	356	336	524	2270	518	2040	938	908	609	481	361	331
6	358	331	473	1740	509	1630	1050	924	766	469	356	326
7	385	330	590	1370	503	1370	1070	934	880	465	367	323
8	370	327	1010	1330	484	1200	1200	934	785	467	361	322
9	358	327	1080	1520	500	1090	1410	912	713	463	353	347
10	354	325	1040	1450	488	1050	1410	869	674	448	352	343
11	353	323	1010	1500	477	983	1300	835	654	437	353	333
12	369	323	899	1370	465	922	1270	802	633	430	353	327
13	368	323	770	1270	481	901	1200	745	721	427	351	322
14	376	322	703	1210	484	910	1110	703	881	425	350	318
15	394	321	638	1150	476	909	1050	694	844	419	347	317
16	390	324	591	1060	474	919	1070	776	773	416	340	315
17	368	342	552	965	501	907	1130	724	737	418	337	314
18	358	338	523	892	515	1000	1220	681	753	414	336	314
19	352	328	501	838	496	966	1300	694	701	413	334	315
20	348	324	483	808	486	892	1260	741	665	407	333	312
21	347	336	467	796	493	950	1240	701	646	410	333	312
22	344	354	453	811	487	862	1120	750	633	414	332	309
23	343	337	440	866	588	815	1020	701	623	412	331	307
24	350	323	432	857	1340	782	1050	689	591	416	331	306
25	343	323	427	800	1300	763	979	695	572	404	329	304
26	336	321	422	749	1180	745	929	672	561	387	329	302
27	335	325	414	707	1310	764	877	635	547	383	328	301
28	335	335	408	672	1390	810	838	614	537	379	328	303
29	335	379	402	640	---	872	815	630	531	377	323	350
30	334	410	413	615	---	990	819	626	518	372	321	332
31	334	---	485	593	---	1150	---	603	---	369	321	---
TOTAL	11032	10057	19158	36298	18158	34732	32955	23299	19924	13329	10667	9652
MEAN	356	335	618	1171	648	1120	1098	752	664	430	344	322
MAX	394	410	1080	2760	1390	2550	1410	934	881	521	372	355
MIN	334	321	402	593	465	745	815	603	518	369	321	301
AC-FT	21880	19950	38000	72000	36020	68890	65370	46210	39520	26440	21160	19140
CFSM	1.65	1.55	2.86	5.42	3.00	5.19	5.09	3.48	3.07	1.99	1.59	1.49
IN.	1.90	1.73	3.30	6.25	3.13	5.98	5.68	4.01	3.43	2.30	1.84	1.66

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1907 - 1994, BY WATER YEAR (WY)

	504	965	1345	1282	1268	1174	1353	1409	1091	623	470	434
MEAN	504	965	1345	1282	1268	1174	1353	1409	1091	623	470	434
MAX	1215	2167	3840	2991	2816	2865	2137	2762	2759	1101	663	595
(WY)	1951	1951	1965	1953	1961	1972	1943	1949	1933	1950	1974	1971
MIN	312	335	432	383	404	616	610	600	412	363	319	309
(WY)	1981	1994	1977	1937	1977	1941	1941	1992	1992	1992	1992	1909

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1907 - 1994

ANNUAL TOTAL	336588	239261	992
ANNUAL MEAN	922	656	1506
HIGHEST ANNUAL MEAN			1506
LOWEST ANNUAL MEAN			569
HIGHEST DAILY MEAN	6120	2760	19400
LOWEST DAILY MEAN	321	301	250
ANNUAL SEVEN-DAY MINIMUM	323	305	273
ANNUAL RUNOFF (AC-FT)	667600	474600	718400
ANNUAL RUNOFF (CFSM)	4.27	3.03	4.59
ANNUAL RUNOFF (INCHES)	57.97	41.21	62.38
10 PERCENT EXCEEDS	1830	1160	1780
50 PERCENT EXCEEDS	591	515	776
90 PERCENT EXCEEDS	348	327	400

## WILLAMETTE RIVER BASIN

14178700 EAST HUMBURG CREEK NEAR DETROIT, OR

LOCATION...Lat 44°47'57", long 122°03'28", in NW 1/4 NE 1/4 sec.15, T.9 S., R.6 E., Marion County, Hydrologic Unit 17090005, in Willamette National Forest, on left bank 1.6 mi upstream from confluence with Humburg Creek, and 6.3 mi northeast of Detroit.

DRAINAGE AREA...7.32 mi<sup>2</sup>.

PERIOD OF RECORD...August 1978 to July 1994 (discontinued).

GAGE...Water-stage recorder. Elevation of gage is 2,050 ft above sea level, from topographic map.

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

AVERAGE DISCHARGE...15 years (water years 1979-93), 36.6 ft<sup>3</sup>/s, 67.91 in/yr, 26,510 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD...Maximum discharge, 1,310 ft<sup>3</sup>/s Dec. 25, 1980, from rating curve extended above 450 ft<sup>3</sup>/s, gage height, 4.42 ft; minimum discharge, 1.6 ft<sup>3</sup>/s Sept. 30, 1987, Oct. 11, 12, 1991, Aug. 17-20, 27, 29, 1992.

EXTREMES FOR PERIOD OCTOBER TO JULY...Peak discharges greater than base discharge of 280 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 1	1400	291	3.45	Jan. 2	2200	*545	*3.83

Minimum discharge, 1.9 ft<sup>3</sup>/s several days in October and November.DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.1	2.1	176	103	16	132	47	18	10	8.3	---	---
2	2.1	2.1	57	246	15	126	44	17	9.7	8.1	---	---
3	2.1	3.1	29	299	15	181	40	17	9.4	7.8	---	---
4	2.0	2.5	37	205	14	147	35	23	9.7	7.7	---	---
5	2.0	2.2	25	148	13	93	32	23	10	7.7	---	---
6	2.1	2.2	18	89	13	64	43	20	22	7.4	---	---
7	2.4	2.1	34	63	13	51	51	19	45	7.1	---	---
8	2.3	2.1	93	80	12	43	76	18	30	6.9	---	---
9	2.1	2.1	91	113	12	38	101	16	21	6.6	---	---
10	2.1	2.1	85	92	11	38	104	15	18	6.4	---	---
11	2.1	2.0	72	97	11	36	74	14	16	---	---	---
12	2.8	1.9	57	82	10	34	63	14	15	---	---	---
13	2.4	2.0	41	77	11	34	52	13	16	---	---	---
14	3.0	2.0	37	73	12	36	45	12	22	---	---	---
15	5.2	2.0	31	60	12	35	41	13	22	---	---	---
16	4.5	2.1	25	49	14	34	41	16	19	---	---	---
17	3.0	3.3	21	41	20	35	41	14	18	---	---	---
18	2.6	2.9	19	36	21	54	42	14	17	---	---	---
19	2.4	2.3	17	32	18	48	40	15	15	---	---	---
20	2.4	2.2	15	30	18	41	37	15	14	---	---	---
21	2.3	2.8	14	29	17	49	34	15	13	---	---	---
22	2.3	3.0	13	31	16	40	30	14	12	---	---	---
23	2.2	e2.6	12	36	36	35	28	13	12	---	---	---
24	2.3	e2.2	12	34	168	33	25	12	11	---	---	---
25	2.2	e2.2	11	30	133	33	24	12	11	---	---	---
26	2.1	e2.0	11	26	119	34	23	11	10	---	---	---
27	2.1	e2.2	11	23	112	40	21	11	9.8	---	---	---
28	2.1	e2.6	10	21	127	43	20	11	9.3	---	---	---
29	2.1	e7.0	9.6	20	---	42	19	12	8.9	---	---	---
30	2.1	10	11	18	---	45	19	11	8.5	---	---	---
31	2.1	---	27	17	---	52	---	11	---	---	---	---
TOTAL	75.6	81.9	1121.6	2300	1009	1746	1292	459	464.3	---	---	---
MEAN	2.44	2.73	36.2	74.2	36.0	56.3	43.1	14.8	15.5	---	---	---
MAX	5.2	10	176	299	168	181	104	23	45	---	---	---
MIN	2.0	1.9	9.6	17	10	33	19	11	8.5	---	---	---
AC-FT	150	162	2220	4560	2000	3460	2560	910	921	---	---	---
CFSM	.33	.37	4.94	10.1	4.92	7.69	5.88	2.02	2.11	---	---	---
IN.	.38	.42	5.70	11.69	5.13	8.87	6.57	2.33	2.36	---	---	---

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1979 - 1993, BY WATER YEAR (WY)

	9.11	47.6	64.1	55.9	73.7	62.1	60.7	34.8	19.5	7.11	3.67	3.62
MEAN	9.11	47.6	64.1	55.9	73.7	62.1	60.7	34.8	19.5	7.11	3.67	3.62
MAX	25.4	102	140	107	175	120	103	62.6	37.0	16.4	7.51	7.32
(WY)	1983	1985	1981	1983	1982	1993	1993	1984	1981	1983	1983	1986
MIN	1.92	7.40	30.2	18.2	28.1	16.0	26.8	12.2	5.07	2.83	1.82	2.20
(WY)	1988	1988	1993	1981	1993	1992	1986	1992	1992	1992	1992	1991

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## WATER YEARS 1979 - 1993

ANNUAL TOTAL	12894.5		
ANNUAL MEAN	35.3		
HIGHEST ANNUAL MEAN		36.6	
LOWEST ANNUAL MEAN		50.5	1982
HIGHEST DAILY MEAN	340	26.4	1992
LOWEST DAILY MEAN	1.9	1080	Dec 25 1980
ANNUAL SEVEN-DAY MINIMUM	2.0	1.7	Oct 11 1991
ANNUAL RUNOFF (AC-FT)	25580	1.7	Aug 25 1992
ANNUAL RUNOFF (CFSM)	4.83	26510	
ANNUAL RUNOFF (INCHES)	65.53	5.00	
10 PERCENT EXCEEDS	91	67.91	
50 PERCENT EXCEEDS	14	80	
90 PERCENT EXCEEDS	2.2	20	
		2.8	

e Estimated



## WILLAMETTE RIVER BASIN

241

14180500 DETROIT LAKE NEAR DETROIT, OR

LOCATION.--Lat 44°43'20", long 122°14'55", in SW 1/4 NW 1/4 sec.7, T.10 S., R.5 E., Marion County, Hydrologic Unit 17090005, in control house near right abutment of Detroit Dam on North Santiam River, 4.9 mi west of Detroit, and at mile 60.9.

DRAINAGE AREA.--437 mi<sup>2</sup>.

PERIOD OF RECORD.--January 1953 to current year. Prior to October 1971, published as Detroit Reservoir near Detroit.

GAGE.--Water-stage recorder. Datum of gage is sea level (levels by Corps of Engineers).

REMARKS.--Lake elevation data for period Dec. 13 to Mar. 23 obtained through U.S. Army Corps of Engineers Columbia River Operational Hydromet System (CROHMS) database. Reservoir is formed by concrete, gravity-type dam with six 42-ft by 28-ft control gates. Length of dam is 1,580 ft, built by Corps of Engineers. Storage began in January 1953. Total capacity is 455,100 acre-ft and usable capacity is 340,100 acre-ft between elevations 1,425.0 ft, proposed lower limit of operation, and 1,569.0 ft, top of spillway gates. Reservoir used for flood control, power development, irrigation, improvement of navigation, pollution abatement, and other purposes. Figures given herein represent total contents.

COOPERATION.--Capacity table furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 457,900 acre-ft July 13, 1972, elevation, 1,569.79 ft; minimum contents, 115,500 acre-ft Jan. 30, 1969, elevation, 1,425.37 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 443,300 acre-ft June 15, elevation, 1,565.60 ft; minimum contents, 156,600 acre-ft Dec. 30, elevation, 1,451.28 ft.

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

1,425	115,000	1,480	210,900	1,530	331,500
1,430	122,200	1,490	232,000	1,540	360,200
1,440	137,700	1,500	254,600	1,550	390,900
1,450	154,400	1,510	278,700	1,560	424,000
1,460	172,200	1,520	304,400	1,570	458,600

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1534.33	1478.26	1457.17	1453.91	1469.26	1495.73	1537.29	1561.76	1563.75	1564.14	1560.49	1553.82
2	1532.65	1476.88	1458.06	1458.24	1469.36	1498.92	1538.33	1562.06	1563.79	1564.11	1560.28	1553.59
3	1530.90	1476.00	1456.68	1466.33	1469.49	1503.20	1539.31	1562.36	1563.81	1564.03	1560.12	1553.45
4	1529.14	1475.08	1455.84	1470.86	1469.67	1508.02	1540.08	1562.84	1563.90	1563.92	1559.90	1553.23
5	1527.40	1474.19	1454.18	1473.66	1469.72	1511.33	1540.82	1563.36	1564.02	1563.86	1559.69	1553.01
6	1525.68	1473.68	1452.46	1473.68	1469.74	1513.67	1541.88	1563.81	1564.44	1563.75	1559.51	1552.78
7	1523.98	1473.19	1452.24	1472.35	1469.73	1515.41	1543.08	1563.92	1564.87	1563.72	1559.32	1552.55
8	1522.21	1472.68	1453.71	1470.96	1469.65	1516.73	1544.68	1564.16	1564.97	1563.69	1559.11	1552.28
9	1520.38	1472.20	1454.62	1470.60	1469.76	1517.82	1546.75	1564.30	1564.92	1563.61	1558.94	1552.11
10	1518.52	1471.67	1455.22	1469.90	1469.72	1518.85	1548.80	1564.11	1564.92	1563.50	1558.73	1551.87
11	1516.84	1471.14	1455.43	1469.32	1469.69	1519.84	1550.35	1563.86	1564.96	1563.43	1558.55	1551.56
12	1514.97	1470.56	1455.12	1468.12	1469.60	1520.63	1551.72	1563.38	1564.95	1563.35	1558.33	1551.28
13	1513.16	1470.09	1453.99	1467.45	1469.69	1521.38	1552.78	1563.05	1565.09	1563.23	1558.13	1550.84
14	1511.34	1469.54	1452.80	1467.63	1469.71	1522.15	1553.68	1562.93	1565.27	1563.14	1557.89	1550.47
15	1509.59	1469.00	1452.30	1467.52	1469.80	1522.88	1554.44	1563.00	1565.25	1563.01	1557.69	1550.06
16	1507.71	1468.04	1452.25	1467.11	1469.87	1523.74	1555.20	1563.13	1565.12	1562.92	1557.50	1549.62
17	1505.73	1467.15	1452.59	1466.40	1470.12	1524.55	1556.04	1563.11	1564.93	1562.82	1557.29	1549.16
18	1503.76	1466.22	1452.74	1465.45	1470.40	1525.64	1556.96	1563.26	1564.94	1562.68	1557.08	1548.72
19	1501.79	1465.24	1452.82	1465.04	1470.69	1526.52	1558.00	1563.47	1564.90	1562.54	1556.89	1548.27
20	1499.70	1464.22	1452.85	1464.96	1470.85	1527.37	1558.94	1563.77	1564.78	1562.42	1556.63	1547.61
21	1497.61	1463.27	1452.85	1465.19	1471.06	1528.52	1559.67	1563.88	1564.67	1562.30	1556.42	1546.94
22	1495.47	1462.37	1452.73	1465.72	1471.17	1529.17	1559.86	1564.06	1564.51	1562.19	1556.18	1546.23
23	1493.63	1460.69	1452.60	1466.41	1472.31	1530.07	1559.97	1564.16	1564.52	1562.02	1555.96	1545.55
24	1491.78	1457.96	1452.44	1467.07	1478.58	1530.72	1560.07	1564.14	1564.47	1561.88	1555.75	1544.85
25	1489.96	1455.97	1452.24	1467.47	1482.51	1531.28	1560.31	1564.17	1564.42	1561.71	1555.53	1544.23
26	1488.32	1454.92	1452.19	1467.81	1485.75	1531.84	1560.45	1564.13	1564.36	1561.57	1555.33	1543.26
27	1486.69	1454.37	1451.98	1468.00	1489.15	1532.45	1560.48	1564.04	1564.25	1561.42	1555.04	1542.33
28	1485.09	1453.87	1451.84	1468.18	1492.64	1533.17	1560.74	1563.95	1564.24	1561.22	1554.82	1541.34
29	1483.41	1453.57	1451.67	1468.53	---	1533.92	1561.11	1563.87	1564.20	1561.02	1554.56	1540.43
30	1481.76	1453.66	1451.47	1468.86	---	1534.93	1561.48	1563.79	1564.19	1560.87	1554.33	1539.34
31	1479.96	---	1451.82	1469.06	---	1536.18	---	1563.64	---	1560.66	1554.03	---
MAX	1534.33	1478.26	1458.06	1473.68	1492.64	1536.18	1561.48	1564.30	1565.27	1564.14	1560.49	1553.82
MIN	1479.96	1453.57	1451.47	1453.91	1469.26	1495.73	1537.29	1561.76	1563.75	1560.66	1554.03	1539.34
(†)	210900	160800	157500	189300	237800	349100	429000	436500	438400	426200	403900	358300
(†)	-137600	-50100	-3300	+31800	+48500	+111300	+79900	+7500	+1900	-12200	-22300	-45600

CAL YR 1993 MAX 1564.94 MIN 1447.60 AC-FT# +700  
WTR YR 1994 MAX 1565.27 MIN 1451.47 AC-FT# +9800

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

## WILLAMETTE RIVER BASIN

14181500 NORTH SANTIAM RIVER AT NIAGARA, OR

LOCATION.--Lat 44°45'10", long 122°17'50", in NE 1/4 NE 1/4 sec.34, T.9 S., R.4 E., Linn County, Hydrologic Unit 17090005, on left bank 0.1 mi downstream from Little Sardine Creek, 0.8 mi downstream from Big Cliff Dam, 2.1 mi east of Niagara, and at mile 57.3.

DRAINAGE AREA.--453 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--December 1908 to January 1920, October 1921 to March 1922, October 1938 to current year. Monthly discharge only for some periods, published in WSP 1318. Published as "North Fork of Santiam River near Niagara" prior to October 1913, and as "above Mayflower Creek, near Detroit" October 1938 to September 1952.

REVISED RECORDS.--WSP 1288: 1914-18, 1920. WSP 1718: 1953-54.

GAGE.--Water-stage recorder. Datum of gage is 1,093.78 ft above sea level (Federal Highway Administration bench mark). See WSP 1738 for history of changes prior to Oct. 1, 1952.

REMARKS.--No estimated daily discharges. Water-discharge records good. Flow regulated since 1953 by Detroit Lake (station 14180500) and Big Cliff Reservoir, usable capacity for reregulating purposes, 2,930 acre-ft. No diversion upstream from station.

AVERAGE DISCHARGE.--66 years (water years 1910-19, 1939-94), 2,291 ft<sup>3</sup>/s, 68.68 in/yr, 1,660,000 acre-ft/yr, adjusted for storage.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 63,200 ft<sup>3</sup>/s Nov. 22, 1909, gage height, 16.4 ft, from floodmark, site and datum then in use, from rating curve extended above 35,000 ft<sup>3</sup>/s; minimum discharge, 19 ft<sup>3</sup>/s Aug. 21, 1963; minimum daily, 395 ft<sup>3</sup>/s Mar. 25, 26, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,830 ft<sup>3</sup>/s Jan. 5, gage height, 5.96 ft; minimum discharge, 794 ft<sup>3</sup>/s Apr. 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3050	2410	1710	1150	978	1020	915	1000	992	974	874	874
2	3060	1940	2100	1410	965	1030	910	940	1000	996	873	881
3	3160	1560	2920	1920	980	987	904	917	1020	1060	882	879
4	3060	1530	2880	3140	965	909	925	915	1030	1010	888	880
5	3140	1500	2820	4380	966	890	926	921	1020	969	877	879
6	3040	1100	2860	5380	965	889	952	1150	1020	955	865	868
7	3080	1040	2240	5140	974	896	957	1480	1570	888	864	868
8	3040	1050	2740	5170	975	893	931	1500	1700	897	867	868
9	3110	1040	3230	5320	976	901	930	1650	1690	877	865	872
10	3110	1040	3230	5300	978	921	927	1970	1470	877	868	961
11	2870	1040	3220	5370	970	924	938	2040	1280	875	865	961
12	3020	1040	3230	5260	976	912	1040	2460	1330	862	871	966
13	3050	1080	3160	4260	976	911	1120	2000	1370	865	867	1130
14	3060	1080	3060	3180	973	917	1160	1480	1770	864	861	1160
15	3040	1060	2140	3110	971	915	1050	1310	2090	871	861	1160
16	3060	1520	1560	3090	974	917	1080	1280	1960	873	871	1170
17	3140	1500	1040	3100	978	903	1100	1450	1950	865	859	1180
18	3050	1490	1040	3080	973	906	1060	1130	1550	869	859	1170
19	3060	1500	1100	2390	999	902	984	957	1520	881	864	1200
20	3030	1510	1070	1900	1000	930	971	967	1510	865	876	1540
21	3060	1490	1100	1600	1010	935	1280	1160	1480	864	871	1520
22	3070	1540	1050	1360	1000	914	1860	1170	1480	855	867	1550
23	2690	2330	1050	1350	1010	907	1990	1180	1330	846	875	1500
24	2690	3030	1020	1340	1050	911	1960	1310	1180	865	867	1530
25	2680	2330	1020	1340	1030	912	1640	1300	1170	875	857	1510
26	2350	1480	1020	1340	1010	916	1600	1330	1160	877	860	1930
27	2330	1040	1020	1350	998	918	1530	1340	1140	870	872	1970
28	2340	997	988	1180	1000	909	1230	1350	976	863	873	1930
29	2350	1030	990	1010	---	910	988	1330	965	870	875	2000
30	2370	1050	993	1010	---	920	910	1380	965	877	879	1970
31	2410	---	1000	997	---	925	---	1340	---	870	876	---
TOTAL	89570	43347	58601	86927	27620	28550	34768	41707	40688	27725	26949	37877
MEAN	2889	1445	1890	2804	986	921	1159	1345	1356	894	869	1263
MAX	3160	3030	3230	5380	1050	1030	1990	2460	2090	1060	888	2000
MIN	2330	997	988	997	965	889	904	915	965	846	857	868
AC-FT	177700	85980	116200	172400	54780	56630	68960	82730	80700	54990	53450	75130
MEAN†	652	603	1836	3320	1860	2730	2503	1467	1389	696	506	496
CFSM†	1.44	1.33	4.05	7.33	4.11	6.03	5.53	3.24	3.07	1.54	1.12	1.10
IN.†	1.66	1.49	4.67	8.45	4.28	6.95	6.16	3.73	3.42	1.77	1.29	1.22
AC-FT†	40100	35880	112900	204200	103300	167900	148900	90230	82600	42790	31150	29530

CAL YR 1993 TOTAL 770908 MEAN 2112 MAX 9990 MIN 777 AC-FT 1529000 MEAN† 2113 CFSM† 4.66 IN.† 63.33 AC-FT† 1530000  
WTR YR 1994 TOTAL 544329 MEAN 1491 MAX 5380 MIN 846 AC-FT 1080000 MEAN† 1505 CFSM† 3.32 IN.† 45.12 AC-FT† 1090000

† Adjusted for change in contents, in Detroit Lake.

## WILLAMETTE RIVER BASIN

243

14181500 NORTH SANTIAM RIVER AT NIAGARA, OR--Continued

## WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: January 1953 to current year.

INSTRUMENTATION.--Temperature recorder since January 1953.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum, 16.5°C July 28, 29, 1958; minimum, 1.0°C Jan. 30 to Feb. 4, 1979.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 14.0°C several days in October; minimum, 4.5°C many days in January and February.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	12.5	12.0	12.5	13.5	13.0	13.0	8.5	8.0	8.0	5.5	5.5	5.5
2	13.0	12.0	12.5	13.5	13.0	13.0	8.0	8.0	8.0	6.0	5.5	5.5
3	13.0	12.0	12.5	13.0	13.0	13.0	8.0	8.0	8.0	6.0	6.0	6.0
4	13.0	12.5	12.5	13.0	12.5	13.0	8.0	7.5	8.0	6.0	5.5	6.0
5	13.0	12.5	12.5	12.5	12.5	12.5	7.5	7.5	7.5	5.5	5.0	5.5
6	13.0	12.5	12.5	12.5	12.5	12.5	7.5	7.5	7.5	5.0	5.0	5.0
7	13.0	13.0	13.0	12.5	12.0	12.0	7.5	7.5	7.5	5.5	5.0	5.5
8	13.0	12.5	13.0	12.0	12.0	12.0	7.5	7.5	7.5	5.5	5.5	5.5
9	13.5	13.0	13.5	12.0	11.5	11.5	7.5	7.5	7.5	5.5	5.5	5.5
10	13.5	13.0	13.0	11.5	11.5	11.5	7.5	7.5	7.5	5.5	5.5	5.5
11	13.5	13.0	13.0	11.5	11.5	11.5	7.5	7.0	7.5	5.5	5.5	5.5
12	13.5	13.0	13.5	11.5	11.5	11.5	7.0	7.0	7.0	5.5	5.5	5.5
13	13.5	13.5	13.5	11.5	11.5	11.5	7.0	7.0	7.0	6.0	5.5	5.5
14	13.5	13.0	13.5	11.5	11.0	11.0	7.0	7.0	7.0	6.0	5.5	5.5
15	13.5	13.5	13.5	11.0	10.5	11.0	7.0	7.0	7.0	6.0	5.5	5.5
16	13.5	13.5	13.5	11.0	11.0	11.0	7.0	6.5	6.5	5.5	5.5	5.5
17	13.5	13.5	13.5	11.0	10.5	11.0	6.5	6.5	6.5	5.5	5.5	5.5
18	13.5	13.5	13.5	10.5	10.5	10.5	6.5	6.5	6.5	5.5	5.5	5.5
19	14.0	13.5	13.5	10.5	10.5	10.5	6.5	6.0	6.0	5.5	5.5	5.5
20	14.0	13.5	13.5	10.5	10.0	10.0	6.0	6.0	6.0	5.5	5.5	5.5
21	14.0	13.5	13.5	10.5	10.0	10.0	6.0	6.0	6.0	5.5	5.5	5.5
22	14.0	13.5	13.5	10.0	10.0	10.0	6.0	6.0	6.0	5.5	5.5	5.5
23	14.0	13.5	13.5	10.0	9.0	9.5	6.0	5.5	5.5	5.5	5.5	5.5
24	14.0	13.5	13.5	9.5	9.0	9.0	5.5	5.5	5.5	5.5	5.5	5.5
25	14.0	13.5	13.5	9.0	8.5	9.0	5.5	5.5	5.5	5.5	5.0	5.5
26	14.0	13.5	13.5	9.0	8.5	8.5	5.5	5.5	5.5	5.0	5.0	5.0
27	13.5	13.5	13.5	8.5	8.5	8.5	5.5	5.5	5.5	5.0	5.0	5.0
28	13.5	13.5	13.5	8.5	8.5	8.5	5.5	5.5	5.5	5.0	5.0	5.0
29	13.5	13.0	13.5	8.5	8.5	8.5	5.5	5.5	5.5	5.0	5.0	5.0
30	13.5	13.0	13.5	8.5	8.5	8.5	5.5	5.5	5.5	5.0	5.0	5.0
31	13.5	13.0	13.5	---	---	---	5.5	5.5	5.5	5.0	4.5	5.0
MONTH	14.0	12.0	13.0	13.5	8.5	11.0	8.5	5.5	6.5	6.0	4.5	5.5

## WILLAMETTE RIVER BASIN

14181500 NORTH SANTIAM RIVER AT NIAGARA, OR--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	4.5	4.5	4.5	5.5	5.5	5.5				---	---	---
2	4.5	4.5	4.5	5.5	5.5	5.5				---	---	---
3	4.5	4.5	4.5	6.0	5.5	6.0				---	---	---
4	4.5	4.5	4.5	6.0	5.5	5.5				---	---	---
5	4.5	4.5	4.5	6.0	5.5	5.5				---	---	---
6	4.5	4.5	4.5	5.5	5.0	5.5				---	---	---
7	4.5	4.5	4.5	5.0	5.0	5.0				---	---	---
8	4.5	4.5	4.5	5.5	5.0	5.0				---	---	---
9	4.5	4.5	4.5	5.5	5.0	5.5				---	---	---
10	4.5	4.5	4.5	5.5	5.5	5.5				---	---	---
11	4.5	4.5	4.5	5.5	5.5	5.5				---	---	---
12	4.5	4.5	4.5	5.5	5.5	5.5				---	---	---
13	4.5	4.5	4.5	5.5	5.5	5.5				---	---	---
14	4.5	4.5	4.5	6.0	5.5	5.5				---	---	---
15	4.5	4.5	4.5	6.0	5.5	5.5				---	---	---
16	4.5	4.5	4.5	6.0	5.5	5.5				---	---	---
17	4.5	4.5	4.5	5.5	5.5	5.5				---	---	---
18	5.0	4.5	4.5	5.5	5.0	5.0				---	---	---
19	5.0	4.5	4.5	5.0	5.0	5.0				---	---	---
20	4.5	4.5	4.5	5.0	5.0	5.0				---	---	---
21	4.5	4.5	4.5	5.0	5.0	5.0				---	---	---
22	4.5	4.5	4.5	5.5	5.0	5.0				---	---	---
23	4.5	4.5	4.5	5.0	5.0	5.0				---	---	---
24	5.0	4.5	5.0	---	---	---				---	---	---
25	5.0	5.0	5.0	---	---	---				---	---	---
26	5.5	5.0	5.0	---	---	---				---	---	---
27	5.5	5.0	5.0	---	---	---				7.0	6.5	7.0
28	5.5	5.5	5.5	---	---	---				7.0	6.5	7.0
29	---	---	---	---	---	---				6.5	6.5	6.5
30	---	---	---	---	---	---				7.0	6.5	6.5
31	---	---	---	---	---	---				7.0	6.5	6.5
MONTH	5.5	4.5	4.5	---	---	---				---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE			JULY			AUGUST			SEPTEMBER			
1	6.5	6.5	6.5	8.5	8.0	8.5	9.5	9.0	9.5	10.5	10.0	10.0
2	7.0	6.5	7.0	8.5	8.0	8.5	9.5	9.0	9.5	10.5	10.0	10.5
3	7.0	6.5	7.0	8.5	8.0	8.0	9.5	9.0	9.5	10.5	10.0	10.5
4	7.0	6.5	6.5	8.5	8.0	8.0	9.5	9.0	9.5	10.5	10.0	10.5
5	7.0	6.5	6.5	8.0	8.0	8.0	9.5	9.5	9.5	11.0	10.5	10.5
6	7.0	6.5	6.5	8.5	7.5	8.0	10.0	9.5	9.5	11.0	10.5	10.5
7	7.0	6.5	6.5	9.0	8.0	8.5	10.0	9.5	9.5	11.0	10.5	10.5
8	7.0	6.5	6.5	8.5	8.0	8.5	9.5	9.0	9.5	10.5	10.0	10.5
9	7.0	6.5	7.0	8.5	8.0	8.5	9.5	9.0	9.5	10.5	10.5	10.5
10	7.5	7.0	7.0	9.0	8.0	8.5	10.0	9.5	9.5	10.5	10.0	10.5
11	7.5	7.0	7.0	9.0	8.0	8.5	9.5	9.5	9.5	10.5	10.0	10.5
12	7.5	7.0	7.0	8.5	8.0	8.0	10.0	9.5	9.5	10.5	10.5	10.5
13	7.5	7.0	7.0	9.0	8.0	8.5	10.0	9.5	10.0	10.5	10.5	10.5
14	7.0	6.5	7.0	8.5	8.0	8.5	10.0	9.5	10.0	10.5	10.5	10.5
15	7.0	6.5	6.5	8.5	8.5	8.5	10.0	9.5	10.0	11.0	10.5	10.5
16	7.0	7.0	7.0	9.0	8.5	8.5	10.0	9.5	10.0	11.0	10.5	11.0
17	7.0	6.5	7.0	9.0	8.0	8.5	10.5	9.5	10.0	11.0	10.5	11.0
18	7.0	6.5	7.0	9.0	8.5	8.5	10.0	9.5	10.0	11.0	11.0	11.0
19	7.0	7.0	7.0	9.5	8.5	9.0	10.0	9.5	10.0	11.0	11.0	11.0
20	7.5	7.0	7.5	9.5	8.5	9.0	10.5	9.5	10.0	11.0	11.0	11.0
21	7.5	7.5	7.5	9.5	8.5	9.0	10.0	9.5	9.5	11.0	11.0	11.0
22	7.5	7.5	7.5	9.5	8.5	9.0	10.0	9.5	9.5	11.5	11.0	11.0
23	7.5	7.5	7.5	9.0	9.0	9.0	10.0	9.5	10.0	11.5	11.0	11.5
24	8.0	7.5	7.5	9.0	8.5	9.0	10.0	9.5	10.0	11.5	11.0	11.0
25	7.5	7.5	7.5	9.5	9.0	9.5	10.5	10.0	10.0	11.5	11.0	11.5
26	7.5	7.0	7.5	10.0	9.0	9.5	10.5	10.0	10.0	11.5	11.0	11.5
27	8.0	7.5	7.5	9.5	9.0	9.0	10.5	10.0	10.0	11.5	11.0	11.0
28	8.0	7.5	8.0	9.5	9.0	9.0	10.0	10.0	10.0	11.5	11.0	11.5
29	8.5	8.0	8.0	9.0	9.0	9.0	10.0	10.0	10.0	12.0	11.5	11.5
30	8.5	8.0	8.5	9.5	9.0	9.5	10.5	10.0	10.5	12.0	12.0	12.0
31	---	---	---	10.0	9.0	9.5	10.5	10.0	10.0	---	---	---
MONTH	8.5	6.5	7.0	10.0	7.5	8.5	10.5	9.0	10.0	12.0	10.0	11.0

## WILLAMETTE RIVER BASIN

245

## 14182500 LITTLE NORTH SANTIAM RIVER NEAR MEHAMA, OR

LOCATION.--Lat 44°47'30", long 122°34'40", in NW 1/4 sec.16, T.9 S., R.2 E., Marion County, Hydrologic Unit 17090005, on left bank 2.0 mi east of Mehama, and at mile 2.0.

DRAINAGE AREA.--112 mi<sup>2</sup> at cableway 1.2 mi downstream where all discharge measurements are made.

PERIOD OF RECORD.--October 1931 to current year. Records for July to September 1924 and July to September 1931 at site 4 mi upstream not equivalent as a result of differences in drainage areas.

REVISED RECORDS.--WSP 754: 1932. WSP 1218: 1934, 1936, 1949-50. WSP 1935: Maximum only, 1932-34, 1936, 1938, 1943, 1945-49, 1950 (M,P), 1951-53 (M), 1954 (M,P), 1955 (M), 1956 (M,P), 1957 (M), 1958-59 (M,P). WSP 2135: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 655.41 ft above sea level. Prior to June 12, 1948, nonrecording gage at about same site and datum.

REMARKS.--No estimated daily discharges. Records good. No regulation or diversion upstream from station. Records herein are for measuring site. Continuous water-quality records for the period May 1985 to September 1986 have been collected at this location.

AVERAGE DISCHARGE.--63 years, 746 ft<sup>3</sup>/s, 90.55 in/yr, 540,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 36,000 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 16.73 ft, from rating curve extended above 17,000 ft<sup>3</sup>/s; minimum discharge, 13 ft<sup>3</sup>/s Aug. 30, 1961.

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 8,200 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 3	0030	*8,960	*9.71	No other peak greater than base discharge.			
Minimum discharge, 20 ft <sup>3</sup> /s Sept. 27-29.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27	34	4370	1640	218	1980	909	314	254	133	45	24
2	27	33	1840	3110	205	1940	759	290	239	139	43	23
3	27	46	872	5400	193	2470	669	280	212	129	42	39
4	27	62	967	2880	181	2230	578	425	209	121	42	75
5	27	46	736	3220	171	1560	510	517	212	120	42	45
6	28	41	532	2140	163	1110	754	451	359	119	40	35
7	35	38	717	1460	157	851	1100	409	963	109	39	31
8	39	36	1830	1360	147	695	1570	370	713	101	40	31
9	34	35	1640	2180	169	603	1840	330	502	94	41	41
10	31	34	1490	2000	168	594	2080	296	390	89	39	60
11	30	33	1660	2240	159	571	1440	270	321	85	37	54
12	38	33	1520	1760	151	502	1180	252	276	80	36	43
13	46	32	1030	1390	170	469	986	226	294	77	35	37
14	50	32	820	1160	223	485	806	206	898	74	34	34
15	73	33	667	963	214	474	681	197	1070	71	34	31
16	109	39	548	783	231	487	653	263	746	69	33	30
17	72	48	458	651	314	505	676	290	568	66	33	28
18	56	71	392	555	529	833	671	271	486	63	31	26
19	50	54	343	483	453	816	647	272	412	62	30	26
20	46	47	304	433	408	646	545	352	351	61	30	25
21	43	56	273	396	414	891	498	352	305	59	31	25
22	41	153	246	409	409	726	453	304	273	57	35	22
23	39	98	223	464	1250	608	399	266	249	56	33	21
24	40	71	207	453	5570	554	420	239	226	54	30	21
25	41	62	192	410	3150	530	401	219	206	55	28	21
26	38	60	182	363	2180	513	369	199	194	52	27	21
27	35	59	172	326	2210	585	338	182	178	50	26	20
28	34	94	161	298	2140	685	316	174	164	48	25	20
29	34	145	153	273	---	713	304	207	151	47	25	26
30	33	498	152	252	---	707	338	289	142	47	25	34
31	34	---	449	233	---	1030	---	243	---	46	24	---
TOTAL	1284	2123	25146	39685	21947	27363	22890	8955	11563	2433	1055	969
MEAN	41.4	70.8	811	1280	784	883	763	289	385	78.5	34.0	32.3
MAX	109	498	4370	5400	5570	2470	2080	517	1070	139	45	75
MIN	27	32	152	233	147	469	304	174	142	46	24	20
AC-FT	2550	4210	49880	78720	43530	54270	45400	17760	22940	4830	2090	1920
CFSM	.37	.63	7.24	11.4	7.00	7.88	6.81	2.58	3.44	.70	.30	.29
IN.	.43	.71	8.35	13.18	7.29	9.09	7.60	2.97	3.84	.81	.35	.32

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1932 - 1994, BY WATER YEAR (WY)

MEAN	383	1122	1419	1320	1172	1029	984	791	462	133	64.5	107
MAX	1594	3121	3680	3615	2581	2645	1712	1439	1684	547	432	490
(WY)	1948	1943	1965	1953	1961	1932	1937	1949	1933	1983	1968	1959
MIN	17.3	25.7	193	218	260	226	268	211	53.5	32.3	19.2	24.3
(WY)	1988	1937	1977	1937	1977	1992	1941	1992	1992	1992	1961	1987

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1932 - 1994

ANNUAL TOTAL	218604	165413	
ANNUAL MEAN	599	453	746
HIGHEST ANNUAL MEAN			1146
LOWEST ANNUAL MEAN			400
HIGHEST DAILY MEAN	5240	Mar 18	21900
LOWEST DAILY MEAN	27	Oct 1	13
ANNUAL SEVEN-DAY MINIMUM	27	Sep 30	15
ANNUAL RUNOFF (AC-FT)	433600	328100	540700
ANNUAL RUNOFF (CFSM)	5.35	4.05	6.66
ANNUAL RUNOFF (INCHES)	72.61	54.94	90.55
10 PERCENT EXCEEDS	1490	1170	1670
50 PERCENT EXCEEDS	307	207	461
90 PERCENT EXCEEDS	37	31	42



## WILLAMETTE RIVER BASIN

## 14183000 NORTH SANTIAM RIVER AT MEHAMA, OR

LOCATION.--Lat 44°47'20", long 122°37'00", in NW 1/4 sec.18, T.9 S., R.2 E., Marion County, Hydrologic Unit 17090005, on right bank 300 ft downstream from highway bridge at Mehama, 0.5 mi downstream from Little North Santiam River, and at mile 38.71.

DRAINAGE AREA.--655 mi<sup>2</sup>, at cableway 0.8 mi downstream, where all discharge measurements are made.

PERIOD OF RECORD.--July 1905 to March 1907, October 1910 to September 1914, September 1921 to current year. Monthly discharge only September 1921, published in WSP 1318. Prior to October 1913, published as North Fork of Santiam River at Mehama.

REVISED RECORDS.--WSP 739: 1922-23(M). WSP 1044: 1943. WSP 1248: 1906, 1911-14, 1924(M), 1926, 1934-36(M), 1937, 1938(M), 1942(M). WSP 2135: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 602.49 ft above sea level. Prior to June 15, 1933, nonrecording gage at site 100 ft upstream at same datum.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since 1953 by Detroit Lake (station 14180500) and Big Cliff Reservoir, usable capacity for reregulating purposes, 2,930 acre-ft. No diversion upstream from station. All records given herein are for measuring site. Continuous water-quality records for the period April 1985 to September 1986 have been collected at this location.

AVERAGE DISCHARGE.--78 years (water years 1906, 1911-14, 1922-94), 3,322 ft<sup>3</sup>/s, 2,407,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 76,600 ft<sup>3</sup>/s Dec. 28, 1945, gage height, 15.37 ft, from rating curve extended above 36,000 ft<sup>3</sup>/s, on basis of slope-area measurement of peak flow; maximum gage height, 17.5 ft Nov. 20, 1921, from graph based on gage readings, and Jan. 6, 1923, from floodmark, at site then in use; minimum discharge, 254 ft<sup>3</sup>/s Aug. 3, 1970; minimum daily, 420 ft<sup>3</sup>/s Sept. 18, 1924.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 12,400 ft<sup>3</sup>/s Jan. 3, gage height, 7.57 ft; minimum discharge, 937 ft<sup>3</sup>/s Aug. 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2960	2350	6900	2960	1360	3880	2150	1460	1450	1240	995	972
2	2950	1980	4170	4960	1330	3820	1970	1430	1390	1270	994	975
3	3060	1660	3750	9200	1320	4620	1840	1390	1370	1300	999	994
4	2970	1610	4030	7170	1300	4200	1730	1540	1390	1270	1000	1020
5	3030	1560	3620	9360	1280	3140	1670	1650	1380	1220	998	997
6	2970	1270	3430	8940	1270	2520	2020	1670	1580	1200	989	970
7	2990	1140	3160	7430	1270	2180	2490	1990	2610	1140	986	970
8	2970	1150	5000	7190	1250	1960	3160	1960	2600	1120	993	977
9	3010	1140	5450	8520	1300	1820	3640	2020	2340	1080	987	991
10	3020	1140	5290	8210	1290	1800	3980	2250	2010	1060	984	1050
11	2780	1140	5540	8570	1270	1750	3020	2330	1760	1040	982	1080
12	2960	1140	5250	7710	1260	1650	2730	2590	1720	1030	985	1090
13	2970	1170	4480	6410	1320	1600	2510	2360	1790	1030	983	1190
14	3010	1180	4090	4710	1380	1610	2330	1860	2730	1030	976	1240
15	3040	1160	3100	4340	1360	1580	2050	1630	3340	1030	973	1240
16	3080	1490	2330	4070	1370	1630	1990	1690	2850	1040	975	1250
17	3110	1590	1780	3890	1490	1610	2010	1840	2640	1030	972	1250
18	3010	1580	1600	3750	1760	1980	1960	1630	2240	1030	968	1250
19	3000	1580	1610	3040	1680	1990	1860	1410	2050	1030	971	1240
20	2970	1560	1510	2510	1620	1820	1710	1520	1980	1020	982	1520
21	2990	1570	1510	2170	1680	2190	1850	1650	1890	1020	978	1550
22	3020	1710	1430	1950	1680	1980	2270	1630	1860	1010	977	1550
23	2670	2240	1400	1990	2680	1820	2380	1590	1730	993	980	1530
24	2640	2880	1350	1960	8920	1750	2410	1640	1550	1000	968	1540
25	2630	2390	1330	1900	5770	1700	2180	1630	1510	1010	963	1530
26	2320	1680	1320	1840	4180	1660	2080	1630	1490	1000	964	1820
27	2280	1240	1300	1800	4260	1720	1990	1610	1460	1000	969	1940
28	2290	1170	1260	1680	4190	1800	1780	1620	1290	1000	972	1890
29	2270	1250	1250	1450	--	1820	1480	1640	1250	997	973	1970
30	2290	1620	1260	1420	--	1850	1460	1770	1240	1000	978	1950
31	2330	--	1540	1390	--	2310	--	1680	--	997	974	--
TOTAL	87590	46340	91040	142490	60840	67760	66700	54310	56490	33237	30388	39536
MEAN	2825	1545	2937	4596	2173	2186	2223	1752	1883	1072	980	1318
MAX	3110	2880	6900	9360	8920	4620	3980	2590	3340	1300	1000	1970
MIN	2270	1140	1250	1390	1250	1580	1460	1390	1240	993	963	970
AC-FT	173700	91920	180600	282600	120700	134400	132300	107700	112000	65930	60270	78420

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1954 - 1994, BY WATER YEAR (WY)

	MEAN	2898	5203	6104	5359	3890	3313	3282	3463	2536	1380	1255	1967
MAX	5109	9857	14300	11430	9197	10890	6128	5897	5521	2528	1833	2800	
(WY)	1960	1974	1978	1956	1961	1972	1993	1960	1955	1983	1968	1959	
MIN	1796	1545	1183	1212	1048	1467	1624	1136	956	757	699	996	
(WY)	1988	1994	1977	1977	1977	1992	1973	1973	1992	1992	1992	1992	

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1954 - 1994

	ANNUAL TOTAL	1101333	776721	3385	1974
	ANNUAL MEAN	3017	2128	5255	1977
	HIGHEST ANNUAL MEAN			1743	1977
	LOWEST ANNUAL MEAN			36200	Dec 22 1964
	HIGHEST DAILY MEAN	14000	Mar 23	963	Aug 1 1992
	LOWEST DAILY MEAN	983	Aug 10	682	Aug 16 1992
	ANNUAL SEVEN-DAY MINIMUM	1080	Aug 9	970	
	ANNUAL RUNOFF (AC-FT)	2184000		1541000	2452000
	10 PERCENT EXCEEDS	5990		3780	6810
	50 PERCENT EXCEEDS	2290		1650	2400
	90 PERCENT EXCEEDS	1180		996	1180

## WILLAMETTE RIVER BASIN

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14185000 SOUTH SANTIAM RIVER BELOW CASCADIA, OR

LOCATION.--Lat 44°23'31", long 122°29'47", in NW 1/4 SW 1/4 sec.31, T.13 S., R.3 E., Linn County, Hydrologic Unit 17090006, on left bank, 0.2 mi upstream from Mouse Creek, 0.8 mi southwest of Cascadia, and at mile 49.2.

DRAINAGE AREA.--174 mi<sup>2</sup>.

PERIOD OF RECORD.--September 1935 to current year. Monthly discharge only September 1935, published in WSP 1318.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 775 ft above sea level, from topographic map. Prior to Sept. 26, 1989, at site 0.7 mi downstream at datum 759.88 above sea level. Prior to Nov. 1, 1935, nonrecording gage at site 0.7 mi downstream at different datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. No regulation or diversion upstream from station. Continuous water-quality records for the period June 1962 to September 1967 and February 1969 to September 1987 have been collected at this location.

AVERAGE DISCHARGE.--59 years, 807 ft<sup>3</sup>/s, 62.98 in/yr, 584,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 27,600 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 19.68 ft, site and datum then in use; minimum discharge, 23 ft<sup>3</sup>/s Dec. 1, 2, 1936, site then in use.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,700 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 24	1130	*6,620	*8.34	No other peak greater than base discharge.			

Minimum daily discharge, 30 ft<sup>3</sup>/s Sept. 26-28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	44	42	1690	622	275	2150	1120	397	317	211	72	43
2	43	42	1250	1450	263	1900	985	373	276	222	71	43
3	43	65	591	3510	252	2580	880	358	253	201	69	50
4	43	72	771	2410	239	3080	769	431	270	190	67	72
5	43	57	561	3050	229	2160	691	492	272	189	68	58
6	44	51	408	2310	222	1540	953	435	613	184	65	50
7	53	48	728	1490	216	1190	1240	403	1120	170	64	46
8	57	46	2020	1320	202	979	1540	375	900	160	64	45
9	50	44	1870	1990	229	843	2020	349	683	151	63	57
10	47	44	1490	1880	233	790	2140	322	549	144	62	76
11	46	43	1490	2190	219	702	1670	302	467	139	59	e65
12	59	43	1310	1770	209	626	1380	285	411	132	59	e52
13	64	42	938	1380	235	580	1160	267	502	128	57	e46
14	59	42	728	1190	295	559	985	253	839	124	56	e43
15	84	43	585	1020	276	535	855	258	1010	121	57	e41
16	101	47	488	865	272	548	801	380	833	117	56	e38
17	74	67	419	740	412	528	777	368	682	112	54	e37
18	62	79	370	642	607	649	753	334	646	109	53	e35
19	57	60	332	572	506	653	727	354	544	105	52	e34
20	53	53	302	518	445	600	641	630	475	101	51	e33
21	50	64	278	482	454	885	607	526	424	97	51	e33
22	48	140	256	481	454	770	545	453	389	94	51	e32
23	47	90	237	535	944	665	492	396	358	93	51	e32
24	51	68	224	520	5080	636	536	354	331	89	49	e31
25	51	60	214	470	2890	645	500	322	307	89	48	e31
26	48	59	205	416	2140	623	491	299	311	84	47	e30
27	45	64	196	382	2630	663	459	279	278	81	46	e30
28	44	86	186	353	2410	711	431	273	254	78	45	e30
29	43	147	180	328	---	718	411	294	238	77	44	e33
30	42	306	183	307	---	856	450	302	223	77	44	e43
31	42	---	250	289	---	1250	---	269	---	75	43	---
TOTAL	1637	2114	20750	35482	22838	31614	27009	11133	14775	3944	1738	1289
MEAN	52.8	70.5	669	1145	816	1020	900	359	492	127	56.1	43.0
MAX	101	306	2020	3510	5080	3080	2140	630	1120	222	72	76
MIN	42	42	180	289	202	528	411	253	223	75	43	30
AC-FT	3250	4190	41160	70380	45300	62710	53570	22080	29310	7820	3450	2560
CFSM	.30	.40	3.85	6.58	4.69	5.86	5.17	2.06	2.83	.73	.32	.25
IN.	.35	.45	4.44	7.59	4.88	6.76	5.77	2.38	3.16	.84	.37	.28

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1936 - 1994, BY WATER YEAR (WY)

	MEAN	293	1081	1478	1415	1350	1167	1140	918	526	169	81.2	96.3
MAX	1296	2441	4319	3278	3260	2913	2052	1639	1261	466	222	318	
(WY)	1951	1943	1965	1953	1961	1972	1937	1960	1937	1983	1968	1959	
MIN	31.6	27.6	82.3	107	130	324	356	282	101	54.2	35.9	40.9	
(WY)	1988	1937	1977	1977	1977	1941	1941	1987	1992	1940	1992	1987	

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1936 - 1994

ANNUAL TOTAL	278392	174323	
ANNUAL MEAN	763	478	
HIGHEST ANNUAL MEAN			807
LOWEST ANNUAL MEAN			1280
HIGHEST DAILY MEAN	6930	Mar 18	359
LOWEST DAILY MEAN	42	Oct 30	23000
ANNUAL SEVEN-DAY MINIMUM	43	Oct 27	23
ANNUAL RUNOFF (AC-FT)	552200		24
ANNUAL RUNOFF (CFSM)	4.38		584300
ANNUAL RUNOFF (INCHES)	59.52		4.64
10 PERCENT EXCEEDS	1940		62.98
50 PERCENT EXCEEDS	405		1790
90 PERCENT EXCEEDS	50		498
			62

e Estimated

## WILLAMETTE RIVER BASIN

14185700 MIDDLE SANTIAM RIVER NEAR UPPER SODA, OR

LOCATION.--Lat 44°30'45", long 122°15'52", in SE 1/4 NE 1/4 sec.24, T.12 S., R.4 E., Linn County, Hydrologic Unit 17090006, on right bank 0.8 mi upstream from Bear Creek, 7.5 mi north of Upper Soda, and at mile 23.9.

DRAINAGE AREA.--74.6 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1980 to May 1994 (discontinued).

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 1,500 ft above sea level, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--13 years (water years 1981-93), 401 ft<sup>3</sup>/s, 73.02 in/yr, 290,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18,400 ft<sup>3</sup>/s Feb. 23, 1986, gage height, 11.05 ft, from rating curve, extended above 3,600 ft<sup>3</sup>/s on basis of slope-area measurement of December 1980; minimum discharge, 18 ft<sup>3</sup>/s Oct. 30, 1987, Sept. 23, 1992.

EXTREMES FOR CURRENT YEAR.--

October to May 1994: Maximum daily discharge during period, 984 ft<sup>3</sup>/s Apr. 10; minimum daily discharge during period, 23 ft<sup>3</sup>/s Nov. 25, 26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	29	27	800	e430	e160	e610	563	254	---	---	---	---
2	29	26	530	e550	e140	e720	529	242	---	---	---	---
3	28	33	285	e790	e130	e840	489	233	---	---	---	---
4	28	36	299	e530	e130	e700	437	283	---	---	---	---
5	28	30	226	e490	e120	e640	399	283	---	---	---	---
6	28	28	184	e460	e120	e580	475	265	---	---	---	---
7	33	27	254	e500	e110	e540	526	254	---	---	---	---
8	34	26	660	e460	e110	e530	658	247	---	---	---	---
9	31	26	655	e460	e110	526	862	232	---	---	---	---
10	29	26	602	e460	e110	502	984	221	---	---	---	---
11	29	25	606	e470	e110	458	839	208	---	---	---	---
12	33	25	521	e480	e100	419	741	198	---	---	---	---
13	36	25	416	e450	e130	402	641	184	---	---	---	---
14	34	25	361	e430	e160	402	561	175	---	---	---	---
15	46	25	308	e360	e150	394	502	170	---	---	---	---
16	50	26	279	e310	e150	392	486	228	---	---	---	---
17	40	33	257	e270	e220	387	489	207	---	---	---	---
18	35	36	e230	e240	e260	448	489	193	---	---	---	---
19	33	30	e200	e220	e230	421	479	214	---	---	---	---
20	31	28	e180	e210	e220	387	430	230	---	---	---	---
21	30	e34	e170	e210	e240	432	410	219	---	---	---	---
22	30	43	e160	e220	e240	381	367	213	---	---	---	---
23	28	35	e150	e260	e500	353	335	203	---	---	---	---
24	33	e25	e140	e260	e770	340	359	191	---	---	---	---
25	31	e23	e130	e230	e550	338	329	181	---	---	---	---
26	29	e23	e120	e210	e550	337	312	e170	---	---	---	---
27	27	24	e120	e200	e490	360	296	e160	---	---	---	---
28	27	29	e110	e190	e600	400	286	e150	---	---	---	---
29	27	58	e110	e180	---	436	277	e160	---	---	---	---
30	26	88	e120	e170	---	502	274	e180	---	---	---	---
31	27	---	e250	e160	---	616	---	e150	---	---	---	---
TOTAL	979	945	9433	10860	6910	14793	14824	6498	---	---	---	---
MEAN	31.6	31.5	304	350	247	477	494	210	---	---	---	---
MAX	50	88	800	790	770	840	984	283	---	---	---	---
MIN	26	23	110	160	100	337	274	150	---	---	---	---
AC-FT	1940	1870	18710	21540	13710	29340	29400	12890	---	---	---	---
CFSM	.42	.42	4.08	4.70	3.31	6.40	6.62	2.81	---	---	---	---
IN.	.49	.47	4.70	5.42	3.45	7.38	7.39	3.24	---	---	---	---

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1981 - 1994, BY WATER YEAR (WY)

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
MEAN	102	519	664	571	704	597	617	418	294	104	48.0	43.5		
MAX	312	1072	1513	931	1680	1221	990	727	555	197	83.3	89.1		
(WY)	1983	1985	1982	1983	1986	1993	1993	1984	1984	1983	1983	1986		
MIN	19.5	31.5	304	247	209	301	175	62.0	43.1	24.0	24.4			
(WY)	1988	1994	1994	1981	1994	1992	1986	1992	1992	1992	1992	1987		

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## WATER YEARS 1981 - 1994

ANNUAL TOTAL	138291		
ANNUAL MEAN	379		
HIGHEST ANNUAL MEAN		401	
LOWEST ANNUAL MEAN		535	1982
HIGHEST DAILY MEAN		287	1992
LOWEST DAILY MEAN	3740	Mar 18	11700
ANNUAL SEVEN-DAY MINIMUM	23	Nov 25	18
ANNUAL RUNOFF (AC-FT)	25	Nov 9	19
ANNUAL RUNOFF (CFSM)	274300		290400
ANNUAL RUNOFF (INCHES)	5.08		5.37
10 PERCENT EXCEEDS	68.96		73.02
50 PERCENT EXCEEDS	912		834
90 PERCENT EXCEEDS	205		285
	29		33

e Estimated

## WILLAMETTE RIVER BASIN

249

14185900 QUARTZVILLE CREEK NEAR CASCADIA, OR

LOCATION.--Lat 44°32'25", long 122°26'05", in NW 1/4 sec.10, T.12 S., R.3 E., Linn County, Hydrologic Unit 17090006, on Bureau of Land Management land, on right bank 80 ft downstream from Panther Creek, 10 mi north of Cascadia, and at mile 6.6.

DRAINAGE AREA.--99.2 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1963 to November 1964 (destroyed by flood of December 1964); October 1965 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 1,050 ft above sea level, from topographic map. Aug. 13, 1963, to Dec. 22, 1964, water-stage recorder on left bank at present datum.

REMARKS.--Records good. No regulation or diversion upstream from station. Continuous water-quality records for the period August 1963 to September 1987 have been collected at this location.

AVERAGE DISCHARGE.--30 years (water years 1964, 1966-94), 643 ft<sup>3</sup>/s, 88.01 in/yr, 465,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,400 ft<sup>3</sup>/s Jan. 20, 1972, gage height, 16.38 ft; minimum discharge, 14 ft<sup>3</sup>/s Aug. 19-23, 1973.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge, 36,500 ft<sup>3</sup>/s Dec. 22, 1964, from slope-area measurement of peak flow.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 1	1430	5,300	10.39	Feb. 24	unknown	*unknown	*unknown

Minimum discharge, 20 ft<sup>3</sup>/s Sept. 27-29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26	28	3140	1280	190	e2100	706	213	191	123	45	26
2	26	27	1340	e1800	179	e1800	597	202	173	123	44	26
3	25	46	557	e3800	171	e2600	518	197	161	115	44	48
4	25	50	677	e2200	164	e2400	443	280	176	109	43	57
5	25	37	473	e3000	156	e1600	400	292	177	108	42	38
6	26	32	350	e2000	148	1010	744	256	434	105	41	33
7	32	30	1040	e1100	145	753	1070	232	955	99	40	30
8	30	29	2190	e1200	136	607	2050	214	636	94	40	30
9	28	28	1970	e1800	151	529	2370	198	438	89	40	36
10	27	27	1530	e1600	146	509	1940	181	345	85	39	54
11	27	26	1440	e2000	142	464	1270	168	289	82	37	45
12	40	26	1170	e1300	135	414	1000	158	253	79	37	36
13	40	26	766	e1100	173	396	796	147	292	76	37	32
14	37	26	609	874	240	398	643	139	568	74	36	30
15	78	27	505	720	234	380	547	157	703	71	35	29
16	85	32	419	586	243	385	518	444	509	70	35	28
17	57	57	357	491	354	399	505	408	402	67	34	27
18	43	68	313	426	451	670	478	321	350	65	33	26
19	38	45	278	383	356	610	447	278	301	63	33	25
20	35	38	251	348	333	511	392	330	267	61	33	24
21	34	52	229	329	348	846	366	301	238	60	32	23
22	32	108	211	334	330	602	326	266	218	58	34	22
23	31	63	195	377	1200	490	299	235	201	57	32	22
24	36	43	182	362	e5200	453	311	213	186	56	31	21
25	34	41	173	330	e2400	462	294	194	173	55	30	21
26	31	40	167	294	e2200	448	274	177	166	53	29	21
27	29	42	159	267	e2400	496	254	165	155	51	28	20
28	29	82	150	246	e2300	547	239	161	144	50	28	20
29	28	225	143	228	---	539	228	192	136	49	28	24
30	27	326	160	214	---	609	232	226	128	48	27	29
31	27	---	368	201	---	887	---	190	---	47	27	---
TOTAL	1088	1727	21512	31190	20625	24914	20257	7135	9365	2342	1094	903
MEAN	35.1	57.6	694	1006	737	804	675	230	312	75.5	35.3	30.1
MAX	85	326	3140	3800	5200	2600	2370	444	955	123	45	57
MIN	25	26	143	201	135	380	228	139	128	47	27	20
AC-FT	2160	3430	42670	61870	40910	49420	40180	14150	18580	4650	2170	1790
CFSM	.35	.58	7.00	10.1	7.43	8.10	6.81	2.32	3.15	.76	.36	.30
IN.	.41	.65	8.07	11.70	7.73	9.34	7.60	2.68	3.51	.88	.41	.34

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1964 - 1994, BY WATER YEAR (WY)

	MEAN	241	987	1218	1243	1065	948	849	599	329	101	59.8	87.4
MAX	753	2224	2897	2450	2441	2018	1600	1114	817	336	240	268	
(WY)	1968	1974	1974	1970	1982	1972	1993	1971	1984	1983	1968	1971	
MIN	20.8	57.6	110	157	208	204	382	182	63.1	36.8	20.9	28.0	
(WY)	1988	1994	1977	1977	1977	1992	1968	1992	1992	1992	1992	1987	

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1964 - 1994

ANNUAL TOTAL	208552	142152	
ANNUAL MEAN	571	389	643
HIGHEST ANNUAL MEAN			1113
LOWEST ANNUAL MEAN			311
HIGHEST DAILY MEAN	5800	Mar 18	5200
LOWEST DAILY MEAN	25	Oct 3	20
ANNUAL SEVEN-DAY MINIMUM	26	Sep 30	21
ANNUAL RUNOFF (AC-FT)	413700	282000	465500
ANNUAL RUNOFF (CFSM)	5.76	3.93	6.48
ANNUAL RUNOFF (INCHES)	78.21	53.31	88.01
10 PERCENT EXCEEDS	1530	1050	1490
50 PERCENT EXCEEDS	261	173	355
90 PERCENT EXCEEDS	31	28	39

e Estimated



## WILLAMETTE RIVER BASIN

## 14186100 GREEN PETER LAKE NEAR FOSTER, OR

LOCATION.--Lat 44°27'10", long 122°32'40", in NE 1/4 SE 1/4 sec.10, T.13 S., R.2 E., Linn County, Hydrologic Unit 17090006, in Green Peter Dam on Middle Santiam River, 7.0 mi northeast of Foster, and at mile 5.7.

DRAINAGE AREA.--273 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1966 to current year. Prior to October 1971, published as Green Peter Reservoir near Foster.

GAGE.--Water-stage recorder. Datum of gage is sea level (levels by Corps of Engineers).

REMARKS.--Reservoir is formed by concrete, gravity-type dam with ogee spillway completed in 1966 by Corps of Engineers; controlled storage began Oct. 6, 1966. Total capacity, 428,100 acre-ft, usable capacity 330,800 acre-ft between elevations 887.0 ft, proposed lower limit of operation, and 1,015.0 ft, top of spillway gates. Reservoir used for flood control, power development, improvement of navigation, pollution abatement, and other purposes. Figures given herein represent total contents.

COOPERATION.--Midnight elevations furnished by Corps of Engineers and reviewed by Geological Survey. Capacity table furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 426,700 acre-ft April 29, 1990, elevation, 1,014.61 ft; minimum contents, 116,900 acre-ft Dec. 15, 1972, elevation, 899.20 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 414,900 acre-ft June 15, elevation, 1,011.39 ft; minimum contents, 160,800 acre-ft Dec. 30, elevation, 922.46 ft.

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

899	116,600	960	251,100
900	118,300	980	309,700
920	155,700	1,000	374,800
940	199,900	1,015	428,100

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	983.20	957.54	941.44	924.72	933.59	970.42	993.38	1007.47	1006.01	1010.43	1003.66	994.77
2	982.45	956.47	945.54	928.27	933.69	973.24	994.30	1007.72	1006.02	1010.35	1003.41	994.45
3	981.69	955.51	941.32	935.03	933.77	976.45	995.09	1007.90	1006.04	1010.26	1003.16	994.17
4	980.92	954.48	941.05	937.15	933.86	978.43	995.81	1008.20	1006.09	1010.17	1002.91	993.87
5	980.16	953.40	940.54	939.72	933.90	978.50	996.55	1008.50	1006.17	1010.09	1002.65	993.54
6	979.41	952.40	939.62	939.97	933.94	977.86	997.51	1008.79	1006.67	1009.95	1002.39	993.20
7	978.65	951.41	939.15	938.95	933.97	978.07	998.51	1008.97	1007.75	1009.77	1002.12	992.42
8	977.88	950.41	940.52	937.99	933.83	978.26	999.58	1009.13	1008.51	1009.57	1001.87	991.33
9	977.17	949.83	940.96	938.65	933.92	978.61	1001.09	1009.26	1009.05	1009.37	1001.60	990.24
10	976.48	949.18	939.95	938.72	933.94	978.99	1001.56	1009.36	1009.49	1009.17	1001.33	989.21
11	975.85	948.54	938.94	939.31	933.98	979.23	1001.35	1009.42	1009.88	1009.10	1001.08	988.14
12	975.04	948.06	937.51	938.92	934.00	979.41	1000.84	1009.41	1010.14	1008.73	1000.81	987.04
13	974.35	947.56	936.28	937.75	934.04	979.52	1000.03	1009.38	1010.57	1008.49	1000.50	985.74
14	973.71	946.92	935.00	936.11	934.18	979.63	1000.24	1009.34	1010.97	1008.26	1000.20	984.43
15	973.11	945.96	934.15	934.97	934.38	979.94	1000.60	1009.45	1011.04	1008.02	999.88	983.11
16	973.07	945.96	933.08	933.49	934.53	980.32	1001.08	1009.82	1010.90	1007.83	999.61	981.77
17	972.98	945.55	931.91	931.74	934.96	980.67	1001.55	1010.18	1010.81	1007.63	999.33	980.44
18	972.86	945.11	931.11	930.72	935.71	981.38	1002.24	1010.03	1010.50	1007.43	999.05	979.13
19	971.95	944.61	930.24	930.25	936.44	982.32	1002.96	1009.46	1010.52	1007.19	998.78	977.79
20	970.93	944.14	929.26	930.16	937.13	983.20	1003.60	1008.99	1010.52	1006.95	998.50	976.44
21	969.91	943.73	928.58	930.39	937.90	984.26	1004.20	1008.60	1010.55	1006.69	998.22	975.32
22	968.87	943.45	927.86	930.75	938.64	984.86	1004.66	1008.15	1010.51	1006.43	997.95	974.46
23	967.48	941.55	927.10	931.24	941.09	985.47	1005.01	1007.67	1010.49	1006.17	997.66	973.58
24	966.06	939.36	926.41	931.72	950.92	986.19	1005.55	1007.11	1010.42	1005.89	997.38	972.72
25	964.65	938.68	925.67	932.05	955.75	986.91	1005.96	1006.56	1010.49	1005.61	997.08	972.72
26	963.68	938.17	924.93	932.29	958.92	987.61	1006.28	1006.30	1010.54	1005.33	996.80	970.87
27	962.69	937.64	924.13	932.48	963.63	988.36	1006.61	1005.70	1010.54	1005.05	996.46	969.97
28	961.66	937.17	923.43	932.62	967.15	989.17	1006.82	1005.74	1010.55	1004.76	996.12	969.05
29	960.67	936.93	922.67	933.02	---	989.96	1007.05	1005.82	1010.52	1004.76	995.78	968.22
30	959.61	936.92	922.52	933.27	---	991.01	1007.31	1005.90	1010.50	1004.20	995.45	967.30
31	958.61	---	922.88	933.46	---	992.32	---	1005.96	---	1003.91	995.11	---
MAX	983.20	957.54	945.54	939.97	967.15	992.32	1007.31	1010.18	1011.04	1010.43	1003.66	994.77
MIN	958.61	936.92	922.52	924.72	933.59	970.42	993.38	1005.70	1006.01	1003.91	995.11	967.30
(†)	247300	192600	161700	184700	271300	349000	400200	395400	411600	388200	358300	271700
(‡)	-74800	-54700	-30900	+23000	+86600	+77700	+51200	-4800	+16200	-23400	-29900	-86600

CAL YR 1993 MAX 1012.12 MIN 920.95 AC-FT† -5800  
WTR YR 1994 MAX 1011.04 MIN 922.52 AC-FT† -50400

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



## WILLAMETTE RIVER BASIN

251

14186600 FOSTER LAKE AT FOSTER, OR

LOCATION.--Lat 44°25'00", long 122°40'25", in NW 1/4 NE 1/4 sec.27, T.13 S., R.1 E., Linn County, Hydrologic Unit 17090006, in Foster Dam on South Santiam River, 0.3 mi above Wiley Creek, 0.5 mi north of Foster, and at mile 37.7.

DRAINAGE AREA.--492 mi<sup>2</sup>.

PERIOD OF RECORD.--December 1966 to current year. Prior to October 1971, published as Foster Reservoir at Foster.

GAGE.--Water-stage recorder. Datum of gage is sea level (levels by Corps of Engineers).

REMARKS.--Lake is formed by rockfill embankment with an impervious core and ogee spillway completed in 1966 by Corps of Engineers; controlled storage began in November 1966. Total capacity, 60,780 acre-ft and usable capacity 33,210 acre-ft between elevations 609.0 ft, proposed lower limit of operation, and 641.0 ft, top of spillway gates. Lake used for reregulation of water released from Green Peter Lake, flood control, power development, pollution abatement, and other purposes. Figures given herein represent total contents.

COOPERATION.--Midnight elevations furnished by Corps of Engineers and reviewed by Geological Survey. Capacity table furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 60,350 acre-ft Apr. 28, 1990, elevation, 640.66 ft; minimum contents, 26,590 acre-ft Nov. 15, 16, 1971, elevation, 607.85 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 56,970 acre-ft Sept. 30, elevation, 637.91 ft; minimum contents, 29,770 acre-ft Dec. 5, elevation, 611.54 ft.

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

607	25,880	630	47,860
610	28,430	635	53,510
615	32,870	640	59,530
620	37,570	641	60,780
625	42,550		

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	637.27	618.00	614.18	613.80	613.52	621.11	622.31	614.59	637.20	636.85	637.01	637.08
2	637.27	617.35	613.03	615.19	613.53	619.12	621.56	614.31	637.19	636.85	637.01	637.09
3	637.27	617.20	613.00	616.56	613.53	620.19	620.61	614.33	637.15	636.78	636.99	637.13
4	637.33	617.35	613.39	614.00	613.52	619.89	619.88	614.51	637.15	636.72	637.00	637.19
5	637.33	616.65	613.44	613.43	613.48	618.44	619.33	614.61	637.15	636.64	636.99	637.23
6	637.41	616.17	613.97	614.97	613.37	618.35	619.11	614.45	637.44	636.70	636.96	637.18
7	637.43	615.71	614.37	613.69	613.30	616.27	618.67	614.51	637.77	636.83	636.96	637.26
8	637.47	615.37	613.31	613.57	613.57	616.57	618.55	614.61	637.62	636.97	636.92	637.35
9	637.26	615.11	613.67	613.52	613.56	616.75	617.79	614.41	637.63	637.09	636.91	637.09
10	637.09	614.87	613.60	613.43	613.54	616.96	617.15	614.29	637.48	637.17	636.83	637.54
11	637.18	614.60	613.66	613.51	613.49	617.09	615.70	614.27	637.19	637.25	636.87	637.38
12	637.20	614.38	613.49	613.54	613.37	617.00	614.29	614.33	637.07	637.31	636.85	637.15
13	637.10	614.17	613.69	613.62	613.56	616.98	614.01	614.39	636.81	637.37	636.95	637.20
14	636.84	614.00	613.81	613.50	613.76	617.21	613.98	614.41	637.09	637.41	637.05	637.26
15	636.99	613.73	613.44	613.59	613.87	616.85	613.81	614.42	637.15	637.37	637.17	637.34
16	635.38	613.76	613.39	613.60	613.93	616.55	613.86	614.47	637.42	637.41	637.13	637.42
17	633.72	613.78	613.80	614.09	614.20	616.25	613.36	614.36	637.20	637.31	637.11	637.37
18	632.00	613.79	613.37	614.13	614.69	616.27	614.53	615.67	637.67	637.23	637.05	637.37
19	630.11	613.73	613.53	613.39	614.67	616.57	614.51	618.97	636.91	637.23	637.03	637.37
20	628.33	613.67	613.77	613.00	614.47	616.75	614.43	622.52	636.78	637.24	636.99	637.37
21	626.49	613.61	613.56	613.27	614.33	617.08	614.35	625.05	636.99	637.25	636.97	637.33
22	624.70	613.86	613.36	613.31	614.23	617.76	614.45	627.45	637.12	637.24	636.93	637.27
23	624.14	614.06	613.21	613.61	615.33	618.14	614.63	629.65	637.17	637.25	636.89	637.23
24	623.84	614.00	613.27	613.73	623.35	618.11	614.43	631.91	637.19	637.23	636.87	637.17
25	623.39	614.09	613.43	613.54	622.14	618.37	614.43	634.27	637.09	637.23	636.83	637.29
26	621.73	613.83	613.51	613.17	622.15	618.51	614.40	635.21	637.13	637.18	636.80	637.30
27	620.92	613.59	613.65	613.23	622.91	618.71	614.30	637.10	637.09	637.17	636.90	637.41
28	620.35	613.55	613.55	613.65	622.39	618.99	614.39	637.07	637.07	637.13	637.01	637.51
29	619.73	613.72	613.43	613.42	---	619.25	614.51	637.12	636.91	637.10	637.05	637.61
30	619.14	613.82	613.20	613.35	---	620.01	614.53	637.16	636.85	637.16	637.07	637.73
31	618.45	---	613.13	613.46	---	621.71	---	637.13	---	637.01	637.07	---
MEAN	631.00	614.72	613.52	613.74	615.42	617.99	616.06	621.66	637.19	637.12	636.97	637.31
MAX	637.47	618.00	614.37	616.56	623.35	621.71	622.31	637.16	637.77	637.41	637.17	637.73
MIN	618.45	613.55	613.00	613.00	613.30	616.25	613.36	614.27	636.78	636.64	636.80	637.08
(†)	36090	31800	31180	31480	39910	39240	32450	56030	55690	55880	55960	56750
(‡)	-20090	-4290	-620	+300	+8430	-670	-6790	+23580	-340	+190	+80	+790

CAL YR 1993 MEAN 625.03 MAX 637.88 MIN 613.00 AC-FT† -1100

WTR YR 1994 MEAN 624.44 MAX 637.77 MIN 613.00 AC-FT† +570

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

‡ Change in contents, in acre-feet.

## WILLAMETTE RIVER BASIN

14187000 WILEY CREEK NEAR FOSTER, OR

LOCATION.--Lat 44°22'20", long 122°37'20", in NE 1/4 NE 1/4 sec.12, T.14 S., R.1 E., Linn County, Hydrologic Unit 17090006, on right bank 0.5 mi downstream from Little Wiley Creek, 3.5 mi southeast of Foster, and at mile 4.4.

DRAINAGE AREA. - - 51.8 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1947 to July 1973, July 1988 to current year.

REVISED RECORDS. - WDR OR-90-2: 1989 (M), WDR OR-93-1: 1992.

GAGE. --Water-stage recorder and crest-stage gage. Elevation of gage is 920 ft above sea level, from topographic map. Prior to April 6, 1965, water-stage recorder at present site at datum of 718.08 ft above sea level. (Corp of Engineers bench mark). Apr. 6, 1965, to July 1973, water-stage recorder at present site at datum 2.00 ft lower than previous datum.

REMARKS...No estimated daily discharges. Records good. Discharge for period Feb. 19 to Mar. 7, Aug. 27, 28 computed from data obtained through U.S. Army Corps of Engineers Columbia River Operational Hydromet System (CROHMS) database. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--31 years (water years 1948-72, 1989-94), 213 ft<sup>3</sup>/s, 55.76 in/yr, 154,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,640 ft<sup>3</sup>/s Jan. 21, 1972, gage height, 9.28 ft, from rating curve extended above 3,700 ft<sup>3</sup>/s; maximum gage height, 11.80 ft, Dec. 21, 1964 (backwater from debris), datum then in use; minimum discharge, 2.9 ft<sup>3</sup>/s August 28-31, 1992.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,300 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 24	1400	*1,500	*4.76				
Minimum discharge, 6.1 ft <sup>3</sup> /s Sept. 23-25.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.0	8.5	230	119	67	487	267	89	70	41	12	6.7
2	6.7	8.5	174	177	60	386	225	83	56	47	12	6.7
3	6.6	13	88	457	57	457	198	78	50	40	11	9.7
4	6.7	16	154	377	56	536	171	91	56	38	11	13
5	6.9	11	102	692	53	447	160	90	54	38	12	9.6
6	7.2	10	73	525	53	311	242	79	120	35	11	8.1
7	9.5	9.8	189	335	52	254	318	72	204	32	11	7.9
8	9.6	9.3	558	283	50	214	460	66	165	30	11	7.5
9	8.5	8.9	513	377	56	184	626	61	131	28	11	11
10	7.9	8.9	344	368	60	165	560	59	103	26	10	15
11	7.8	8.6	366	373	57	142	422	55	87	24	9.6	14
12	15	8.5	332	323	53	125	337	54	76	23	9.8	11
13	13	8.7	233	274	73	113	267	50	102	22	9.7	9.3
14	12	8.9	189	234	107	105	225	48	144	21	9.2	8.6
15	21	8.8	149	196	91	97	193	55	203	21	9.7	8.1
16	25	11	121	169	82	100	168	78	164	21	9.1	8.0
17	15	22	105	149	121	98	150	83	140	20	8.9	7.6
18	12	25	91	131	182	130	135	74	152	19	8.7	7.0
19	11	16	80	119	156	136	127	69	123	18	8.7	7.0
20	10	13	72	105	138	131	113	78	105	17	8.4	7.0
21	9.7	14	68	96	149	246	106	70	95	16	8.4	6.9
22	9.2	39	61	95	164	202	95	66	84	15	8.5	6.6
23	9.0	24	59	115	282	169	90	61	78	15	8.1	6.2
24	11	17	54	115	1220	157	100	57	68	15	7.9	6.1
25	11	15	51	113	839	155	99	52	64	16	7.9	6.5
26	9.7	23	49	100	599	147	94	49	66	14	7.3	6.7
27	8.8	17	47	88	719	147	91	46	56	13	7.0	6.4
28	8.3	24	44	80	616	145	84	49	52	13	6.7	6.4
29	8.2	48	42	77	---	137	81	57	47	13	7.3	12
30	8.2	69	45	74	---	182	101	56	44	14	7.0	16
31	8.4	---	59	71	---	327	---	50	---	13	6.8	---
TOTAL	319.9	524.4	4742	6817	6212	6632	6305	2025	2959	718	286.7	262.6
MEAN	10.3	17.5	153	220	222	214	210	65.3	98.6	23.2	9.25	8.75
MAX	25	69	558	692	1220	536	626	91	204	47	12	16
MIN	6.6	8.5	42	71	50	97	81	46	44	13	6.7	6.1
AC-FT	635	1040	9410	13520	12320	13150	12510	4020	5870	1420	569	521
CFSM	.20	.34	2.95	4.25	4.28	4.13	4.06	1.26	1.90	.45	.18	.17
INF.	.23	.38	3.41	4.90	4.46	4.76	4.53	1.45	2.12	.52	.21	.19

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1948 - 1994, BY WATER YEAR (WY)

MEAN	85.1	266	391	443	377	347	272	184	90.2	32.9	17.5	19.2
MAX	397	620	1107	842	944	625	490	353	286	75.9	53.4	67.8
(WY)	1951	1951	1965	1953	1961	1972	1955	1963	1993	1969	1968	1968
MIN	8.08	15.7	109	82.1	112	85.0	133	62.8	20.2	11.8	4.40	5.15
(WY)	1989	1953	1960	1963	1973	1992	1968	1973	1992	1992	1992	1992

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1948 - 1994
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ANNUAL TOTAL	70236.5		37803.6				
ANNUAL MEAN	192		104			213	
HIGHEST ANNUAL MEAN						318	1956
LOWEST ANNUAL MEAN						104	1994
HIGHEST DAILY MEAN	1430	Mar 18	1220	Feb 24		6410	Dec 22 1964
LOWEST DAILY MEAN	6.6	Oct 3	6.1	Sep 24		2.9	Aug 28 1992
ANNUAL SEVEN-DAY MINIMUM	6.9	Sep 30	6.4	Sep 22		3.0	Aug 26 1992
ANNUAL RUNOFF (AC-FT)	139300		74980			154000	
ANNUAL RUNOFF (CFSM)	3.71		2.00			4.10	
ANNUAL RUNOFF (INCHES)	50.44		27.15			55.76	
10 PERCENT EXCEEDS	498		267			485	
50 PERCENT EXCEEDS	109		56			116	
90 PERCENT EXCEEDS	9.3		8.2			13	

## WILLAMETTE RIVER BASIN

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## 14187200 SOUTH SANTIAM RIVER NEAR FOSTER, OR

LOCATION.--Lat 44°24'45", long 122°41'15", in SE 1/4 NE 1/4 sec.28, T.13 S., R.1 E., Linn County, Hydrologic Unit 17090006, on left bank 0.6 mi downstream from Wiley Creek and at mile 37.0.

DRAINAGE AREA.--557 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1973 to current year. Records for October 1966 to July 1973 (published as South Santiam River at Foster, station 14186700) at site 0.5 mi upstream not equivalent owing to inflow between sites.

GAGE.--Water-stage recorder. Elevation of gage is 560 ft above sea level, from topographic map.

REMARKS.--No estimated daily discharges. Water-discharge records good. Flow regulated since October 1966 by Green Peter Lake (station 14186100) and since December 1966 by Foster Lake (station 14186600). No diversion upstream from station.

AVERAGE DISCHARGE.--21 years, 2,754 ft<sup>3</sup>/s, 67.14 in/yr, 1,995,000 acre-ft/yr, adjusted for storage.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18,900 ft<sup>3</sup>/s Apr. 28, 1990, gage height, 16.75 ft; minimum discharge, 410 ft<sup>3</sup>/s June 3, 1992.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 9,840 ft<sup>3</sup>/s Jan. 6, gage height, 14.43 ft; minimum discharge, 440 ft<sup>3</sup>/s May 25.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1350	1910	2740	862	793	3860	1360	866	812	789	666	703
2	1350	1940	3780	1340	795	3810	1810	844	801	800	657	705
3	1350	1760	3670	4160	790	3870	1780	836	795	794	657	710
4	1340	1640	3110	7940	780	7170	1480	853	808	784	656	716
5	1350	2000	2660	8260	777	7940	1300	866	802	788	658	709
6	1350	1760	2400	7210	781	6360	1810	847	858	791	655	738
7	1370	1720	3210	7440	781	4820	2990	833	1250	785	656	1420
8	1380	1660	5760	6570	779	2970	4030	827	1270	782	656	1960
9	1380	1110	5890	7310	782	2210	6140	822	918	771	658	1980
10	1390	1090	6750	7280	791	2050	7280	812	849	769	656	1990
11	1350	1090	6750	7490	784	1930	7000	811	830	768	657	2090
12	1370	1080	6660	7010	778	1940	6540	816	822	774	656	2130
13	1370	917	4740	6490	794	1830	5610	812	837	769	651	2260
14	1360	909	4210	6340	833	1670	3100	807	1640	764	658	2270
15	1360	904	3340	5000	812	1520	2250	798	2860	761	656	2270
16	1370	871	3030	4860	802	1500	1740	824	2420	763	660	2270
17	1370	884	2750	4490	925	1460	1460	824	2250	760	661	2270
18	1360	888	2490	3570	1060	1500	1100	827	2120	761	662	2260
19	2670	877	2160	2880	908	840	995	815	1940	767	661	2260
20	2800	873	2050	2100	865	832	935	819	1400	760	658	2270
21	2830	877	1840	1350	891	1430	877	817	1100	760	658	1900
22	2820	907	1820	1220	891	1430	847	804	1070	759	658	1490
23	2540	2670	1770	1210	992	1180	859	804	1070	760	670	1480
24	2510	2950	1540	1300	3230	984	866	798	1050	760	660	1490
25	2540	1110	1510	1370	5360	847	852	601	811	756	660	1490
26	2500	996	1510	1360	3370	850	862	811	815	757	663	1470
27	2050	996	1500	1120	3690	846	851	794	802	751	650	1420
28	1920	918	1500	929	3950	847	869	791	792	752	648	1400
29	1930	929	1500	807	--	839	843	802	799	751	691	1450
30	1920	1170	994	799	--	880	873	815	794	750	705	1480
31	1910	--	791	793	--	1060	--	803	--	755	709	--
TOTAL	55460	39406	94425	120860	38784	71275	69309	25199	35385	23811	20527	49051
MEAN	1789	1314	3046	3899	1385	2299	2310	813	1179	768	662	1635
MAX	2830	2950	6750	8260	5360	7940	7280	866	2860	800	709	2270
MIN	1340	871	791	793	777	832	843	601	792	750	648	703
AC-FT	110000	78160	187300	239700	76930	141400	137500	49980	70190	47230	40720	97290
MEAN†	246	322	2533	4276	3098	3551	3058	1118	1447	391	177	193
CFSM†	0.44	0.58	4.55	7.68	5.56	6.38	5.49	2.01	2.60	0.70	0.32	0.35
IN.†	0.51	0.65	5.24	8.85	5.79	7.35	6.12	2.31	2.90	0.81	0.37	0.39
AC-FT†	15110	19170	155800	263000	172000	218400	181900	68760	86050	24020	10890	11480

CAL YR 1993 TOTAL 954157 MEAN 2614 MAX 12800 MIN 620 AC-FT 1893000 MEAN† 2605 CFSM† 4.68 IN.† 63.49 AC-FT† 1886000  
WTR YR 1994 TOTAL 643492 MEAN 1763 MAX 8260 MIN 601 AC-FT 1276000 MEAN† 1693 CFSM† 3.04 IN.† 41.27 AC-FT† 1226000

† Adjusted for change in contents in Green Peter Lake and Foster Lake.

## WILLAMETTE RIVER BASIN

14187200 SOUTH SANTIAM RIVER NEAR FOSTER, OR--Continued

## WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: July 1973 to current year.

INSTRUMENTATION.--Temperature recorder since July 1973.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum, 15.5°C at times in 1975, 1978, 1981, 1987, 1990, 1993; minimum recorded, 2.5°C Dec. 30, 31, 1978, Feb. 1, 1980, Feb. 7, 1985.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 14.0°C on several days during May and July, but may have been higher during period of missing record; minimum, 4.5°C on several days in February.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	11.5	11.5	11.5	11.5	11.5	11.5	9.0	8.0	8.5	7.0	6.5	6.5
2	11.5	11.5	11.5	11.5	11.0	11.5	9.0	8.0	8.5	7.0	6.5	6.5
3	11.5	11.5	11.5	11.5	11.0	11.0	9.0	9.0	9.0	7.5	7.0	7.5
4	11.5	11.5	11.5	11.0	11.0	11.0	9.0	8.0	8.5	7.5	7.0	7.5
5	11.5	11.5	11.5	11.0	11.0	11.0	8.5	8.0	8.0	7.5	7.0	7.0
6	11.5	11.5	11.5	11.0	10.5	10.5	8.5	8.0	8.0	7.0	7.0	7.0
7	11.5	11.0	11.5	10.5	10.5	10.5	8.5	8.0	8.0	7.0	6.5	7.0
8	12.5	11.0	11.5	10.5	10.5	10.5	8.5	7.5	8.0	7.5	7.0	7.0
9	12.5	11.0	11.5	10.5	10.0	10.5	8.5	8.0	8.0	7.5	7.0	7.5
10	12.0	11.5	11.5	10.5	10.5	10.5	9.0	8.5	8.5	7.0	7.0	7.0
11	11.5	11.5	11.5	10.5	10.0	10.5	9.0	8.5	8.5	7.5	7.0	7.0
12	11.5	11.5	11.5	10.5	10.5	10.5	8.5	8.0	8.5	7.5	7.0	7.5
13	11.5	11.5	11.5	10.5	10.0	10.5	8.5	8.0	8.5	7.5	7.0	7.5
14	11.5	11.5	11.5	10.5	10.0	10.0	8.5	8.5	8.5	7.5	7.0	7.0
15	11.5	11.5	11.5	10.0	9.5	10.0	8.5	8.0	8.5	7.5	7.0	7.0
16	11.5	11.5	11.5	10.0	10.0	10.0	8.0	7.5	8.0	7.5	7.0	7.0
17	11.5	11.0	11.5	10.0	9.5	10.0	7.5	7.5	7.5	7.0	6.5	6.5
18	12.0	11.0	11.5	10.0	9.5	10.0	7.5	7.0	7.0	6.5	6.5	6.5
19	12.5	11.5	12.0	10.0	9.5	9.5	7.0	7.0	7.0	6.5	6.0	6.0
20	12.5	11.5	12.0	9.5	9.5	9.5	7.0	6.5	6.5	6.5	6.0	6.0
21	12.5	12.0	12.0	9.5	9.5	9.5	6.5	6.5	6.5	6.5	6.0	6.5
22	12.5	11.5	12.0	9.5	9.0	9.0	6.5	6.5	6.5	7.0	6.5	6.5
23	12.5	11.5	12.0	9.0	9.0	9.0	6.5	6.5	6.5	7.5	7.0	7.0
24	12.0	11.5	11.5	9.5	9.0	9.0	6.5	6.0	6.0	7.0	6.5	7.0
25	12.0	11.5	11.5	9.0	8.5	8.5	6.0	6.0	6.0	6.5	6.0	6.5
26	11.5	11.0	11.5	8.5	8.5	8.5	6.0	6.0	6.0	6.5	6.0	6.0
27	11.5	11.5	11.5	8.5	8.5	8.5	6.0	6.0	6.0	6.0	6.0	6.0
28	12.0	11.5	11.5	8.5	8.5	8.5	6.0	6.0	6.0	6.0	5.5	6.0
29	11.5	11.5	11.5	9.0	8.0	8.5	6.0	6.0	6.0	5.5	5.0	5.5
30	11.5	11.5	11.5	9.0	8.0	8.5	6.0	6.0	6.0	5.5	5.0	5.5
31	11.5	11.5	11.5	---	---	---	6.5	6.0	6.5	5.5	5.0	5.0
MONTH	12.5	11.0	11.5	11.5	8.0	10.0	9.0	6.0	7.5	7.5	5.0	6.5

14187200 WILLAMETTE RIVER BASIN  
SOUTH SANTIAM RIVER NEAR FOSTER, OR--Continued

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TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

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



LOCATION: -Lat 44°29'55", long 122°49'20", in SW 1/4 NW 1/4 sec.28, T.12 S., R.1 W., Linn County, Hydrologic Unit 17090006, on left bank 0.1 mi downstream from highway bridge at Waterloo, 2.1 mi upstream from Hamilton Creek, and at mile 23.3.

PERIOD OF RECORD.--July 1905 to March 1907, October 1910 to December 1911 (gage heights only January to December 1911), July 1923 to current year. Monthly discharge only for some periods, published in WSP 1318. Published as South Fork of Santiam River at Waterloo 1905-07, 1910-11.

GAGE.--Water-stage recorder. Datum of gage is 370.39 ft above sea level. Prior to Dec. 31, 1911, nonrecording gage at site 0.5 mi downstream at datum about 5.0 ft lower. July 1, 1923, to Nov. 12, 1934, nonrecording gage, at present site and datum.

AVERAGE DISCHARGE.--72 years (water years 1906, 1924-94), 2,903 ft<sup>3</sup>/s, 2,103,000 acre-ft/yr.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 10,200 ft<sup>3</sup>/s Jan. 6, gage height, 7.49 ft; minimum discharge, 392 ft<sup>3</sup>/s May 25.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1350	1940	2550	904	822	4310	1550	932	784	804	683	686
2	1360	1980	3990	1290	822	4260	2090	902	768	815	642	685
3	1340	1850	3780	4000	812	4410	2030	893	753	807	639	696
4	1340	1700	3390	8160	796	7100	1740	919	767	792	633	706
5	1340	1980	2860	9000	790	8650	1510	933	767	795	642	697
6	1350	1840	2500	7570	790	6810	2000	899	833	798	640	694
7	1370	1760	3110	8110	790	5410	3140	877	1170	788	642	1340
8	1380	1710	5740	6930	785	3420	4430	866	1380	778	639	1960
9	1390	1230	6190	7550	788	2530	6310	851	964	776	645	2070
10	1390	1090	7140	7690	826	2300	7790	831	844	769	636	2100
11	1360	1080	7290	7770	806	2130	7470	823	808	766	633	2190
12	1380	1080	7120	7370	794	2100	7010	823	792	769	636	2240
13	1380	946	5300	6790	819	2010	5980	818	794	767	635	2320
14	1360	895	4470	6590	923	1940	3690	809	1400	761	640	2370
15	1380	888	3620	5340	874	1650	2570	809	2910	758	639	2370
16	1380	859	3200	5090	855	1640	2020	849	2670	764	634	2370
17	1370	896	2910	4630	960	1590	1670	861	2300	769	635	2370
18	1370	896	2660	3910	1360	1670	1330	847	2330	763	638	2370
19	2450	867	2290	3010	1120	1040		825	2100	769	634	2360
20	2830	854	2140	2360	1040	982	1080	851	1630	763	638	2360
21	2850	868	1950	1580	1100	1620	987	842	1190	763	634	2050
22	2850	925	1890	1340	1120	1650	930	819	1160	761	630	1650
23	2620	2390	1850	1370	1270	1400	946	806	1150	765	645	1560
24	2550	3020	1630	1430	3810	1150	952	800	1130	769	636	1580
25	2550	1440	1550	1520	6190	980	943	564	910	765	631	1580
26	2620	993	1560	1490	4220	972	930	787	854	762	640	1570
27	2110	989	1540	1280	4120	953	923	770	835	754	623	1490
28	1940	926	1530	1070	4480	945	931	770	815	757	621	1480
29	1950	870	1530	873	---	930	900	777	811	756	649	1530
30	1950	1140	1130	852	---	1020	955	793	806	754	687	1570
31	1940	---	836	835	---	1570	---	774	---	760	686	---
TOTAL	55800	39902	99246	127704	43882	79142	75937	25720	36425	23937	19885	51014
MEAN	1800	1330	3201	4119	1567	2553	2531	830	1214	772	641	1700
MAX	2850	3020	7290	9000	6190	8650	7790	933	2910	815	687	2370
MIN	1340	854	836	835	785	930	900	564	753	754	621	685
AC - FT	110700	79150	196900	253300	87040							

MEAN	1512	4273	5605	5253	4697	3968	3616	2706	1670	634	462	719
MAX	5530	10340	15470	12220	12070	10530	7935	5875	5906	1526	1239	2769
(WY)	1969	1907	1965	1953	1961	1932	1937	1933	1933	1983	1969	1968
MIN	143	111	1068	713	597	865	1056	792	437	176	126	144
(WY)	1926	1930	1945	1977	1977	1992	1926	1987	1940	1926	1940	1965

ANNUAL TOTAL	1011928		678594			
ANNUAL MEAN	2772		1859		2903	
HIGHEST ANNUAL MEAN					4666	1974
LOWEST ANNUAL MEAN					1407	1977
HIGHEST DAILY MEAN	13200	Apr 4	9000	Jan 5	77000	Dec 22 1964
LOWEST DAILY MEAN	613	Aug 11	564	May 25	67	Oct 8 1966
ANNUAL SEVEN-DAY MINIMUM	622	Aug 7	632	Aug 22	75	Oct 7 1966
ANNUAL RUNOFF (AC-FT)	2007000		1346000		2103000	
10 PERCENT EXCEEDS	6360		4240		6700	
50 PERCENT EXCEEDS	1530		1140		1770	
90 PERCENT EXCEEDS	858		697		264	

## WILLAMETTE RIVER BASIN

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14187600 LEBANON SANTIAM CANAL NEAR LEBANON, OR

LOCATION.--Lat 44°30'54", long 122°51'49", in SW 1/4 NW 1/4 sec.19, T.12 S., R.1 W., Linn County, Hydrologic Unit 17090006, near right bank, on downstream side of bridge on Headgate Road, 2.2 mi east of Lebanon.

PERIOD OF RECORD.--May 1992 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 370 ft above sea level, from topographic map.

REMARKS.--No estimated daily discharges. Records good. Flow completely regulated.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 191 ft<sup>3</sup>/s Mar. 8, 1994; minimum daily discharge, 25 ft<sup>3</sup>/s Jan. 18, 1994.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	97	73	63	91	131	182	147	125	155	143	146	146
2	96	72	61	74	102	180	162	123	146	143	144	145
3	96	71	52	39	76	184	160	122	156	143	143	145
4	100	71	52	44	94	170	151	124	172	142	143	145
5	97	77	51	40	127	150	143	125	172	142	143	144
6	97	72	49	35	127	140	158	122	171	143	143	142
7	94	72	50	82	127	167	165	119	174	143	143	144
8	87	70	50	106	126	191	165	117	161	143	143	145
9	87	68	37	83	127	183	165	116	152	143	143	143
10	88	66	33	35	131	178	150	114	147	143	143	143
11	88	66	29	35	129	174	169	113	149	146	143	145
12	87	66	29	34	127	172	187	113	148	156	143	142
13	87	65	32	61	131	169	178	113	148	157	144	134
14	86	64	37	137	95	169	162	112	157	151	144	141
15	80	64	36	139	102	161	158	116	165	149	145	150
16	75	63	35	101	135	156	151	123	136	149	144	150
17	75	64	40	26	139	147	140	124	121	149	144	150
18	74	64	45	25	152	155	138	122	173	149	144	150
19	76	63	44	31	140	135	145	120	168	149	143	158
20	77	63	44	33	134	130	140	123	158	149	143	154
21	78	63	43	110	148	153	132	121	147	149	143	149
22	78	63	43	164	159	152	127	119	146	149	143	142
23	76	66	77	95	164	146	127	117	145	149	144	146
24	75	65	95	69	165	136	128	116	146	149	143	149
25	75	59	94	27	165	129	127	115	140	150	143	149
26	76	56	77	31	157	131	126	172	138	150	143	149
27	74	56	46	114	155	129	124	153	140	150	142	148
28	73	55	46	152	174	132	124	156	144	150	142	148
29	73	55	46	134	---	134	122	157	143	150	144	143
30	73	58	73	132	---	139	127	158	143	150	146	138
31	73	---	88	131	---	160	---	156	---	150	147	---
TOTAL	2568	1950	1597	2410	3739	4834	4398	3926	4561	4578	4451	4377
MEAN	82.8	65.0	51.5	77.7	134	156	147	127	152	148	144	146
MAX	100	77	95	164	174	191	187	172	174	157	147	158
MIN	73	55	29	25	76	129	122	112	121	142	142	134
AC-FT	5090	3870	3170	4780	7420	9590	8720	7790	9050	9080	8830	8680
CAL YR 1993	TOTAL 24648	MEAN 67.5	MAX 124	MIN 29	AC-FT 48890							
WTR YR 1994	TOTAL 43389	MEAN 119	MAX 191	MIN 25	AC-FT 86060							

## WILLAMETTE RIVER BASIN

14188610 SCHAFFER CREEK NEAR LACOMB, OR

LOCATION.--Lat 44°37'11", long 122°27'53", in NE 1/4 SE 1/4 sec.8, T.11 S., R.3 E., Linn County, Hydrologic Unit 17090006, on right bank, 40 ft upstream from Crabtree Creek, and 8.0 mi east of LaComb.

DRAINAGE AREA. - -1.03 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1993 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,900 ft above sea level, from topographic map.

REMARKS.--No estimated daily discharges. Records poor.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 106 ft<sup>3</sup>/s Feb. 24, 1994, gage height, 6.00 ft; minimum discharge, 0.09 ft<sup>3</sup>/s Sept. 30, 1993.

EXTREMES FOR PERIOD JULY TO SEPTEMBER 1993.--Minimum discharge, 0.09 ft<sup>3</sup>/s Sept.30, 1993.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 106 ft<sup>3</sup>/s Feb. 24, gage height, 6.00 ft; minimum discharge, 0.10 ft<sup>3</sup>/s Oct. 1-6.

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

[illegible]

## WILLAMETTE RIVER BASIN

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14188610 SCHAFER CREEK NEAR LACOMB, OR--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.10	.21	61	22	.94	32	16	2.3	2.6	.99	.22	.12
2	.10	.19	31	34	.83	32	12	2.2	2.3	1.0	.21	.12
3	.10	.53	14	66	.72	45	9.7	2.2	2.0	.94	.20	.54
4	.10	.42	16	44	.66	36	7.4	7.3	2.5	.87	.20	.34
5	.10	.37	10	35	.63	21	6.1	7.7	2.6	.83	.19	.24
6	.11	.30	7.0	19	.60	12	14	6.2	11	.76	.19	.21
7	.16	.27	26	11	.54	8.4	17	4.8	22	.70	.19	.19
8	.14	.25	44	16	.44	6.3	46	3.6	15	.67	.19	.24
9	.14	.24	37	51	.47	5.7	44	2.7	10	.65	.18	.27
10	.14	.23	35	33	.45	8.6	34	2.1	7.1	.60	.17	.42
11	.14	.19	34	44	.43	7.7	20	1.7	5.0	.55	.16	.42
12	.31	.19	21	24	.42	6.3	17	1.4	3.4	.52	.17	.33
13	.21	.18	12	16	.42	7.1	13	1.1	6.6	.47	.16	.28
14	.31	.17	9.8	14	.44	8.0	9.7	1.1	16	.47	.16	.26
15	1.4	.22	7.9	11	.61	7.5	8.2	1.6	19	.44	.15	.23
16	1.2	.28	5.7	7.9	.64	7.2	9.0	6.9	14	.42	.15	.21
17	.75	.75	3.9	5.4	1.2	6.6	9.4	8.8	10	.40	.15	.20
18	.61	.61	2.8	3.7	1.5	9.9	8.9	7.4	7.6	.38	.15	.19
19	.48	.48	2.1	3.0	1.3	8.6	8.1	6.5	5.6	.36	.15	.18
20	.44	.44	1.6	2.5	1.1	7.6	6.1	8.5	4.1	.36	.14	.17
21	.39	1.0	1.4	2.4	.99	10	6.1	7.1	3.1	.33	.14	.16
22	.32	1.3	1.1	3.1	.91	7.7	4.4	5.7	2.5	.31	.14	.15
23	.30	.86	1.0	7.1	10	5.9	3.3	4.2	2.1	.29	.14	.15
24	.38	.67	.90	5.8	77	4.9	3.8	3.0	1.8	.27	.14	.14
25	.30	.62	.82	4.0	41	4.4	4.0	2.2	1.7	.27	.14	.14
26	.28	.59	.86	2.9	36	4.1	3.7	1.8	1.6	.27	.13	.14
27	.26	.67	.88	2.2	37	6.6	3.2	1.4	1.5	.26	.13	.14
28	.24	1.1	.81	1.7	41	11	3.1	1.3	1.3	.25	.12	.15
29	.24	5.8	.78	1.4	---	12	3.0	1.8	1.2	.24	.12	.23
30	.24	10	2.4	1.2	---	16	3.3	2.3	1.1	.23	.13	.24
31	.23	---	8.7	1.0	---	23	---	2.0	---	.23	.13	---
TOTAL	10.22	29.13	401.45	495.3	258.24	389.1	353.5	118.9	186.3	15.33	4.94	6.80
MEAN	.33	.97	12.9	16.0	9.22	12.6	11.8	3.84	6.21	.49	.16	.23
MAX	1.4	10	61	66	77	45	46	8.8	22	1.0	.22	.54
MIN	.10	.17	.78	1.0	.42	4.1	3.0	1.1	1.1	.23	.12	.12
AC-FT	20	58	796	982	512	772	701	236	370	30	9.8	13
CFSM	.32	.94	12.6	15.5	8.95	12.2	11.4	3.72	6.03	.48	.15	.22
IN.	.37	1.05	14.50	17.89	9.33	14.05	12.77	4.29	6.73	.55	.18	.25

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1994 - 1994, BY WATER YEAR (WY)

MEAN	.33	.97	12.9	16.0	9.22	12.6	11.8	3.84	6.21	.49	.16	.23
MAX	.33	.97	12.9	16.0	9.22	12.6	11.8	3.84	6.21	.49	.16	.23
(WY)	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994
MIN	.33	.97	12.9	16.0	9.22	12.6	11.8	3.84	6.21	.49	.16	.23
(WY)	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994

## SUMMARY STATISTICS

## FOR 1994 WATER YEAR

ANNUAL TOTAL	2269.21
ANNUAL MEAN	6.22
HIGHEST DAILY MEAN	77 Feb 24
LOWEST DAILY MEAN	.10 Oct 1
ANNUAL SEVEN-DAY MINIMUM	.11 Oct 1
ANNUAL RUNOFF (AC-FT)	4500
ANNUAL RUNOFF (CFSM)	6.04
ANNUAL RUNOFF (INCHES)	81.96
10 PERCENT EXCEEDS	17
50 PERCENT EXCEEDS	1.2
90 PERCENT EXCEEDS	.16

## WILLAMETTE RIVER BASIN

14189000 SANTIAM RIVER AT JEFFERSON, OR

LOCATION.--Lat 44°42'55", long 123°00'40", in SE 1/4 sec.11, T.10 S., R.3 W., Marion County, Hydrologic Unit 17090005, on right bank 350 ft upstream from Southern Pacific railroad bridge at Jefferson, 2.1 mi downstream from confluence of North and South Santiam Rivers, and at mile 9.62.

DRAINAGE AREA.--1,790 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--October 1905 to June 1906 (gage heights and discharge measurements only), October 1907 to September 1916, October 1939 to current year. Gage-height records collected at same site since 1907 are contained in reports of National Weather Service.

REVISED RECORDS.--WSP 904: Drainage area. WSP 1094: 1908, 1910, 1912, 1943. WSP 1248: 1911, 1915-16(M). WSP 1935: 1909, WDR OR-93-1: 1974.

GAGE.--Water-stage recorder. Datum of gage is 199.63 ft above sea level. Prior to Sept. 22, 1940, nonrecording gages at sites within 350 ft downstream at datum 3.00 ft higher.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since 1953 by Detroit Lake (station 14180500), since 1966 by Green Peter Lake (station 14186100) and by Foster Lake (station 14186600). Salem Canal diverts from North Santiam River at Stayton for irrigation and power; most of this water reaches Willamette River by way of Mill Creek at Salem. Stayton Canal diverts from North Santiam River at Stayton for irrigation of lands near town of West Stayton; some return flow reaches North Santiam River upstream from station. Albany power canal diverts from South Santiam River at Lebanon; return flow reaches Willamette River at Albany. Continuous water-quality records for the period October 1963 to September 1987 have been collected at this location. Periodic suspended sediment data are available for the period October 1991 to September 1993.

AVERAGE DISCHARGE.--64 years (water years 1908-16, 1940-94), 7,641 ft<sup>3</sup>/s, 5,536,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 197,000 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 24.22 ft; minimum discharge observed, 260 ft<sup>3</sup>/s Aug. 15-22, Aug. 24 to Sept. 2, 1940.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood stage of 25.0 ft was reached in December 1861, and 23.4 ft in February 1890 (information from Corps of Engineers). On Nov. 21, 1921, the stage reached 19.5 ft at gage on railroad bridge 350 ft downstream, corresponding gage height at present site and datum, 24.4 ft, from curve of relation, discharge, 202,000 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 30,300 ft<sup>3</sup>/s Feb. 24, gage height, 11.65 ft; minimum discharge, 917 ft<sup>3</sup>/s Aug. 26-28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

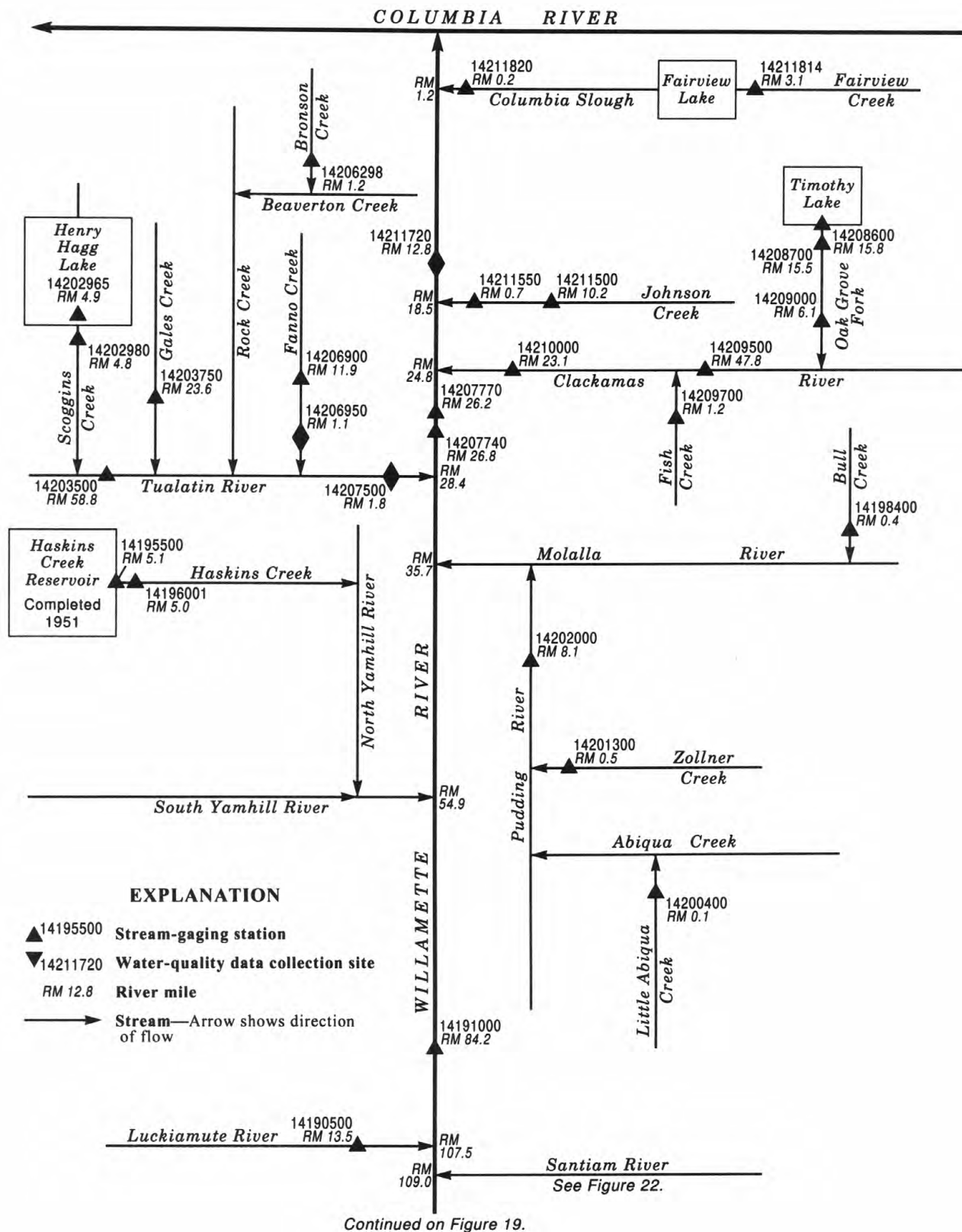
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4380	4640	8480	4510	2860	12200	5610	2820	2430	1860	1150	1030
2	4410	4370	12100	6430	2800	11400	5580	2780	2240	1910	1020	1030
3	4500	3970	9000	18000	2770	13100	5170	2700	2160	1960	1000	1090
4	4500	3670	9160	19700	2730	14400	4700	2780	2120	1950	1010	1230
5	4520	3730	8300	24800	2620	15700	4220	3080	2150	1890	1010	1210
6	4490	3620	7270	22100	2570	12100	5010	2880	2340	1830	1020	1130
7	4580	3170	7210	19700	2560	10300	7200	3120	2530	1720	1020	1440
8	4640	3090	12100	17100	2510	7640	10100	3100	4590	1570	1060	2280
9	4620	2830	15600	18800	2500	6150	12800	3060	3730	1530	1060	2610
10	4650	2480	15700	20100	2620	5660	15300	3200	3210	1490	1020	2650
11	4470	2450	18100	19700	2550	5230	13400	3340	2810	1450	984	2800
12	4640	2440	17000	18900	2490	4860	12200	3360	2610	1360	986	2890
13	4720	2400	13800	16600	2530	4650	10700	3520	2630	1320	996	2920
14	4710	2320	11000	13600	2930	4450	8580	2960	3620	1300	987	3130
15	4880	2290	9530	12000	2880	4050	6450	2640	6660	1290	1010	3120
16	4920	2430	7540	10900	2780	4100	5430	2740	6630	1300	985	3130
17	4950	2760	6450	10200	2970	4110	4870	2920	5500	1310	997	3140
18	4860	2860	5530	9520	4370	4420	4470	2900	5300	1260	970	3160
19	5350	2800	4970	7630	4050	4840	3930	2500	4580	1230	958	3140
20	6180	2730	4550	6500	3730	4020	3690	2580	4150	1210	967	3240
21	6180	2740	4280	5120	4040	5080	3510	2730	3410	1200	1000	3250
22	6270	3040	3980	4390	4230	5370	3820	2710	3270	1180	1020	2880
23	5880	4140	3830	4870	5220	4930	4000	2610	3190	1180	1010	2690
24	5570	5960	3580	4980	19400	4370	4100	2550	2880	1190	1000	2710
25	5560	5090	3380	4990	22400	3920	3930	2450	2680	1240	967	2710
26	5490	3380	3320	4640	14800	3700	3650	2360	2480	1200	958	2840
27	4850	2780	3290	4280	13100	3630	3520	2410	2420	1180	945	3060
28	4540	2460	3230	3850	13500	3640	3350	2400	2220	1170	953	3020
29	4540	2410	3160	3260	---	3650	2920	2450	2020	1140	986	3150
30	4540	2990	2970	3090	---	3660	2890	2630	1940	1170	1040	3240
31	4530	---	2890	2980	---	6170	---	2520	---	1180	1030	---
TOTAL	152920	96040	241300	343240	154510	201500	185100	86800	99500	43770	31119	75920
MEAN	4933	3201	7784	11070	5518	6500	6170	2800	3317	1412	1004	2531
MAX	6270	5960	18100	24800	22400	15700	15300	3520	6660	1960	1150	3250
MIN	4380	2290	2890	2980	2490	3630	2890	2360	1940	1140	945	1030
AC-FT	303300	190500	478600	680800	306500	399700	367100	172200	197400	86820	61720	150600

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1967 - 1994, BY WATER YEAR (WY)

	MEAN	4938	11440	15240	13990	10190	8872	7577	6426	4468	1906	1678	3160
MAX	11890	26850	31700	24520	21250	25700	16150	11270	11150	4825	2883	5325	
(WY)	1969	1974	1978	1974	1982	1972	1993	1984	1984	1983	1968	1968	
MIN	2490	2882	2420	2178	1897	3245	3874	2115	1287	958	1004	1553	
(WY)	1988	1988	1977	1977	1977	1992	1968	1973	1992	1992	1994	1967	

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1967 - 1994
ANNUAL TOTAL	2571600	1711719	
ANNUAL MEAN	7045	4690	7480
HIGHEST ANNUAL MEAN			12310
LOWEST ANNUAL MEAN			3512
HIGHEST DAILY MEAN	38200	Mar 23	78800
LOWEST DAILY MEAN	1290	Aug 10	764
ANNUAL SEVEN-DAY MINIMUM	1390	Aug 8	794
ANNUAL RUNOFF (AC-FT)	5101000		5419000
10 PERCENT EXCEEDS	15700		16500
50 PERCENT EXCEEDS	4540		4860
90 PERCENT EXCEEDS	2030		1550





**Figure 26.** Schematic diagram showing gaging stations in the Willamette River Basin, from the Luckiamute River downstream to the mouth.

## WILLAMETTE RIVER BASIN

14190500 LUCKIAMUTE RIVER NEAR SUVER, OR

LOCATION.--Lat 44°47'00", long 123°14'00", in SW 1/4 SW 1/4 sec.18, T.9 S., R.4 W., Polk County, Hydrologic Unit 17090003, on right bank 10 ft upstream from highway bridge at Helmick State Park, 3.0 mi northwest of Suver, 4.7 mi downstream from Little Luckiamute River, and at mile 13.5.

DRAINAGE AREA.--240 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1905 to October 1911, July 1940 to current year.

REVISED RECORDS.--WSP 1044: Drainage area. WSP 1094: 1945-46. WSP 1248: 1905-11.

GAGE.--Water-stage recorder. Datum of gage is 171.92 ft above sea level. Aug. 18, 1905, to Oct. 31, 1911, nonrecording gage at present site at different datum, Aug. 20 to Oct. 15, 1940, nonrecording gage at present site and datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Some diurnal fluctuation during periods of low flow caused by millpond upstream from station. A few small diversions for irrigation upstream from station. Continuous water-quality records for the period October 1963 to September 1987 have been collected at this location.

AVERAGE DISCHARGE.--60 years, 873 ft<sup>3</sup>/s, 49.44 in/yr, 632,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 32,900 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 34.52 ft; minimum discharge, 0.65 ft<sup>3</sup>/s Aug. 13, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,600 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 25	0830	*9,960	*28.62	No other peak greater than base discharge.			
Minimum discharge, 19 ft <sup>3</sup> /s Sept. 24.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	29	40	e514	1220	454	2450	925	359	180	114	40	20
2	29	40	e1020	1890	433	2010	827	343	170	112	32	21
3	27	40	467	3360	415	1930	763	340	161	111	32	21
4	29	43	392	3990	395	1680	709	407	159	109	29	45
5	28	46	398	4190	377	1460	664	399	162	107	31	51
6	30	44	e310	4050	362	1280	782	346	167	96	33	36
7	34	42	506	2830	353	1140	1000	318	246	92	31	29
8	38	42	1530	2200	338	1020	1410	298	247	87	32	28
9	39	42	2050	1940	328	936	1830	285	210	84	33	32
10	36	42	1890	1750	346	875	1900	272	187	81	38	45
11	35	42	3000	1740	326	806	1580	257	169	79	35	72
12	40	44	3110	1590	310	741	1340	249	160	72	34	64
13	58	45	2020	1380	416	694	1150	237	164	67	33	46
14	56	45	1490	1210	924	653	1020	228	228	63	35	40
15	62	44	1270	1070	725	618	911	227	354	60	35	36
16	81	44	1010	938	704	614	831	263	336	60	30	36
17	77	49	e825	839	1050	702	762	289	294	60	27	33
18	64	52	e730	763	1330	873	703	250	259	61	27	30
19	55	51	e640	698	1340	1050	655	227	234	53	26	29
20	49	49	e590	643	1210	938	612	222	213	49	26	26
21	47	47	537	597	1610	1250	576	220	191	46	29	23
22	45	51	489	588	2040	1350	543	213	178	44	32	21
23	44	78	447	716	2590	1370	511	198	172	40	27	21
24	e42	69	416	773	4740	e1520	485	187	165	44	25	20
25	e42	54	390	777	8900	e1390	497	175	155	46	24	22
26	e50	49	368	677	6070	e1240	460	168	150	44	23	25
27	e44	58	348	617	3920	e1140	426	162	146	40	22	26
28	e40	56	328	576	3060	e1040	402	160	130	37	24	26
29	e41	58	313	537	---	e933	384	196	122	35	26	25
30	41	75	307	506	---	896	376	240	117	34	22	30
31	41	---	637	478	---	1020	---	193	---	36	21	---
TOTAL	1373	1481	28342	45133	45066	35619	25034	7928	5826	2063	914	979
MEAN	44.3	49.4	914	1456	1609	1149	834	256	194	66.5	29.5	32.6
MAX	81	78	3110	4190	8900	2450	1900	407	354	114	40	72
MIN	27	40	307	478	310	614	376	160	117	34	21	20
AC-FT	2720	2940	56220	89520	89390	70650	49650	15730	11560	4090	1810	1940
CFSM	.18	.21	3.81	6.07	6.71	4.79	3.48	1.07	.81	.28	.12	.14
IN.	.21	.23	4.39	7.00	6.99	5.52	3.88	1.23	.90	.32	.14	.15

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1906 - 1994, BY WATER YEAR (WY)

	175	1049	2008	2218	2010	1427	855	418	201	79.8	42.6	52.9
MEAN	175	1049	2008	2218	2010	1427	855	418	201	79.8	42.6	52.9
MAX	1241	4574	5112	4727	4769	3002	1847	1026	512	184	85.0	190
(WY)	1948	1910	1965	1956	1949	1961	1955	1963	1984	1906	1906	1959
MIN	20.2	49.4	106	151	253	391	312	190	74.3	30.0	9.45	17.0
(WY)	1953	1994	1977	1977	1977	1941	1977	1966	1992	1967	1967	1967

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1906 - 1994
ANNUAL TOTAL	228271	199758	873
ANNUAL MEAN	625	547	1464
HIGHEST ANNUAL MEAN			230
LOWEST ANNUAL MEAN			25200
HIGHEST DAILY MEAN	3800	Jan 21	8900
LOWEST DAILY MEAN	27	Oct 3	20
ANNUAL SEVEN-DAY MINIMUM	29	Sep 30	22
ANNUAL RUNOFF (AC-FT)	452800	396200	632700
ANNUAL RUNOFF (CFSM)	2.61	2.28	3.64
ANNUAL RUNOFF (INCHES)	35.38	30.96	49.44
10 PERCENT EXCEEDS	1580	1400	2290
50 PERCENT EXCEEDS	407	213	343
90 PERCENT EXCEEDS	40	30	36

e Estimated

## WILLAMETTE RIVER BASIN

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14191000 WILLAMETTE RIVER AT SALEM, OR

LOCATION.--Lat 44°56'40", long 123°02'30", in SE 1/4 SW 1/4 sec. 22, T.7 S., R.3 W., Marion County, Hydrologic Unit 17090007, on right bank 300 ft upstream from Center Street Bridge in Salem and at mile 84.16.

DRAINAGE AREA.--7,280 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--October 1909 to December 1916, January 1923 to current year. Monthly discharge only January 1923 to September 1927, published in WSP 1318. Gage-height records collected at about the same site since 1892 are contained in reports of National Weather Service.

REVISED RECORDS.--WSP 1318: 1915(M).

GAGE.--Water-stage recorder. Datum of gage is 106.14 ft above sea level. Oct. 1, 1909, to Dec. 31, 1916, nonrecording gage at site 0.5 mi upstream at datum 8.00 ft higher. Jan. 1, 1923, to Nov. 26, 1934, nonrecording gage at Center Street Bridge at datum 8.00 ft higher. Nov. 27, 1934, to Sept. 30, 1962, water-stage recorder at present site at datum 8.00 ft higher.

REMARKS.--Records good. Flow regulated by 12 reservoirs upstream from station (see elsewhere in this report). Many small diversions for irrigation upstream from station; part of flow of Salem Canal, which diverts water from North Santiam River, returns to Willamette River downstream from station, through Mill Creek at Salem.

AVERAGE DISCHARGE.--78 years, 23,200 ft<sup>3</sup>/s, 43.28 in/yr, 16,800,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 348,000 ft<sup>3</sup>/s Jan. 8, 1923, gage height, 38.3 ft, present datum; minimum discharge, 2,470 ft<sup>3</sup>/s Aug. 27, 1940, gage height, 3.55 ft, present datum.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge, 500,000 ft<sup>3</sup>/s Dec. 4, 1861, gage height, about 47 ft present datum, from rating curve extended above 250,000 ft<sup>3</sup>/s in 1916. Floods of Jan. 16, 1881, and Feb. 5, 1890, reached stages of 44.3 ft, discharge, 428,000 ft<sup>3</sup>/s, and 45.1 ft, discharge, 448,000 ft<sup>3</sup>/s, respectively, from floodmarks and information by Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 60,800 ft<sup>3</sup>/s Feb. 25, gage height, 16.74 ft; minimum discharge, 5,740 ft<sup>3</sup>/s July 1, 2, 16, gage height, 4.83 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11400	10300	9240	9470	9520	36400	e22400	9160	7050	5750	6210	6560
2	11400	10500	19000	14600	9160	32000	20200	9070	6790	5770	6090	6580
3	11400	10700	18100	29300	8920	31800	17300	8830	6670	5910	6000	6660
4	11500	10900	17700	45000	8690	34500	15400	8690	6530	6020	6020	6860
5	11500	10800	17800	52400	8450	39400	13900	8990	6560	5980	6040	7020
6	12200	10800	16300	57400	8220	34800	13900	9160	6740	5880	6080	6890
7	12800	9930	15300	53300	8110	29100	17400	8820	7750	5990	6080	6610
8	13000	9700	19500	44700	8030	23700	22400	8740	10000	6030	6150	6720
9	13000	9580	32100	40600	7830	19900	29400	8580	10200	5910	6140	7700
10	13300	8800	37500	43300	7860	17900	34100	8520	9120	5900	6150	7740
11	13400	8570	42900	43800	7960	16800	33600	8440	8210	5900	6190	7980
12	13400	8500	46400	43200	7950	15500	30300	8310	7640	5900	6210	8140
13	13600	8490	42100	40000	8000	14400	27300	8380	7400	5850	6170	8170
14	13400	8410	32200	35100	9690	13600	23900	7960	7620	5830	6340	8410
15	13300	8380	25900	31600	10600	12800	19500	7470	10200	5830	6460	8430
16	13400	8380	20300	27900	10200	12300	16800	7520	12500	5790	6390	8410
17	13500	8770	17100	25700	10800	12400	15300	8200	11900	5810	6370	8370
18	13300	8980	14600	23800	14400	12500	14000	8490	11200	5930	6380	8340
19	13200	9020	12800	21100	16400	14000	12900	8010	10300	5980	6440	8340
20	13900	8940	11500	18200	15300	13700	12000	7590	9580	5970	6480	8240
21	13800	8470	10800	15500	15200	14000	11500	7760	8570	5920	6530	8540
22	13300	8200	9990	13800	18600	16800	11200	7970	7880	5900	6650	8290
23	13000	8700	9480	13900	19500	17400	11200	7790	7600	5880	6620	8000
24	12500	11300	9040	16000	34100	16800	11100	7460	7420	5900	6610	7940
25	12500	12400	8650	16900	58700	15600	11200	7210	7070	6050	6580	8060
26	12300	9930	8370	15600	53800	14300	10900	6870	6700	6110	6550	8090
27	11300	8120	8180	13800	42900	13500	10400	6840	6510	6030	6510	8310
28	10800	7010	8010	12500	40400	12800	10100	6800	6270	5980	6510	8370
29	10500	6440	7770	11500	---	12400	9590	6880	5950	5960	6570	8480
30	10400	6610	7680	10400	---	11900	9180	7160	5900	6000	6600	9000
31	10300	---	7530	9930	---	15100	---	7250	---	6110	6580	---
TOTAL	386600	275630	563840	850300	479290	598100	518370	248920	243830	183770	196700	235250
MEAN	12470	9188	18190	27430	17120	19290	17280	8030	8128	5928	6345	7842
MAX	13900	12400	46400	57400	58700	39400	34100	9160	12500	6110	6650	9000
MIN	10300	6440	7530	9470	7830	11900	9180	6800	5900	5750	6000	6560
AC-FT	766800	546700	1118000	1687000	950700	1186000	1028000	493700	483600	364500	390200	466600
CFSM	1.71	1.26	2.50	3.77	2.35	2.65	2.37	1.10	1.12	.81	.87	1.08
IN.	1.98	1.41	2.88	4.34	2.45	3.06	2.65	1.27	1.25	.94	1.01	1.20

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1969 - 1994, BY WATER YEAR (WY)

	MEAN	13810	29480	46450	44140	33300	29100	23420	18270	13710	7505	7287	10130
MAX	24390	70400	91780	78420	62870	73670	46440	31280	30910	12410	9540	13340	
(WY)	1969	1974	1978	1974	1986	1972	1993	1993	1984	1983	1971	1978	
MIN	7935	8444	6780	6377	5313	11270	10260	7701	5657	5737	5734	6155	
(WY)	1988	1988	1977	1977	1977	1992	1977	1973	1992	1992	1992	1992	

## SUMMARY STATISTICS

	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1969 - 1994
ANNUAL TOTAL	7996270	4780600	
ANNUAL MEAN	21910	13100	23010
HIGHEST ANNUAL MEAN			37960
LOWEST ANNUAL MEAN			9792
HIGHEST DAILY MEAN	80900	Mar 24	199000
LOWEST DAILY MEAN	6440	Nov 29	4140
ANNUAL SEVEN-DAY MINIMUM	7900	Jul 14	4340
ANNUAL RUNOFF (AC-FT)	15860000	9482000	16670000
ANNUAL RUNOFF (CFSM)	3.01	1.80	3.16
ANNUAL RUNOFF (INCHES)	40.86	24.43	42.95
10 PERCENT EXCEEDS	46100	27500	52800
50 PERCENT EXCEEDS	13800	9160	14700
90 PERCENT EXCEEDS	8380	6090	6700

e Estimated

## WILLAMETTE RIVER BASIN

14195500 HASKINS CREEK RESERVOIR NEAR MCMINNVILLE, OR

LOCATION.--Lat 45°18'43", long 123°21'23", in SW 1/4 NW 1/4 sec.18, T.3 S., R.5 W., Yamhill County, Hydrologic Unit 17090008, on control tower 250 ft upstream from dam on Haskins Creek, 11 mi northwest of McMinnville, and at mile 5.1.

DRAINAGE AREA.--6.88 mi<sup>2</sup>.

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

REVISED RECORDS.--WSP 1738: Drainage area. WDR OR-79-1: 1978 (maximum contents).

GAGE.--Nonrecording gage. Datum of gage is sea level (levels by city of McMinnville). Prior to February 1981, at datum 20.0 ft lower.

REMARKS.--Reservoir is formed by earthfill dam equipped with five siphon spillways which act as overflow weirs until priming occurs, approximately 815.0 ft elevation. Capacity of reservoir (based on May 1992 resurvey, new capacity table put into use Oct. 1, 1991), 721 acre-ft between elevations 741.5 ft, invert of outlet tunnel, and 815.0 ft, crest of siphon spillways. Dead storage negligible. Rated capacity of three siphons is 700 ft<sup>3</sup>/s each and remaining two siphons 350 ft<sup>3</sup>/s each. Water is used for municipal supply of city of McMinnville.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 748 acre-ft Nov. 17, 1954, elevation, 815.65 ft, present datum; no contents at times during winter months.

EXTREMES FOR CURRENT YEAR.--Maximum contents observed, 721 acre-ft many days during the year, elevation, 815.0 ft, present datum; no contents several days in April.

## MONTHEND ELEVATIONS AND CONTENTS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept.30.....	800.1	425	-
Oct. 31.....	806.8	543	+118
Nov. 30.....	808.0	566	+23
Dec. 31.....	815.0	721	+155
CAL YR 1993.....	-	-	0
Jan. 31.....	815.0	721	0
Feb. 28.....	815.0	721	0
Mar. 31.....	761.0	25	-696
Apr. 30.....	797.5	384	+359
May 31.....	807.7	560	+176
June 30.....	804.0	491	-69
July 31.....	797.7	387	-104
Aug. 31.....	803.3	479	+92
Sept.30.....	806.0	528	+49
WTR YR 1994.....	-	-	+103

## WILLAMETTE RIVER BASIN

265

14196001 HASKINS CREEK BELOW RESERVOIR, NEAR MCMINNVILLE, OR

LOCATION.--Lat 45°18'39", long 123°21'06", in SE 1/4 NW 1/4 sec.18, T.3 S., R.5 W., Yamhill County, Hydrologic Unit 17090008, on right bank 800 ft downstream from Haskins Creek Reservoir, 11 mi northwest of McMinnville, and at mile 5.0.

DRAINAGE AREA.--6.90 mi<sup>2</sup>.

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

REVISED RECORDS.--WSP 1738: Drainage area. Maximum discharge for water year 1957, published in WSP 1518, has been found to be unreliable and should not be used.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 707 ft above sea level, topographic survey of 1955. Prior to Aug. 5, 1952, water-stage recorder at site 600 ft upstream at different datum.

REMARKS.--No estimated daily discharges. Records fair. All records given herein include flow in pipeline which diverts 600 ft upstream from station for municipal supply of McMinnville. Flow regulated by Haskins Creek Reservoir (station 14195500). Water from McGuire Lake (station 14302800) on the Nestucca River is diverted through a tunnel to Haskins Creek Reservoir to augment summer flows.

COOPERATION.--Meter readings for diversion and elevations of Haskins Creek Reservoir furnished by city of McMinnville.

AVERAGE DISCHARGE.--43 years, 30.4 ft<sup>3</sup>/s, 59.83 in/yr, 22,030 acre-ft/yr, adjusted for storage and diversion.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,030 ft<sup>3</sup>/s Dec. 23, 1964, gage height, 5.98 ft, from floodmark, from rating curve extended above 400 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; maximum daily discharge, 515 ft<sup>3</sup>/s Jan. 21, 1972; minimum daily, 0.10 ft<sup>3</sup>/s Oct. 27, 28, 1966.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 201 ft<sup>3</sup>/s Feb. 24; minimum daily, 6.2 ft<sup>3</sup>/s Nov. 14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	7.6	7.8	65	18	67	29	7.9	8.3	14	13	14
2	9.7	7.5	6.5	55	16	62	27	8.1	7.6	12	15	10
3	9.7	7.8	7.4	71	16	61	26	8.3	7.7	11	16	10
4	9.4	7.7	7.4	81	15	61	25	7.9	8.5	11	14	8.1
5	9.2	7.7	8.3	74	15	61	24	8.4	8.7	12	14	7.7
6	9.1	7.0	9.7	65	14	60	32	8.7	9.3	11	13	10
7	7.4	7.0	28	58	14	60	33	9.8	7.7	13	12	11
8	7.9	7.0	49	53	13	57	53	10	7.1	15	12	11
9	8.6	7.1	84	58	14	55	57	10	8.3	16	12	7.9
10	8.8	7.6	80	47	14	51	53	9.4	9.3	16	12	7.2
11	8.5	7.7	99	50	13	47	35	9.6	11	15	15	7.4
12	7.3	7.8	64	47	13	48	18	10	10	14	15	7.5
13	8.1	7.6	49	46	27	47	20	8.7	11	14	14	7.4
14	7.9	6.2	34	34	25	44	19	8.2	7.6	16	13	7.8
15	8.1	7.5	34	37	25	40	20	8.8	7.4	15	13	9.2
16	7.2	7.8	30	33	42	34	21	9.2	7.8	13	13	9.5
17	6.3	8.3	25	31	49	36	22	9.2	8.7	14	12	9.4
18	6.6	8.3	22	28	44	41	22	9.3	8.8	14	13	10
19	7.6	8.3	21	26	43	44	21	8.9	9.5	15	12	10
20	7.8	8.1	17	24	39	44	21	9.2	10	17	11	10
21	7.6	7.3	17	23	48	52	19	8.9	13	20	11	11
22	6.7	7.8	15	23	47	54	14	8.7	14	16	10	11
23	6.6	8.1	14	28	91	53	8.3	10	14	16	9.8	12
24	7.0	7.9	13	29	201	54	8.6	13	12	14	11	11
25	7.1	8.2	13	26	146	51	8.3	12	12	13	13	10
26	7.0	8.5	12	24	111	50	8.2	11	11	14	13	10
27	7.9	8.9	11	23	92	46	8.5	10	11	16	12	9.6
28	7.6	8.2	11	21	80	45	8.4	10	13	17	11	10
29	7.6	7.8	11	20	---	44	8.3	8.0	15	17	11	9.8
30	7.1	7.9	13	19	---	41	7.8	7.3	15	14	10	7.7
31	7.7	---	20	18	---	37	---	7.5	---	12	11	---
TOTAL	245.1	232.2	833.1	1237	1285	1547	677.4	286.0	304.3	447	386.8	287.2
MEAN	7.91	7.74	26.9	39.9	45.9	49.9	22.6	9.23	10.1	14.4	12.5	9.57
MAX	10	8.9	99	81	201	67	57	13	15	20	16	14
MIN	6.3	6.2	6.5	18	13	34	7.8	7.3	7.1	11	9.8	7.2
AC-FT	486	461	1650	2450	2550	3070	1340	567	604	887	767	570
MEAN†	3.17	4.45	29.0	39.8	45.9	38.6	28.6	12.1	8.99	6.02	4.28	3.61
CFSM†	0.46	0.65	4.21	5.77	6.65	5.60	4.14	1.75	1.30	0.87	0.62	0.52
IN.†	0.53	0.72	4.85	6.66	6.93	6.45	4.62	2.02	1.45	1.01	0.71	0.58
AC-FT†	195	265	1785	2450	2550	2374	1699	743	535	370	263	215

CAL YR 1993 TOTAL 8048.4 MEAN 22.1 MAX 111 MIN 6.2 AC-FT 15960 MEAN† 20.2 CFSM† 2.92 IN.† 39.69 AC-FT† 14600  
WTR YR 1994 TOTAL 7768.1 MEAN 21.3 MAX 201 MIN 6.2 AC-FT 15410 MEAN† 18.6 CFSM† 2.70 IN.† 36.62 AC-FT† 13470

† Adjusted for change in contents in Haskins Creek Reservoir and diversion from McGuire Lake.



## WILLAMETTE RIVER BASIN

14198400 BULL CREEK NEAR WILHOIT, OR

LOCATION.--Lat 44°57'42", long 122°22'59", in NW 1/4 SE 1/4 sec.13, T.7 S., R.3 E., Clackamas County, Hydrologic Unit 17090009, on left bank 0.5 mi upstream from mouth, and 11 mi southeast of Wilhoit and at mile 0.43.

DRAINAGE AREA.--0.43 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1993 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,680 ft above sea level, from topographic map.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, unknown, occurred Feb. 24, 1994 during time when recorder was out of operation; minimum discharge, 0.02 ft<sup>3</sup>/s Sept. 25-28, 1994.

EXTREMES FOR PERIOD APRIL TO SEPTEMBER 1993.--Maximum discharge, 9.0 ft<sup>3</sup>/s Apr. 10, gage height, 4.85 ft; minimum discharge, 0.06 ft<sup>3</sup>/s Sept. 29, 30.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 6.0 ft<sup>3</sup>/s Feb. 24; minimum discharge, 0.02 ft<sup>3</sup>/s Sept. 25-28.

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	---	---	---	---	---	---	1.5	3.2	3.1	.63	.91	.18
2	---	---	---	---	---	---	1.5	2.9	3.1	.68	.82	.18
3	---	---	---	---	---	---	2.9	3.4	2.8	.64	.73	.18
4	---	---	---	---	---	---	3.8	3.9	2.6	.61	.65	.17
5	---	---	---	---	---	---	3.1	3.6	5.1	.57	.60	.17
6	---	---	---	---	---	---	2.5	3.4	5.6	.54	.57	.15
7	---	---	---	---	---	---	2.2	3.3	6.9	.52	.54	.14
8	---	---	---	---	---	---	2.5	3.2	6.5	.51	.48	.13
9	---	---	---	---	---	---	4.7	3.0	4.5	.48	.45	.12
10	---	---	---	---	---	---	8.0	2.6	3.2	.46	.42	.10
11	---	---	---	---	---	---	7.4	2.2	2.7	.45	.40	.09
12	---	---	---	---	---	---	5.0	1.9	2.4	.43	.37	.09
13	---	---	---	---	---	---	3.9	1.7	2.2	.44	.37	.09
14	---	---	---	---	---	---	3.3	1.5	2.0	.47	.36	.08
15	---	---	---	---	---	---	2.8	1.4	1.9	.59	.45	.10
16	---	---	---	---	---	---	2.4	1.3	1.7	.50	.40	.11
17	---	---	---	---	---	---	2.5	1.2	1.6	.81	.36	.11
18	---	---	---	---	---	---	2.8	1.1	1.4	.65	.33	.11
19	---	---	---	---	---	---	2.9	1.1	1.3	.69	.33	.10
20	---	---	---	---	---	---	2.6	1.1	1.2	.84	.33	.10
21	---	---	---	---	---	---	2.5	1.1	1.1	.93	.31	.09
22	---	---	---	---	---	---	2.4	1.1	1.1	e1.1	.28	.10
23	---	---	---	---	---	---	2.5	.99	1.1	e1.3	.29	.09
24	---	---	---	---	---	---	2.8	.86	.96	e1.2	.27	.09
25	---	---	---	---	---	---	3.2	.90	.89	e1.1	.25	.09
26	---	---	---	---	---	---	3.9	.85	.85	.95	.24	.08
27	---	---	---	---	---	---	4.2	1.1	.86	.85	.22	.08
28	---	---	---	---	---	---	3.6	1.3	.81	.93	.22	.08
29	---	---	---	---	---	---	3.2	1.3	.74	1.2	.22	.07
30	---	---	---	---	---	---	3.2	1.3	.67	1.2	.20	.08
31	---	---	---	---	---	---	---	2.1	---	1.0	.19	---
TOTAL	---	---	---	---	---	---	99.8	59.90	70.88	23.27	12.56	3.35
MEAN	---	---	---	---	---	---	3.33	1.93	2.36	.75	.41	.11
MAX	---	---	---	---	---	---	8.0	3.9	6.9	1.3	.91	.18
MIN	---	---	---	---	---	---	1.5	.85	.67	.43	.19	.07
AC-FT	---	---	---	---	---	---	198	119	141	46	25	6.6
CFSM	---	---	---	---	---	---	7.74	4.49	5.49	1.75	.94	.26
IN.	---	---	---	---	---	---	8.63	5.18	6.13	2.01	1.09	.29

e Estimated

## WILLAMETTE RIVER BASIN

267

14198400 BULL CREEK NEAR WILHOIT, OR--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.08	.06	1.3	e1.0	e.4	e2.1	e.9	e.4	e.4	.34	.07	.03
2	.08	.05	.64	e1.3	e.4	e2.1	e.8	e.4	e.3	.36	.07	.03
3	.07	.21	.41	e3.4	e.4	e2.0	e.8	e.4	e.2	.31	.06	.09
4	.08	.12	.74	e2.7	e.4	e1.9	e.7	e.5	e.3	.29	.07	.07
5	.08	.09	.52	e3.6	e.4	e1.7	e.7	e.4	e.3	.33	.06	.04
6	.10	.09	.39	e2.8	e.4	e1.5	e1.0	e.4	e.5	.30	.06	.03
7	.14	.09	.79	e2.2	e.3	e1.3	e1.1	e.4	e.5	.28	.06	.03
8	.12	.09	2.2	e1.9	e.3	e1.2	e1.8	e.3	e.4	.26	.07	.11
9	.09	.08	3.0	e1.9	e.4	e1.1	e2.0	e.3	e.4	.25	.06	.24
10	.07	.07	2.8	e1.6	e.4	e1.0	e2.2	e.3	e.3	.24	.06	.29
11	.06	.07	3.2	e1.7	e.4	e.9	e1.8	e.3	e.3	.24	.06	.20
12	.11	.07	2.2	e1.5	e.3	e.8	e1.7	e.3	e.3	.23	.06	.14
13	.10	.08	1.6	e1.3	e.5	e.7	e1.4	e.3	e.4	.22	.06	.12
14	.20	.07	e1.1	e1.2	e.6	e.7	e1.2	e.3	.65	.22	.06	.09
15	.23	.07	e.8	e1.0	e.5	e.6	e1.1	e.3	1.4	.21	.06	.08
16	.16	.08	e.6	e.9	e.5	e.8	e1.0	e.4	1.5	.20	.05	.07
17	.11	.19	e.6	e.8	e.8	e.7	e.8	e.4	1.3	.19	.05	.05
18	.09	.16	e.5	e.8	e.9	e1.1	e.8	e.3	1.1	.18	.05	.06
19	.06	.12	e.5	e.7	e.9	e1.0	e.7	e.3	.97	.16	.05	.05
20	.05	.10	e.4	e.6	e.9	e1.0	e.7	e.3	.82	.15	.04	.05
21	.05	.12	e.4	e.6	e1.0	e1.5	e.6	e.3	.72	.14	.04	.04
22	.05	.16	e.4	e.6	e1.0	e1.3	e.6	e.3	.64	.13	.06	.03
23	.05	.13	e.4	e.7	e1.2	e1.2	e.6	e.2	.57	.12	.05	.03
24	.11	.11	e.4	e.7	e6.0	e1.1	e.6	e.2	.52	.12	.04	.03
25	.06	.11	e.3	e.6	e5.6	e1.0	e.6	e.2	.49	.12	.04	.03
26	.05	.12	e.3	e.6	e3.9	e.9	e.5	e.2	.47	.11	.04	.02
27	.05	.25	e.3	e.5	e3.2	e.8	e.5	e.2	.42	.09	.03	.02
28	.05	.23	e.3	e.5	e2.6	e.8	e.4	e.2	.40	.08	.03	.03
29	.05	.25	e.3	e.4	---	e.7	e.4	e.4	.37	.09	.03	.11
30	.05	.34	e.3	e.4	---	e.8	e.4	e.3	.35	.09	.03	.07
31	.06	---	e.4	e.4	---	e1.1	---	e.3	---	.09	.03	---
TOTAL	2.71	3.78	28.09	38.9	35.5	35.4	28.4	9.8	17.29	6.14	1.60	2.28
MEAN	.087	.13	.91	1.25	1.27	1.14	.95	.32	.58	.20	.052	.076
MAX	.23	.34	3.2	3.6	6.0	2.1	2.2	.50	1.5	.36	.07	.29
MIN	.05	.05	.30	.40	.30	.60	.40	.20	.20	.08	.03	.02
AC-FT	5.4	7.5	56	77	70	70	56	19	34	12	3.2	4.5
CFSM	.20	.29	2.11	2.92	2.95	2.66	2.20	.74	1.34	.46	.12	.18
IN.	.23	.33	2.43	3.37	3.07	3.06	2.46	.85	1.50	.53	.14	.20

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1994 - 1994, BY WATER YEAR (WY)

	MEAN	.087	.13	.91	1.25	1.27	1.14	.95	.32	.58	.20	.052	.076
MAX	.087	.13	.91	1.25	1.27	1.14	.95	.32	.58	.20	.052	.076	
(WY)	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994
MIN	.087	.13	.91	1.25	1.27	1.14	.95	.32	.58	.20	.052	.076	
(WY)	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994

## SUMMARY STATISTICS

## FOR 1994 WATER YEAR

ANNUAL TOTAL  
ANNUAL MEAN  
HIGHEST DAILY MEAN  
LOWEST DAILY MEAN  
ANNUAL SEVEN-DAY MINIMUM  
ANNUAL RUNOFF (AC-FT)  
ANNUAL RUNOFF (CFSM)  
ANNUAL RUNOFF (INCHES)  
10 PERCENT EXCEEDS  
50 PERCENT EXCEEDS  
90 PERCENT EXCEEDS

209.89  
.58  
6.0 Feb 24  
.02 Sep 26  
.03 Sep 22  
416  
1.34  
18.16  
1.4  
.30  
.05

e Estimated

## WILLAMETTE RIVER BASIN

14200400 LITTLE ABIQUA CREEK NEAR SCOTTS MILLS, OR

LOCATION.--Lat 44°57'21", long 122°37'38", in SW 1/4 SE 1/4 sec.13, T.7 S., R.1 E, Marion County, Hydrologic Unit 17090009, on left bank, 4 mi south of Scotts Mills, and 0.1 mi upstream from mouth.

DRAINAGE AREA.--9.81 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1993 to current year.

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

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

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 303 ft<sup>3</sup>/s Feb. 24, 1994, gage height, 4.62 ft; minimum discharge, 1.9 ft<sup>3</sup>/s Oct. 2-4, 1993.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 303 ft<sup>3</sup>/s Feb. 24, gage height, 4.62 ft; minimum discharge, 1.9 ft<sup>3</sup>/s Oct. 2-4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	3.0	53	38	16	85	35	17	14	9.5	3.0	2.1
2	1.9	2.8	20	53	16	83	32	16	11	10	3.0	2.1
3	1.9	6.2	12	138	15	81	30	16	10	9.2	2.9	6.3
4	1.9	5.0	23	110	15	78	28	20	12	8.9	3.0	4.7
5	2.0	3.7	15	144	14	68	28	17	11	9.5	3.1	2.9
6	2.3	3.3	12	113	14	60	42	15	19	8.9	2.9	2.6
7	3.1	3.2	23	87	13	53	43	14	21	8.2	2.9	2.5
8	2.5	3.2	55	75	13	47	71	13	16	7.7	3.1	3.9
9	2.2	3.1	58	75	16	43	79	13	14	7.2	3.0	5.8
10	2.1	3.1	61	64	15	41	88	12	13	6.8	2.8	5.4
11	2.1	3.1	81	70	14	35	74	12	12	6.5	2.7	3.5
12	3.2	3.1	65	60	13	32	68	11	12	6.2	2.7	3.1
13	2.7	3.2	47	54	21	29	56	11	18	6.0	2.6	2.8
14	6.0	3.1	38	48	24	27	48	11	25	5.9	2.5	2.7
15	8.0	3.4	31	42	21	26	43	12	27	5.9	2.7	2.6
16	5.8	4.6	26	37	20	30	38	14	21	5.7	2.5	2.6
17	3.9	6.5	23	33	30	29	34	15	20	5.2	2.4	2.4
18	3.1	6.5	21	30	35	45	31	13	19	5.0	2.4	2.4
19	2.8	4.6	19	28	36	40	29	13	17	4.9	2.4	2.4
20	2.7	4.1	18	25	35	41	27	13	16	4.5	2.4	2.4
21	2.5	6.4	16	24	40	59	25	12	15	4.2	2.4	2.4
22	2.5	11	15	25	39	53	23	11	14	3.9	2.6	2.3
23	2.8	7.1	14	29	85	50	23	10	14	3.9	2.4	2.3
24	5.0	4.6	14	27	241	46	24	10	13	3.9	2.3	2.3
25	3.5	5.1	13	24	224	40	22	9.6	12	4.2	2.3	2.4
26	3.0	4.6	13	22	156	36	21	9.3	12	3.7	2.2	2.3
27	2.8	5.8	12	20	130	33	19	9.1	11	3.5	2.1	2.3
28	2.6	7.2	11	19	105	31	18	9.7	10	3.3	2.1	2.3
29	2.6	10	11	18	---	28	18	14	10	3.3	2.2	4.2
30	2.5	12	13	18	---	31	18	11	9.7	3.3	2.1	3.4
31	3.0	---	17	17	---	45	---	11	---	3.2	2.1	---
TOTAL	95.0	152.6	850	1567	1416	1425	1135	394.7	448.7	182.1	79.8	91.4
MEAN	3.06	5.09	27.4	50.5	50.6	46.0	37.8	12.7	15.0	5.87	2.57	3.05
MAX	8.0	12	81	144	241	85	88	20	27	10	3.1	6.3
MIN	1.9	2.8	11	17	13	26	18	9.1	9.7	3.2	2.1	2.1
AC-FT	188	303	1690	3110	2810	2830	2250	783	890	361	158	181
CFSM	.31	.51	2.74	5.05	5.06	4.60	3.78	1.27	1.50	.59	.26	.30
IN.	.35	.57	3.16	5.83	5.27	5.30	4.22	1.47	1.67	.68	.30	.34

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1994 - 1994, BY WATER YEAR (WY)

	MEAN	3.06	5.09	27.4	50.5	50.6	46.0	37.8	12.7	15.0	5.87	2.57	3.05
MAX	3.06	5.09	27.4	50.5	50.6	46.0	37.8	12.7	15.0	5.87	2.57	3.05	
(WY)	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994
MIN	3.06	5.09	27.4	50.5	50.6	46.0	37.8	12.7	15.0	5.87	2.57	3.05	
(WY)	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994

## SUMMARY STATISTICS

## FOR 1994 WATER YEAR

ANNUAL TOTAL	7837.3
ANNUAL MEAN	21.5
HIGHEST DAILY MEAN	241 Feb 24
LOWEST DAILY MEAN	1.9 Oct 2
ANNUAL SEVEN-DAY MINIMUM	2.1 Aug 27
ANNUAL RUNOFF (AC-FT)	15550
ANNUAL RUNOFF (CFSM)	2.15
ANNUAL RUNOFF (INCHES)	29.15
10 PERCENT EXCEEDS	53
50 PERCENT EXCEEDS	12
90 PERCENT EXCEEDS	2.4

## WILLAMETTE RIVER BASIN

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## WATER-QUALITY RECORDS

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: July 1993 to current year.

WATER TEMPERATURE: July 1993 to current year.

INSTRUMENTATION.--Water-quality monitor.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum recorded, 63 microsiemens Sept. 29, 30, 1993; minimum, 16 microsiemens Feb. 24, 1994.

WATER TEMPERATURE: Maximum, 19.0°C July 23, 1994, minimum, 0.0°C Nov. 24-26, 1993.

## EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum, 59 microsiemens Oct. 28, 29, 31; minimum, 16 microsiemens Feb. 24.

WATER TEMPERATURE: Maximum, 19.0°C July 23, minimum 0.0°C Nov. 24-26.

## SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	54	53	54	57	56	57	43	40	40	33	29	32
2	57	53	54	57	55	56	42	39	40	32	26	30
3	56	54	54	57	49	54	41	40	41	---	---	---
4	56	53	54	54	51	52	41	36	38	29	26	27
5	56	53	54	54	53	54	40	39	39	32	25	27
6	56	53	55	56	53	54	41	37	40	25	22	25
7	57	52	54	58	54	56	40	32	36	25	25	25
8	56	51	52	58	54	56	34	30	33	26	23	24
9	55	51	53	56	52	54	33	29	31	25	23	24
10	54	52	53	54	52	53	36	27	33	25	23	24
11	54	52	53	54	52	53	36	27	31	25	21	23
12	55	51	53	54	52	53	32	26	29	26	22	24
13	56	51	52	54	52	53	33	29	31	26	24	25
14	54	48	52	54	53	54	30	27	29	27	26	26
15	54	48	50	54	53	54	31	29	29	29	26	27
16	53	50	52	53	50	52	33	27	29	31	28	29
17	56	53	54	52	48	50	32	27	30	28	27	28
18	58	55	56	50	47	48	32	31	32	29	28	29
19	56	55	56	51	49	50	33	32	32	31	29	30
20	56	55	56	52	51	51	33	33	33	32	31	31
21	57	55	56	52	45	51	34	33	33	33	32	32
22	57	56	57	51	45	48	34	33	33	33	31	32
23	58	56	57	---	---	---	34	34	34	31	29	30
24	57	53	55	54	50	52	35	34	34	31	30	31
25	56	54	55	54	51	53	36	34	35	33	31	32
26	57	55	56	53	51	52	36	35	36	34	32	33
27	58	56	57	51	49	50	39	34	37	33	32	32
28	59	57	58	49	46	48	38	36	37	33	32	32
29	59	58	58	47	43	46	40	37	38	33	31	32
30	58	57	58	45	43	45	39	34	37	33	32	33
31	59	57	58	---	---	---	34	33	33	34	33	33
MONTH	59	48	55	---	---	---	43	26	34	---	---	---

## WILLAMETTE RIVER BASIN

14200400 LITTLE ABIQUA CREEK NEAR SCOTTS MILLS, OR--Continued

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	34	33	33	26	23	25	31	29	30	36	33	34
2	34	33	33	26	21	23	31	30	30	37	34	35
3	35	34	34	22	19	21	31	28	30	35	34	35
4	35	33	34	21	19	20	31	29	30	35	32	34
5	35	34	34	23	20	21	31	29	30	36	34	35
6	35	34	35	25	23	24	30	26	28	38	35	36
7	35	33	34	26	24	25	29	28	29	40	34	37
8	35	34	35	26	25	25	29	26	27	38	33	35
9	35	32	33	28	26	27	29	24	28	36	34	35
10	34	33	33	30	28	28	25	23	25	37	35	36
11	34	33	33	30	29	29	26	24	25	37	35	36
12	34	33	34	30	28	29	26	23	25	38	36	37
13	34	30	32	30	29	29	25	24	25	40	37	38
14	33	30	31	31	29	30	27	25	25	41	39	40
15	33	30	32	31	30	31	28	26	27	44	36	39
16	33	30	32	30	29	30	29	27	28	39	34	36
17	33	29	31	31	29	30	31	28	29	37	34	35
18	32	28	31	31	25	28	32	30	31	37	34	35
19	32	25	27	29	28	29	33	30	31	37	35	36
20	26	25	25	30	26	29	34	32	33	35	33	34
21	26	24	25	28	25	27	34	30	31	37	35	35
22	26	25	26	28	27	28	33	31	32	37	35	36
23	25	18	21	28	27	28	33	31	32	38	37	38
24	19	16	18	28	27	28	33	31	32	39	36	37
25	19	18	18	29	27	28	33	31	32	38	36	38
26	19	18	19	29	28	28	33	32	33	39	37	38
27	19	18	19	30	28	29	34	32	33	39	37	38
28	25	19	21	31	29	30	35	33	34	39	36	37
29	---	---	---	31	30	30	35	34	34	37	32	34
30	---	---	---	32	27	31	35	33	34	37	34	35
31	---	---	---	30	27	28	---	---	---	37	32	35
MONTH	35	16	29	32	19	27	35	23	30	44	32	36

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE			JULY			AUGUST			SEPTEMBER			
1	33	31	32	34	32	33	52	51	52	33	29	31
2	34	32	33	34	32	32	54	52	54	32	30	31
3	35	34	35	34	31	33	54	53	54	35	29	33
4	36	31	33	33	32	32	56	54	55	30	29	29
5	35	34	34	33	31	32	54	52	53	34	29	31
6	34	28	30	34	32	33	53	50	51	33	32	33
7	31	29	30	34	33	34	53	51	52	33	30	32
8	31	29	30	35	33	34	52	48	50	31	28	30
9	32	30	31	36	34	35	51	48	49	30	27	29
10	33	31	32	36	34	35	54	50	51	27	24	26
11	34	31	33	37	35	36	56	53	54	28	25	27
12	34	32	33	37	36	36	55	54	54	26	23	25
13	34	29	31	38	36	37	58	55	56	30	24	27
14	30	23	28	38	36	37	58	56	57	29	26	28
15	26	23	24	38	36	38	56	53	54	29	26	28
16	27	25	26	39	37	38	54	49	52	29	27	28
17	27	26	27	40	39	40	52	49	51	29	27	28
18	27	26	27	41	39	40	53	50	52	29	28	29
19	28	27	27	42	40	41	54	52	53	32	29	31
20	30	28	28	43	41	42	55	53	54	33	30	31
21	30	29	29	44	43	44	54	50	52	32	28	29
22	31	29	30	45	43	44	53	49	52	31	29	30
23	31	29	30	45	44	44	49	44	47	30	28	29
24	29	27	28	46	43	44	45	42	43	29	28	29
25	29	28	29	48	43	45	45	42	44	29	29	29
26	30	28	29	49	46	48	45	40	43	---	---	---
27	31	29	30	51	45	48	44	40	42	---	---	---
28	32	30	31	52	48	50	43	39	41	---	---	---
29	33	31	32	54	51	52	39	36	37	---	---	---
30	33	31	32	53	52	52	39	36	38	---	---	---
31	---	---	---	52	51	52	36	32	34	---	---	---
MONTH	36	23	30	54	31	40	58	32	49	---	---	---



## WILLAMETTE RIVER BASIN

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14200400 LITTLE ABIQUA CREEK NEAR SCOTTS MILLS, OR--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	13.0	10.0	11.5	7.5	6.0	7.0	7.5	5.5	7.0	7.0	6.0	6.5
2	12.5	9.5	11.0	7.5	5.5	6.5	7.0	6.0	6.5	8.0	6.0	7.0
3	13.0	10.5	11.5	9.0	7.0	8.0	8.0	7.0	7.5	8.5	7.5	8.0
4	12.5	10.0	11.5	8.0	6.5	7.0	7.5	5.0	6.5	8.5	7.5	8.0
5	12.5	10.5	11.5	6.5	5.0	6.0	5.0	3.5	4.0	7.5	7.0	7.5
6	12.0	11.0	11.5	6.0	4.0	5.0	5.5	3.0	4.0	7.5	6.0	7.0
7	11.5	10.0	11.0	5.0	3.5	4.0	6.5	5.5	6.0	7.5	6.0	6.5
8	11.0	8.0	9.5	4.5	3.0	3.5	7.0	6.5	7.0	8.0	7.0	7.5
9	11.0	8.0	9.5	6.0	3.0	4.5	8.0	6.5	7.5	8.0	7.5	7.5
10	11.5	9.0	10.0	6.0	4.5	5.0	8.5	7.5	8.0	7.5	6.5	7.0
11	11.5	9.5	10.5	6.0	3.5	5.0	8.0	7.0	7.5	8.0	7.5	8.0
12	12.0	11.0	11.5	6.5	6.0	6.5	7.5	6.5	7.0	8.5	7.5	8.0
13	12.0	10.5	11.0	7.0	4.5	6.0	8.0	6.5	7.0	8.0	7.0	7.5
14	11.0	10.0	10.5	4.5	3.0	4.0	8.0	7.0	7.5	7.5	6.0	7.0
15	11.5	10.5	11.0	5.5	3.0	4.0	7.5	5.5	7.0	8.5	7.0	7.5
16	11.0	9.5	10.0	6.0	4.5	5.0	5.5	4.5	5.0	7.0	5.5	6.5
17	10.0	8.0	9.0	6.5	5.0	6.0	4.5	3.0	3.5	6.5	5.0	5.5
18	9.0	6.5	8.0	6.0	4.5	5.0	3.5	2.5	3.0	5.5	4.5	5.0
19	10.0	7.5	8.5	4.5	3.0	3.5	3.0	2.0	2.5	5.5	4.0	4.5
20	9.5	7.0	8.0	4.0	2.5	3.0	3.0	2.0	2.5	5.5	4.0	5.0
21	11.0	9.0	9.5	5.0	3.0	4.0	3.0	2.0	2.5	7.5	5.0	6.5
22	10.0	8.0	9.0	4.0	2.5	3.5	2.5	1.5	2.0	8.5	7.0	8.0
23	10.5	8.0	9.0	3.0	.5	2.0	1.5	.5	1.5	8.5	7.0	8.0
24	10.5	8.0	9.0	.5	.0	.0	2.5	1.5	2.0	7.5	5.5	7.0
25	8.5	6.0	7.5	.5	.0	.0	3.0	1.5	2.0	6.0	4.5	5.0
26	9.0	6.0	7.5	1.5	.0	.5	3.5	2.5	3.0	5.0	4.0	4.5
27	9.5	6.5	8.0	2.5	1.5	2.0	3.5	2.5	3.0	5.0	4.5	5.0
28	10.5	8.0	9.0	3.5	2.0	2.5	4.0	2.5	3.0	4.5	3.0	4.0
29	9.5	7.5	8.5	4.5	3.0	4.0	4.0	3.0	3.5	4.5	3.0	3.5
30	9.0	7.0	8.0	5.5	4.0	4.5	5.5	3.5	4.5	4.5	3.0	3.5
31	10.0	7.5	9.0	---	---	---	6.5	5.5	6.0	4.0	2.0	3.0
MONTH	13.0	6.0	9.5	9.0	.0	4.5	8.5	.5	5.0	8.5	2.0	6.5

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	4.0	2.5	3.5	10.5	8.0	9.0	10.5	8.0	9.0	11.0	7.0	9.0
2	4.0	2.5	3.0	9.0	8.5	8.5	10.5	7.0	8.5	10.0	8.5	9.5
3	4.0	2.0	3.0	10.0	8.5	9.0	9.0	7.5	8.5	10.5	8.0	9.5
4	3.5	2.0	3.0	9.0	7.5	8.5	10.0	6.5	8.0	12.0	10.0	11.0
5	3.5	1.5	2.5	8.0	6.0	7.0	8.0	5.5	7.0	14.5	8.5	11.5
6	4.0	2.0	3.0	8.0	5.0	6.0	8.0	7.0	7.5	15.0	9.5	12.0
7	5.0	3.0	4.0	8.5	5.0	6.5	9.0	7.0	8.0	15.0	10.5	13.0
8	3.0	1.0	2.0	8.5	5.0	7.0	8.5	7.5	8.0	14.5	11.5	13.0
9	4.5	3.0	3.5	9.5	6.0	7.5	9.0	7.5	8.0	14.0	10.5	12.0
10	5.0	3.5	4.0	9.0	7.5	8.5	9.0	7.5	8.0	14.5	10.0	12.0
11	5.5	3.5	4.5	9.0	6.0	7.5	11.5	6.5	8.5	14.0	11.5	12.5
12	5.5	3.5	4.5	9.5	5.5	7.0	9.5	7.5	8.5	13.0	11.0	12.0
13	5.0	4.0	5.0	10.0	6.5	8.0	9.0	6.5	7.5	12.0	8.5	10.5
14	6.5	4.0	5.0	10.5	6.5	8.0	11.0	6.5	8.5	11.5	9.0	10.5
15	7.0	5.5	6.5	9.0	6.0	8.0	12.5	6.5	9.0	11.0	10.0	10.5
16	7.0	6.0	6.5	8.5	7.0	7.5	13.0	8.5	10.5	11.0	9.5	10.0
17	7.0	6.0	6.5	8.0	6.5	7.0	14.0	9.0	11.0	10.5	9.5	10.0
18	6.0	5.0	5.5	7.5	5.5	6.5	14.0	9.5	11.5	11.5	9.5	10.5
19	7.0	4.5	5.5	7.5	5.5	6.0	11.5	10.0	11.0	11.0	10.0	10.5
20	6.5	5.0	5.5	7.5	5.5	6.5	13.0	7.5	10.5	11.0	10.0	10.5
21	6.0	5.0	5.5	6.5	5.0	6.0	12.0	9.5	10.5	12.0	10.0	11.0
22	6.5	5.0	5.5	6.5	5.0	5.5	11.5	7.5	9.5	13.5	10.0	11.5
23	6.5	6.0	6.5	7.5	5.0	6.0	10.5	7.5	9.0	14.0	10.0	12.0
24	7.5	6.5	7.0	9.5	6.0	7.5	11.0	8.0	9.5	15.0	11.0	13.0
25	8.0	7.5	7.5	10.0	5.0	7.0	10.5	8.5	9.5	14.5	12.0	13.0
26	8.5	7.5	8.0	10.5	5.0	7.5	10.0	8.0	9.0	13.0	10.5	11.5
27	8.5	7.5	8.0	11.5	5.5	8.0	10.5	8.5	9.5	12.0	9.0	10.5
28	9.5	8.0	9.0	12.0	6.5	9.0	12.0	8.5	10.0	10.5	9.5	10.0
29	---	---	---	11.5	6.5	9.0	10.5	9.0	10.0	11.0	10.0	10.5
30	---	---	---	10.0	8.5	9.0	11.0	8.0	9.5	13.0	9.0	11.0
31	---	---	---	8.5	8.0	8.5	---	---	---	12.0	11.0	11.5
MONTH	9.5	1.0	5.0	12.0	5.0	7.5	14.0	5.5	9.0	15.0	7.0	11.0

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

## WILLAMETTE RIVER BASIN

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14201300 ZOLLNER CREEK NEAR MOUNT ANGEL, OR

LOCATION.--Lat 45°06'02", long 122°49'14", in SW 1/4 SW 1/4 sec. 28, T.5 S., R.1 W., Marion County, Hydrologic Unit 17090009, downstream on left bank corner of Monitor-McKee Road bridge, 2.3 mi north-northwest of Mount Angel.

DRAINAGE AREA.--15.0 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1993 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 120 ft above sea level, from topographic map.

REMARKS.--Records poor. Flows subject to backwater from the Pudding River (14202000). Many diversions for irrigation upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 509 ft<sup>3</sup>/s Feb. 24, 1994, gage height 12.58 ft; maximum gage height, 14.19 ft, Feb. 26, (backwater from Pudding River); minimum daily discharge, 0.04 ft<sup>3</sup>/s Sept. 21, 22, 1994.

EXTREMES FOR CURRENT YEAR.--Maximum discharge 509 ft<sup>3</sup>/s Feb. 24, gage height 12.58 ft; maximum gage height, 14.19 ft, Feb. 26, (backwater from Pudding River); minimum daily discharge, 0.04 ft<sup>3</sup>/s Sept. 21, 22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.58	.84	15	67	8.3	e75	6.8	4.0	1.8	.15	.34	.13
2	.53	.98	18	116	8.1	e60	6.2	3.7	1.9	.14	.38	.16
3		1.1	5.1	e300	7.8	e65	6.3	3.5	2.8	.12	.28	.22
4	.40	1.3	8.6	e200	7.4	e42	5.9	4.4	2.4	.18	.30	.45
5	.39	2.2	6.8	e210	7.1	e28	6.0	4.1	3.2	.47	.50	.40
6	4.5	2.2	4.4	e130	7.0	e17	6.8	3.9	3.5	.18	.46	.33
7	13	2.1	5.5	e65	7.1	e11	9.3	1.7	5.5	.22	.63	.36
8	.89	1.3	65	e34	6.8	e11	14	1.3	5.1	.15	.54	.96
9	.16	1.2	141	e24	6.9	10	36	1.2	2.8	.12	.42	.46
10	.12	2.0	107	e30	6.6	10	e65	1.3	3.4	.11	.43	.24
11	.12	1.9	244	e28	6.4	8.3	e28	1.3	2.6	e.08	.55	.17
12	.13	2.0	187	e26	6.1	7.7	e22	1.2	2.7	.12	.59	.17
13	.22	2.6	103	e24	7.7	7.4	18	1.1	3.6	.15	.46	.29
14	2.4	2.5	40	24	12	7.2	13	1.1	5.1	.15	.39	.36
15	6.8	2.6	28	18	13	7.1	9.9	1.4	7.2	.13	.35	.28
16	3.7	3.4	21	14	12	6.9	8.4	2.3	7.9	.15	.27	.35
17	1.4	2.5	16	12	33	6.5	7.6	2.5	7.0	.20	.30	.33
18	3.4	2.2	9.6	11	95	7.1	6.9	2.1	7.5	.67	.13	.18
19	8.5	1.8	8.4	10	58	6.8	6.5	2.6	7.2	.69	.12	.16
20	.34	1.5	7.7	e9.0	37	6.7	6.0	3.0	8.2	.48	.11	.12
21	.11	1.7	7.2	e8.0	40	13	5.8	2.2	6.8	.25	.10	.04
22	.11	3.6	6.6	10	60	11	5.5	1.7	6.9	.17	.09	.04
23	.12	2.8	6.3	48	62	9.9	5.2	1.8	4.8	.15	.10	.13
24	.31	1.6	6.1	55	e320	9.0	4.9	1.4	5.5	.19	.09	.20
25	.35	1.4	5.9	35	e300	7.8	4.9	1.1	8.0	.20	.07	.25
26	.41	1.1	5.7	24	e180	7.3	4.5	1.1	7.8	.23	.09	.13
27	.33	1.3	5.3	18	e130	7.0	4.3	1.2	5.6	.25	.11	.17
28	.38	1.5	4.8	14	e110	6.9	4.2	1.4	4.7	.20	.07	.10
29	.66	1.6	4.5	11	---	6.4	4.4	1.4	.91	.33	.07	.68
30	.47	1.9	4.8	9.9	---	6.8	4.2	1.3	.14	.34	.07	.96
31	.43	---	6.0	8.8	---	8.7	---	1.4	---	.39	.12	---
TOTAL	51.70	56.72	1104.3	1593.7	1555.3	494.5	336.5	63.7	142.55	7.36	8.53	8.82
MEAN	1.67	1.89	35.6	51.4	55.5	16.0	11.2	2.05	4.75	.24	.28	.29
MAX	13	3.6	244	300	320	75	65	4.4	8.2	.69	.63	.96
MIN	.11	.84	4.4	8.0	6.1	6.4	4.2	1.1	.14	.08	.07	.04
AC-FT	103	113	2190	3160	3080	981	667	126	283	15	17	17

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1994 - 1994, BY WATER YEAR (WY)

	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994
MEAN	1.67	1.89	35.6	51.4	55.5	16.0	11.2	2.05	4.75	.24	.28	.29
MAX	1.67	1.89	35.6	51.4	55.5	16.0	11.2	2.05	4.75	.24	.28	.29
(WY)	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994
MIN	1.67	1.89	35.6	51.4	55.5	16.0	11.2	2.05	4.75	.24	.28	.29
(WY)	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994

## SUMMARY STATISTICS

## FOR 1994 WATER YEAR

ANNUAL TOTAL	5423.68
ANNUAL MEAN	14.9
HIGHEST DAILY MEAN	320 Feb 24
LOWEST DAILY MEAN	.04 Sep 21
ANNUAL SEVEN-DAY MINIMUM	.08 Aug 24
ANNUAL RUNOFF (AC-FT)	10760
10 PERCENT EXCEEDS	31
50 PERCENT EXCEEDS	3.4
90 PERCENT EXCEEDS	.15

e Estimated

## WILLAMETTE RIVER BASIN

14201300 ZOLLNER CREEK NEAR MOUNT ANGEL, OR--Continued

## WATER-QUALITY RECORDS

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: July 1993 to current year.

WATER TEMPERATURE: July 1993 to current year.

## INSTRUMENTATION.--Water-quality monitor.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum, 610 microsiemens Oct. 23, 1993; minimum recorded, 265 microsiemens Apr. 6, 1994.

WATER TEMPERATURE: Maximum, 24.5°C July 21-23, 1994; minimum, 0.5°C Nov. 25, 26, 1993.

## EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum, 610 microsiemens Oct. 23; minimum recorded, 265 microsiemens Apr. 6.

WATER TEMPERATURE: Maximum, 24.5°C July 21-23; minimum, 0.5°C Nov. 25, 26.

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER				NOVEMBER			DECEMBER			JANUARY		
1	409	391	402	381	356	368	336	277	312	367	280	327
2	392	378	386	378	340	357	345	314	327	376	333	361
3	378	372	375	355	333	347	385	345	366	345	280	302
4	377	369	372	343	327	333	440	365	403	383	285	327
5	388	377	382	379	331	357	458	425	448	314	273	286
6	448	378	389	386	379	383	441	413	423	322	300	313
7	589	428	540	385	380	383	416	337	393	322	318	320
8	584	567	575	386	382	384	401	330	370	332	320	325
9	570	545	557	384	371	378	420	335	401	338	331	335
10	546	512	529	375	358	366	423	366	403	344	337	340
11	513	498	504	359	350	354	438	348	385	343	338	340
12	498	459	481	356	350	353	461	437	445	348	337	342
13	464	446	458	358	346	353	456	443	450	343	335	339
14	446	282	389	352	347	350	465	444	458	349	340	344
15	395	319	376	359	346	349	470	450	460	351	346	348
16	435	369	402	366	349	356	474	466	470	347	344	345
17	477	372	445	380	366	371	469	454	460	392	344	366
18	485	451	478	371	365	368	458	443	451	400	392	396
19	464	411	424	370	366	369	443	424	438	406	398	402
20	412	404	409	367	354	359	433	373	414	424	388	400
21	418	398	406	358	347	356	373	362	368	480	407	442
22	549	396	434	350	314	333	367	361	364	480	406	447
23	610	526	577	368	332	352	362	348	357	414	322	378
24	533	442	472	366	342	351	355	349	352	387	338	366
25	450	411	435	346	342	343	355	347	350	426	358	390
26	412	388	400	350	345	348	354	347	352	415	367	384
27	391	383	388	348	315	335	360	354	357	421	358	387
28	383	367	374	336	327	333	358	354	357	361	351	356
29	449	363	386	329	315	323	357	351	354	353	347	350
30	455	398	428	329	300	322	353	317	347	349	343	346
31	398	357	376	---	---	---	367	330	344	345	340	343
MONTH	610	282	437	386	300	354	474	277	393	480	273	356

## WILLAMETTE RIVER BASIN

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14201300 ZOLLNER CREEK NEAR MOUNT ANGEL, OR--Continued

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	343	338	341	---	---	---	315	307	312	344	335	339
2	341	335	338	---	---	---	308	280	295	377	341	364
3	338	335	337	---	---	---	286	277	282	361	323	350
4	338	333	336	---	---	---	295	281	287	323	309	316
5	335	329	333	---	---	---	306	282	297	335	315	321
6	330	325	328	---	---	---	290	265	280	359	335	349
7	329	325	327	---	---	---	295	280	286	343	336	339
8	331	323	328	---	---	---	292	280	285	345	337	340
9	325	309	318	---	---	---	290	278	286	340	329	335
10	322	314	319	---	---	---	292	274	281	362	337	346
11	324	317	320	---	---	---	314	287	303	372	361	366
12	324	314	319	---	---	---	316	303	312	372	361	366
13	315	281	303	---	---	---	306	291	299	389	364	371
14	359	303	346	---	---	---	317	300	308	391	374	383
15	349	315	325	---	---	---	319	301	308	385	359	379
16	344	330	340	---	---	---	322	301	308	370	341	359
17	346	307	331	---	---	---	314	301	306	360	319	344
18	334	303	318	---	---	---	325	302	314	352	338	345
19	338	327	333	---	---	---	331	319	324	350	303	340
20	348	332	339	---	---	---	339	320	327	343	314	335
21	352	336	343	---	---	---	340	319	330	358	342	353
22	346	339	342	---	---	---	342	324	332	365	346	355
23	341	330	337	---	---	---	340	321	330	395	363	382
24	---	---	---	310	300	306	347	311	324	410	380	390
25	---	---	---	317	309	312	339	314	323	410	380	391
26	---	---	---	314	308	311	343	314	331	396	381	387
27	---	---	---	319	308	313	331	311	319	388	369	377
28	---	---	---	326	315	318	341	325	331	387	349	370
29	---	---	---	328	316	323	377	327	352	366	341	352
30	---	---	---	328	291	315	360	325	341	364	352	358
31	---	---	---	317	287	306	---	---	---	364	352	360
MONTH	---	---	---	---	---	---	377	265	310	410	303	357
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE			JULY			AUGUST			SEPTEMBER			
1	365	334	356	---	---	---	336	328	331	330	322	326
2	371	363	367	---	---	---	344	333	337	334	327	330
3	379	371	373	---	---	---	366	328	344	341	318	325
4	383	373	379	---	---	---	352	347	349	323	313	319
5	384	375	379	---	---	---	357	350	353	436	322	372
6	387	354	374	---	---	---	356	347	351	485	436	471
7	399	360	379	---	---	---	372	350	360	475	409	450
8	416	384	404	---	---	---	377	369	371	409	299	348
9	419	413	416	---	---	---	371	368	369	347	312	330
10	420	403	413	---	---	---	371	366	369	353	346	350
11	426	406	414	---	---	---	378	368	373	364	348	357
12	424	409	415	---	---	---	387	375	380	373	358	361
13	417	396	407	---	---	---	403	383	389	397	361	375
14	399	372	383	---	---	---	444	400	418	416	376	400
15	379	360	374	---	---	---	471	444	457	430	408	421
16	388	375	381	340	329	334	470	448	464	421	400	409
17	394	386	389	337	329	333	450	424	439	429	410	425
18	390	367	377	339	330	335	425	411	418	429	421	424
19	389	373	380	375	335	353	419	405	411	449	428	439
20	405	384	392	385	375	383	410	396	402	449	441	445
21	406	400	403	384	375	380	403	393	398	448	432	441
22	412	403	407	380	368	373	398	386	392	448	434	443
23	445	411	429	372	360	366	394	383	388	448	415	431
24	472	429	454	367	359	362	390	377	383	417	391	402
25	493	468	475	361	352	356	384	370	377	447	404	427
26	513	490	501	354	344	349	379	364	372	483	447	467
27	509	496	504	348	331	339	371	357	364	484	461	473
28	501	490	496	333	324	328	363	350	355	463	455	459
29	---	---	---	327	319	322	356	343	349	457	369	421
30	---	---	---	324	319	321	352	337	344	442	409	427
31	---	---	---	332	321	325	341	326	334	---	---	---
MONTH	---	---	---	---	---	---	471	326	379	485	299	402



## WILLAMETTE RIVER BASIN

14201300 ZOLLNER CREEK NEAR MOUNT ANGEL, OR--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	15.0	12.5	13.5	9.5	8.0	8.5	8.0	5.5	7.0	7.5	6.0	7.0
2	14.5	12.0	13.5	8.0	7.5	7.5	7.5	7.0	7.5	8.5	7.5	8.0
3	14.5	12.0	13.5	9.0	7.5	8.5	9.0	7.5	8.5	9.5	8.5	9.0
4	14.5	12.5	13.5	9.0	8.0	8.5	9.0	7.5	8.5	9.5	8.5	9.0
5	14.0	12.5	13.5	8.0	7.0	7.5	7.5	5.5	6.5	8.5	7.5	8.0
6	13.5	13.0	13.0	7.0	6.0	6.5	6.0	5.5	5.5	8.0	7.5	8.0
7	15.0	13.5	14.0	6.0	5.0	5.5	7.5	6.0	6.5	7.5	6.5	7.0
8	14.5	11.5	13.0	5.0	4.0	4.5	8.0	7.5	7.5	8.5	7.5	8.0
9	14.0	11.5	12.5	4.5	4.0	4.0	9.0	7.5	8.0	9.0	8.5	8.5
10	13.5	11.5	12.5	5.5	4.5	5.0	9.5	9.0	9.0	9.0	8.0	8.5
11	13.0	11.5	12.0	5.0	4.0	4.5	9.5	8.5	9.0	9.0	8.5	8.5
12	13.5	12.0	13.0	6.0	4.5	5.5	8.5	8.5	8.5	9.0	9.0	9.0
13	14.0	12.5	13.5	7.0	6.0	6.5	8.5	8.0	8.5	9.5	9.0	9.0
14	13.5	13.0	13.0	6.0	4.5	5.0	9.0	8.5	9.0	9.5	9.0	9.5
15	13.5	13.0	13.5	5.0	4.0	4.5	9.0	8.5	9.0	9.5	8.5	9.0
16	13.0	12.5	12.5	6.5	5.0	5.5	8.5	7.5	7.5	8.5	7.5	8.0
17	13.0	11.5	12.0	7.0	6.0	6.5	7.5	6.0	7.0	7.5	6.5	7.0
18	12.0	11.0	11.5	6.5	5.5	6.0	6.0	4.5	5.0	7.0	6.0	6.5
19	13.0	11.0	12.0	6.5	5.5	6.0	4.5	4.0	4.0	6.5	6.0	6.0
20	12.5	10.5	11.5	6.0	5.5	6.0	4.0	3.0	3.5	6.0	5.5	6.0
21	12.5	11.0	11.5	6.0	5.0	5.5	4.0	3.5	3.5	6.5	5.5	6.0
22	12.5	10.5	11.5	5.5	5.0	5.5	3.5	3.0	3.0	7.5	6.5	7.0
23	11.5	10.0	11.0	5.0	3.5	4.5	3.5	3.0	3.0	8.5	7.5	8.0
24	12.0	10.5	11.0	3.5	1.5	2.0	3.5	3.0	3.0	8.5	8.0	8.5
25	11.0	9.5	10.0	1.5	.5	1.0	3.0	2.5	3.0	8.0	7.0	7.5
26	10.5	9.0	9.5	1.0	.5	1.0	3.0	2.5	2.5	7.5	7.0	7.0
27	10.0	8.5	9.5	2.0	1.0	1.5	3.5	3.0	3.0	7.0	6.5	7.0
28	10.0	8.5	9.0	2.5	1.5	2.5	3.5	2.0	2.5	7.0	6.0	6.5
29	10.5	9.0	9.5	4.0	2.5	3.5	3.5	2.5	3.0	6.0	5.0	5.5
30	10.0	9.0	9.5	5.5	4.0	4.5	4.5	3.0	3.5	6.0	4.5	5.0
31	10.0	9.0	9.5	---	---	---	6.0	4.5	5.5	5.0	4.0	4.5
MONTH	15.0	8.5	12.0	9.5	.5	5.0	9.5	2.0	6.0	9.5	4.0	7.5

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





## WILLAMETTE RIVER BASIN

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14202000 PUDDING RIVER AT AURORA, OR

## WATER-QUALITY RECORDS

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: August 1993 to current year.

WATER TEMPERATURE: August 1993 to current year.

## INSTRUMENTATION.--Water-quality monitor.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum, 270 microsiemens Sept. 5, 6, 1994; minimum, 53 microsiemens June 16, 17, 1994.

WATER TEMPERATURE: Maximum, 28.0°C July 22, 23, 1994; minimum, 0.5°C Nov. 26, 27, 1993.

## EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum, 270 microsiemens Sept. 5, 6; minimum, 53 microsiemens June 16, 17.

WATER TEMPERATURE: Maximum, 28.0°C July 22, 23; minimum, 0.5°C Nov. 26, 27.

## SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	147	137	143	186	180	182	161	144	154	114	105	109
2	161	145	152	193	184	189	158	56	110	125	104	114
3	167	157	162	189	184	187	89	56	70	109	99	105
4	172	166	169	190	180	186	94	89	91	99	76	85
5	177	168	172	190	182	187	90	78	87	83	75	79
6	186	175	180	191	178	184	83	77	80	79	69	74
7	185	175	179	186	178	182	88	83	86	73	69	70
8	182	177	180	185	175	180	92	84	88	87	73	79
9	187	177	182	182	176	178	101	86	92	89	87	89
10	200	181	187	185	175	180	98	90	93	87	76	81
11	227	200	217	186	179	183	120	96	109	83	76	79
12	217	190	199	188	181	183	119	99	111	81	75	78
13	190	182	186	193	182	188	99	92	95	86	79	83
14	185	178	182	191	184	188	101	97	99	91	85	88
15	184	175	180	192	184	189	105	100	102	92	88	90
16	183	170	177	192	184	189	109	104	107	89	84	87
17	175	167	170	189	181	186	108	101	104	87	85	86
18	176	157	169	189	183	186	103	97	101	88	87	88
19	158	154	156	190	184	188	98	95	97	91	88	89
20	157	152	155	190	181	183	97	94	96	92	90	91
21	177	152	159	184	176	180	96	94	95	92	91	91
22	181	172	177	184	173	177	96	94	95	93	91	92
23	174	167	170	176	166	172	98	95	96	102	92	97
24	184	172	178	178	171	175	98	95	97	108	102	107
25	187	177	182	180	166	175	102	96	100	109	107	108
26	188	178	183	166	161	162	103	100	102	109	105	107
27	198	179	187	164	157	161	106	101	103	106	103	105
28	180	175	177	165	159	163	114	101	107	104	103	103
29	186	178	182	173	162	167	111	102	104	104	101	103
30	181	167	174	167	159	164	107	102	105	103	101	102
31	182	170	179	---	---	---	110	103	107	102	100	101
MONTH	227	137	176	193	157	180	161	56	99	125	69	92

## WILLAMETTE RIVER BASIN

14202000 PUDDING RIVER AT AURORA, OR--Continued

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	102	100	101	72	67	68	84	70	76	96	90	94
2	103	101	102	80	72	76	72	69	71	91	89	90
3	103	101	103	83	76	81	74	72	73	94	89	93
4	104	102	103	76	72	73	75	73	75	97	93	95
5	104	102	103	77	72	74	79	75	77	96	90	94
6	105	102	104	84	77	81	85	79	80	91	83	86
7	105	102	103	89	84	86	86	75	81	91	83	88
8	105	103	105	89	86	89	75	72	73	96	90	93
9	105	104	105	86	84	85	72	---	---	97	91	94
10	106	103	105	87	85	86	---	---	---	99	92	95
11	104	98	102	88	84	86	---	---	---	100	95	98
12	101	98	100	87	84	86	---	---	---	100	94	97
13	103	100	102	90	87	89	---	---	---	103	97	100
14	110	102	106	92	90	91	---	---	---	104	100	102
15	110	96	103	94	91	92	---	---	---	107	101	104
16	101	96	99	95	93	94	77	---	---	106	101	104
17	103	98	100	95	88	92	78	76	77	104	98	100
18	126	103	114	89	84	86	81	78	79	101	94	96
19	126	107	115	87	71	80	82	80	81	---	---	---
20	107	100	103	72	68	70	83	81	82	---	---	---
21	100	97	99	80	72	77	85	82	84	---	---	---
22	105	97	100	80	70	74	87	85	86	---	---	---
23	105	102	103	74	72	73	88	86	87	---	---	---
24	105	76	97	77	74	75	90	87	89	---	---	---
25	85	65	75	77	75	76	91	85	88	---	---	---
26	65	60	62	78	76	77	87	85	86	---	---	---
27	64	61	62	79	77	78	88	86	88	---	---	---
28	67	64	66	79	77	78	92	87	90	---	---	---
29	---	---	---	80	75	78	94	90	93	---	---	---
30	---	---	---	77	75	76	95	93	94	---	---	---
31	---	---	---	84	77	81	---	---	---	---	---	---
MONTH	126	60	98	95	67	81	---	---	---	---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE			JULY			AUGUST			SEPTEMBER			
1	91	85	88	97	93	96	217	210	213	265	260	262
2	94	88	91	100	95	98	217	213	215	265	260	263
3	94	89	91	104	95	100	216	212	214	265	260	262
4	95	89	92	112	96	106	218	214	216	262	257	260
5	98	94	96	103	95	100	218	215	217	270	260	265
6	96	92	94	104	94	99	219	215	217	270	253	260
7	93	86	91	105	94	100	218	211	215	260	248	252
8	86	67	78	110	102	106	212	206	208	269	242	260
9	72	67	69	111	103	107	212	206	209	242	229	237
10	76	70	74	118	110	114	221	212	217	230	208	217
11	79	74	77	120	111	116	227	217	223	212	203	209
12	82	76	79	123	112	117	240	226	232	205	194	201
13	85	77	81	125	116	122	241	237	240	195	182	188
14	85	79	82	140	120	128	239	231	235	182	172	177
15	80	64	74	148	136	139	233	228	231	177	163	168
16	64	53	59	151	144	148	232	226	229	168	159	165
17	61	53	58	150	146	148	227	218	223	172	159	167
18	71	59	62	158	149	153	220	214	217	176	167	171
19	64	60	63	170	158	164	215	211	213	181	173	176
20	66	60	63	176	170	173	214	210	212	186	180	182
21	70	63	67	183	176	180	218	212	215	189	184	187
22	73	67	70	179	175	177	230	218	224	199	187	194
23	77	71	74	180	175	178	239	229	234	205	196	201
24	80	76	78	185	178	181	239	235	238	204	197	200
25	85	77	80	185	178	181	249	236	243	208	201	204
26	83	79	82	197	185	191	252	246	250	207	202	205
27	83	80	81	201	196	199	250	246	248	209	203	207
28	84	80	82	201	194	198	255	249	252	221	208	215
29	85	82	83	202	192	197	257	252	255	224	219	222
30	93	85	89	209	201	204	268	257	263	227	223	225
31	---	---	---	212	208	210	267	263	266	---	---	---
MONTH	98	53	78	212	93	146	268	206	229	270	159	213



## WILLAMETTE RIVER BASIN

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14202000 PUDDING RIVER AT AURORA, OR--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	17.0	16.0	17.0	10.5	9.5	10.0	6.0	4.0	5.0	6.5	4.5	5.0
2	17.0	16.0	16.5	10.0	9.0	9.5	7.0	6.0	6.5	7.5	6.5	7.0
3	17.0	16.0	17.0	9.5	9.0	9.5	7.5	6.5	7.0	8.0	7.0	7.5
4	17.0	16.0	16.5	10.0	9.0	9.5	8.0	7.0	7.5	9.0	8.0	8.5
5	17.0	15.5	16.0	9.5	8.5	9.0	7.5	6.5	7.0	9.0	8.0	8.5
6	15.5	15.0	15.5	8.5	7.5	8.0	6.5	5.5	6.0	8.0	7.5	7.5
7	15.5	15.0	15.0	8.0	7.0	7.0	6.0	5.5	5.5	7.5	7.0	7.0
8	15.0	14.0	14.5	7.0	6.0	6.5	7.0	6.0	6.0	7.5	7.0	7.0
9	15.0	14.0	14.5	6.0	5.5	6.0	7.5	6.5	7.0	8.0	7.0	7.5
10	15.0	14.0	14.5	6.0	5.5	6.0	8.0	7.0	7.5	8.0	7.5	8.0
11	14.5	13.5	14.0	5.5	5.0	5.5	8.5	8.0	8.0	8.0	7.5	7.5
12	14.5	14.0	14.5	6.0	5.5	5.5	8.0	7.5	8.0	8.0	8.0	8.0
13	15.0	14.0	15.0	6.5	5.5	6.0	7.5	7.0	7.5	8.5	8.0	8.5
14	15.0	14.5	15.0	6.0	5.5	5.5	7.5	7.0	7.5	8.5	8.5	8.5
15	15.0	14.5	15.0	5.5	4.5	5.0	8.0	7.5	7.5	9.0	8.0	8.5
16	14.5	14.0	14.0	5.5	5.0	5.5	8.0	7.0	7.5	8.5	8.0	8.0
17	14.0	13.0	13.5	6.0	5.5	6.0	7.0	6.0	6.5	8.0	6.5	7.0
18	13.0	12.5	13.0	6.0	5.5	6.0	6.0	4.5	5.5	6.5	6.0	6.5
19	13.0	12.5	13.0	6.5	6.0	6.0	5.0	3.5	4.0	6.0	5.5	6.0
20	13.0	12.0	12.5	6.0	6.0	6.0	3.5	3.0	3.5	5.5	5.0	5.5
21	13.0	12.5	12.5	6.0	5.5	6.0	3.5	3.0	3.0	5.5	5.0	5.5
22	13.0	12.0	12.5	6.0	5.0	5.5	3.0	2.5	3.0	6.0	5.5	5.5
23	12.5	11.5	12.0	5.0	3.5	4.5	3.0	2.5	3.0	7.5	6.0	6.5
24	12.5	11.5	12.0	3.5	2.0	3.0	3.0	2.5	2.5	8.0	7.5	7.5
25	12.0	11.0	11.5	2.0	1.0	1.5	2.5	2.5	2.5	7.5	7.0	7.5
26	12.0	11.0	11.5	1.0	.5	1.0	2.5	2.5	2.5	7.0	6.0	6.5
27	11.5	10.5	11.0	2.0	.5	1.0	2.5	2.0	2.5	6.0	6.0	6.0
28	11.5	10.5	11.0	2.0	1.5	1.5	2.5	2.0	2.0	6.0	5.5	5.5
29	11.5	10.5	11.0	3.0	2.0	2.5	3.0	2.5	2.5	5.5	5.0	5.5
30	11.5	10.0	10.5	4.0	2.5	3.0	3.5	2.5	3.0	5.0	4.0	4.5
31	11.5	10.5	11.0	---	---	---	4.5	3.5	4.0	4.5	4.0	4.0
MONTH	17.0	10.0	13.5	10.5	.5	5.5	8.5	2.0	5.0	9.0	4.0	7.0

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



## WILLAMETTE RIVER BASIN

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14202965 HENRY HAGG LAKE NEAR GASTON, OR

LOCATION.--Lat 45°28'25", long 123°11'51", in SE 1/4 NE 1/4 sec.20, T.1 S., R.4 W., Washington County, Hydrologic Unit 17090010, at left end of Scoggins Dam on Scoggins Creek, 3.8 mi northwest of Gaston, and at mile 4.9.

DRAINAGE AREA.--38.7 mi<sup>2</sup>.

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

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

REMARKS.--Reservoir is formed by earthfill dam with gated concrete spillway and a gated outlet tunnel. Storage began in January 1975. Total capacity at elevation 305.7 ft, maximum water-surface elevation, is 63,360 acre-ft, of which 56,160 acre-ft is active storage above elevation 239.3 ft, proposed minimum pool. Reservoir is used for irrigation, flood control, and recreation. Figures given herein represent active storage.

COOPERATION.--Daily elevations at 0800 and capacity table furnished by Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 53,730 acre-ft Apr. 30, 1988, elevation, 303.58 ft; minimum contents observed since first filling, 808 acre-ft Oct. 31, 1975, elevation, 237.21 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents observed, 53,710 acre-ft May 3, elevation, 303.56 ft; minimum contents observed, 21,890 acre-ft Nov. 30, elevation, 270.80 ft.

## MONTHEND ELEVATION AND CONTENTS AT 0800, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	283.89	33,400	-
Oct. 31.....	277.24	27,350	-6,050
Nov. 30.....	270.80	21,890	-5,460
Dec. 31.....	278.74	28,680	+6,790
CAL YR 1993.....	-	-	+4,530
Jan. 31.....	285.91	35,320	+6,640
Feb. 28.....	297.05	46,560	+11,240
Mar. 31.....	301.38	51,260	+4,700
Apr. 30.....	303.46	53,590	+2,330
May 31.....	303.47	53,600	+10
June 30.....	301.83	51,760	-1,840
July 31.....	290.72	40,030	-11,730
Aug. 31.....	279.42	29,290	-10,740
Sept. 30.....	270.99	22,040	-7,250
WTR YR 1994.....	-	-	-11,360

## WILLAMETTE RIVER BASIN

14202980 SCOGGINS CREEK BELOW HENRY HAGG LAKE, NEAR GASTON, OR

LOCATION.--Lat 45°28'10", long 123°11'56", in SE 1/4 NE 1/4 sec.20, T.1 S., R.4 W., Washington County, Hydrologic Unit 17090010, on left bank 600 ft downstream from Scoggins Dam, 800 ft upstream from small left bank tributary, 3.7 mi northwest of Gaston, and at mile 4.8.

DRAINAGE AREA.--38.8 mi<sup>2</sup>.

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

GAGE.--Water-stage recorder. Datum of gage is 187.48 ft above sea level.

REMARKS.--No estimated daily discharges. Records good. Flow completely regulated by Henry Hagg Lake since January 1975. Discharge not adjusted for storage or release from Henry Hagg Lake as evaporation from reservoir at times exceeds natural flow.

AVERAGE DISCHARGE.--19 years, 98.3 ft<sup>3</sup>/s, 71,250 acre-ft.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,050 ft<sup>3</sup>/s Apr. 5, 1991, gage height, 18.01 ft; minimum discharge, 1.4 ft<sup>3</sup>/s Nov. 16, 1978.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 264 ft<sup>3</sup>/s Mar. 4, gage height, 6.31 ft; minimum discharge, 7.4 ft<sup>3</sup>/s Dec. 1, gage height, 3.26 ft.

## DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

## DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	135	128	34	14	11	13	30	21	14	165	199	159
2	119	136	13	13	11	14	11	29	13	177	199	159
3	119	136	13	13	11	86	11	62	21	176	209	160
4	119	136	13	13	11	210	11	213	27	176	214	160
5	130	136	13	14	11	257	11	88	28	153	204	160
6	138	126	13	68	12	256	72	25	19	138	199	152
7	138	120	13	114	12	228	100	11	31	156	199	143
8	137	119	13	114	12	209	133	10	32	173	188	129
9	137	119	13	114	12	155	160	30	18	179	179	118
10	137	119	54	206	12	117	160	43	26	179	187	118
11	116	119	48	261	12	90	160	34	42	189	193	118
12	102	95	13	260	12	52	159	22	42	205	193	92
13	102	78	13	259	12	51	105	15	29	210	192	84
14	101	77	52	259	12	52	75	15	15	219	192	92
15	102	77	85	257	12	52	56	15	11	213	192	104
16	101	77	85	257	12	51	46	20	11	205	185	127
17	102	77	42	256	12	51	46	31	11	205	180	137
18	101	77	13	183	12	66	46	39	11	224	187	136
19	90	84	13	70	12	74	40	30	11	246	191	136
20	88	92	13	28	12	74	36	27	50	250	191	125
21	94	92	13	11	12	138	36	27	101	232	191	135
22	94	122	13	11	12	184	31	27	113	237	177	147
23	94	159	13	11	13	152	26	27	102	244	166	140
24	94	154	13	11	14	131	26	31	79	243	154	135
25	94	132	13	11	13	97	26	39	92	225	149	134
26	94	95	13	11	13	76	22	39	92	206	149	126
27	94	74	13	11	13	76	15	39	126	201	149	121
28	94	74	13	11	13	62	13	39	147	201	149	113
29	103	67	13	11	---	51	14	39	147	200	149	104
30	120	62	13	11	---	53	18	39	147	200	149	95
31	119	---	13	11	---	53	---	30	---	199	155	---
TOTAL	3408	3159	712	2894	338	3231	1695	1156	1608	6226	5610	3859
MEAN	110	105	23.0	93.4	12.1	104	56.5	37.3	53.6	201	181	129
MAX	138	159	85	261	14	257	160	213	147	250	214	160
MIN	88	62	13	11	11	13	11	10	11	138	149	84
AC-FT	-6760	6270	1410	5740	670	6410	3360	2290	3190	12350	11130	7650

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1976 - 1994, BY WATER YEAR (WY)

	MEAN	98.3	74.3	123	114	74.0	114	78.5	55.5	58.3	120	142	125
MAX	155	233	433	337	303	326	261	98.7	121	201	190	206	
(WY)	1980	1985	1978	1983	1982	1983	1991	1984	1992	1994	1991	1993	
MIN	26.2	16.7	10.9	9.85	9.50	10.8	12.0	19.9	14.3	52.3	83.4	72.9	
(WY)	1978	1988	1991	1992	1977	1977	1985	1977	1977	1993	1977	1977	

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1976 - 1994
ANNUAL TOTAL	28577.5	33896	98.3
ANNUAL MEAN	78.3	92.9	172
HIGHEST ANNUAL MEAN			40.4
LOWEST ANNUAL MEAN			1610
HIGHEST DAILY MEAN	435	261	5.3
LOWEST DAILY MEAN	9.6	10	5.8
ANNUAL SEVEN-DAY MINIMUM	11	11	71250
ANNUAL RUNOFF (AC-FT)	56680	67230	200
10 PERCENT EXCEEDS	150	199	74
50 PERCENT EXCEEDS	64	88	13
90 PERCENT EXCEEDS	11	12	

## WILLAMETTE RIVER BASIN

285

14203500 TUALATIN RIVER NEAR DILLEY, OR

LOCATION.--Lat 45°28'30", long 123°07'23", in NE 1/4 NW 1/4 sec.24, T.1 S., R.4 W., Washington County, Hydrologic Unit 17090010, on left bank 5 ft upstream from highway bridge, 1.0 mi south of Dilley, 1.2 mi downstream from Scoggins Creek, and at mile 58.8.

DRAINAGE AREA.--125 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1939 to current year. Prior to October 1940 monthly discharge only, published in WSP 1318.

REVISED RECORDS.--WSP 1935: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 147.57 ft above sea level. Prior to June 16, 1950, nonrecording gage at several sites within 200 ft of present site at datum 4.00 ft higher. June 16, 1950, to Aug. 10, 1966, water-stage recorder at present site at datum 4.00 ft higher.

REMARKS.--Records fair. Diurnal fluctuation caused by operation of millpond on Scoggins Creek upstream from station and regulation by Henry Hagg Lake since January 1975. Diversions upstream from station of approximately 3,000 acre-ft from J. W. Barney Reservoir on the Middle Fork of North Fork Trask River for municipal water supply and irrigation in Wapato Lake area. Continuous water-quality records for the period November 1963 to September 1968 have been collected at this location.

AVERAGE DISCHARGE.--55 years, 378 ft<sup>3</sup>/s, 273,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 17,100 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 19.34 ft, from rating curve extended above 6,000 ft<sup>3</sup>/s; minimum discharge, 0.08 ft<sup>3</sup>/s Sept. 3, 1967.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,080 ft<sup>3</sup>/s Feb. 25, gage height, 17.54 ft; minimum discharge, 52 ft<sup>3</sup>/s June 20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	153	136	e150	395	160	1000	218	106	60	161	193	162
2	135	147	e220	554	152	758	179	106	57	175	189	161
3	136	147	e125	669	146	707	167	115	57	175	194	166
4	136	152	e110	785	140	735	156	282	64	176	204	170
5	143	149	e100	966	133	731	150	193	64	166	199	168
6	155	143	86	1000	129	674	203	120	66	146	191	163
7	157	131	159	837	126	607	294	90	78	152	192	150
8	158	132	332	725	120	538	375	82	89	167	191	146
9	161	131	540	663	121	477	513	85	70	177	180	135
10	161	131	651	637	121	396	529	106	60	179	183	137
11	149	130	1010	715	115	344	497	94	76	179	191	140
12	135	120	883	705	111	274	454	84	75	191	189	126
13	136	95	608	655	151	252	386	71	72	191	187	106
14	135	94	490	605	193	235	304	70	72	201	187	112
15	136	93	442	562	183	221	264	75	82	200	190	116
16	138	95	371	525	315	215	228	80	71	189	184	134
17	126	96	292	494	473	239	209	90	65	189	176	145
18	123	94	211	441	504	281	194	94	63	199	179	146
19	118	94	182	295	479	326	179	87	58	217	185	147
20	108	104	162	230	426	323	165	80	65	229	186	141
21	114	103	148	188	460	456	159	77	117	211	186	139
22	114	123	137	185	485	527	150	75	124	211	181	154
23	113	156	129	230	582	507	141	72	127	221	166	155
24	114	168	123	255	1190	468	138	71	103	225	157	148
25	114	138	117	272	1980	423	139	78	114	222	153	149
26	113	123	110	251	1790	356	128	73	116	200	152	144
27	113	94	105	230	1550	327	116	74	129	193	152	134
28	113	92	101	210	1280	300	108	77	152	193	154	132
29	114	92	97	193	--	266	106	86	152	194	153	126
30	131	102	98	180	--	249	105	86	151	194	150	122
31	132	--	133	169	--	247	--	78	--	193	155	--
TOTAL	4084	3605	8422	14821	13615	13459	6954	2957	2649	5916	5529	4274
MEAN	132	120	272	478	486	434	232	95.4	88.3	191	178	142
MAX	161	168	1010	1000	1980	1000	529	282	152	229	204	170
MIN	108	92	86	169	111	215	105	70	57	146	150	106
AC-FT	8100	7150	16710	29400	27010	26700	13790	5870	5250	11730	10970	8480

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1976 - 1994, BY WATER YEAR (WY)

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
MEAN	144	284	574	612	588	506	342	158	108	134	151	145							
MAX	230	881	1596	1184	1215	1086	974	338	183	195	199	229							
(WY)	1983	1985	1978	1980	1983	1983	1991	1984	1984	1985	1981	1978							
MIN	71.8	47.2	41.1	31.8	62.0	165	99.8	80.8	65.9	91.0	93.0	82.6							
(WY)	1978	1988	1977	1977	1977	1992	1977	1977	1979	1977	1977	1985							

## SUMMARY STATISTICS

	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1976 - 1994
ANNUAL TOTAL	84283	86285	
ANNUAL MEAN	231	236	311
HIGHEST ANNUAL MEAN			529
LOWEST ANNUAL MEAN			104
HIGHEST DAILY MEAN	1330	Apr 11	5170
LOWEST DAILY MEAN	67	Jul 26	22
ANNUAL SEVEN-DAY MINIMUM	72	Jul 20	23
ANNUAL RUNOFF (AC-FT)	167200	171100	225400
10 PERCENT EXCEEDS	477	518	755
50 PERCENT EXCEEDS	152	155	167
90 PERCENT EXCEEDS	94	86	79

e Estimated



## WILLAMETTE RIVER BASIN

14203750 GALES CREEK NEAR GLENWOOD, OR

LOCATION.--Lat 45°38'37", long 123°22'09", in NE 1/4 SE 1/4 sec.24, T.2 N., R.6 W., Washington County, Hydrologic Unit 17090010, on left bank, 300 ft upstream from bridge over Gales Creek at Forest Park campground, and 4.7 mi west of Glenwood, and at mile 23.6.

DRAINAGE AREA.--7.3 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1993 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 920 ft above sea level, from topographic map.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 180 ft<sup>3</sup>/s Feb. 24, 1994, gage height, 2.99 ft; minimum discharge, 1.4 ft<sup>3</sup>/s Sept. 25-27, 1994.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 180 ft<sup>3</sup>/s Feb. 24, gage height, 2.99 ft; minimum discharge, 1.4 ft<sup>3</sup>/s Sept. 25-27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.8	2.6	38	71	16	128	30	14	8.0	6.2	3.1	2.0
2	1.8	2.6	18	64	15	110	28	14	7.6	6.2	3.0	2.1
3	1.8	3.0	11	73	14	99	26	14	7.3	6.0	2.9	3.7
4	1.8	2.8	14	105	14	91	25	16	7.3	6.0	3.0	2.9
5	1.9	2.6	11	140	13	77	24	14	7.3	6.0	3.0	2.7
6	2.0	2.6	9.3	123	13	65	27	13	8.9	5.8	2.9	2.5
7	2.1	2.5	19	93	12	55	28	13	13	5.5	3.0	2.3
8	2.0	2.6	48	80	12	46	48	12	10	5.2	3.5	2.4
9	1.9	2.5	92	75	12	41	69	12	9.1	5.0	3.5	2.8
10	2.0	2.5	118	74	12	37	68	11	8.4	4.9	3.3	2.8
11	2.0	2.5	130	74	11	33	58	11	8.0	4.8	3.1	2.8
12	2.2	2.4	86	68	11	30	49	10	7.9	4.6	3.0	2.9
13	2.2	2.5	60	59	22	28	41	10	8.9	4.6	2.9	2.7
14	2.2	2.5	44	50	24	26	37	10	12	4.5	2.8	2.6
15	4.3	2.7	35	43	41	25	33	11	10	4.5	2.7	2.5
16	3.3	2.9	29	37	78	25	31	11	9.9	4.3	2.7	2.3
17	3.2	2.9	25	33	76	31	28	11	9.5	4.1	2.7	2.2
18	3.1	2.9	22	30	69	46	26	9.9	9.4	4.1	2.7	2.1
19	2.7	2.9	20	27	60	44	25	9.6	8.8	3.9	2.7	2.0
20	2.7	2.9	18	25	53	52	23	9.4	8.4	3.8	2.7	2.0
21	2.5	3.5	16	23	49	90	22	9.2	8.0	3.6	2.7	1.9
22	2.5	3.8	15	22	52	78	20	8.9	7.7	3.5	2.8	1.8
23	2.6	3.4	14	23	105	62	20	8.6	7.6	3.5	2.7	1.8
24	2.7	3.3	13	24	164	55	19	8.3	7.3	3.6	2.5	1.8
25	2.6	3.2	12	23	164	48	18	8.1	7.1	3.6	2.4	1.7
26	2.6	3.1	11	21	171	43	17	8.1	7.1	3.5	2.3	1.6
27	2.4	3.1	11	20	158	41	16	7.9	6.9	3.4	2.2	1.6
28	2.3	3.2	10	19	142	39	16	8.4	6.6	3.3	2.2	1.6
29	2.4	4.1	9.9	18	---	36	15	9.6	6.4	3.4	2.3	1.8
30	2.4	11	11	17	---	34	15	8.6	6.3	3.3	2.1	1.8
31	2.5	---	13	16	---	32	---	8.2	---	3.2	2.0	---
TOTAL	74.5	95.1	983.2	1570	1583	1647	902	329.8	250.7	137.9	85.4	67.7
MEAN	2.40	3.17	31.7	50.6	56.5	53.1	30.1	10.6	8.36	4.45	2.75	2.26
MAX	4.3	11	130	140	171	128	69	16	13	6.2	3.5	3.7
MIN	1.8	2.4	9.3	16	11	25	15	7.9	6.3	3.2	2.0	1.6
AC-FT	148	189	1950	3110	3140	3270	1790	654	497	274	169	134
CFSM	.33	.43	4.34	6.94	7.74	7.28	4.12	1.46	1.14	.61	.38	.31
IN.	.38	.48	5.01	8.00	8.07	8.39	4.60	1.68	1.28	.70	.44	.34

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1994 - 1994, BY WATER YEAR (WY)

	MEAN	2.40	3.17	31.7	50.6	56.5	53.1	30.1	10.6	8.36	4.45	2.75	2.26
MAX	2.40	3.17	31.7	50.6	56.5	53.1	30.1	10.6	8.36	4.45	2.75	2.26	
(WY)	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994
MIN	2.40	3.17	31.7	50.6	56.5	53.1	30.1	10.6	8.36	4.45	2.75	2.26	
(WY)	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994

## SUMMARY STATISTICS

## FOR 1994 WATER YEAR

ANNUAL TOTAL	7726.3
ANNUAL MEAN	21.2
HIGHEST DAILY MEAN	171
LOWEST DAILY MEAN	1.6
ANNUAL SEVEN-DAY MINIMUM	1.7
ANNUAL RUNOFF (AC-FT)	15330
ANNUAL RUNOFF (CFSM)	2.90
ANNUAL RUNOFF (INCHES)	39.37
10 PERCENT EXCEEDS	61
50 PERCENT EXCEEDS	8.9
90 PERCENT EXCEEDS	2.3

## WILLAMETTE RIVER BASIN

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14203750 GALES CREEK NEAR GLENWOOD, OR--Continued

## WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: July 1993 to current year.

INSTRUMENTATION.--Water-quality monitor since July 1993. Electronic data logger set for thirty minute recording interval.

EXTREMES FOR PERIOD OF RECORD.--

WATER TEMPERATURE: Maximum, 14.5°C July 21-23, 1994, minimum, 2.0°C Nov. 24-26, 1993.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 14.5°C July 21-23, minimum 2.0°C Nov. 24-26.

## TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

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

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

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

## WILLAMETTE RIVER BASIN

289

14206298 BRONSON CREEK AT 185TH AVENUE, NEAR ALOHA, OR

LOCATION.--Lat 45°31'57", long 122°51'59", in NE 1/4 NE 1/4 sec.36, T.1 N., R.2 W., Washington County, Hydrologic Unit 17090010, on left bank at 185th Avenue bridge, near Aloha, and at mile 1.48.

DRAINAGE AREA.--4.15 mi<sup>2</sup>.

PERIOD OF RECORD.--May to September 1994.

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

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

EXTREMES FOR PERIOD MAY TO SEPTEMBER.--Maximum discharge, 9.4 ft<sup>3</sup>/s Sept. 3, gage height, 5.65 ft; minimum discharge, 0.02 ft<sup>3</sup>/s Aug. 30, 31, Sept. 1-3.

DISCHARGE, CUBIC FEET PER SECOND, MAY TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	MAY	JUN	JUL	AUG	SEP
1	e1.2	1.5	.38	.08	.03
2	e1.1	.90	.39	.08	.02
3	e1.2	.74	.42	.08	.38
4	e1.3	.70	.41	.07	.10
5	1.3	.70	.39	.08	.11
6	1.0	1.4	.37	.14	.12
7	.85	2.2	.38	.37	.12
8	.87	1.9	.37	.19	.18
9	.83	1.1	.39	.18	.70
10	.81	.78	.38	.19	.93
11	.82	.62	.37	.17	.95
12	.80	.57	.32	.14	.51
13	.74	.76	.28	.12	.30
14	.73	1.1	.26	.11	.22
15	.82	1.7	.26	.11	.21
16	.96	1.2	.24	.09	.16
17	.98	.87	.21	.07	.18
18	1.0	.82	.17	.06	.17
19	.84	.75	.17	.06	.20
20	.79	.58	.21	.06	.19
21	.77	.51	.23	.06	.18
22	.65	.47	.18	.06	.20
23	.68	.54	.16	.06	.37
24	.64	.53	.15	.05	.16
25	.58	.48	.13	.04	.12
26	.53	.47	.12	.04	.12
27	.51	.47	.12	.03	.12
28	.51	.43	.11	.04	.10
29	.58	.44	.11	.05	.17
30	.61	.44	.11	.04	.11
31	.90	---	.09	.02	---
TOTAL	25.90	25.67	7.88	2.94	7.43
MEAN	.84	.86	.25	.095	.25
MAX	1.3	2.2	.42	.37	.95
MIN	.51	.43	.09	.02	.02
AC-FT	51	51	16	5.8	15

e Estimated





## WILLAMETTE RIVER BASIN

291

14206950 FANNO CREEK AT DURHAM, OR

LOCATION.--Lat 45°24'13", long 122°45'13", in NE 1/4 NW 1/4 sec.13, T.2 S., R.1 W., Washington County, Hydrologic Unit 17090010, on left bank under Durham Road bridge, at Durham, and at mile 1.13.

DRAINAGE AREA.--31.5 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September to November 1966, September 1972 to September 1977 (discharge measurements only), October 1993 to September 1994.

GAGE.--Water-stage recorder. Datum of gage is 116.83 ft above sea level (levels by Corps of Engineers).

REMARKS.--Records good except for those below 5 ft<sup>3</sup>/s, which are fair and estimated daily discharges, which are poor. No regulation or diversion upstream from station.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,040 ft<sup>3</sup>/s Feb. 24, gage height, 9.17 ft; minimum discharge, 1.2 ft<sup>3</sup>/s Oct. 1.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.3	12	211	255	17	73	25	15	18	5.4	5.3	e3.3
2	1.7	5.5	76	153	16	76	22	16	10	6.0	3.7	3.5
3	1.8	5.0	29	194	21	80	20	18	8.3	4.9	2.8	14
4	1.6	7.7	50	159	15	59	19	35	12	5.6	2.6	15
5	1.4	5.8	21	186	13	41	26	17	9.3	7.1	2.6	5.2
6	4.5	4.9	14	84	12	35	65	14	14	6.8	3.8	3.5
7	8.1	3.7	94	57	12	31	45	14	36	6.9	7.2	2.3
8	6.0	3.2	216	67	11	27	144	13	15	5.5	7.9	11
9	3.8	3.2	223	49	13	29	113	15	9.4	4.1	6.4	22
10	3.2	3.1	222	41	14	37	67	11	8.2	3.8	5.2	39
11	2.9	3.1	311	51	12	27	42	9.6	7.1	3.3	4.5	31
12	5.6	3.1	75	56	11	22	54	11	6.9	3.3	4.6	8.4
13	16	3.8	46	43	75	21	36	9.8	16	3.5	4.6	6.2
14	28	4.2	66	33	35	20	30	9.5	15	5.9	4.6	4.5
15	52	5.7	37	28	23	21	26	9.8	17	4.3	3.9	2.8
16	39	6.0	28	24	39	24	25	21	9.0	2.8	3.5	2.3
17	13	17	23	22	96	44	22	30	8.8	2.6	4.0	3.6
18	7.2	15	20	21	96	62	21	16	16	3.2	4.1	2.7
19	5.6	5.9	19	20	64	33	27	15	10	3.4	3.2	2.4
20	5.1	3.9	17	19	48	45	20	16	8.5	3.4	4.9	e2.3
21	3.9	26	15	18	121	109	19	11	6.9	2.8	6.1	e2.2
22	3.8	35	13	27	54	66	18	9.9	5.4	2.8	4.0	e2.1
23	3.6	15	12	77	119	58	21	7.7	4.1	3.5	2.9	e2.1
24	4.4	7.1	12	85	756	42	29	7.7	4.6	4.6	2.2	e2.1
25	3.3	5.1	12	56	431	31	20	6.5	5.4	4.4	2.0	e2.5
26	3.1	4.3	12	33	171	28	17	6.2	5.2	3.9	1.8	e2.3
27	2.7	9.0	11	28	158	25	16	6.5	4.8	3.1	1.5	e2.3
28	2.7	8.8	10	24	108	24	14	7.6	4.6	2.6	1.6	3.2
29	2.6	22	9.5	21	---	21	20	15	5.9	2.3	2.0	e4.5
30	2.5	56	26	19	---	34	24	12	6.8	2.9	1.9	e3.5
31	24	---	60	17	---	52	---	12	---	5.5	3.2	---
TOTAL	264.4	310.1	1990.5	1967	2561	1297	1047	417.8	308.2	130.2	118.6	211.8
MEAN	8.53	10.3	64.2	63.5	91.5	41.8	34.9	13.5	10.3	4.20	3.83	7.06
MAX	52	56	311	255	756	109	144	35	36	7.1	7.9	39
MIN	1.3	3.1	9.5	17	11	20	14	6.2	4.1	2.3	1.5	2.1
AC-FT	524	615	3950	3900	5080	2570	2080	829	611	258	235	420
CFSM	.27	.33	2.04	2.01	2.90	1.33	1.11	.43	.33	.13	.12	.22
IN.	.31	.37	2.35	2.32	3.02	1.53	1.24	.49	.36	.15	.14	.25

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1994 - 1994, BY WATER YEAR (WY)

	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994
MEAN	8.53	10.3	64.2	63.5	91.5	41.8	34.9	13.5	10.3	4.20	3.83	7.06
MAX	8.53	10.3	64.2	63.5	91.5	41.8	34.9	13.5	10.3	4.20	3.83	7.06
(WY)	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994
MIN	8.53	10.3	64.2	63.5	91.5	41.8	34.9	13.5	10.3	4.20	3.83	7.06
(WY)	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994

## SUMMARY STATISTICS

## FOR 1994 WATER YEAR

ANNUAL TOTAL	10623.6
ANNUAL MEAN	29.1
HIGHEST DAILY MEAN	756 Feb 24
LOWEST DAILY MEAN	1.3 Oct 1
ANNUAL SEVEN-DAY MINIMUM	1.9 Aug 24
ANNUAL RUNOFF (AC-FT)	21070
ANNUAL RUNOFF (CFSM)	.92
ANNUAL RUNOFF (INCHES)	12.55
10 PERCENT EXCEEDS	65
50 PERCENT EXCEEDS	12
90 PERCENT EXCEEDS	2.8

e Estimated

## WILLAMETTE RIVER BASIN

14206950 FANNO CREEK AT DURHAM, OR--Continued

## WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD---

SPECIFIC CONDUCTANCE: October 1993 to September 1994.

WATER TEMPERATURE: October 1993 to September 1994.

INSTRUMENTATION--Water-quality monitor.

EXTREMES FOR CURRENT YEAR---

SPECIFIC CONDUCTANCE: Maximum recorded, 306 microsiemens Aug. 18; minimum, 54 microsiemens Sept. 10.

WATER TEMPERATURE: Maximum, 23.5°C July 21-24; minimum, 0.5°C Nov. 25, 26.

## SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	---	---	---	216	175	202	123	91	102	163	82	105
2	---	---	---	227	216	224	148	95	124	118	90	108
3	---	---	---	226	202	219	183	148	168	123	103	111
4	---	---	---	237	220	233	168	147	155	131	120	126
5	---	---	---	239	232	236	189	165	176	135	105	119
6	---	---	---	234	228	231	210	189	200	161	122	148
7	---	---	---	237	229	233	196	103	143	176	161	170
8	---	---	---	245	234	240	104	84	94	173	165	168
9	---	---	---	248	241	244	100	84	93	180	171	177
10	---	---	---	251	243	246	118	77	93	190	180	186
11	---	---	---	257	245	252	108	80	91	190	174	179
12	---	---	---	257	249	253	149	108	131	183	160	172
13	---	---	---	253	235	247	169	149	161	189	161	175
14	---	---	---	247	236	243	164	145	153	200	189	196
15	---	---	---	250	216	242	172	147	161	204	199	201
16	---	---	---	236	213	227	182	172	178	206	199	203
17	---	---	---	240	163	210	187	180	184	212	202	207
18	234	221	230	205	178	190	194	187	191	214	211	213
19	239	232	236	210	202	207	197	193	195	219	213	216
20	252	236	242	228	209	217	204	196	199	221	218	219
21	254	241	248	230	109	196	210	204	206	223	218	221
22	249	244	246	166	134	154	218	207	212	225	184	218
23	248	242	245	168	151	157	228	218	222	185	137	166
24	245	233	238	199	168	185	240	228	237	150	126	141
25	246	239	243	214	199	208	235	229	232	169	130	150
26	248	242	245	228	214	223	232	228	230	187	169	179
27	254	245	249	229	214	220	232	228	231	196	187	193
28	275	254	267	227	218	221	237	231	234	197	191	195
29	264	253	260	230	186	202	236	233	235	199	192	196
30	259	254	256	187	121	155	242	182	227	201	195	198
31	256	142	201	---	---	---	182	163	166	204	197	201
MONTH	---	---	---	257	109	217	242	77	175	225	82	176

## WILLAMETTE RIVER BASIN

293

14206950 FANNO CREEK AT DURHAM, OR--Continued

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	210	204	206	185	173	180	223	185	195	---	---	---
2	214	210	212	190	168	182	229	208	216	---	---	---
3	212	203	208	173	158	166	242	210	232	---	---	---
4	207	204	205	180	166	174	251	242	248	---	---	---
5	211	206	209	189	178	185	250	197	239	---	---	---
6	218	211	214	195	189	192	197	109	162	---	---	---
7	218	215	216	198	194	196	183	128	164	---	---	---
8	218	216	217	201	197	199	168	107	124	---	---	---
9	226	216	221	205	181	198	160	105	136	---	---	---
10	226	217	222	192	178	184	182	117	162	---	---	---
11	231	224	226	198	183	190	196	182	189	---	---	---
12	230	225	227	198	191	194	194	164	177	---	---	---
13	229	103	167	204	198	202	195	171	185	---	---	---
14	161	120	143	208	203	205	201	191	196	---	---	---
15	181	160	172	208	183	203	217	201	207	---	---	---
16	182	168	177	210	182	201	214	207	210	---	---	---
17	170	115	141	197	156	172	220	212	216	---	---	---
18	138	118	131	182	124	154	226	208	219	---	---	---
19	143	136	140	185	152	168	---	---	---	---	---	---
20	156	143	150	193	125	174	---	---	---	---	---	---
21	156	112	124	148	99	126	---	---	---	---	---	---
22	144	122	134	170	143	159	---	---	---	---	---	---
23	168	107	141	180	146	166	---	---	---	---	---	---
24	110	66	77	191	172	182	---	---	---	---	---	---
25	150	81	117	202	191	197	---	---	---	---	---	---
26	153	137	146	206	202	204	---	---	---	---	---	---
27	160	129	143	211	206	208	---	---	---	---	---	---
28	173	160	166	215	210	213	---	---	---	---	---	---
29	---	---	---	219	213	216	---	---	---	---	---	---
30	---	---	---	222	129	200	---	---	---	---	---	---
31	---	---	---	188	154	175	---	---	---	---	---	---
MONTH	231	66	173	222	99	186	---	---	---	---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE			JULY			AUGUST			SEPTEMBER			
1	---	---	---	253	243	250	270	252	264	---	---	---
2	---	---	---	251	223	234	269	253	264	288	274	285
3	---	---	---	263	225	243	271	264	268	291	182	258
4	---	---	---	274	255	267	273	261	270	264	234	243
5	---	---	---	256	222	240	270	265	268	260	232	247
6	---	---	---	224	206	214	271	243	267	296	254	280
7	---	---	---	241	224	232	290	205	260	303	293	299
8	---	---	---	247	233	244	265	239	255	300	171	247
9	---	---	---	251	243	248	270	258	266	236	147	213
10	---	---	---	262	244	250	281	265	274	215	54	169
11	---	---	---	268	244	249	280	260	275	208	138	163
12	---	---	---	248	239	246	283	269	278	208	180	194
13	---	---	---	248	241	246	288	265	282	239	208	224
14	---	---	---	249	236	245	296	280	291	249	237	242
15	---	---	---	270	239	243	292	268	287	257	249	255
16	---	---	---	250	241	245	296	284	292	262	257	260
17	216	177	207	249	242	246	301	294	298	263	257	261
18	200	149	183	256	249	252	306	296	302	266	258	264
19	204	176	195	266	251	259	301	287	295	265	247	262
20	215	204	211	265	257	262	295	284	291	259	249	256
21	228	214	221	267	260	264	293	269	285	257	252	255
22	232	226	229	269	261	265	271	260	266	255	253	254
23	256	229	240	276	262	270	277	259	268	269	253	261
24	267	256	262	284	272	277	282	276	279	275	268	273
25	259	227	245	272	251	268	287	279	283	277	271	275
26	239	222	236	264	234	258	285	278	282	278	273	276
27	240	232	237	264	242	260	283	261	278	277	273	275
28	240	230	237	268	253	264	286	279	284	276	266	274
29	254	236	241	267	263	265	287	269	283	277	259	269
30	264	246	256	266	247	261	289	278	285	274	261	269
31	---	---	---	271	253	266	288	271	284	---	---	---
MONTH	---	---	---	284	206	253	306	205	278	---	---	---

## WILLAMETTE RIVER BASIN

14206950 FANNO CREEK AT DURHAM, OR--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

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

## WILLAMETTE RIVER BASIN

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14206950 FANNO CREEK AT DURHAM, OR--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	16.5	14.5	16.0	19.5	17.0	17.5	20.5	18.5	19.5	---	---	---
2	16.5	14.0	15.5	17.5	16.0	17.0	20.5	19.0	20.5	17.0	16.0	16.5
3	16.5	14.5	15.5	17.0	15.5	16.5	21.5	20.0	21.0	17.5	16.5	17.0
4	16.5	15.0	15.5	17.0	15.0	16.0	21.0	19.5	20.5	18.0	16.5	17.5
5	16.5	15.0	15.5	16.0	15.0	15.5	19.5	19.0	19.5	18.0	16.0	17.0
6	15.5	14.5	15.0	18.0	14.5	16.0	19.5	18.0	19.0	18.0	16.5	17.5
7	15.5	14.0	14.5	20.0	16.0	18.0	19.5	18.0	19.0	18.0	17.0	17.5
8	16.5	14.0	15.5	20.0	17.5	19.0	18.0	17.5	18.0	17.5	16.5	17.5
9	18.0	14.5	16.5	20.0	17.5	19.0	19.0	17.0	18.0	17.5	16.5	17.0
10	19.5	16.5	18.0	19.5	17.0	18.5	20.0	17.5	18.5	17.0	15.5	16.5
11	20.0	17.5	18.5	19.5	17.5	19.0	20.0	18.5	19.0	16.5	15.5	16.0
12	19.0	17.5	18.5	19.5	17.5	19.0	20.0	19.0	19.5	16.5	14.5	15.5
13	17.5	15.5	16.5	20.0	17.5	19.0	20.5	19.0	20.0	16.5	14.5	15.5
14	16.0	14.5	15.5	20.0	17.5	19.0	20.0	19.0	19.5	17.5	15.5	16.5
15	16.5	14.5	15.5	19.5	18.0	18.5	19.5	18.5	19.0	17.5	16.0	17.0
16	17.0	14.0	15.5	20.5	18.5	19.5	19.5	18.5	19.0	18.0	16.5	17.5
17	16.5	14.5	15.5	20.5	18.5	20.0	19.5	18.5	19.0	18.5	17.5	18.0
18	17.0	15.0	16.0	20.5	19.0	20.0	19.5	18.0	19.0	18.5	17.5	18.0
19	18.0	14.5	16.5	21.5	19.5	20.5	19.5	19.0	19.0	18.5	17.5	18.0
20	20.0	16.5	18.0	23.0	20.5	21.5	19.0	18.0	19.0	18.5	17.5	18.0
21	20.5	17.5	19.0	23.5	21.5	22.5	19.0	17.5	18.5	18.5	17.5	18.0
22	20.5	17.5	19.0	23.5	22.5	23.0	19.0	17.5	18.0	18.5	17.5	18.0
23	20.0	17.5	18.0	23.5	21.5	23.0	18.5	17.5	18.0	18.5	17.5	18.0
24	18.5	16.0	17.5	23.5	21.5	22.0	18.0	17.0	17.5	18.0	17.0	17.5
25	18.0	16.0	17.0	21.5	19.5	20.5	18.0	17.0	18.0	17.0	16.5	17.0
26	17.0	15.5	16.5	21.5	19.5	20.5	18.5	17.5	18.0	17.0	16.5	17.0
27	18.5	15.5	17.0	21.5	19.5	21.0	19.0	17.5	18.0	17.0	16.5	17.0
28	20.0	16.5	18.0	21.5	20.5	21.0	19.0	18.0	18.5	17.5	16.5	17.0
29	20.0	17.0	18.5	21.0	19.5	20.0	19.0	18.0	18.5	17.0	16.5	17.0
30	19.5	17.0	18.5	20.0	18.5	19.0	18.5	17.0	18.0	17.5	16.5	17.0
31	---	---	---	20.0	18.0	19.0	19.0	17.5	18.0	---	---	---
MONTH	20.5	14.0	17.0	23.5	14.5	19.5	21.5	17.0	19.0	18.5	14.5	17.0



## WILLAMETTE RIVER BASIN

14207500 TUALATIN RIVER AT WEST LINN, OR  
(National stream quality accounting network station)

LOCATION.--Lat 45°21'03", long 122°40'30", in SW 1/4 sec.34, T.2 S., R.1 E., Clackamas County, Hydrologic Unit 17090010, on left bank 300 ft upstream from bridge on State Highway 212, 0.4 mi west of West Linn city limits, and at mile 1.8.

DRAINAGE AREA.--706 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1928 to current year. Prior to October 1960, published as "near Willamette."

REVISED RECORDS.--WSP 1014: 1943. WSP 1184: 1947. WSP 1248: 1941. WSP 1935: Drainage area. WDR OR-75-1: 1974(M). WDR OR-77-1: 1971-73, 1975, 1976(M).

GAGE.--Water-stage recorder. Datum of gage is 85.61 ft above sea level (levels by Corps of Engineers). Prior to June 12, 1941, nonrecording gage at datum 1.02 ft higher.

REMARKS.--No estimated daily discharges. Water-discharge records good. Discharges for June 15, 16 computed from data obtained through U.S. Army Corps of Engineers Columbia River Operational Hydromet System (CROHMS) database. October 1951 to September 1970, records published for this station included the daily flow in Oswego Canal, which diverts at point 5.0 mi upstream from station for development of power between outlet of Lake Oswego and Willamette River. Adjustment for diversion to Lake Oswego provided by Oregon Water Resources Department since October 1, 1991. Some regulation in low-water season by flashboards on crest of diversion dam for Oswego Canal and regulation by Henry Haggy Lake since January 1975. Several diversions upstream from station for irrigation.

AVERAGE DISCHARGE.--66 years, 1,484 ft<sup>3</sup>/s, 28.54 in/yr, 1,075,000 acre-ft/yr, adjusted for diversion in Oswego Canal.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 23,300 ft<sup>3</sup>/s Dec. 23, 1933, gage height, 17.72 ft; minimum daily discharge, 0.20 ft<sup>3</sup>/s July 30 to Aug. 2, 1966.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,910 ft<sup>3</sup>/s Feb. 25, gage height, 9.28 ft; minimum discharge, 98 ft<sup>3</sup>/s Sept. 2, 3.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	121	177	718	1050	1010	5400	1250	506	251	155	127	106
2	143	182	1060	2010	932	5440	1150	484	241	148	129	102
3	145	187	1230	3150	880	5410	1040	482	225	154	124	106
4	133	193	997	3530	827	5250	945	513	210	169	117	125
5	129	198	682	3780	774	4930	882	599	196	186	116	137
6	137	200	530	3800	730	4570	900	693	200	193	122	148
7	149	201	543	3740	697	4200	970	575	241	183	127	150
8	161	204	932	3710	670	3810	1270	457	286	159	133	154
9	170	206	1800	3620	646	3380	1550	369	335	141	146	154
10	177	199	2630	3470	618	2940	1830	341	314	135	151	176
11	188	192	3430	3300	608	2430	1910	336	245	135	142	197
12	216	193	3510	3110	579	1960	1880	337	207	138	135	193
13	220	190	3420	2940	654	1640	1780	326	205	123	127	190
14	208	185	3330	2760	792	1430	1620	301	200	109	124	172
15	224	174	3120	2530	1020	1290	1430	286	204	117	126	147
16	255	168	2740	2280	1110	1200	1270	288	222	123	129	132
17	272	169	2200	2020	1460	1180	1140	342	230	134	126	120
18	271	179	1700	1790	2200	1240	1040	352	224	138	122	116
19	237	179	1330	1620	2550	1310	962	351	216	134	116	120
20	210	174	1080	1430	2540	1380	893	366	204	132	112	127
21	189	179	926	1230	2670	1580	833	362	193	135	120	128
22	176	209	815	1100	2700	1880	783	337	173	134	134	122
23	173	210	728	1140	2790	2270	737	285	177	127	148	116
24	172	220	661	1320	4640	2380	714	257	164	123	148	117
25	172	240	604	1570	5630	2290	686	244	161	131	140	119
26	172	245	556	1690	5360	2100	661	215	159	141	124	121
27	165	229	525	1610	5340	1870	644	211	157	145	113	123
28	152	242	499	1460	5330	1670	598	200	159	134	110	121
29	146	234	470	1330	---	1510	567	204	157	123	110	118
30	148	259	456	1200	---	1380	543	220	158	120	113	118
31	161	---	529	1100	---	1340	---	247	---	123	110	---
TOTAL	5592	6017	43751	70390	55757	80660	32478	11086	6314	4342	3921	4075
MEAN	180	201	1411	2271	1991	2602	1083	358	210	140	126	136
MAX	272	259	3510	3800	5630	5440	1910	693	335	193	151	197
MIN	121	168	456	1050	579	1180	543	200	157	109	110	102
AC-FT	11090	11930	86780	139600	110600	160000	64420	21990	12520	8610	7780	8080
MEAN†	232	253	1471	2330	2037	2657	1131	398	256	191	169	190
CFSM†	0.33	0.36	2.08	3.30	2.89	3.76	1.60	0.56	0.36	0.27	0.24	0.27
IN.†	0.38	0.40	2.40	3.81	3.00	4.34	1.79	0.65	0.40	0.31	0.28	0.30
AC-FT†	14290	15080	90460	143300	113100	163400	67280	24490	15230	11720	10380	11310

CAL YR 1993 TOTAL 382903 MEAN 1049 MAX 4400 MIN 110 AC-FT 759500 MEAN† 1091 CFSM† 1.54 IN.† 20.97 AC-FT† 789700  
WTR YR 1994 TOTAL 324383 MEAN 889 MAX 5630 MIN 102 AC-FT 643400 MEAN† 939 CFSM† 1.33 IN.† 18.06 AC-FT† 680000

† Adjusted for diversion in Oswego Canal.

## WILLAMETTE RIVER BASIN

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14207500 TUALATIN RIVER AT WEST LINN, OR--Continued

## WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1975 to September 1981.

WATER TEMPERATURE: October 1975 to September 1981.

REMARKS.--Some samples were analyzed by different methods and may have data with different levels of detection.

## WATER-QUALITY DATA

DATE	TIME	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)	BAROMETRIC PRESSURE (MM HG)	OXYGEN, DIS-SOLVED (PER CENT SATURATION)	COLIFORM, FECA, 0.7 UM-MF (COLS./100 ML)	STREPTOCOCCI, FECA, KF AGAR (COLS. PER 100 ML)
NOV 1993 03...	0911	182	247	7.5	12.0	2.2	8.3	759	77	44	190
JAN 1994 06...	1054	3800	108	7.2	8.5	28	10.5	766	89	K3	760
MAY 06...	1000	689	173	7.2	14.5	3.4	8.6	758	85	33	110
SEP 08...	1002	155	263	7.1	19.5	1.5	8.0	753	89	93	47

DATE	ENTEROCOCCI, MF WATER TOTAL (COL / 100 ML)	HARDNESS, TOTAL (MG/L AS CaCO3)	CALCIUM, DIS-SOLVED (MG/L AS Ca)	MAGNESIUM, DIS-SOLVED (MG/L AS Mg)	SODIUM, DIS-SOLVED (MG/L AS Na)	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 CO)
NOV 1993 03...	--	73	21	4.9	18	34	0.9	1.4	60	73	0
JAN 1994 06...	--	35	9.1	2.9	5.7	25	0.4	1.4	26	32	0
MAY 06...	22	56	15	4.6	11	29	0.6	1.9	56	69	0
SEP 08...	33	--	--	--	--	--	--	--	68	83	0

DATE	SULFATE, DIS-SOLVED (MG/L AS SO4)	CHLORIDE, DIS-SOLVED (MG/L AS CL)	FLUORIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C (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, NITRITE, DIS-SOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC DIS-SOLVED (MG/L AS N)
NOV 1993 03...	28	15	0.2	23	158	157	0.21	77.6	0.04	0.01	0.3
JAN 1994 06...	6.0	5.6	<0.1	17	87	80	0.12	893	0.31	0.03	0.5
MAY 06...	12	10	0.2	21	113	118	0.15	210	0.15	0.07	0.3
SEP 08...	20	18	0.4	--	159	--	--	--	0.03	0.01	--

DATE	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NO2+NO3, DIS-SOLVED (MG/L AS N)	PHOSPHORUS, DIS-SOLVED (MG/L AS P)	PHOSPHORUS, DIS-SOLVED (MG/L AS P)	PHOSPHORUS, ORTHO, DIS-SOLVED (MG/L AS P)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUSPENDED TOTAL (MG/L AS C)	ALUMINUM, 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 1993 03...	0.3	2.0	0.08	0.08	0.06	3.6	--	20	17	<3	150
JAN 1994 06...	0.8	3.3	0.19	0.09	0.07	3.9	1.0	490	18	<3	250
MAY 06...	0.5	1.8	0.08	0.04	0.04	2.6	0.7	30	17	<3	240
SEP 08...	0.5	1.4	0.07	<0.01	0.02	--	--	--	--	--	--

DATE	LITHIUM, DIS-SOLVED (UG/L AS LI)	MANGANESE, DIS-SOLVED (UG/L AS MN)	MOLYBDENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELENIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRONTIUM, DIS-SOLVED (UG/L AS SR)	VANADIUM, DIS-SOLVED (UG/L AS V)	SEDIMENT, DIS-SOLVED (MG/L)	SEDIMENT, DIS-SOLVED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV 1993 03...	<4	130	<10	2	<1	<1	74	<6	7	3.4	E96
JAN 1994 06...	<4	41	<10	1	<1	<1	55	<6	57	585	93
MAY 06...	<4	81	<10	1	<1	<1	67	<6	13	24	94
SEP 08...	--	--	--	--	--	--	--	--	7	2.9	E97

E - Estimated.

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

## WILLAMETTE RIVER BASIN

14207740 WILLAMETTE RIVER ABOVE FALLS, AT OREGON CITY, OR

LOCATION.--Lat 45°20'55", long 122°37'08", in SW 1/4 SW 1/4 sec.31, T.2 S., R.2 E., Clackamas County, Hydrologic Unit 17090007, on right bank 0.2 mi above Willamette Falls, 0.6 mi downstream from Tualatin River, and at mile 26.8.

DRAINAGE AREA.--10,000 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--October 1976 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, 64.79 ft Dec. 17, 1977; minimum, 52.51 ft July 12, 1992.

EXTREMES FOR CURRENT YEAR.--Maximum recorded gage height, 59.91 ft Feb. 26, but may have been higher during period of missing record; minimum recorded, 53.14 ft June 29.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	55.54	55.35	55.08	54.54	---	58.11	55.48	53.94	53.52	54.48	---	54.60
2	55.48	---	56.15	55.76	---	57.62	55.70	53.92	53.44	54.35	---	54.63
3	55.47	55.45	56.46	56.90	---	57.40	55.39	53.89	53.39	54.33	---	54.66
4	55.51	55.44	56.23	58.21	---	57.43	55.09	---	53.34	54.46	---	54.71
5	55.54	---	56.20	---	---	57.57	54.85	---	53.34	54.68	---	54.79
6	55.60	55.45	56.11	---	---	57.48	54.74	54.03	53.39	54.75	---	54.82
7	55.71	55.39	55.97	---	---	56.98	55.03	53.95	53.54	54.72	54.52	54.79
8	55.71	55.30	56.29	---	---	56.48	55.59	53.86	53.88	54.71	54.44	54.72
9	55.70	55.33	57.16	---	---	56.01	56.46	53.79	54.15	54.47	54.42	54.84
10	55.72	55.30	57.81	---	---	55.68	57.01	53.75	53.99	54.13	54.38	54.98
11	55.74	55.21	58.15	---	53.81	55.45	57.13	---	53.74	54.08	54.39	55.02
12	55.74	55.18	58.45	---	53.79	55.23	56.86	53.70	53.57	54.08	54.48	55.06
13	55.77	55.18	58.28	---	53.82	55.01	56.55	53.67	53.49	54.03	54.55	---
14	55.79	55.16	57.64	---	54.19	54.85	56.23	53.67	53.50	53.86	54.55	55.13
15	55.79	55.15	56.95	---	54.61	54.72	55.83	53.58	53.73	53.81	---	55.12
16	55.78	55.15	56.41	---	54.64	54.61	55.44	53.58	54.22	53.93	54.69	55.11
17	55.79	55.18	55.92	---	54.84	54.58	55.15	53.67	54.31	54.04	54.54	55.11
18	55.81	55.24	55.57	---	55.46	54.64	54.96	53.77	54.15	54.23	54.47	55.10
19	55.78	55.27	55.26	---	55.85	54.82	54.78	53.75	54.05	54.52	54.44	55.09
20	55.79	55.26	55.00	---	55.79	54.97	54.62	53.65	53.94	54.65	54.60	55.08
21	55.84	55.25	---	---	55.71	55.03	54.48	53.64	53.81	54.59	54.70	55.16
22	55.80	55.15	54.63	---	56.06	55.43	54.37	53.68	53.61	54.56	54.71	55.16
23	55.75	55.17	54.45	---	56.29	55.67	54.34	53.67	53.48	54.31	54.69	55.10
24	55.67	55.34	54.33	---	57.56	55.64	54.33	---	53.43	54.00	54.68	55.02
25	55.66	55.62	54.23	---	59.54	55.52	54.32	53.56	53.38	53.96	54.67	55.03
26	55.68	55.55	54.17	---	59.81	55.29	54.28	53.49	53.30	54.27	54.65	55.07
27	55.62	55.22	54.09	---	59.18	55.09	54.19	53.45	53.26	54.48	54.64	55.12
28	55.50	54.93	54.04	---	58.52	54.94	54.12	53.44	53.25	54.41	54.61	55.15
29	55.43	54.70	54.00	---	---	54.82	54.06	53.44	53.28	54.28	54.60	55.14
30	55.36	54.61	53.97	---	---	54.71	53.96	53.50	54.03	54.15	54.61	55.18
31	55.34	---	53.96	---	---	54.78	---	53.58	---	54.08	54.63	---
MEAN	55.66	---	---	---	---	55.70	55.18	---	53.65	54.30	---	---
MAX	55.84	---	---	---	---	58.11	57.13	---	54.31	54.75	---	---
MIN	55.34	---	---	---	---	54.58	53.96	---	53.25	53.81	---	---

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LOCATION.--Lat 45°21'28", long 122°36'35", in NE 1/4 NW 1/4 sec.31, T.2 S., R.2 E., Clackamas County, Hydrologic Unit 17090007, on right bank 0.5 mi below Willamette Falls, 1.4 mi upstream from Clackamas River, and at mile 26.2.

REMARKS.--Flow regulated by many reservoirs upstream. Gage out of operation during period October to January and July to September. Fragmentary record for this period available in files of the Portland field office.

EXTREMES FOR CURRENT YEAR.--Not determined, refer to REMARKS for explanation.

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	---	---	---	14.57	13.14	13.85	9.29	7.25	8.15	8.26	6.62	7.41
2	---	---	---	13.32	11.98	12.65	9.05	7.23	8.07	7.88	6.51	7.28
3	---	---	---	12.90	11.92	12.30	8.04	6.13	7.19	7.89	6.29	7.10
4	---	---	---	12.67	11.87	12.23	7.35	6.00	6.63	7.69	6.42	7.01
5	---	---	---	12.52	11.82	12.17	7.31	6.00	6.67	8.23	6.60	7.39
6	---	---	---	12.13	10.60	11.75	8.22	6.28	7.32	8.44	6.78	7.68
7	---	---	---	10.67	9.57	10.32	8.48	6.83	7.72	8.79	7.21	7.88
8	---	---	---	9.96	8.81	9.54	9.52	7.59	8.56	8.65	6.90	7.60
9	---	---	---	9.47	8.12	8.84	11.06	9.01	10.19	8.60	6.55	7.38
10	---	---	---	9.14	7.43	8.39	11.49	10.48	11.01	8.56	6.50	7.32
11	---	---	---	---	---	---	11.76	10.85	11.24	9.06	6.88	7.75
12	---	---	---	8.01	6.27	7.14	11.50	10.37	10.87	8.94	7.12	7.84
13	8.00	5.23	---	7.78	5.98	6.88	10.77	9.67	10.16	8.57	6.90	7.65
14	---	---	---	---	---	---	10.07	8.78	9.42	8.43	6.72	7.51
15	8.08	6.00	6.89	8.05	5.76	6.72	9.13	7.45	8.34	8.12	6.11	7.21
16	8.12	---	---	7.98	5.86	6.65	8.44	6.64	7.49	7.46	5.72	6.69
17	---	---	---	7.99	---	---	7.68	5.81	6.78	7.62	6.39	6.97
18	---	---	---	8.08	5.97	7.07	7.26	5.73	6.33	7.67	6.00	6.78
19	---	---	---	---	---	---	7.09	5.82	6.45	7.69	6.03	6.90
20	---	---	---	---	---	---	7.13	5.91	6.56	7.81	6.06	6.84
21	---	---	---	---	---	---	7.57	5.96	6.78	8.14	5.96	6.87
22	---	---	---	---	---	---	7.84	5.96	6.84	---	---	---
23	10.13	8.06	9.02	9.29	7.63	8.38	8.56	6.36	7.55	8.84	6.37	7.50
24	16.23	9.54	12.98	9.41	7.84	8.60	9.13	6.69	7.64	9.35	6.63	7.79
25	18.33	16.23	17.58	9.26	7.70	8.39	9.70	6.77	7.94	9.71	6.90	7.87
26	18.15	17.43	17.85	8.94	6.79	7.72	9.67	6.86	7.87	9.21	6.76	7.78
27	17.43	15.30	16.34	8.89	6.42	7.42	9.65	6.85	7.81	9.31	7.24	8.03
28	15.30	14.17	14.64	8.77	6.27	7.40	9.38	6.77	7.70	8.93	6.73	7.71
29	---	---	---	8.98	6.23	7.42	9.12	6.72	7.61	8.69	6.71	7.53
30	---	---	---	9.28	6.43	7.54	8.61	6.74	7.47	7.90	5.97	6.96
31	---	---	---	9.21	6.70	7.58	---	---	---	7.90	6.16	6.83
MONTH	---	---	---	---	---	---	11.76	5.73	8.01	---	---	---
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	7.71	5.89	6.68	---	---	---	---	---	---	---	---	---
2	7.69	5.84	6.61	---	---	---	---	---	---	---	---	---
3	7.50	5.68	6.31	---	---	---	---	---	---	---	---	---
4	7.73	5.85	6.54	---	---	---	---	---	---	---	---	---
5	8.00	5.85	6.60	---	---	---	---	---				

## WILLAMETTE RIVER BASIN

14208600 TIMOTHY LAKE NEAR GOVERNMENT CAMP, OR

LOCATION.--Lat 45°06'50", long 121°48'35", in NE 1/4 sec.27, T.5 S., R.8 E., Clackamas County, Hydrologic Unit 17090011, Mount Hood National Forest, in intake structure 350 ft upstream from dam on Oak Grove Fork, 0.4 mi upstream from Anvil Creek, 14 mi south of Government Camp, and at mile 15.8.

DRAINAGE AREA.--53.8 mi<sup>2</sup>.

PERIOD OF RECORD.--May 1956 to current year. Prior to October 1957, published as Timothy Meadows Reservoir.

GAGE.--Nonrecording gage. Datum of gage is sea level (levels by Portland General Electric Co.).

REMARKS.--Reservoir is formed by earthfill dam with concrete spillway built by Portland General Electric Co. Usable storage began May 28, 1956. Capacity, 65,710 acre-ft at elevation 3,190 ft, normal maximum operating level. Usable capacity increased in 1966 water year to 64,450 acre-ft between elevations 3,125.0 ft, invert of outlet pipe, and 3,192.0 ft, top of radial gates. Storage of 4,060 acre-ft below elevation 3,125.0 ft not normally available for release. Water is used for power generation. Figures given herein represent total contents.

COOPERATION.--Elevations and capacity table furnished by Portland General Electric Co.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 68,800 acre-ft Oct. 3, 1967, elevation, 3,192.2 ft; minimum contents observed, 16,010 acre-ft Feb. 24, 1957, elevation, 3,144.5 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents observed, 66,960 acre-ft June 30, elevation, 3,190.90 ft; minimum contents observed, 51,740 acre-ft Nov. 19-21, elevation, 3,179.25 ft.

## MONTHEND ELEVATION AND CONTENTS AT 0800, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept.30.....	3,190.37	66,220	-
Oct. 31.....	3,186.50	61,000	-5,220
Nov. 30.....	3,179.39	51,910	-9,090
Dec. 31.....	3,181.15	54,110	+2,200
CAL YR 1993.....	-	-	+2,160
Jan. 31.....	3,184.17	57,950	+3,840
Feb. 28.....	3,186.01	60,350	+2,400
Mar. 31.....	3,183.07	56,540	-3,810
Apr. 30.....	3,187.73	62,630	+6,090
May 31.....	3,190.00	65,710	+3,080
June 30.....	3,190.90	66,960	+1,250
July 31.....	3,190.82	66,850	-110
Aug. 31.....	3,190.59	66,530	-320
Sept.30.....	3,190.44	66,320	-210
WTR YR 1994.....	-	-	+100



## WILLAMETTE RIVER BASIN

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## 14208700 OAK GROVE FORK NEAR GOVERNMENT CAMP, OR

LOCATION.--Lat 45°06'50", long 121°48'50", in NE 1/4 sec.27, T.5 S., R.8 E., Clackamas County, Hydrologic Unit 17090011, Mount Hood National Forest, on right bank 0.1 mi upstream from Anvil Creek, 0.3 mi downstream from Timothy Lake, 14 mi south of Government Camp, and at mile 15.5.

DRAINAGE AREA.--54.4 mi<sup>2</sup>.

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

GAGE.--Water-stage recorder and artificial control. Datum of gage is 3,041.83 ft above sea level (Portland General Electric Co. bench mark).

REMARKS.--No estimated daily discharges. Records good. Flow regulated since 1956 by Timothy Lake (station 14208600). No diversion upstream from station.

AVERAGE DISCHARGE.--38 years, 128 ft<sup>3</sup>/s, 31.95 in/yr, 92,740 acre-ft/yr, adjusted for storage.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,110 ft<sup>3</sup>/s Dec. 24, 1964, gage height, 3.93 ft, from rating curve extended above 290 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; minimum discharge, 3.7 ft<sup>3</sup>/s Sept. 23, 1968.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 441 ft<sup>3</sup>/s Nov. 2, gage height, 2.64 ft; minimum discharge, 32 ft<sup>3</sup>/s Apr. 27, 28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	64	378	57	61	38	39	40	39	39	50	43	42
2	65	383	39	57	42	39	40	39	39	59	42	43
3	65	366	39	39	41	40	40	39	39	51	42	43
4	64	385	73	40	38	40	40	38	39	49	43	44
5	64	385	39	40	38	40	40	38	40	48	43	43
6	64	384	39	39	38	40	40	38	40	48	43	42
7	59	384	39	39	38	40	40	38	40	48	43	42
8	54	384	39	39	38	158	40	38	39	49	42	42
9	54	384	39	39	38	227	40	38	40	51	42	43
10	50	384	39	39	38	248	40	38	40	49	43	43
11	40	384	39	40	38	247	39	38	39	49	42	43
12	39	384	39	40	38	283	40	40	41	49	42	43
13	40	384	39	40	38	293	40	38	41	47	43	43
14	40	384	38	40	40	291	39	39	43	45	43	42
15	54	384	38	40	41	290	39	39	42	45	42	42
16	100	291	38	39	38	260	39	39	42	44	42	43
17	106	235	38	39	38	243	39	39	42	44	42	42
18	106	105	38	39	38	218	39	39	42	43	43	42
19	107	72	38	39	38	246	39	39	42	43	43	42
20	107	60	52	39	38	262	39	39	41	43	43	42
21	107	60	61	39	39	249	39	39	41	43	43	42
22	178	62	61	38	265	270	39	39	41	43	43	42
23	347	62	61	38	260	293	39	38	41	44	42	42
24	345	62	61	38	82	302	39	38	44	43	42	43
25	353	62	61	38	40	308	39	38	42	43	42	42
26	360	62	61	38	40	309	39	38	43	43	42	42
27	342	62	61	38	39	310	38	38	43	44	43	42
28	360	62	61	38	39	217	36	39	43	44	42	42
29	360	62	61	38	---	39	38	40	42	44	42	42
30	362	62	61	38	---	39	39	40	46	44	42	42
31	371	---	61	38	---	40	---	39	---	44	42	---
TOTAL	4827	7118	1510	1246	1576	5920	1177	1198	1236	1431	1316	1272
MEAN	156	237	48.7	40.2	56.3	191	39.2	38.6	41.2	46.2	42.5	42.4
MAX	371	385	73	61	265	310	40	40	46	59	43	44
MIN	39	60	38	38	38	39	36	38	39	43	42	42
AC-FT	9570	14120	3000	2470	3130	11740	2330	2380	2450	2840	2610	2520
MEAN†	70.7	84.5	84.6	103	99.6	129	142	88.8	62.2	44.4	37.2	38.8
CFSM†	1.30	1.55	1.56	1.89	1.83	2.37	2.61	1.63	1.14	0.82	0.68	0.71
IN.†	1.50	1.73	1.79	2.18	1.91	2.73	2.90	1.88	1.28	0.94	0.79	0.80
AC-FT†	4350	5030	5200	6310	5530	7930	8420	5460	3700	2730	2290	2310

CAL YR 1993 TOTAL 41040 MEAN 112 MAX 385 MIN 38 AC-FT 81400 MEAN† 115 CFSM† 2.11 IN.† 28.81 AC-FT† 83560  
WTR YR 1994 TOTAL 29827 MEAN 81.7 MAX 385 MIN 36 AC-FT 59160 MEAN† 81.9 CFSM† 1.51 IN.† 20.43 AC-FT† 59260

† Adjusted for change in contents in Timothy Lake.

## WILLAMETTE RIVER BASIN

## 14209000 OAK GROVE FORK ABOVE POWERPLANT INTAKE, OR

LOCATION.--Lat 45°04'20", long 121°57'00", on line between secs.3 and 4, T.6 S., R.7 E., Clackamas County, Hydrologic Unit 17090011, Mount Hood National Forest, on right bank 0.2 mi upstream from Spring Creek, 0.7 mi upstream from Kink Creek, 1.0 mi upstream from Portland General Electric Co. diversion dam, 24 mi southeast of Estacada, and at mile 6.1.

DRAINAGE AREA.--126 mi<sup>2</sup>.

PERIOD OF RECORD.--May 1909 to current year. Monthly discharge only for some periods, published in WSP 1318. Published as both Oak Grove Fork of Clackamas River at proposed intake, near Cazadero, and Oak Grove Fork of Clackamas River at intake, near Cazadero, May 1909 to September 1910, as Oak Grove Fork of Clackamas River at intake, near Cazadero, October 1910 to September 1921, and as Oak Grove Fork at Portland General Electric Power Co. intake, October 1921 to September 1929.

REVISED RECORDS.--WSP 1248: 1909, 1910(M), 1916, 1918, 1923, 1932. WSP 1935: 1914, 1921.

GAGE.--Water-stage recorder. Datum of gage is 2,052.31 ft above sea level. May 21, 1909, to Nov. 17, 1911, nonrecording gage and Mar. 26, 1912, to Sept. 30, 1923, water-stage recorder, at various sites 0.7 mi downstream, below Kink Creek, at different datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Flow regulated since 1956 by Timothy Lake (station 14208600). No diversion upstream from station.

AVERAGE DISCHARGE.--85 years (water years 1910-94), 492 ft<sup>3</sup>/s, 356,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,000 ft<sup>3</sup>/s Jan. 7, 1923, gage height, 5.45 ft, site and datum then in use, from rating curve extended above 2,300 ft<sup>3</sup>/s on basis of peak discharge for other stations in Clackamas River basin; minimum discharge, 161 ft<sup>3</sup>/s Sept. 16, 1993.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 742 ft<sup>3</sup>/s Nov. 13, gage height, 2.89 ft; minimum discharge, 173 ft<sup>3</sup>/s Nov. 26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	258	570	378	299	259	e420	393	325	245	237	220	217
2	258	579	285	374	261	e433	393	318	240	251	220	217
3	258	589	255	581	257	e472	392	316	240	239	220	221
4	258	573	318	574	250	e520	375	332	241	236	220	220
5	258	573	248	567	246	e486	368	319	246	238	219	217
6	258	570	235	468	245	e433	408	310	266	236	220	216
7	260	569	250	398	244	e401	411	306	279	234	220	216
8	246	569	305	383	241	e499	423	301	257	234	220	216
9	241	588	310	426	244	e605	422	294	248	235	220	219
10	238	563	323	424	241	601	420	290	245	233	219	220
11	220	549	318	489	e241	573	407	284	243	231	219	219
12	220	583	291	466	e237	606	414	281	241	230	219	217
13	219	566	268	467	e237	611	405	275	251	228	218	216
14	229	563	260	436	e241	612	394	271	274	227	219	216
15	238	549	251	408	e246	619	383	273	265	225	219	214
16	300	495	243	383	e234	599	386	278	256	225	218	215
17	307	433	239	361	e250	578	396	270	254	224	218	215
18	303	292	237	344	e250	580	411	270	255	223	218	213
19	303	257	234	331	e246	584	428	275	249	223	218	213
20	302	240	243	318	e241	596	417	276	245	221	218	213
21	302	243	254	309	e241	594	421	264	243	222	220	213
22	346	247	252	311	e453	589	402	260	241	221	219	213
23	535	241	248	318	e499	602	391	255	240	222	218	213
24	535	247	242	320	e520	602	398	252	241	221	217	213
25	544	240	248	301	e472	606	377	250	239	220	217	212
26	555	242	250	291	e395	604	361	247	240	220	217	211
27	553	238	249	281	e371	608	349	245	238	220	217	211
28	540	240	245	275	e383	538	340	248	236	220	217	211
29	555	247	245	270	--	334	335	256	235	220	216	216
30	554	257	247	264	--	356	339	249	235	220	217	213
31	562	--	254	261	--	395	--	245	--	220	216	--
TOTAL	10755	12712	8225	11698	8245	16656	11759	8635	7428	7056	6773	6456
MEAN	347	424	265	377	294	537	392	279	248	228	218	215
MAX	562	589	378	581	520	619	428	332	279	251	220	221
MIN	219	238	234	261	234	334	335	245	235	220	216	211
AC-FT	21330	25210	16310	23200	16350	33040	23320	17130	14730	14000	13430	12810

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1957 - 1994, BY WATER YEAR (WY)

	MEAN	385	496	557	563	558	558	556	573	436	321	300	336
MAX	517	613	1047	1036	959	1377	825	1104	1126	517	429	516	
(WY)	1975	1969	1965	1974	1982	1972	1974	1971	1974	1974	1974	1960	
MIN	236	288	265	255	250	327	311	279	248	228	218	215	
(WY)	1982	1988	1994	1977	1977	1977	1978	1994	1994	1994	1994	1994	

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1957 - 1994

ANNUAL TOTAL	151378	116398		
ANNUAL MEAN	415	319	469	
HIGHEST ANNUAL MEAN			709	1974
LOWEST ANNUAL MEAN			319	1994
HIGHEST DAILY MEAN	1100	Mar 23	619	Mar 15
LOWEST DAILY MEAN	219	Oct 13	211	Sep 26
ANNUAL SEVEN-DAY MINIMUM	229	Oct 9	212	Sep 22
ANNUAL RUNOFF (AC-FT)	300300		230900	340000
10 PERCENT EXCEEDS	662		558	656
50 PERCENT EXCEEDS	332		256	457
90 PERCENT EXCEEDS	248		218	268

e Estimated

## 14209500 CLACKAMAS RIVER ABOVE THREE LYNX CREEK, OR

LOCATION.--Lat 45°07'30", long 122°04'20", in NE1 sec.21, T.5 S., R.6 E., Clackamas County, Hydrologic Unit 17090011, Mount Hood National Forest, on right bank 0.1 mi upstream from Three Lynx Creek, 0.25 mi downstream from powerplant, 17 mi southeast of Estacada, and at mile 47.8.

DRAINAGE AREA.--479 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1909 to December 1913, October 1921 to current year. Prior to October 1911 (monthly discharge only), published in WSP 1318.

REVISED RECORDS.--WSP 1148: Drainage area. WSP 1248: 1910(M), 1912, 1948-50(M).

GAGE.--Water-stage recorder. Datum of gage is 1,091.69 ft above sea level (levels by Portland General Electric Co.). Apr. 23, 1909, to Jan. 4, 1914, nonrecording gage at about same site and datum. Nov. 1, 1921, to Dec. 27, 1924, water-stage recorder at present site at datum 0.91 ft higher.

REMARKS.--Records excellent except for estimated daily discharges, which are good. Minor regulation since May 1956 by Timothy Lake (station 14208600).

AVERAGE DISCHARGE.--77 years, 1,959 ft<sup>3</sup>/s, 55.57 in/yr, 1,419,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 68,200 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 21.7 ft, from floodmark, from rating curve extended above 34,100 ft<sup>3</sup>/s on basis of slope-area measurement at gage height 15.06 ft; minimum recorded discharge, 261 ft<sup>3</sup>/s Oct. 7, 1987; minimum daily, 410 ft<sup>3</sup>/s Sept. 4, 1986.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 8,100 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 3	0330	*9,310	*7.20	No other peak greater than base discharge.			

Minimum discharge, 363 ft<sup>3</sup>/s Oct. 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	594	871	2380	2200	1040	3320	2190	1330	867	750	561	507
2	592	875	2120	3370	1010	3450	2080	1280	838	767	560	500
3	589	936	1330	7870	981	4120	1990	1250	816	738	557	513
4	589	917	1480	6060	949	4260	1840	1410	818	723	558	531
5	588	886	1230	5890	921	3410	1710	1520	833	745	555	506
6	589	878	1020	4130	913	2760	1950	1430	984	729	551	e490
7	614	873	1260	3020	898	2350	2120	1410	1340	705	549	e470
8	594	870	2440	2770	849	2170	2500	1380	1230	698	553	e485
9	579	869	3040	3110	894	2030	2970	1320	1090	686	551	e500
10	570	875	2940	3090	869	1990	2910	1260	1020	671	546	542
11	520	854	2760	3190	853	1880	2570	1210	959	665	543	546
12	588	865	2310	2990	829	1800	2420	1160	917	654	541	531
13	594	865	1830	2860	887	1760	2240	1100	949	649	541	522
14	600	857	1580	2670	999	1780	2050	1060	1270	641	538	518
15	691	854	1390	2440	911	1790	1850	1030	1400	637	537	514
16	713	806	1240	2170	923	1800	1840	1120	1260	634	537	514
17	677	789	1130	1940	979	1770	2000	1070	1170	625	535	511
18	655	638	1040	1760	1090	2050	2130	1030	1190	621	533	507
19	652	585	978	1730	1040	2030	2220	1080	1080	607	531	505
20	638	565	941	1410	1010	1890	2120	1090	1010	598	530	503
21	637	597	915	1420	1030	2130	2050	1030	958	592	529	502
22	733	655	878	1460	1210	1940	1890	1010	919	588	542	497
23	857	603	849	1580	1590	1830	1770	966	886	584	536	499
24	847	e560	824	1610	4920	1760	1780	932	865	581	528	498
25	856	e550	809	1570	4510	1720	1660	906	839	578	525	492
26	832	e550	805	1390	3240	1680	1660	885	829	574	567	528
27	823	592	790	1300	3030	1710	1460	861	804	572	588	524
28	899	590	771	1230	3090	1740	1400	854	783	572	592	508
29	829	622	759	1160	---	1660	1370	913	763	571	556	525
30	876	847	766	1110	---	1830	1470	917	750	571	526	526
31	863	---	939	1070	---	2350	---	868	---	566	521	---
TOTAL	21278	22694	43544	79570	41465	68760	60210	34682	29437	19892	16917	15314
MEAN	686	756	1405	2567	1481	2218	2007	1119	981	642	546	510
MAX	899	936	3040	7870	4920	4260	2970	1520	1400	767	592	546
MIN	520	550	759	1070	829	1660	1370	854	750	566	521	470
AC-FT	42200	45010	86370	157800	82250	136400	119400	68790	58390	39460	33550	30380
CFSM	1.43	1.58	2.93	5.36	3.09	4.63	4.19	2.34	2.05	1.34	1.14	1.07
IN.	1.65	1.76	3.38	6.18	3.22	5.34	4.68	2.69	2.29	1.54	1.31	1.19

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1910 - 1994, BY WATER YEAR (WY)

	MEAN	993	2181	2807	2816	2702	2465	2653	2675	1806	952	751	760
MAX	2511	5773	8271	7157	6205	6559	4477	5548	4879	1778	987	1242	
(WY)	1948	1910	1965	1953	1982	1972	1943	1949	1933	1950	1950	1959	
MIN	593	573	786	739	734	1313	1179	1057	674	592	534	510	
(WY)	1993	1930	1977	1937	1977	1941	1992	1992	1992	1992	1992	1994	

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1910 - 1994

ANNUAL TOTAL	628191	453763	1959
ANNUAL MEAN	1721	1243	3128
HIGHEST ANNUAL MEAN			1974
LOWEST ANNUAL MEAN			1062
HIGHEST DAILY MEAN	11100	7870	48000
LOWEST DAILY MEAN	520	470	410
ANNUAL SEVEN-DAY MINIMUM	578	499	490
ANNUAL RUNOFF (AC-FT)	1246000	900000	1419000
ANNUAL RUNOFF (CFSM)	3.59	2.60	4.09
ANNUAL RUNOFF (INCHES)	48.79	35.24	55.57
10 PERCENT EXCEEDS	3530	2350	3670
50 PERCENT EXCEEDS	1040	898	1470
90 PERCENT EXCEEDS	610	532	687

e Estimated

## WILLAMETTE RIVER BASIN

## 14209700 FISH CREEK NEAR THREE LYNX, OR

LOCATION...Lat 45°08'52", long 122°09'07", in NE 1/4 SE 1/4 sec.11, T.5 S., R.5 E., Clackamas County, Hydrologic Unit 17090011, Mount Hood National Forest, on right bank, 0.7 mi upstream from Clackamas River, and at mile 1.15.

DRAINAGE AREA...45.2 mi<sup>2</sup>.

PERIOD OF RECORD...October 1989 to current year.

GAGE...Water-stage recorder and crest-stage gage. Datum of gage is 940 ft above sea level, from topographic map.

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

AVERAGE DISCHARGE...5 years, 174 ft<sup>3</sup>/s, 52.43 in/yr, 126,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD...Maximum discharge, 3,830 ft<sup>3</sup>/s Dec. 6, 1991, gage height, 9.34 ft; minimum discharge, 6.0 ft<sup>3</sup>/s Sept. 1, 2, 1992.

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

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 2	2330	1,880	8.02	Feb. 24	1430	(a)	*8.25
Feb. 24	1430	*1,950	8.08				

Minimum discharge, 9.6 ft<sup>3</sup>/s Sept. 25-29.

(a) From crest-stage gage.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	13	803	363	75	623	267	105	60	41	16	11
2	12	13	468	675	71	632	238	99	55	46	16	11
3	12	49	256	1370	68	677	224	97	52	40	16	14
4	12	36	352	946	65	600	200	120	51	38	15	16
5	12	26	238	914	61	456	180	125	50	47	15	14
6	12	22	168	663	59	342	268	118	82	42	15	13
7	18	20	231	425	58	268	369	109	168	38	15	12
8	17	19	562	356	51	223	417	100	142	35	15	12
9	15	18	660	448	59	192	505	90	113	33	15	15
10	14	17	654	473	55	178	472	81	93	31	14	19
11	13	17	640	661	53	162	387	75	79	30	14	17
12	14	17	451	568	51	148	338	71	70	28	14	16
13	14	16	319	508	65	140	288	65	91	27	14	14
14	18	16	249	408	81	142	254	62	203	26	14	14
15	25	16	202	326	82	142	222	60	270	26	13	13
16	29	19	165	262	93	148	213	68	211	25	13	12
17	22	22	139	219	115	145	219	64	164	24	13	12
18	19	26	120	187	150	189	219	60	137	23	13	11
19	17	22	106	162	136	184	214	58	112	22	13	11
20	16	20	94	144	125	174	186	60	95	21	13	11
21	15	24	84	131	122	281	173	57	82	20	13	11
22	15	42	76	136	119	220	153	54	73	20	13	10
23	14	30	70	155	382	184	145	51	67	19	13	10
24	14	24	66	159	1550	164	155	48	62	19	13	10
25	14	22	63	147	912	154	140	46	57	18	12	9.9
26	14	20	61	131	650	149	129	44	56	17	12	9.7
27	13	21	58	117	553	162	117	42	51	16	12	9.6
28	13	29	55	106	593	177	110	43	47	17	11	9.6
29	13	47	53	96	---	195	107	58	44	17	11	11
30	13	118	57	88	---	219	114	63	42	17	11	11
31	13	---	102	80	---	281	---	56	---	17	11	---
TOTAL	475	801	7622	11424	6454	7951	7023	2249	2879	840	418	369.8
MEAN	15.3	26.7	246	369	230	256	234	72.5	96.0	27.1	13.5	12.3
MAX	29	118	803	1370	1550	677	505	125	270	47	16	19
MIN	12	13	53	80	51	140	107	42	42	16	11	9.6
AC-FT	942	1590	15120	22660	12800	15770	13930	4460	5710	1670	829	733
CFSM	.34	.59	5.44	8.15	5.10	5.67	5.18	1.61	2.12	.60	.30	.27
IN.	.39	.66	6.27	9.40	5.31	6.54	5.78	1.85	2.37	.69	.34	.30

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1990 - 1994, BY WATER YEAR (WY)

	1990	1991	1992	1993	1994	1990	1991	1992	1993	1994
MEAN	41.1	255	274	306	270	274	327	170	118	35.9
MAX	121	429	411	431	402	516	447	274	195	62.8
(WY)	1991	1992	1992	1990	1991	1993	1993	1991	1993	1993
MIN	15.3	26.7	216	187	110	87.0	234	68.0	20.9	13.6
(WY)	1994	1994	1991	1993	1993	1992	1994	1992	1992	1992

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1990 - 1994

ANNUAL TOTAL	64949	48505.8	174	1993
ANNUAL MEAN	178	133	205	1994
HIGHEST ANNUAL MEAN			133	1991
LOWEST ANNUAL MEAN			2400	1992
HIGHEST DAILY MEAN	1570	Mar 23	1550	Feb 24
LOWEST DAILY MEAN	12	Oct 2	9.6	Sep 27
ANNUAL SEVEN-DAY MINIMUM	12	Sep 30	9.8	Sep 22
ANNUAL RUNOFF (AC-FT)	128800	96210	126300	
ANNUAL RUNOFF (CFSM)	3.94	2.94	3.86	
ANNUAL RUNOFF (INCHES)	53.45	39.92	52.43	
10 PERCENT EXCEEDS	454	359	413	
50 PERCENT EXCEEDS	81	59	100	
90 PERCENT EXCEEDS	16	13	12	



## 14210000 CLACKAMAS RIVER AT ESTACADA, OR

LOCATION.--Lat 45°18'00", long 122°21'10", in NE 1/4 sec.19, T.3 S., R.4 E., Clackamas County, Hydrologic Unit 17090011, on left bank 0.2 mi downstream from River Mill Dam, 1.5 mi northwest of Estacada, and at mile 23.1.

DRAINAGE AREA.--671 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1908 to current year. Monthly discharge only April 1908, published in WSP 1318. Published as "near Cazadero" January 1909 to September 1957.

REVISED RECORDS.--WSP 1248: 1908-9, 1910(M), 1916, 1917(M), 1922(M), 1923. WSP 1288: Drainage area (former site). WSP 1638: 1919(M).

GAGE.--Water-stage recorder. Datum of gage is 286.93 ft above sea level (levels by Portland General Electric Co.). See WSP 1738 for history of changes prior to Oct. 1, 1957. Oct. 1, 1957, to Feb. 16, 1965, water-stage recorder at same site at datum 12.00 ft higher. Feb. 17, 1965 to Sept. 30, 1991, water-stage recorder at same site at datum 10 ft higher.

REMARKS.--Records good except for estimated daily discharges, which are fair. Discharges for period Jan. 1-28 computed from data obtained through U.S. Army Corps of Engineers Columbia River Operational Hydromet System (CROHMS) database. Large diurnal fluctuations and some regulation caused by powerplants at River Mill Dam and, since 1958, North Fork Dam. Minor regulation since 1956 by Timothy Lake (station 14208600). Two small diversions upstream from station for Oregon City and Estacada municipal water supply.

AVERAGE DISCHARGE.--86 years, 2,718 ft<sup>3</sup>/s, 55.01 in/yr, 1,969,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 86,900 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 28.36 ft (present datum); minimum discharge, 50 ft<sup>3</sup>/s Mar. 10, 1961, from rating curve extended below 260 ft<sup>3</sup>/s; minimum daily, 285 ft<sup>3</sup>/s Oct. 4, 5, 1958, caused by filling of North Fork dam forebay.

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 15,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 3	0500	*14,400	*17.17				

Minimum daily discharge, 560 ft<sup>3</sup>/s Sept. 7.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	633	1030	3840	2940	1430	5200	3040	1860	1240	1020	705	e610
2	638	1050	3690	4070	1400	5330	2850	1790	1140	1090	678	e600
3	729	1240	2140	12100	1360	5980	2730	1770	1140	1040	703	e620
4	805	1170	2490	9050	1330	6250	2530	1910	1120	979	683	e640
5	761	1090	2020	9090	1290	4990	2350	2060	1150	1020	689	e610
6	792	1040	1630	6860	1240	3910	2810	1940	1400	1020	681	e590
7	759	1050	1790	4760	1260	3250	3510	1890	1970	972	678	e560
8	671	1030	3600	3920	1160	2890	3610	1840	1830	936	674	e580
9	705	1040	4770	4490	1240	2700	4330	1820	1590	915	676	e600
10	714	1040	4400	4690	1220	2640	4240	1660	1470	882	661	e650
11	661	1030	4370	5230	1190	2500	3480	1560	1370	874	660	e660
12	649	1020	3480	4820	1140	2350	3430	1560	1290	891	698	e640
13	767	1030	2760	4690	1230	2290	3120	1480	1380	820	612	e630
14	739	1010	2380	4110	1370	2290	2920	1430	1890	833	641	e620
15	865	1020	2060	3590	1350	2300	2610	1380	2330	819	693	e620
16	936	997	1850	3110	1610	2310	2490	1530	2040	803	635	e620
17	874	1020	1670	2750	1430	2290	2620	1560	1800	802	643	e610
18	818	889	1530	2490	1390	2630	2760	1440	1800	805	640	e610
19	814	792	1410	2380	1600	2630	2840	1380	1590	834	634	e610
20	810	726	1350	2060	1570	2440	2720	1500	1480	764	646	e600
21	802	759	1310	2010	1590	2930	2600	1410	1400	765	628	e600
22	844	963	1230	2040	1740	2630	2440	1360	1310	743	647	e600
23	1070	839	1190	2170	2690	2430	2280	1310	1250	745	662	e600
24	999	714	1150	2210	9950	2330	2500	1250	1220	737	617	e600
25	1030	741	1110	2170	8380	2250	2290	1240	1180	732	638	e590
26	1000	740	1110	1930	5570	2190	2210	1170	1150	721	628	e630
27	1010	723	1080	1820	4930	2240	2010	1170	1150	657	725	e630
28	1010	780	1060	1730	4930	2310	1920	1140	1060	684	678	e610
29	1000	859	1040	1640	---	2180	1880	1270	1050	699	688	e630
30	1030	1160	1020	1570	---	2330	2020	1300	1030	744	632	e630
31	1010	---	1320	1500	---	3120	---	1190	---	699	e630	---
TOTAL	25945	28592	65850	117990	66590	94110	83140	47170	42820	26045	20503	18400
MEAN	837	953	2124	3806	2378	3036	2771	1522	1427	840	661	613
MAX	1070	1240	4770	12100	9950	6250	4330	2060	2330	1090	725	660
MIN	633	714	1020	1500	1140	2180	1880	1140	1030	657	612	560
AC-FT	51460	56710	130600	234000	132100	186700	164900	93560	84930	51660	40670	36500
CFSM	1.25	1.42	3.17	5.67	3.54	4.52	4.13	2.27	2.13	1.25	.99	.91
IN.	1.44	1.59	3.65	6.54	3.69	5.22	4.61	2.62	2.37	1.44	1.14	1.02

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 1994, BY WATER YEAR (WY)

MEAN	1295	3180	4357	4420	4085	3647	3616	3398	2194	1143	875	939
MAX	2712	6263	11170	8821	8938	8921	5296	6396	5143	2018	1208	1602
(WY)	1969	1974	1965	1974	1982	1972	1993	1969	1974	1974	1974	1959
MIN	725	806	1030	1036	977	1850	1867	1456	882	763	659	613
(WY)	1989	1988	1977	1977	1977	1992	1967	1992	1992	1992	1992	1994

## SUMMARY STATISTICS

	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1959 - 1994
ANNUAL TOTAL	876544	637155	
ANNUAL MEAN	2401	1746	2755
HIGHEST ANNUAL MEAN			4407
LOWEST ANNUAL MEAN			1454
HIGHEST DAILY MEAN	15200	Mar 23	57200
LOWEST DAILY MEAN	633	Oct 1	285
ANNUAL SEVEN-DAY MINIMUM	701	Oct 8	507
ANNUAL RUNOFF (AC-FT)	1739000	1264000	1996000
ANNUAL RUNOFF (CFSM)	3.58	2.60	4.11
ANNUAL RUNOFF (INCHES)	48.60	35.32	55.79
10 PERCENT EXCEEDS	5000	3480	5200
50 PERCENT EXCEEDS	1560	1240	2150
90 PERCENT EXCEEDS	801	638	780

e Estimated



LOCATION.--Lat 45°28'40", long 122°30'24", in lot 2, SW 1/4 sec.13, T.1 S., R.2 E., Multnomah County, Hydrologic Unit 17090012, on right bank 0.3 mi southwest of Sycamore station, 2.5 mi east of city limits of Portland, and at mile 10.2.

PERIOD OF RECORD.--July 1940 to current year.

REVISED RECORDS.--WSP 1318: 1941(M). WDR OR-75-1: 1974. WDR OR-77-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 228.47 ft above sea level.

REMARKS.--Records good except for estimated records, which are poor. Since January 1980, on occasion overflow from the Powell Butte Reservoir enters Johnson Creek at Circle Avenue, mile 11.6. Slight diurnal fluctuation at low flow caused by recreational ponds upstream. Small diversions for irrigation upstream from station.

AVERAGE DISCHARGE,--54 years, 52.9 ft<sup>3</sup>/s, 27.11 in/yr, 38,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,620 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 14.68 ft; minimum discharge, 0.08 ft<sup>3</sup>/s Aug. 21, 1966.

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

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 3	0900	539	7.86	Feb. 24	1900	*1,600	*13.21

Minimum discharge, 0.56 ft<sup>3</sup>/s Aug. 29,30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.7	e1.8	e85	191	26	134	58	9.1	5.5	2.3	1.2	.93
2	2.0	e1.6	e32	231	24	127	46	9.2	3.6	3.0	1.2	.82
3	2.3	e4.1	e16	412	21	119	40	8.2	3.2	2.5	.93	6.5
4	1.6	e2.3	e52	251	19	92	34	15	3.3	2.1	1.2	2.2
5	1.4	e2.3	e22	273	18	70	35	8.9	3.0	2.4	.93	1.9
6	2.4	e1.8	e15	159	16	55	61	8.0	6.7	2.2	.96	1.4
7	e2.7	e1.6	e46	106	16	46	58	6.7	11	2.0	.93	1.3
8	e2.0	e1.7	e135	95	14	39	160	6.2	6.6	2.0	1.1	2.6
9	e1.6	e1.8	e124	82	19	34	145	5.6	4.4	2.2	1.3	2.6
10	e1.2	e2.0	e186	74	18	43	112	5.1	3.6	1.9	1.3	2.6
11	e1.7	e1.5	e200	78	16	37	79	4.8	3.3	1.6	1.3	2.2
12	e2.7	e1.2	e85	114	14	28	72	4.5	3.0	1.5	.98	1.5
13	e1.9	e1.6	e57	119	35	25	56	4.3	7.8	1.4	.92	1.3
14	e7.8	e1.6	62	85	28	23	46	4.0	11	1.6	.90	1.1
15	e11	e5.2	43	64	26	22	39	6.1	17	1.5	.85	1.2
16	e6.1	e5.0	33	51	29	28	33	7.3	7.0	1.6	1.0	1.1
17	e2.9	e5.0	27	43	58	28	28	8.9	5.3	1.5	.95	.77
18	e2.0	e3.9	23	37	91	72	25	6.1	9.6	1.5	1.3	1.0
19	e1.7	e2.4	20	33	111	58	20	4.9	5.2	1.5	1.3	.84
20	e1.6	e1.4	18	29	85	69	17	9.4	4.3	1.7	1.2	1.0
21	e1.7	e2.8	16	26	102	134	17	12	3.9	1.5	.91	1.0
22	e2.2	e12	14	49	77	100	14	5.2	3.7	1.3	1.3	1.3
23	e1.9	e4.5	13	115	424	74	16	4.1	3.5	1.3	1.2	1.4
24	e2.0	e2.9	12	108	1430	55	20	4.0	3.0	1.3	1.0	1.4
25	e1.9	e1.8	11	91	553	43	14	3.4	2.8	1.3	1.2	1.5
26	e2.3	e2.8	11	74	292	34	12	3.0	4.9	1.3	1.2	1.9
27	e2.1	e1.9	9.6	50	303	29	11	2.7	2.8	1.4	1.1	2.0
28	e2.1	e2.3	8.7	42	199	26	10	2.9	2.6	1.4	.91	1.6
29	e2.7	e5.1	8.6	36	---	22	8.9	8.4	2.4	1.3	.84	2.6
30	e3.1	e28	19	31	---	27	9.6	6.3	2.4	1.3	.97	1.9
31	e8.0	---	37	27	---	93	---	4.3	---	1.4	1.1	---
TOTAL	88.3	113.9	1440.9	3176	4064	1786	1296.5	198.6	156.4	52.8	33.48	51.46
MEAN	2.85	3.80	46.5	102	145	57.6	43.2	6.41	5.21	1.70	1.08	1.72
MAX	11	28	200	412	1430	134	160	15	17	3.0	1.3	6.5
MIN	1.2	1.2	8.6	26	14	22	8.9	2.7	2.4	1.3	.84	.77
AC-FT	175	226	2860	6300	8060	3540	2570	394	310	105	66	102
CFSM	.11	.14	1.75	3.87	5.48	2.17	1.63	.24	.20	.06	.04	.06
IN.	.12	.16	2.02	4.46	5.70	2.51	1.82	.28	.22	.07	.05	.07

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 1994, BY WATER YEAR (WY)

MEAN	9.85	68.5	124	139	118	85.1	49.2	25.4	11.3	3.07	1.87	2.78
MAX	65.4	239	302	308	320	196	130	90.1	63.5	30.0	8.04	11.4
(WY)	1969	1951	1965	1970	1949	1957	1955	1963	1984	1983	1968	1972
MIN	1.29	1.56	4.34	9.01	16.0	18.1	9.46	3.32	1.46	.64	.44	.55
(WY)	1966	1953	1977	1977	1977	1982	1942	1966	1966	1973	1970	1967

### SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

## WATER YEARS 1941 - 1994

ANNUAL TOTAL	14245.7			12458.34					
ANNUAL MEAN	39.0			34.1			52.9		
HIGHEST ANNUAL MEAN							91.3		1974
LOWEST ANNUAL MEAN							15.6		1977
HIGHEST DAILY MEAN	412	Mar	23	1430	Feb	24	2150	Dec	22 1964
LOWEST DAILY MEAN	1.2	Oct	10	.77	Sep	17	.10	Aug	7 1973
ANNUAL SEVEN-DAY MINIMUM	1.5	Sep	20	.95	Aug	27	.11	Aug	5 1973
ANNUAL RUNOFF (AC-FT)	28260			24710			38300		
ANNUAL RUNOFF (CFSM)	1.47			1.29			1.99		
ANNUAL RUNOFF (INCHES)	20.00			17.49			27.11		
10 PERCENT EXCEEDS	114			87			144		
50 PERCENT EXCEEDS	14			5.6			14		
90 PERCENT EXCEEDS	1.9			1.2			1.1		

e Estimated

## WILLAMETTE RIVER BASIN

307

14211550 JOHNSON CREEK AT MILWAUKIE, OR

LOCATION.--Lat 45°27'11", long 122°38'31", in NE 1/4 SE 1/4 sec.26, T.1 S., R.1 E., Clackamas County, Hydrologic Unit 17090012, on the right bank upstream side of the Milport Road bridge, in the city limits of Milwaukie, and at mile 0.7.

DRAINAGE AREA.--51.8 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1989 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is sea level, from State of Oregon.

REMARKS.--No estimated daily discharges. Record good. Small diversions for irrigation upstream from station. Significant portion of summer flow is from Crystal Springs, through Crystal Springs Creek, which enters 0.5 mi upstream from gage.

AVERAGE DISCHARGE.--5 years, 61.4 ft<sup>3</sup>/s, 16.09 in/yr, 44,450 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,730 ft<sup>3</sup>/s Feb. 24, 1994, gage height 29.41 ft; minimum discharge, 10 ft<sup>3</sup>/s July 1, 3-5, 1994.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 750 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 3	1200	754	27.39	Feb. 24	1230	*1,730	*29.41

Minimum discharge, 10 ft<sup>3</sup>/s July 1, 3-5.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	19	147	234	37	188	89	23	20	11	15	15
2	16	15	68	253	34	165	72	23	17	11	15	15
3	16	17	40	579	32	170	63	26	16	10	14	22
4	15	16	71	334	29	130	55	36	15	10	14	23
5	15	15	46	351	27	101	52	26	15	15	14	16
6	15	15	35	213	26	81	89	23	21	18	15	15
7	16	15	72	145	26	68	93	21	26	17	14	14
8	16	15	182	125	24	60	200	20	22	16	14	21
9	16	15	183	111	27	53	202	19	18	17	14	20
10	15	15	236	101	31	60	160	20	16	16	15	38
11	15	15	285	108	27	62	116	18	14	16	15	18
12	16	14	114	129	25	47	107	17	14	15	15	16
13	16	15	77	156	58	43	87	17	17	15	14	15
14	28	14	82	112	52	40	73	18	23	14	15	14
15	31	15	62	87	43	38	60	18	35	14	15	14
16	25	18	48	70	48	44	54	29	22	15	14	14
17	19	21	39	59	76	52	47	28	18	15	14	14
18	17	21	33	52	121	97	41	25	22	14	14	14
19	16	18	29	46	138	100	38	21	16	13	14	14
20	15	17	26	42	111	96	34	24	16	13	16	14
21	15	22	24	38	129	175	31	39	15	13	16	14
22	15	36	22	61	103	134	30	24	14	13	16	13
23	15	21	21	145	432	104	32	20	15	14	15	13
24	14	17	20	139	1600	82	41	19	13	14	15	13
25	16	19	19	120	1020	67	31	19	12	14	15	13
26	15	20	18	99	441	57	29	17	14	14	15	14
27	15	19	18	72	444	48	25	17	13	13	15	14
28	14	17	17	59	280	43	25	16	11	13	16	14
29	15	20	17	51	---	39	25	22	11	14	16	15
30	14	40	24	45	---	42	26	23	11	14	15	16
31	18	---	54	40	---	115	---	20	---	15	16	---
TOTAL	520	556	2129	4176	5441	2601	2027	688	514	436	460	485
MEAN	16.8	18.5	68.7	135	194	83.9	67.6	22.2	17.1	14.1	14.8	16.2
MAX	31	40	285	579	1600	188	202	39	35	18	16	38
MIN	14	14	17	38	24	38	25	16	11	10	14	13
AC-FT	1030	1100	4220	8280	10790	5160	4020	1360	1020	865	912	962
CFSM	.32	.36	1.33	2.60	3.75	1.62	1.30	.43	.33	.27	.29	.31
IN.	.37	.40	1.53	3.00	3.91	1.87	1.46	.49	.37	.31	.33	.35

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1990 - 1994, BY WATER YEAR (WY)

	1990	1991	1992	1993	1994	1990	1991	1992	1993	1994
MEAN	24.2	53.6	98.1	133	136	80.5	81.7	49.8	32.0	19.1
MAX	40.4	84.2	135	183	194	114	137	91.3	47.9	21.5
(WY)	1991	1991	1992	1990	1994	1993	1993	1991	1993	1991
MIN	16.8	18.5	68.7	106	34.0	44.1	50.4	22.2	16.7	14.1
(WY)	1994	1994	1994	1992	1993	1992	1990	1994	1992	1994

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1990 - 1994

ANNUAL TOTAL	20629	20033	61.4
ANNUAL MEAN	56.5	54.9	70.2
HIGHEST ANNUAL MEAN			54.9
LOWEST ANNUAL MEAN			
HIGHEST DAILY MEAN	458	1600	1600
LOWEST DAILY MEAN	14	10	10
ANNUAL SEVEN-DAY MINIMUM	15	11	11
ANNUAL RUNOFF (AC-FT)	40920	39740	44450
ANNUAL RUNOFF (CFSM)	1.09	1.06	1.18
ANNUAL RUNOFF (INCHES)	14.81	14.39	16.09
10 PERCENT EXCEEDS	135	118	138
50 PERCENT EXCEEDS	29	20	31
90 PERCENT EXCEEDS	15	14	15

## WILLAMETTE RIVER BASIN

14211720 WILLAMETTE RIVER AT PORTLAND, OR  
(National stream quality accounting network station)

LOCATION.--Lat 45°31'07", long 122°40'00", in NW 1/4 NE 1/4 sec.3, T.1 S., R.1 E., Multnomah County, Hydrologic Unit 17090012, in pier at east end of drawspan, on upstream side of Morrison Bridge, in Portland, and at mile 12.8.

DRAINAGE AREA.--11,100 mi<sup>2</sup>, approximately.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1972 to September 1994 (discontinued). Gage-height records collected in this vicinity since 1879 are in reports of the National Weather Service.

GAGE.--Acoustic velocity meter (AVM) with water-stage and velocity-index recorder. Datum of gage is 1.55 ft above sea level (levels by National Weather Service).

REMARKS.--Water-discharge records fair except for estimated daily discharges below 50,000 ft<sup>3</sup>/s, which are poor. Flow regulated by many reservoirs upstream. Many diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--22 years, 31,370 ft<sup>3</sup>/s, 22,730,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 283,000 ft<sup>3</sup>/s Jan. 18, 1974; maximum gage height, 23.84 ft Jan. 18, 1974; minimum daily discharge, 4,200 ft<sup>3</sup>/s July 10, 1978.

EXTREMES OUTSIDE PERIOD OF RECORD.--Floods of June 7, 1894, and June 1, 1948, reached stages of 33.0 ft and 30.0 ft, respectively, from information by National Weather Service.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 117,000 ft<sup>3</sup>/s Feb. 25; maximum gage height, 8.60 ft Feb. 25; minimum daily discharge, 7,400 ft<sup>3</sup>/s (estimated) on several days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13500	13200	e18000	19200	17400	70200	30700	14900	e11000	e9000	e7600	e7600
2	13500	12100	26900	30300	16300	62200	e29000	14400	e11000	9660	e7500	e7600
3	13900	e12400	28700	53800	16000	58600	e27000	14800	e10000	9000	e7400	e7800
4	13400	e12600	26300	73100	16300	59900	e25000	14200	10500	9710	e7400	e7900
5	13700	e12900	25800	85300	15400	61100	22700	e15000	9750	7930	e7400	e8000
6	12800	13100	22400	88600	14800	59900	22300	e15000	9320	e7700	e7400	e8000
7	13600	13000	21300	86000	13900	49800	26300	e14000	11500	e8000	e7400	e7500
8	14400	12100	27200	73400	15200	e42000	32100	e14000	14200	e8000	e7500	e7500
9	15700	12500	43300	65200	12400	e37000	42900	e14000	16000	e7800	e7500	e8400
10	15900	12900	55400	63600	13900	e32000	51000	e13000	15700	e7800	e7600	e8900
11	16400	11300	64800	64400	15200	e30000	51100	e12000	e14000	e7800	e7600	e9000
12	14400	10600	70700	64200	12800	27500	48200	e12000	e12000	e7800	e7400	e9100
13	14900	11200	65400	61300	13600	25400	43000	12100	e11000	e7500	e7400	e9100
14	14600	11300	55800	55200	15500	23300	e38000	e12000	10800	e7500	e7700	e9400
15	14600	9640	44700	49100	18500	22500	e34000	11100	13600	e7500	e7800	e9500
16	15900	e10500	36900	43800	19100	21200	29200	10900	18600	e7500	e7600	e9400
17	15600	11200	30800	39100	21500	20900	26800	11700	18500	e7600	e7600	e9300
18	15100	12400	26200	34700	27800	21700	e25000	13300	e17000	e7700	e7700	e9200
19	14600	11500	23700	33600	31000	24000	e23000	12700	e16000	e7700	e7600	e9200
20	16100	11800	20200	28900	30500	24700	22100	11800	e15000	e7700	e7800	e9100
21	15700	10600	19000	25900	27600	26400	20100	13000	e13000	e7400	e7900	e9400
22	15400	11400	18000	24100	31900	29900	18300	e13000	e12000	e7500	e7800	e9100
23	15400	12100	16800	23200	36100	32400	17400	e12000	e12000	e7500	e7900	e8900
24	16200	12400	15900	24100	72200	31200	18100	e12000	e11000	e7500	e7900	e8800
25	14100	15700	15900	27800	103000	30600	17800	e11000	10900	e7700	e7900	e8900
26	e14000	14800	15200	27400	103000	28700	16900	e11000	e11000	e7800	e7800	e9000
27	14000	12300	13300	24200	90600	e27000	16400	10600	e10000	e7600	e7600	e9100
28	12800	10900	12700	22700	76800	e26000	15900	9860	e10000	e7400	e7700	e9200
29	e13000	8870	13000	20800	---	e24000	14800	9410	e9500	e7400	e7700	e9400
30	e13200	9960	12400	19900	---	e23000	14500	11600	e9100	e7400	e7700	e9800
31	13500	---	13000	17000	---	e25000	---	e12000	---	e7500	e7600	---
TOTAL	449900	357270	899700	1369900	898300	1078100	819600	388370	373970	243600	236400	263100
MEAN	14510	11910	29020	44190	32080	34780	27320	12530	12470	7858	7626	8770
MAX	16400	15700	70700	88600	103000	70200	51100	15000	18600	9710	7900	9800
MIN	12800	8870	12400	17000	12400	20900	14500	9410	9100	7400	7400	7500
AC-FT	892400	708600	1785000	2717000	1782000	2138000	1626000	770300	741800	483200	468900	521900

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1973 - 1994, BY WATER YEAR (WY)

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
MEAN	15560	38930	63490	59230	49700	43230	35310	24930	17960	9307	8335	11410										
MAX	22150	98410	129200	119200	94040	77790	72060	46730	38730	15870	11850	17350										
(WY)	1976	1974	1978	1974	1982	1974	1993	1993	1984	1983	1993	1978										
MIN	8915	10300	8894	8795	8050	17980	17630	11150	7125	6541	6136	7684										
(WY)	1988	1988	1977	1977	1977	1978	1977	1973	1992	1973	1973	1992										

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1973 - 1994

ANNUAL TOTAL	11811870	7378210																				
ANNUAL MEAN	32360	20210																				
HIGHEST ANNUAL MEAN																						
LOWEST ANNUAL MEAN																						
HIGHEST DAILY MEAN	122000	Mar 24	103000	Feb 25	276000	Jan 18	1974															
LOWEST DAILY MEAN	8870	Nov 29	7400	Jul 21	4200	Jul 10	1978															
ANNUAL SEVEN-DAY MINIMUM	10800	Nov 11	7430	Aug 2	5260	Jul 31	1973															
ANNUAL RUNOFF (AC-FT)	23430000		14630000		22730000																	
10 PERCENT EXCEEDS	68800		43100		72000																	
50 PERCENT EXCEEDS	20900		13900		20000																	
90 PERCENT EXCEEDS	11500		7660		8000																	

e Estimated

## 14211720 WILLAMETTE RIVER AT PORTLAND, OR--Continued

## WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: December 1975 to September 1981.

WATER TEMPERATURE: November 1975 to September 1981.

## WATER-QUALITY DATA

DATE	TIME	DIS-CHARGE, IN CUBIC FEET PER SECOND	DIS-CHARGE, INST. 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)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FEICAL, 0.7 UM-MF (COLS./100 ML)	STREP-TOCOCCI FEICAL, KF AGAR (COLS. PER 100 ML)
OCT 1993												
08...	1330	14400	19300	76	7.5	16.0	--	9.1	767	92	--	--
NOV												
04...	1024	E12600	--	78	7.7	12.5	1.7	10.5	763	98	84	K17
DEC												
09...	1130	43300	12400	65	7.3	7.0	--	12.0	757	99	--	--
JAN 1994												
11...	1402	64400	59600	60	7.4	7.5	9.0	12.8	761	108	K130	170
FEB												
14...	1115	15500	19800	96	7.3	5.0	--	12.9	769	99	32	88
25...	1100	103000	106000	69	7.1	6.5	--	13.5	763	110	--	--
MAR												
14...	0908	23300	33600	80	7.2	9.5	4.2	11.9	769	103	100	48
APR												
11...	1000	51100	56800	66	7.2	10.0	--	12.2	771	107	140	--
MAY												
10...	0939	E13000	--	90	7.2	16.5	2.4	9.8	766	100	K8	K16
JUN												
14...	0949	10800	16400	79	7.2	17.5	2.3	8.8	764	92	83	42
JUL												
25...	1021	E7700	--	98	7.1	24.0	2.0	7.5	765	89	21	K18
AUG												
08...	0850	E7500	--	98	7.2	22.5	--	7.4	760	86	--	--
SEP												
13...	1157	E9100	--	92	7.1	19.5	2.1	7.8	762	85	130	K14
ENTERO-COCCI ME, MF WATER TOTAL (COL / 100 ML)												
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	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)
OCT 1993												
08...	--	24	6.4	2.0	5.7	33	0.5	1.0	26	31	0	3.8
NOV												
04...	--	25	6.5	2.1	5.5	32	0.5	0.9	25	30	0	3.8
DEC												
09...	--	23	5.9	1.9	4.5	29	0.4	0.9	23	28	0	3.0
JAN 1994												
11...	71	21	5.4	1.8	3.9	28	0.4	0.7	19	23	0	3.3
FEB												
14...	28	32	8.2	2.8	6.9	31	0.5	0.9	30	36	0	6.1
25...	--	24	6.1	2.1	4.2	26	0.4	1.2	19	23	0	4.4
MAR												
14...	K9	27	7.0	2.3	4.9	28	0.4	0.7	24	30	0	4.3
APR												
11...	25	22	5.6	1.9	4.0	28	0.4	0.7	23	29	0	3.9
MAY												
10...	K6	27	7.0	2.4	6.1	32	0.5	0.8	30	37	0	4.8
JUN												
14...	29	24	6.2	2.1	6.2	35	0.5	0.8	27	33	0	4.3
JUL												
25...	K14	26	6.6	2.3	8.2	40	0.7	0.8	29	35	0	5.9
AUG												
08...	70	26	6.6	2.2	8.1	40	0.7	0.9	29	35	0	5.3
SEP												
13...	25	26	6.5	2.3	7.8	38	0.7	1.2	--	44	0	5.2
CHLO-RIDE, DIS-SOLVED (MG/L AS CL)												
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)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)
OCT 1993												
08...	3.8	0.1	16	61	56	0.08	0.08	0.01	<0.2	<0.2	0.27	0.07
NOV												
04...	4.0	0.1	16	61	55	0.08	0.09	0.01	<0.2	0.2	0.28	0.08
DEC												
09...	3.6	<0.1	15	51	51	0.07	0.11	0.02	<0.2	0.2	0.55	0.08
JAN 1994												
11...	3.2	<0.1	15	55	49	0.08	0.05	0.01	<0.2	0.2	0.89	0.08
FEB												
14...	5.6	<0.1	18	71	71	0.10	0.16	0.01	0.2	0.4	1.00	0.09
25...	3.8	<0.1	14	60	54	0.08	0.08	0.01	0.2	0.5	1.40	0.24
MAR												
14...	4.1	<0.1	17	55	60	0.08	0.11	0.02	<0.2	0.2	0.98	0.07
APR												
11...	3.7	<0.1	14	53	52	0.07	0.08	0.02	<0.2	0.3	0.67	0.05
MAY												
10...	5.2	<0.1	14	65	61	0.09	0.05	0.01	<0.2	0.3	0.54	0.05
JUN												
14...	4.5	<0.1	16	68	58	0.09	0.12	0.01	<0.2	0.3	0.33	0.07
JUL												
25...	6.3	<0.1	16	67	65	0.09	0.06	0.01	--	0.3	0.29	0.11
AUG												
08...	6.3	<0.1	15	66	63	0.09	0.07	<0.01	<0.2	0.2	0.23	0.10
SEP												
13...	5.9	<0.1	16	66	68	0.09	0.09	0.01	--	<0.2	0.24	0.07

E - Estimated.

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

## WILLAMETTE RIVER BASIN

14211720 WILLAMETTE RIVER AT PORTLAND, OR--Continued

## WATER-QUALITY DATA

DATE	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)	CARBON, ORGANIC SUS- PENDED TOTAL (MG/L AS C)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ANTI- MONY, DIS- SOLVED (UG/L AS SB)	ARSENIC, DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM, DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)
OCT 1993												
08...	0.04	0.04	1.4	0.3	--	--	--	--	--	--	--	--
NOV												
04...	0.05	0.06	1.3	0.4	30	--	--	5	--	--	--	<3
DEC												
09...	0.05	0.05	2.5	0.4	--	--	--	--	--	--	--	--
JAN 1994												
11...	0.04	0.03	2.0	0.4	170	--	--	7	--	--	--	<3
FEB												
14...	0.07	0.08	1.8	0.5	--	--	--	--	--	--	--	--
25...	0.03	0.01	2.7	3.8	--	--	--	--	--	--	--	--
MAR												
14...	0.05	0.04	1.7	0.5	--	--	--	--	--	--	--	--
APR												
11...	0.03	0.03	2.8	0.8	110	<1	<1	7	<1	<1	<1	<1
MAY												
10...	0.03	0.04	1.7	0.5	<10	--	--	7	--	--	--	<3
JUN												
14...	0.05	0.04	1.6	0.7	20	<1	<1	6	<1	<1	<1	<1
JUL												
25...	0.07	0.07	--	--	<10	--	--	6	--	--	--	<3
AUG												
08...	0.07	0.06	2.4	0.6	--	--	--	--	--	--	--	--
SEP												
13...	0.07	0.06	1.6	0.4	20	<1	<1	5	<1	<1	<1	<3
DATE	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM, DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY, DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	URANIUM, NATURAL, DIS- SOLVED (UG/L AS U)
OCT 1993												
08...	--	35	--	--	8	--	--	--	--	--	--	--
NOV												
04...	--	52	--	<4	11	--	<10	<1	<1	<1	39	--
DEC												
09...	--	120	--	--	10	--	--	--	--	--	--	--
JAN 1994												
11...	--	130	--	<4	8	--	<10	<1	<1	<1	35	<0.01
FEB												
14...	--	88	--	--	20	--	--	--	--	--	--	--
25...	--	77	--	--	16	--	--	--	--	--	--	--
MAR												
14...	--	--	--	--	--	--	--	--	--	--	--	--
APR												
11...	<1	190	<1	--	7	<0.1	<1	<1	<1	<1	--	<1
MAY												
10...	--	60	--	<4	11	--	<10	<1	<1	<1	42	--
JUN												
14...	<1	--	<1	--	6	E0.6	<1	<1	<1	<1	--	<1
JUL												
25...	--	33	--	<4	<1	--	10	<1	<1	<1	41	--
AUG												
08...	--	48	--	--	3	--	--	--	--	--	--	--
SEP												
13...	1	49	<1	<4	6	<0.1	<10	<1	<1	<1	40	0.02
DATE	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	RADIUM 226, DIS- SOLVED, RADON METHOD (PCI/L)	RA-226 2 SIGMA WATER, DISS, (PCI/L)	PER- THANE, TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	LINDANE, TOTAL (UG/L)	CHLOR- DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	
OCT 1993												
08...	--	--	--	--	--	--	--	--	--	--	--	
NOV												
04...	<6	--	--	--	--	--	--	--	--	--	--	
DEC												
09...	--	--	--	--	--	--	--	--	--	--	--	
JAN 1994												
11...	<6	--	0.03	<0.01	--	--	--	--	--	--	--	
FEB												
14...	--	--	--	--	--	--	--	--	--	--	--	
25...	--	--	--	--	--	--	--	--	--	--	--	
MAR												
14...	--	--	--	--	--	--	--	--	--	--	--	
APR												
11...	--	1	--	--	--	--	--	--	--	--	--	
MAY												
10...	<6	--	--	--	<0.1	<0.001	<0.001	<0.1	<0.001	<0.001	<0.001	
JUN												
14...	--	2	--	--	--	--	--	--	--	--	--	
JUL												
25...	<6	--	--	--	--	--	--	--	--	--	--	
AUG												
08...	--	--	--	--	--	--	--	--	--	--	--	
SEP												
13...	<6	2	<0.02	<0.01	--	--	--	--	--	--	--	

E - Estimated.



## WILLAMETTE RIVER BASIN

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14211720 WILLAMETTE RIVER AT PORTLAND, OR--Continued

## WATER-QUALITY DATA

DATE	DI-ELDRIN, TOTAL (UG/L)	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, WATER UNFLTRD REC (UG/L)	TOX-APHENE, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE, TOTAL (UG/L)	METH- OXY- CHLOR, TOTAL (UG/L)	PCB, TOTAL (UG/L)	NAPH- THA- LENES, POLY- CHLOR, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	CHLORO- PHYL A FLUORO- METRIC METHOD CORR. (UG/L)	HALIDE TOTAL ORGANIC WATER RECOV. (UG/L AS CL)
OCT 1993												
08...	--	--	--	--	--	--	--	--	--	--	--	--
NOV												
04...	--	--	--	--	--	--	--	--	--	--	--	--
DEC												
09...	--	--	--	--	--	--	--	--	--	--	--	--
JAN 1994												
11...	--	--	--	--	--	--	--	--	--	--	--	<5
FEB												
14...	--	--	--	--	--	--	--	--	--	--	0.92	6
25...	--	--	--	--	--	--	--	--	--	--	--	--
MAR												
14...	--	--	--	--	--	--	--	--	--	--	0.94	10
APR												
11...	--	--	--	--	--	--	--	--	--	--	2.70	9
MAY												
10...	<0.001	<0.001	<0.001	<1	<0.001	<0.001	<0.01	<0.1	<0.1	<0.01	3.57	21
JUN												
14...	--	--	--	--	--	--	--	--	--	--	3.80	28
JUL												
25...	--	--	--	--	--	--	--	--	--	--	12.1	55
AUG												
08...	--	--	--	--	--	--	--	--	--	--	4.00	49
SEP												
13...	--	--	--	--	--	--	--	--	--	--	1.30	9

DATE	*DIAZ- INON D10, SURROGT RECOVERY PERCENT	*TERBUTH YLAZINE, SURROGT RECOVERY PERCENT	*HCH ALPHA, D6 SURROGT RECOVERY PERCENT	PROP- CHLOR, WATER, DISS, REC (UG/L)	BUTYL- ATE, WATER, DISS, REC (UG/L)	SI- MAZINE, WATER, DISS, REC (UG/L)	PRO- METON, WATER, DISS, REC (UG/L)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L)	CYANA- ZINE, WATER, DISS, REC (UG/L)	FONOFOS, WATER, DISS, REC (UG/L)	ALPHA BHC, DIS- SOLVED (UG/L)	P,P' DDE, DISSOLV (UG/L)
OCT 1993												
08...	--	--	--	--	--	--	--	--	--	--	--	--
NOV												
04...	70	102	70	<0.007	<0.002	<0.005	<0.003	<0.002	<0.004	<0.003	<0.002	<0.006
DEC												
09...	100	133	100	<0.007	<0.002	0.023	<0.003	<0.002	<0.004	<0.003	<0.002	<0.006
JAN 1994												
11...	--	--	--	--	--	--	--	--	--	--	--	--
FEB												
14...	100	91	90	<0.007	<0.002	<0.005	<0.003	<0.002	<0.004	<0.003	<0.002	<0.006
25...	100	110	90	<0.007	<0.002	0.064	<0.003	E0.026	<0.004	<0.003	<0.002	<0.006
MAR												
14...	100	102	90	<0.007	<0.002	0.013	<0.003	<0.002	<0.004	<0.003	<0.002	<0.006
APR												
11...	100	105	100	<0.007	<0.002	0.049	<0.003	E0.010	<0.004	0.010	<0.002	<0.006
MAY												
10...	100	109	100	<0.007	<0.002	0.010	<0.003	E0.005	<0.004	<0.003	<0.002	<0.006
JUN												
14...	100	100	100	<0.007	<0.002	0.016	<0.003	<0.002	<0.004	<0.003	<0.002	<0.006
JUL												
25...	--	--	--	--	--	--	--	--	--	--	--	--
AUG												
08...	80	116	90	<0.007	<0.002	0.005	0.003	<0.002	<0.004	<0.003	<0.002	<0.006
SEP												
13...	100	128	100	<0.007	<0.002	0.008	<0.003	<0.002	<0.004	<0.003	<0.002	<0.006

DATE	CHLOR- PYRIFOS, DIS- SOLVED (UG/L)	LINDANE, DIS- SOLVED (UG/L)	DI- ELDRIN, DIS- SOLVED (UG/L)	METO- LACHLOR, WATER DISSOLV (UG/L)	MALA- THION, DIS- SOLVED (UG/L)	PARA- THION, DIS- SOLVED (UG/L)	DI- AZINON, DIS- SOLVED (UG/L)	ATRA- ZINE, WATER, DISS, REC (UG/L)	ALA- CHLOR, WATER, DISS, REC, (UG/L)	ACETO- CHLOR, WATER FLTRD REC (UG/L)	METRI- BUZIN, SENCOR WATER DISSOLV (UG/L)	2,6-DI- ETHYL ANILINE, WAT FLT 0.7 U GF, REC (UG/L)
OCT 1993												
08...	--	--	--	--	--	--	--	--	--	--	--	--
NOV												
04...	<0.004	<0.004	<0.001	0.004	<0.005	<0.006	<0.002	<0.001	<0.002	--	<0.004	<0.003
DEC												
09...	<0.004	<0.004	<0.001	0.010	<0.005	<0.006	0.006	0.053	<0.002	--	<0.004	<0.003
JAN 1994												
11...	--	--	--	--	--	--	--	--	--	--	--	--
FEB												
14...	<0.004	<0.004	<0.001	0.004	<0.005	<0.006	<0.002	0.028	<0.002	--	<0.004	<0.003
25...	<0.004	<0.004	<0.001	0.016	<0.005	<0.006	<0.002	0.160	<0.002	--	0.029	<0.003
MAR												
14...	<0.004	<0.004	<0.001	0.006	<0.005	<0.006	<0.002	0.037	<0.002	--	<0.004	<0.003
APR												
11...	<0.004	<0.004	<0.001	0.008	<0.005	<0.006	<0.002	0.170	<0.002	<0.009	<0.004	<0.003
MAY												
10...	<0.004	<0.004	<0.001	0.005	<0.005	<0.006	0.006	0.020	<0.002	<0.009	<0.004	<0.003
JUN												
14...	<0.004	<0.004	<0.001	0.004	<0.005	<0.006	0.009	0.012	<0.002	<0.009	<0.004	<0.003
JUL												
25...	--	--	--	--	--	--	--	--	--	--	--	--
AUG												
08...	<0.004	<0.004	<0.001	<0.004	<0.005	<0.006	0.007	0.010	<0.002	<0.009	<0.004	<0.003
SEP												
13...	<0.004	<0.004	<0.001	E0.003	<0.005	<0.006	E0.008	E0.013	<0.002	<0.009	<0.004	<0.003

\* - Percent recovery of surrogate analyses added to water sample prior to extraction.  
E - Estimated.

## WILLAMETTE RIVER BASIN

14211720 WILLAMETTE RIVER AT PORTLAND, OR--Continued

## WATER-QUALITY DATA

DATE	TRI- FLUR- ALIN, WAT FLT 0.7 U GF, REC (UG/L)	ETHAL- FLUR- ALIN, WAT FLT 0.7 U GF, REC (UG/L)	PHORATE, WATER FLTRD 0.7 U GF, REC (UG/L)	TER- BACIL, WATER FLTRD 0.7 U GF, REC (UG/L)	LIN- URON, WATER FLTRD 0.7 U GF, REC (UG/L)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L)	EPTC, WATER FLTRD 0.7 U GF, REC (UG/L)	PEB- ULATE, WATER FLTRD 0.7 U GF, REC (UG/L)	TEBU- THIURON, WATER FLTRD 0.7 U GF, REC (UG/L)	MOL- INATE, WATER FLTRD 0.7 U GF, REC (UG/L)	ETHO- PROP, WATER FLTRD 0.7 U GF, REC (UG/L)	BEN- FLUR- ALIN, WAT FLT 0.7 U GF, REC (UG/L)
OCT 1993												
08...	--	--	--	--	--	--	--	--	--	--	--	--
NOV												
04...	<0.002	<0.004	<0.002	<0.007	<0.002	<0.002	<0.002	<0.004	<0.010	<0.003	<0.003	<0.002
DEC												
09...	<0.002	<0.004	<0.002	<0.007	<0.002	<0.002	<0.002	<0.004	<0.010	<0.003	<0.003	<0.002
JAN 1994												
11...	--	--	--	--	--	--	--	--	--	--	--	--
FEB												
14...	<0.002	<0.004	<0.002	<0.007	<0.002	<0.002	<0.002	<0.004	<0.010	<0.003	<0.003	<0.002
25...	<0.002	<0.004	<0.002	E0.032	<0.002	<0.002	<0.002	<0.004	0.006	<0.003	<0.003	<0.002
MAR												
14...	<0.002	<0.004	<0.002	<0.007	<0.002	<0.002	<0.002	<0.004	<0.010	<0.003	<0.003	<0.002
APR												
11...	<0.002	<0.004	<0.002	E0.080	<0.002	<0.002	<0.002	<0.004	<0.010	<0.003	<0.003	<0.002
MAY												
10...	<0.002	<0.004	<0.002	<0.007	<0.002	<0.002	0.005	<0.004	<0.010	<0.003	<0.003	<0.002
JUN												
14...	<0.002	<0.004	<0.002	<0.007	<0.002	<0.002	0.005	<0.004	<0.010	<0.003	<0.003	<0.002
JUL												
25...	--	--	--	--	--	--	--	--	--	--	--	--
AUG												
08...	<0.002	<0.004	<0.002	<0.007	<0.002	<0.002	<0.002	<0.004	<0.010	<0.003	<0.003	<0.002
SEP												
13...	<0.002	<0.004	<0.002	<0.007	<0.002	<0.002	<0.002	<0.004	<0.010	<0.003	<0.003	<0.002
DATE	CARBO- FURAN, WATER FLTRD 0.7 U GF, REC (UG/L)	TER- BUFOS, WATER FLTRD 0.7 U GF, REC (UG/L)	PRON- AMIDE, WATER FLTRD 0.7 U GF, REC (UG/L)	DISUL- FOTON, WATER FLTRD 0.7 U GF, REC (UG/L)	TRIAL- LATE, WATER FLTRD 0.7 U GF, REC (UG/L)	PRO- PANIL, WATER FLTRD 0.7 U GF, REC (UG/L)	CAR- BARYL, WATER FLTRD 0.7 U GF, REC (UG/L)	THIO- BENCARB, WATER FLTRD 0.7 U GF, REC (UG/L)	DCPA, WATER FLTRD 0.7 U GF, REC (UG/L)	PENDI- METH- ALIN, WAT FLT 0.7 U GF, REC (UG/L)	NAPROP- AMIDE, WATER FLTRD 0.7 U GF, REC (UG/L)	PRO- PARGITE, WATER FLTRD 0.7 U GF, REC (UG/L)
OCT 1993												
08...	--	--	--	--	--	--	--	--	--	--	--	--
NOV												
04...	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003	<0.002	<0.002	<0.004	<0.004	<0.013
DEC												
09...	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003	<0.002	<0.002	<0.004	<0.004	<0.013
JAN 1994												
11...	--	--	--	--	--	--	--	--	--	--	--	--
FEB												
14...	<0.003	<0.007	0.005	<0.017	<0.001	<0.004	<0.003	<0.002	<0.002	<0.004	<0.004	<0.013
25...	<0.003	<0.007	0.030	<0.017	0.004	<0.004	E0.017	<0.002	<0.002	<0.004	0.068	<0.013
MAR												
14...	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003	<0.002	<0.002	<0.004	<0.004	<0.013
APR												
11...	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003	<0.002	<0.002	<0.004	<0.004	<0.013
MAY												
10...	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003	<0.002	<0.002	<0.004	<0.004	<0.013
JUN												
14...	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003	<0.002	<0.002	<0.004	<0.004	<0.013
JUL												
25...	--	--	--	--	--	--	--	--	--	--	--	--
AUG												
08...	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003	<0.002	<0.002	<0.004	<0.004	<0.013
SEP												
13...	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003	<0.002	<0.002	<0.004	<0.004	<0.013
DATE	METHYL AZIN- PHOS, WAT FLT 0.7 U GF, REC (UG/L)	PER- METHRIN, CIS WAT FLT 0.7 U GF, REC (UG/L)	AN- TIMONY, SED. SUSP. (UG/G)	ARSENIC, SED. SUSP. (UG/G)	BARIUM, SED. SUSP. (UG/G)	BERYL- LIUM, SED. SUSP. (UG/G)	CADMIUM, SED. SUSP. (UG/G)	CHRO- MIUM, SED. SUSP. (UG/G)	COPPER, SED. SUSP. (UG/G)	GOLD SEDI- MENT SUSP. (UG/G)	LEAD, SED. SUSP. (UG/G)	MAN- GANESE, SED. SUSP. (UG/G)
OCT 1993												
08...	--	--	--	--	--	--	--	--	--	--	--	--
NOV												
04...	<0.001	<0.005	--	--	--	--	--	--	--	--	--	--
DEC												
09...	<0.001	<0.005	--	--	--	--	--	--	--	--	--	--
JAN 1994												
11...	--	--	--	--	--	--	--	--	--	--	--	--
FEB												
14...	<0.001	<0.005	--	--	--	--	--	--	--	--	--	--
25...	<0.001	<0.005	--	--	--	--	--	--	--	--	--	--
MAR												
14...	<0.001	<0.005	--	--	--	--	--	--	--	--	--	--
APR												
11...	<0.001	<0.005	0.6	6.9	470	<2	0.3	80	66	<10	15	1500
MAY												
10...	<0.001	<0.005	--	--	--	--	--	--	--	--	--	--
JUN												
14...	<0.001	<0.005	0.4	2.6	480	<8	<2.0	82	110	<60	7.9	4000
JUL												
25...	--	--	--	--	--	--	--	--	--	--	--	--
AUG												
08...	<0.001	<0.005	--	--	--	--	--	--	--	--	--	--
SEP												
13...	<0.001	<0.005	0.8	7.0	440	<2	0.5	71	51	<20	30	4000

## 14211720 WILLAMETTE RIVER AT PORTLAND, OR--Continued

## WATER-QUALITY DATA

DATE	MERCURY, SED. SUSP. (UG/G)	MOLYB- DENUM, SED. SUSP. (UG/G)	NICKEL, SED. SUSP. (UG/G)	SELE- NIUM, SED. SUSP. (UG/G)	SILVER, SED. SUSP. (UG/G)	VANA- DIUM, SED. SUSP. (UG/G)	ZINC, SED. SUSP. (UG/G)	ALUM- INUM, SED, SUSP PERCENT	CALCIUM, SED. SUSP. PERCENT	IRON, SEDI- MENT SUSP. PERCENT	MAGNES- IUM, SEDI- MENT SUSP. PERCENT	PHOS- PHORUS, SEDI- MENT SUSP. PERCENT
OCT 1993												
08...	--	--	--	--	--	--	--	--	--	--	--	--
NOV												
04...	--	--	--	--	--	--	--	--	--	--	--	--
DEC												
09...	--	--	--	--	--	--	--	--	--	--	--	--
JAN 1994												
11...	--	--	--	--	--	--	--	--	--	--	--	--
FEB												
14...	--	--	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--	--	--
MAR												
14...	--	--	--	--	--	--	--	--	--	--	--	--
APR												
11...	1.5	1.0	36	0.6	0.7	180	130	8.2	1.5	5.8	1.1	0.16
MAY												
10...	--	--	--	--	--	--	--	--	--	--	--	--
JUN												
14...	0.18	0.2	38	0.32	0.4	170	180	8.1	1.6	6.0	1.0	0.23
JUL												
25...	--	--	--	--	--	--	--	--	--	--	--	--
AUG												
08...	--	--	--	--	--	--	--	--	--	--	--	--
SEP												
13...	0.17	1.1	34	--	2.0	150	160	7.4	1.6	5.2	0.96	0.22

DATE	POTAS- SIUM, SEDI- MENT SUSP. PERCENT	SODIUM, SEDI- MENT SUSP. PERCENT	TITA- NIUM, SEDI- MENT SUSP. PERCENT	BISMUTH, SEDI- MENT SUSP. (UG/G)	COBALT, SEDI- MENT SUSP. (UG/G)	EURO- PIUM, SEDI- MENT SUSP. (UG/G)	GALLIUM, SEDI- MENT SUSP. (UG/G)	HOLMIUM, SEDI- MENT SUSP. (UG/G)	LANTHA- NUM, SEDI- MENT SUSP. (UG/G)	NEODYM- IUM, SEDI- MENT SUSP. (UG/G)	NIOBIUM, SEDI- MENT SUSP. (UG/G)	SCAN- DIUM, SEDI- MENT SUSP. (UG/G)
OCT 1993												
08...	--	--	--	--	--	--	--	--	--	--	--	--
NOV												
04...	--	--	--	--	--	--	--	--	--	--	--	--
DEC												
09...	--	--	--	--	--	--	--	--	--	--	--	--
JAN 1994												
11...	--	--	--	--	--	--	--	--	--	--	--	--
FEB												
14...	--	--	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--	--	--
MAR												
14...	--	--	--	--	--	--	--	--	--	--	--	--
APR												
11...	0.96	0.94	0.78	<20	27	<3	20	<7	30	28	17	23
MAY												
10...	--	--	--	--	--	--	--	--	--	--	--	--
JUN												
14...	0.83	0.91	0.81	<80	34	<20	<30	<30	25	32	<30	22
JUL												
25...	--	--	--	--	--	--	--	--	--	--	--	--
AUG												
08...	--	--	--	--	--	--	--	--	--	--	--	--
SEP												
13...	0.80	0.97	0.71	<20	28	<4	19	<8	25	23	29	20

DATE	STRON- TIUM, SEDI- MENT SUSP. (UG/G)	TANTA- LUM, SEDI- MENT SUSP. (UG/G)	THORIUM, SEDI- MENT SUSP. (UG/G)	TIN, SEDI- MENT SUSP. (UG/G)	URANIUM, SEDI- MENT SUSP. (UG/G)	YTTRIUM, SEDI- MENT SUSP. (UG/G)	YTTER- BIUM, SEDI- MENT SUSP. (UG/G)	LITHIUM, SEDI- MENT SUSP. (UG/G)	CERIUM, SEDI- MENT SUSP. (UG/G)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 1993												
08...	--	--	--	--	--	--	--	--	--	6	313	E95
NOV												
04...	--	--	--	--	--	--	--	--	--	8	E272	87
DEC												
09...	--	--	--	--	--	--	--	--	--	12	402	95
JAN 1994												
11...	--	--	--	--	--	--	--	--	--	26	4180	94
FEB												
14...	--	--	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	146	41800	91
MAR												
14...	--	--	--	--	--	--	--	--	--	14	1270	80
APR												
11...	210	<70	8.0	<8	2	29	3	29	55	16	2450	98
MAY												
10...	--	--	--	--	--	--	--	--	--	6	E211	E93
JUN												
14...	210	<300	1.6	<40	1	24	<8	27	54	10	443	94
JUL												
25...	--	--	--	--	--	--	--	--	--	12	E249	99
AUG												
08...	--	--	--	--	--	--	--	--	--	36	--	98
SEP												
13...	210	<80	9.4	<10	2	22	2	24	47	5	E123	E96

E - Estimated

## WILLAMETTE RIVER BASIN

14211814 FAIRVIEW CREEK AT GLISAN STREET, NEAR GRESHAM, OR

LOCATION.--Lat 45°31'40", long 122°26'51", in Land Grant parcel number 58, T.1 N., R.3 E., Multnomah County, Hydrologic Unit 17090012, on right bank at upstream side of culvert on Glisan St., 0.4 mi east of the intersection of 202nd Ave. and Glisan St., 1.7 mi northwest of Gresham City Hall, and at mile 3.05.

DRAINAGE AREA.--4.94 mi<sup>2</sup>.

PERIOD OF RECORD.--May 1992 to current year.

GAGE.--Water-stage recorder. Datum of gage is 205 ft above sea level, from topographic map.

REMARKS.--Records fair except for estimated daily discharges, which are poor. No regulation or diversion. High flows affected to an unknown degree by two small ponds just upstream from station.

AVERAGE DISCHARGE.--2 years, 3.33 ft<sup>3</sup>/s, 9.16 in/yr, 2,410 acre-ft/yr.EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 52 ft<sup>3</sup>/s Feb. 24, 1994, gage height, 5.88 ft; minimum discharge, 0.29 ft<sup>3</sup>/s Aug. 30, Sept. 1, 1992.EXTREMES FOR CURRENT YEAR.--Maximum discharge, 52 ft<sup>3</sup>/s Feb. 24, gage height, 5.88 ft; minimum daily discharge, 0.4 ft<sup>3</sup>/s several days in August and September.DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.71	1.8	12	11	2.4	10	4.8	2.8	2.5	e1.4	e.7	e.4
2	.69	1.3	6.8	12	2.3	10	3.7	2.7	2.3	e1.8	e.6	e.4
3	.69	1.6	3.7	19	2.3	9.9	3.3	2.8	1.9	e1.6	e.5	e2.5
4	.69	1.6	5.0	13	2.3	7.3	3.1	3.6	1.7	e1.3	e.6	e1.0
5	.69	1.1	3.5	12	2.9	6.1	3.1	3.0	e1.4	e1.5	e.5	e.9
6	.82	.88	2.5	8.5	3.2	5.6	4.6	2.7	e2.3	e1.3	e.5	e.7
7	1.2	.86	4.8	5.6	3.0	4.9	4.4	2.6	e3.0	e1.2	e.4	e.6
8	.98	.80	10	5.0	2.6	4.7	7.8	2.5	e2.5	e1.2	e.5	e1.2
9	.76	.79	11	4.8	2.6	4.4	6.7	2.3	e2.3	e1.3	e.6	e1.2
10	.70	.71	10	4.3	2.8	5.1	5.0	2.2	e2.0	e1.1	e.6	e1.2
11	.67	.70	13	4.7	2.6	5.1	3.9	2.3	e1.6	e1.0	e.6	e1.0
12	.69	.77	6.2	6.6	2.3	4.3	3.8	2.2	e1.5	e.9	e.5	e.7
13	.72	.78	4.1	7.9	4.3	3.9	3.8	2.2	e2.5	e.9	e.4	e.6
14	2.1	.78	4.6	4.8	4.9	3.8	3.8	2.2	e3.0	e.9	e.4	e.5
15	3.5	.94	3.8	3.9	3.3	3.8	3.4	2.4	e4.0	e.9	e.4	e.6
16	3.6	1.6	3.0	3.4	3.3	4.3	3.1	3.0	e2.4	e.9	e.5	e.5
17	2.3	1.9	2.6	3.2	4.7	4.9	2.9	2.9	e2.0	e.9	e.5	e.4
18	1.8	2.4	2.4	3.1	6.9	6.6	2.9	2.7	e2.7	e.9	e.6	e.5
19	1.4	1.6	2.3	2.9	6.6	6.1	2.9	2.3	e2.5	e.9	e.6	e.4
20	1.2	1.2	2.2	2.8	4.7	5.1	2.9	2.4	e2.3	e1.0	e.6	e.5
21	1.0	2.0	2.1	2.7	5.4	8.8	2.8	2.5	e2.1	e.9	e.5	e.5
22	1.0	3.5	2.0	4.4	4.7	6.2	2.8	2.3	e2.1	e.8	e.6	e.6
23	.99	2.4	1.9	8.5	11	4.7	2.9	2.2	e2.0	e.8	e.6	e.6
24	1.0	1.6	1.9	7.7	42	4.0	3.8	2.2	e1.8	e.8	e.5	e.6
25	.93	1.1	1.8	6.2	24	3.8	3.1	2.2	e1.7	e.8	e.6	e.7
26	.80	.86	1.7	4.2	17	3.6	2.8	2.1	e2.4	e.8	e.6	e.9
27	.80	.90	1.7	3.4	18	3.5	2.7	2.0	e1.7	e.9	e.5	e.9
28	.80	1.0	1.6	3.1	14	3.3	2.7	2.0	e1.5	e.9	e.5	e.8
29	.80	1.7	1.5	2.9	--	3.3	2.7	2.6	e1.4	e.8	e.4	e1.2
30	.80	3.3	2.0	2.7	--	3.5	3.1	2.4	e1.4	e.8	e.5	e.9
31	1.9	--	4.4	2.5	--	7.8	--	2.2	--	e.9	e.5	--
TOTAL	36.73	42.47	136.1	186.8	206.1	168.4	109.3	76.5	64.5	32.1	16.4	23.5
MEAN	1.18	1.42	4.39	6.03	7.36	5.43	3.64	2.47	2.15	1.04	.53	.78
MAX	3.6	3.5	13	19	42	10	7.8	3.6	4.0	1.8	.70	2.5
MIN	.67	.70	1.5	2.5	2.3	3.3	2.7	2.0	1.4	.80	.40	.40
AC-FT	73	84	270	371	409	334	217	152	128	64	33	47
CFSM	.24	.29	.89	1.22	1.49	1.10	.74	.50	.44	.21	.11	.16
IN.	.28	.32	1.02	1.41	1.55	1.27	.82	.58	.49	.24	.12	.18

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1993 - 1994, BY WATER YEAR (WY)

	1993	1994	1993	1994	1993	1994	1993	1994	1993	1994	1993	1994
MEAN	1.33	2.78	5.05	5.65	4.95	5.09	4.91	3.55	2.82	1.97	1.09	.87
MAX	1.48	4.14	5.72	6.03	7.36	5.43	6.18	4.63	3.50	2.90	1.66	.95
(WY)	1993	1993	1993	1994	1994	1994	1993	1993	1993	1993	1993	1993
MIN	1.18	1.42	4.39	5.27	2.54	4.74	3.64	2.47	2.15	1.04	.53	.78
(WY)	1994	1994	1994	1993	1993	1993	1994	1994	1994	1994	1994	1994

## SUMMARY STATISTICS FOR 1993 CALENDAR YEAR FOR 1994 WATER YEAR WATER YEARS 1993 - 1994

	1993	1994	1993	1994	1993	1994	1993	1994
ANNUAL TOTAL	1200.62	1098.90						
ANNUAL MEAN	3.29	3.01						
HIGHEST ANNUAL MEAN								
LOWEST ANNUAL MEAN								
HIGHEST DAILY MEAN	24 Apr 3	42 Feb 24						
LOWEST DAILY MEAN	.67 Oct 11	.40 Aug 7						
ANNUAL SEVEN-DAY MINIMUM	.70 Sep 28	.46 Aug 27						
ANNUAL RUNOFF (AC-FT)	2380	2180						
ANNUAL RUNOFF (CFSM)	.67	.61						
ANNUAL RUNOFF (INCHES)	9.04	8.28						
10 PERCENT EXCEEDS	5.9	6.1						
50 PERCENT EXCEEDS	2.6	2.2						
90 PERCENT EXCEEDS	.87	.60						

e Estimated

## WILLAMETTE RIVER BASIN

315

## 14211820 COLUMBIA SLOUGH AT PORTLAND, OR

LOCATION.--Lat 45°32'38", long 122°45'49", in NE 1/4 SE 1/4 sec.23, T.2 N., R.1 W., Multnomah County, Hydrologic Unit 17090012, on right bank, 0.25 mi upstream from mouth, and 1.25 mi upstream from confluence of Willamette and Columbia Rivers.

DRAINAGE AREA.--Indeterminate.

PERIOD OF RECORD.--October 1989 to current year.

GAGE.--Acoustic velocity meter with water-stage and velocity-index recorder. Datum of gage is 1.53 ft above sea level.

REMARKS.--Records poor due to large positive and negative flows. Discharges for November 19 to December 25, January 6-12, and January 28 to August 12 determined from acoustic velocity record at the site and from water-stage data collected at Willamette River at Portland (station 14211720).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 424 ft<sup>3</sup>/s June 20, 1991, maximum gage height, 13.16 ft May 18, 1993; minimum daily discharge, -231 ft<sup>3</sup>/s Mar. 26, 1990.

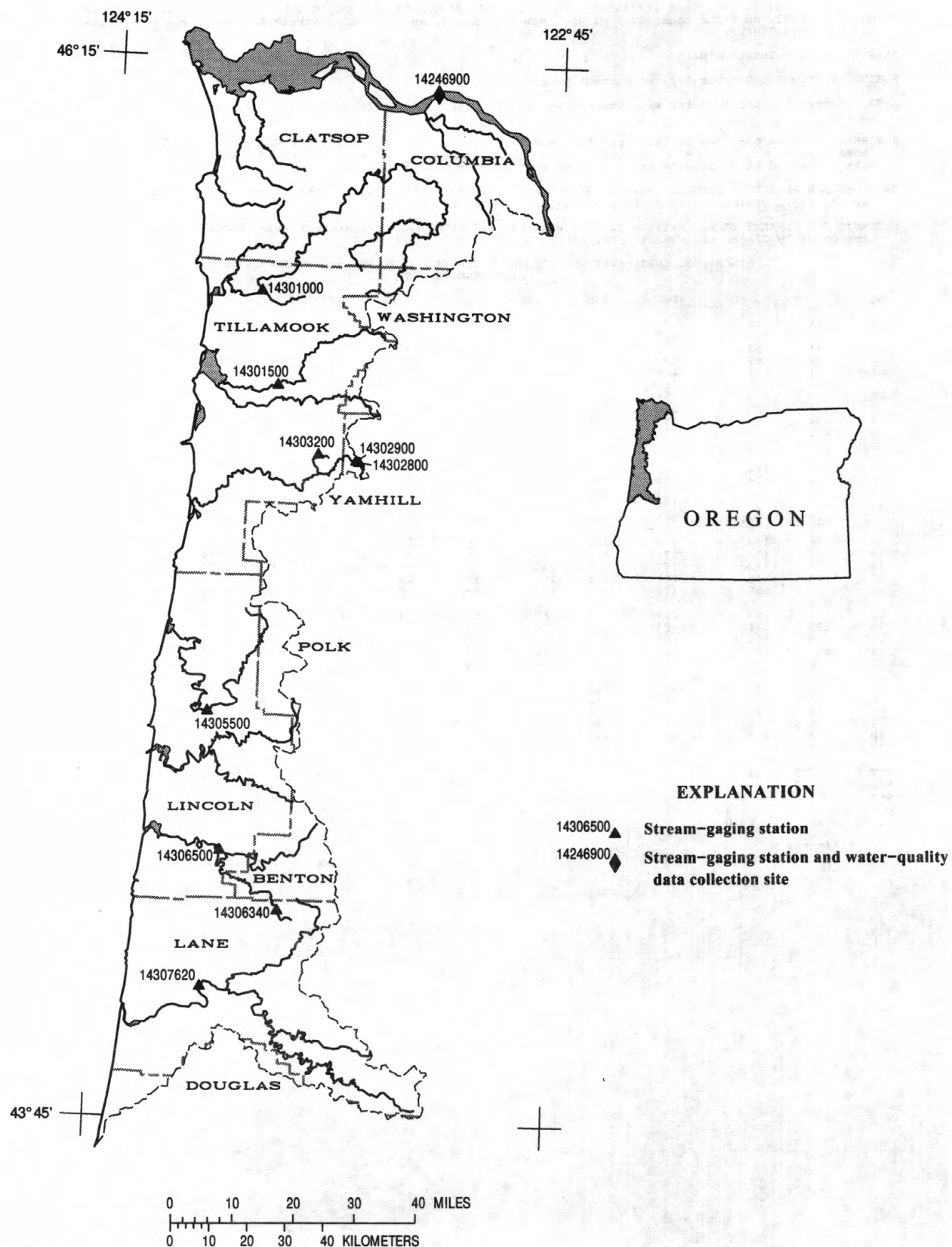
EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 327 ft<sup>3</sup>/s Feb. 27; maximum gage height, 8.82 ft May 25; minimum daily discharge, -99 ft<sup>3</sup>/s May 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	61	118	130	---	46	151	104	92	139	52	65	56
2	63	131	275	---	55	144	189	97	92	141	40	27
3	81	94	195	---	115	84	231	147	82	99	63	14
4	71	159	170	---	144	210	67	63	14	53	-7.4	47
5	69	174	144	---	78	238	7.1	30	34	21	.15	22
6	e102	164	96	172	56	281	-20	-17	-14	-33	42	7.6
7	e120	121	214	239	5.1	112	57	-7.8	20	35	44	5.0
8	e144	99	211	36	41	41	65	78	-18	11	3.4	6.6
9	e82	92	185	154	-48	76	67	53	-16	-14	-51	55
10	107	134	188	60	75	122	131	16	44	56	43	70
11	87	144	145	47	142	162	18	-49	37	.74	24	69
12	34	95	170	114	41	82	88	-30	71	-16	31	122
13	51	79	23	149	103	90	63	49	-86	50	66	149
14	-11	72	179	122	72	20	154	13	15	74	109	89
15	10	-.36	277	143	49	48	173	109	-3.0	78	83	66
16	86	108	178	220	126	54	122	108	198	110	69	32
17	71	118	131	118	160	55	147	47	120	111	87	14
18	5.3	e163	167	49	142	-2.9	46	136	83	75	17	56
19	18	e141	209	173	206	159	24	72	131	12	13	38
20	96	145	100	100	142	176	65	64	44	-29	46	39
21	111	53	119	118	65	117	4.0	65	-35	-2.7	31	51
22	125	124	107	115	56	92	-31	40	-19	-9.3	35	1.1
23	79	152	105	117	63	153	-44	-81	19	-17	34	7.0
24	101	77	80	33	216	7.8	38	-99	25	71	49	80
25	60	106	52	68	268	103	13	-26	-8.9	-27	39	91
26	124	41	---	103	176	136	32	-2.8	115	21	13	64
27	28	45	---	62	327	53	34	11	9.4	42	-1.3	45
28	41	47	---	90	74	-9.7	40	87	75	89	122	73
29	140	-5.4	---	76	---	-1.8	42	46	144	85	67	104
30	73	141	---	147	---	73	80	169	63	92	69	73
31	89	---	---	43	---	82	---	98	---	89	63	---
TOTAL	2318.3	3131.24	---	---	2995.1	3107.4	2006.1	1377.4	1374.5	1319.74	1307.85	1573.3
MEAN	74.8	104	---	---	107	100	66.9	44.4	45.8	42.6	42.2	52.4
MAX	144	174	---	---	327	281	231	169	198	141	122	149
MIN	-11	-5.4	---	---	-48	-9.7	-44	-99	-86	-33	-51	1.1
AC-FT	4600	6210	---	---	5940	6160	3980	2730	2730	2620	2590	3120

e Estimated





**Figure 27.** Location of surface-water and water-quality stations in the Oregon Coastal Drainages north of the Siuslaw River Basin and in the lower Columbia River.

## COLUMBIA RIVER MAIN STEM

317

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 mi<sup>2</sup>, 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 affected by tide which can cause reverse direction during tidal cycle when mean daily flows are less than 250,000 ft<sup>3</sup>/s. Mean discharge values are based on a 24 hour day, not a tidal cycle.

AVERAGE DISCHARGE.--4 years (water years 1969, 1992-94), 211,000 ft<sup>3</sup>/s, 152,800,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 581,000 ft<sup>3</sup>/s Jan. 28, 1970; minimum daily discharge, 73,700 ft<sup>3</sup>/s Sept. 7, 1994.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 298,000 ft<sup>3</sup>/s Feb. 26; maximum elevation, 8.30 ft Dec. 11; minimum daily discharge, 73,700 ft<sup>3</sup>/s Sept. 7.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	130000	e119000	e161000	e140000	e200000	247000	192000	268000	232000	190000	128000	103000
2	132000	e137000	188000	151000	e217000	228000	185000	241000	230000	189000	119000	93500
3	109000	119000	160000	185000	e230000	243000	175000	243000	222000	168000	116000	90000
4	106000	142000	e152000	201000	e224000	e228000	179000	233000	223000	153000	127000	96200
5	117000	e144000	e148000	241000	e211000	e206000	193000	243000	221000	152000	131000	87000
6	118000	e151000	e134000	e245000	e212000	e220000	209000	251000	222000	172000	129000	77300
7	133000	e108000	e186000	e248000	e204000	e187000	e186000	253000	230000	184000	103000	73700
8	150000	e104000	e157000	e233000	e209000	e222000	e191000	247000	235000	174000	98400	e77000
9	139000	e154000	192000	231000	e211000	e233000	e200000	232000	238000	175000	108000	e80400
10	118000	e168000	195000	198000	e222000	202000	e190000	230000	226000	177000	106000	86000
11	115000	e132000	207000	227000	e205000	e185000	e169000	236000	235000	159000	90800	88100
12	121000	e119000	e186000	222000	e179000	e180000	e218000	245000	212000	170000	92000	e93000
13	122000	e101000	189000	235000	e204000	155000	e197000	249000	200000	179000	99200	e96700
14	117000	e99000	210000	214000	e156000	e138000	e212000	239000	226000	174000	102000	e97200
15	122000	e112000	204000	224000	181000	167000	e196000	231000	248000	165000	114000	e100000
16	118000	e134000	e202000	e196000	178000	170000	186000	217000	247000	165000	130000	e97000
17	107000	129000	e197000	e163000	175000	188000	170000	231000	233000	158000	125000	e91500
18	111000	e126000	e205000	e192000	e178000	e184000	157000	230000	229000	154000	121000	e96700
19	132000	e137000	e192000	e224000	e199000	e212000	184000	231000	221000	170000	122000	e88200
20	151000	e136000	e157000	e214000	e199000	e218000	195000	231000	202000	174000	110000	e90000
21	134000	e123000	e197000	e199000	e163000	e209000	206000	225000	211000	173000	95600	e92600
22	124000	e83600	e193000	166000	e184000	e208000	e204000	217000	212000	168000	90700	e88400
23	114000	e152000	e187000	144000	e209000	e223000	213000	218000	213000	161000	90700	e93900
24	129000	e175000	e179000	153000	e196000	218000	211000	228000	201000	158000	86300	e103000
25	125000	e214000	e157000	e174000	e274000	e229000	200000	229000	201000	146000	83500	e97000
26	144000	e178000	e161000	e181000	e298000	e210000	204000	225000	194000	162000	85100	e87700
27	134000	e177000	e126000	e200000	e294000	e167000	210000	244000	183000	162000	91200	e91000
28	120000	e134000	e164000	e196000	e233000	e150000	216000	240000	184000	155000	113000	e99700
29	132000	e114000	e173000	e203000	---	e154000	220000	229000	179000	151000	107000	e108000
30	125000	e161000	e154000	e200000	---	180000	231000	221000	166000	156000	103000	e109000
31	143000	---	e125000	e172000	---	187000	---	223000	---	137000	102000	---
TOTAL	3892000	4082600	5438000	6172000	5845000	6148000	5899000	7280000	6476000	5131000	3319500	2772100
MEAN	125500	136100	175400	199100	208700	198300	196600	234800	215900	165500	107100	92400
MAX	151000	214000	210000	248000	298000	247000	231000	268000	248000	190000	131000	109000
MIN	106000	83600	125000	140000	156000	138000	157000	217000	166000	137000	83500	73700
AC-FT	7720000	8098000	10790000	12240000	11590000	12190000	11700000	14440000	12850000	10180000	6584000	5498000

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1969 - 1994, 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	1994
MEAN	139900	182900	224000	253000	224700	216800	254800	326900	297000	200600	139900	118100														
MAX	166700	248000	271400	334200	259900	247800	406500	469600	392100	265000	184500	146100														
(WY)	1969	1969	1969	1970	1970	1971	1969	1969	1969	1969	1991	1991														
MIN	118000	136100	175400	199100	191100	196700	196200	234800	203900	139500	107100	92400														
(WY)	1993	1994	1994	1994	1993	1992	1992	1994	1992	1992	1994	1994														

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1969 - 1994

	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	1994
ANNUAL TOTAL	77144000						62455200																			
ANNUAL MEAN	211400						171100																			
HIGHEST ANNUAL MEAN																										
LOWEST ANNUAL MEAN																										
HIGHEST DAILY MEAN				472000			298000		Feb 26		581000		Jan 28 1970													
LOWEST DAILY MEAN				83600		May 18	73700		Sep 7		73700		Sep 7 1994													
ANNUAL SEVEN-DAY MINIMUM				103000		Sep 15	81400		Sep 5		81400		Sep 5 1994													
ANNUAL RUNOFF (AC-FT)				153000000			123900000				152800000															
10 PERCENT EXCEEDS				363000			231000				339000															
50 PERCENT EXCEEDS				192000			177000				199000															
90 PERCENT EXCEEDS				119000			99100				121000															

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 1993 to current year.

WATER TEMPERATURE: August 1967 to September 1970. October 1993 to current year.

INSTRUMENTATION.--Temperature recorder August 1967 to September 1970. Temperature and specific conductance recorders from October 1992 to current year.

REMARKS.--Since February, 1994, specific conductance and temperature sensors located on right bank. Prior to that time sensors were located on left bank. It was determined that daily record collected prior to February 1994 is not representative of the cross section due to a seasonal influence from several upstream sloughs.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum recorded, 188 microsiemens Feb. 5, but may have been higher during periods of missing record; minimum recorded, 113 microsiemens Feb. 28, but may have been lower during periods of missing record.

WATER TEMPERATURE: Maximum, 22.5°C July 23-27, but may have been higher during period of missing record, minimum, 4.0°C Feb. 5-12.

## WATER-QUALITY DATA

DATE	TIME	DIS-CHARGE, IN CUBIC FEET PER SECOND	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH WATER FIELD (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	DIS-1 SOLVED GAS (PER-CENT SATURATION)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (PER-CENT SATURATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML)
NOV 1993												
05...	1021	E144000	--	173	8.1	13.5	1.3	9.7	--	764	93	210
FEB 1994												
17...	1107	175000	281000	163	8.0	4.5	1.1	13.2	--	736	106	K6
MAR												
17...	1003	188000	326000	156	8.2	7.5	1.7	13.0	--	758	108	32
APR												
14...	1000	E212000	--	146	8.3	9.5	--	11.9	--	771	104	K11
21...	1041	206000	39000	157	8.3	12.0	1.0	12.2	--	758	114	--
29...	1007	220000	357000	171	8.3	12.5	2.0	11.8	--	759	111	--
MAY												
05...	0942	243000	223000	179	8.5	13.0	3.8	11.8	--	758	113	--
12...	1027	245000	376000	159	8.6	15.0	3.8	12.1	--	768	119	K13
20...	1104	231000	113000	139	8.4	14.5	4.0	11.4	109	764	112	250
25...	0921	229000	392000	152	8.4	16.0	3.0	10.3	110	767	104	K3
JUN												
10...	0956	226000	362000	127	8.0	16.0	2.8	10.8	109	768	109	<1
16...	1004	247000	261000	125	7.9	16.0	2.5	10.3	106	768	103	K5
JUL												
28...	0913	155000	193000	144	7.8	22.5	1.5	9.0	105	762	104	K4
AUG												
11...	1004	90800	233000	149	7.8	22.0	--	8.1	--	761	92	K7
SEP												
12...	0959	E93000	--	151	7.7	19.5	1.0	8.5	--	763	93	32
DATE		STREP-TOCOCCI, KF AGAR (COLS. PER 100 ML)	ENTERO-COCCI ME, MF WATER TOTAL (COL / 100 ML)	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 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 CO)
NOV 1993												
05...	K6	--	67	18	5.3	9.0	22	0.5	1.4	61	74	0
FEB 1994												
17...	42	K4	66	18	5.2	7.2	19	0.4	1.3	63	77	0
MAR												
17...	34	K4	66	18	5.1	6.8	18	0.4	1.1	59	72	0
APR												
14...	--	K4	59	16	4.7	7.0	20	0.4	1.1	53	64	0
21...	--	--	62	17	4.8	6.8	19	0.4	1.1	60	73	0
29...	--	--	63	17	5.1	7.7	21	0.4	1.2	71	65	11
MAY												
05...	--	--	72	19	6.0	9.0	21	0.5	1.4	68	80	1
12...	K3	--	57	15	4.7	7.2	21	0.4	1.3	59	67	3
20...	--	K5	55	15	4.2	5.7	18	0.3	1.2	54	58	4
25...	--	K5	62	17	4.8	7.5	20	0.4	1.2	56	66	1
JUN												
10...	K23	K1	51	14	3.8	5.4	18	0.3	1.0	49	59	0
16...	K2	K3	51	14	3.9	4.8	17	0.3	1.0	51	62	0
JUL												
28...	K9	K1	51	14	3.9	6.1	20	0.4	0.90	49	60	0
AUG												
11...	--	K2	56	15	4.4	7.1	21	0.4	1.3	53	64	0
SEP												
12...	35	153	55	15	4.3	7.5	22	0.4	1.1	52	62	0

E - Estimated.

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

14246900 COLUMBIA RIVER AT BEAVER ARMY TERMINAL, NEAR QUINCY, OR--Continued

## WATER-QUALITY DATA

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)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)
NOV 1993												
05...	14	5.6	0.2	11	106	101	0.14	--	--	--	--	--
FEB 1994												
17...	13	4.7	0.2	11	102	101	0.14	0.05	0.01	--	<0.2	0.470
MAR												
17...	12	4.1	0.1	10	95	94	0.13	0.04	<0.01	--	0.3	0.260
APR												
14...	12	5.1	0.1	10	94	89	0.13	0.04	<0.01	<0.2	<0.2	0.260
21...	12	4.7	0.1	9.5	98	95	0.13	0.03	0.01	--	0.3	0.600
29...	14	5.0	0.2	11	105	105	0.14	0.02	<0.01	--	0.5	0.220
MAY												
05...	14	5.6	0.2	9.6	107	106	0.15	0.01	<0.01	--	0.5	0.140
12...	12	4.6	0.2	8.3	96	90	0.13	0.01	<0.01	--	0.3	0.071
20...	10	3.4	0.1	8.3	92	80	0.13	--	--	--	--	--
25...	12	5.0	0.1	9.2	89	91	0.12	0.04	0.03	--	0.3	0.064
JUN												
10...	9.5	3.6	0.1	8.4	72	76	0.10	0.02	<0.01	--	0.2	0.170
16...	9.0	3.1	0.1	8.6	81	75	0.11	0.06	<0.01	--	0.3	<0.050
JUL												
28...	10	4.9	0.2	7.6	83	78	0.11	0.02	<0.01	--	<0.2	0.110
AUG												
11...	11	4.8	<0.1	9.2	88	85	0.12	0.02	<0.01	<0.2	<0.2	0.170
SEP												
12...	11	6.2	0.1	8.1	96	84	0.13	0.02	<0.01	--	<0.2	0.086

DATE	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)	CARBON, ORGANIC SUS- PENDED TOTAL (MG/L AS C)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ANTI- MONY, DIS- SOLVED (UG/L AS SB)	ARSENIC, DIS- SOLVED (UG/L AS AS)	BARIIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM, DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)
NOV 1993												
05...	--	--	--	--	--	20	--	--	24	--	--	--
FEB 1994												
17...	0.04	0.03	0.017	--	--	--	--	--	--	--	--	--
MAR												
17...	0.04	0.01	0.004	--	--	20	--	--	21	--	--	--
APR												
14...	0.03	<0.01	0.007	1.7	0.9	50	<1	<1	20	<1	<1	<1
21...	0.04	0.02	<0.010	--	--	--	--	--	--	--	--	--
29...	0.03	<0.01	<0.010	--	--	--	--	--	--	--	--	--
MAY												
05...	0.05	0.02	<0.010	--	--	--	--	--	--	--	--	--
12...	0.02	<0.01	<0.010	--	--	<10	--	--	19	--	--	--
20...	--	--	0.001	2.0	1.3	10	<1	1	18	<1	<1	<1
25...	0.03	<0.01	<0.010	--	--	--	--	--	--	--	--	--
JUN												
10...	0.02	<0.01	<0.010	--	--	--	--	--	--	--	--	--
16...	0.03	<0.01	<0.010	--	--	--	--	--	--	--	--	--
JUL												
28...	0.06	0.01	<0.010	--	--	<10	--	--	19	--	--	--
AUG												
11...	0.03	0.04	0.024	2.0	0.8	9	<1	1	21	<1	<1	1
SEP												
12...	0.02	0.02	0.020	--	--	20	--	--	20	--	--	--

DATE	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM, DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY, DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)
NOV 1993												
05...	<3	--	11	--	6	2	--	<10	<1	<1	<1	100
FEB 1994												
17...	--	--	--	--	--	--	--	--	--	--	--	--
MAR												
17...	<3	--	29	--	<4	3	--	<10	<1	<1	<1	88
APR												
14...	<1	<1	46	<1	--	1	<0.1	<1	<1	<1	<1	--
21...	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--	--
MAY												
05...	--	--	--	--	--	--	--	--	--	--	--	--
12...	<3	--	15	--	<4	<1	--	<10	<1	<1	<1	89
20...	<1	1	--	<1	--	<1	<0.1	<1	<1	<1	<1	--
25...	--	--	--	--	--	--	--	--	--	--	--	--
JUN												
10...	--	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--	--
JUL												
28...	<3	--	10	--	<4	<1	--	<10	<1	<1	<1	76
AUG												
11...	<1	1	15	<1	--	<1	3.6	<1	<1	<1	<1	--
SEP												
12...	<3	--	14	--	5	<1	--	<10	<1	<1	<1	84

## COLUMBIA RIVER MAIN STEM

14246900 COLUMBIA RIVER AT BEAVER ARMY TERMINAL, NEAR QUINCY, OR--Continued

## WATER-QUALITY DATA

DATE	URANIUM NATURAL, DIS- SOLVED (UG/L AS U)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	CHLORO- PHYLL A, FLUORO- METRIC METHOD CORR. (UG/L)	HALIDE, TOTAL ORGANIC WATER RECOV. (UG/L AS CL)	*DIAZ- INON, D10 SURROGT RECOVERY PERCENT	*TERBUTH YLAZINE, SURROGT RECOVERY PERCENT	*HCH ALPHA, D6 SURROGT RECOVERY PERCENT	PROP- CHLOR, WATER, DISS, REC (UG/L)	BUTYL- ATE, WATER, DISS, REC (UG/L)	SI- MAZINE, WATER, DISS, REC (UG/L)	PRO- METON, WATER, DISS, REC (UG/L)
NOV 1993												
05...	--	<6	--	--	--	--	--	--	--	--	--	--
FEB 1994												
17...	--	--	--	2.7	6	--	--	--	--	--	--	--
MAR 17...	--	<6	--	8.6	<5	--	--	--	--	--	--	--
APR 14...	<1	--	14	23.7	15	100	110	100	<0.007	<0.002	0.011	<0.003
21...	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	15.6	13	--	--	--	--	--	--	--
MAY 05...	--	--	--	19.7	11	--	--	--	--	--	--	--
12...	--	<6	--	18.5	17	--	--	--	--	--	--	--
20...	<1	--	<1	--	21	100	130	100	<0.007	<0.002	<0.005	<0.003
25...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 10...	--	--	--	11.2	19	--	--	--	--	--	--	--
16...	--	--	--	13.3	21	--	--	--	--	--	--	--
JUL 28...	--	<6	--	6.5	24	--	--	--	--	--	--	--
AUG 11...	<1	--	2	7.2	38	100	130	100	0.007	<0.002	<0.005	<0.003
SEP 12...	--	<6	--	3.3	7	--	--	--	--	--	--	--

DATE	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L)	CYANA- ZINE, WATER, DISS, REC (UG/L)	PONOFOS, WATER DISS REC (UG/L)	ALPHA BHC, DIS- SOLVED (UG/L)	P, P' DDE, DISSOLV (UG/L)	CHLOR- PYRIFOS, DIS- SOLVED (UG/L)	LINDANE, DIS- SOLVED (UG/L)	DI- ELDRIN, DIS- SOLVED (UG/L)	METO- LACHLOR, WATER DISSOLV (UG/L)	MALA- THION, DIS- SOLVED (UG/L)	PARA- THION, DIS- SOLVED (UG/L)
NOV 1993											
05...	--	--	--	--	--	--	--	--	--	--	--
FEB 1994											
17...	--	--	--	--	--	--	--	--	--	--	--
MAR 17...	--	--	--	--	--	--	--	--	--	--	--
APR 14...	0.003	<0.004	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	0.002	<0.005	<0.006
21...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--
MAY 05...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
20...	<0.002	<0.004	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	<0.004	<0.005	<0.006
25...	--	--	--	--	--	--	--	--	--	--	--
JUN 10...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
JUL 28...	--	--	--	--	--	--	--	--	--	--	--
AUG 11...	<0.002	<0.004	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	0.003	<0.005	<0.006
SEP 12...	--	--	--	--	--	--	--	--	--	--	--

DATE	DI- AZINON, DIS- SOLVED (UG/L)	ATRA- ZINE, WATER, DISS, REC (UG/L)	ALA- CHLOR, WATER, DISS, REC (UG/L)	METRI- BUZIN, WATER DISSOLV (UG/L)	2,6-DI- ETHYL ANILINE, WAT FLT 0.7 U GF, REC (UG/L)	TRI- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L)	ETHAL- FLUR- ALIN, WAT FLT 0.7 U GF, REC (UG/L)	PHORATE, WATER FLTRD 0.7 U GF, REC (UG/L)	TER- BACIL, WATER FLTRD 0.7 U GF, REC (UG/L)	LIN- URON, WATER FLTRD 0.7 U GF, REC (UG/L)	METHYL PARA- THION, WAT FLT 0.7 U GF, REC (UG/L)
NOV 1993											
05...	--	--	--	--	--	--	--	--	--	--	--
FEB 1994											
17...	--	--	--	--	--	--	--	--	--	--	--
MAR 17...	--	--	--	--	--	--	--	--	--	--	--
APR 14...	<0.002	0.032	<0.002	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.002
21...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--
MAY 05...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
20...	<0.002	<0.001	<0.002	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.002
25...	--	--	--	--	--	--	--	--	--	--	--
JUN 10...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
JUL 28...	--	--	--	--	--	--	--	--	--	--	--
AUG 11...	<0.002	0.0040	<0.002	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.002
SEP 12...	--	--	--	--	--	--	--	--	--	--	--

\* - Percent recovery of surrogate analyses added to water sample prior to extraction.



14246900 COLUMBIA RIVER AT BEAVER ARMY TERMINAL, NEAR QUINCY, OR--Continued

## WATER-QUALITY DATA

[illegible][illegible][illegible]

## COLUMBIA RIVER MAIN STEM

14246900 COLUMBIA RIVER AT BEAVER ARMY TERMINAL, NEAR QUINCY, OR--Continued

## WATER-QUALITY DATA

DATE	SELE- NIUM, SED. SUSP. (UG/G)	SILVER, SED. SUSP. (UG/G)	VANA- DIUM, SED. SUSP. (UG/G)	ZINC, SED. SUSP. (UG/G)	ALUM- INUM, SED, SUS PERCENT	CALCIUM, SED. SUSP. PERCENT	IRON SEDI- MENT, SUSP. PERCENT	MAGNES- IUM, SEDI- MENT SUSP. PERCENT	PHOS- PHORUS, SEDI- MENT SUSP. PERCENT	POTAS- SIUM, SEDI- MENT SUSP. PERCENT	SODIUM, SEDI- MENT SUSP. PERCENT
NOV 1993											
05...	--	--	--	--	--	--	--	--	--	--	--
FEB 1994											
17...	--	--	--	--	--	--	--	--	--	--	--
MAR											
17...	--	--	--	--	--	--	--	--	--	--	--
APR											
14...	0.4	0.6	120	160	7.4	2.3	4.1	1.1	0.13	1.2	1.8
21...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--
MAY											
05...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
20...	0.6	0.7	110	210	6.8	2.1	4.2	1.1	0.16	1.2	1.5
25...	--	--	--	--	--	--	--	--	--	--	--
JUN											
10...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
JUL											
28...	--	--	--	--	--	--	--	--	--	--	--
AUG											
11...	0.6	0.3	120	190	6.8	2.0	4.1	1.0	0.19	1.2	1.4
SEP											
12...	--	--	--	--	--	--	--	--	--	--	--

DATE	TITA- NIUM, SEDI- MENT SUSP. PERCENT	BISMUTH, SEDI- MENT SUSP. (UG/G)	COBALT, SEDI- MENT SUSP. (UG/G)	EURO- PIUM, SEDI- MENT SUSP. (UG/G)	GALLIUM, SEDI- MENT SUSP. (UG/G)	HOLMIUM, SEDI- MENT SUSP. (UG/G)	LANTHA- NUM, SEDI- MENT SUSP. (UG/G)	NEODYM- IUM, SEDI- MENT SUSP. (UG/G)	NIOBIUM, SEDI- MENT SUSP. (UG/G)	SCAN- DIUM, SEDI- MENT SUSP. (UG/G)	STRON- TIUM, SEDI- MENT SUSP. (UG/G)
NOV 1993											
05...	--	--	--	--	--	--	--	--	--	--	--
FEB 1994											
17...	--	--	--	--	--	--	--	--	--	--	--
MAR											
17...	--	--	--	--	--	--	--	--	--	--	--
APR											
14...	0.53	<20	17	<4	19	<8	28	28	15	15	320
21...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--
MAY											
05...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
20...	0.47	<20	19	<4	16	<8	25	23	10	14	270
25...	--	--	--	--	--	--	--	--	--	--	--
JUN											
10...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
JUL											
28...	--	--	--	--	--	--	--	--	--	--	--
AUG											
11...	0.49	<20	18	<4	20	<8	25	22	15	15	260
SEP											
12...	--	--	--	--	--	--	--	--	--	--	--

DATE	TANTA- LUM, SEDI- MENT SUSP. (UG/G)	THORIUM, SEDI- MENT SUSP. (UG/G)	TIN, SEDI- MENT SUSP. (UG/G)	URANIUM, SEDI- MENT SUSP. (UG/G)	YTTRIUM, SEDI- MENT SUSP. (UG/G)	YTTER- BIUM, SEDI- MENT SUSP. (UG/G)	LITHIUM, SEDI- MENT SUSP. (UG/G)	CERIUM, SEDI- MENT SUSP. (UG/G)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. & FINER THAN .062 MM
NOV 1993											
05...	--	--	--	--	--	--	--	--	<1	--	--
FEB 1994											
17...	--	--	--	--	--	--	--	--	7	5310	E80
MAR											
17...	--	--	--	--	--	--	--	--	8	7040	E89
APR											
14...	<80	7	<10	1.8	22	3	24	50	12	--	82
21...	--	--	--	--	--	--	--	--	10	1050	81
29...	--	--	--	--	--	--	--	--	16	15400	82
MAY											
05...	--	--	--	--	--	--	--	--	19	11400	86
12...	--	--	--	--	--	--	--	--	17	17300	77
20...	<80	7	<10	1.5	21	4	23	43	12	3660	89
25...	--	--	--	--	--	--	--	--	20	21200	58
JUN											
10...	--	--	--	--	--	--	--	--	19	18600	65
16...	--	--	--	--	--	--	--	--	15	10600	77
JUL											
28...	--	--	--	--	--	--	--	--	8	4170	E98
AUG											
11...	<80	7	<10	2.8	21	2	25	46	8	5030	E100
SEP											
12...	--	--	--	--	--	--	--	--	5	E1260	E96

E - Estimated.

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	---	---	---	122	114	117	178	170	174	180	176	179
2	---	---	---	128	120	124	179	171	174	187	178	181
3	---	---	---	126	117	122	177	168	173	185	180	182
4	184	179	181	125	119	122	173	168	170	181	176	179
5	188	180	183	125	120	122	175	169	172	181	177	179
6	187	179	182	127	122	124	183	174	179	181	173	178
7	185	180	182	133	127	129	187	177	182	178	170	174
8	181	173	178	134	128	131	181	173	177	175	167	171
9	173	168	170	145	131	141	176	162	169	173	167	170
10	181	169	172	148	142	145	166	149	157	171	165	168
11	182	176	179	153	146	149	152	142	146	170	163	166
12	185	177	182	154	145	150	147	141	143	168	156	162
13	182	175	179	164	148	154	146	141	143	159	151	155
14	187	176	181	164	154	160	151	146	148	153	146	149
15	179	169	175	164	156	160	153	148	150	147	140	144
16	175	166	171	166	156	161	153	146	150	142	137	140
17	170	160	166	162	154	157	152	148	150	141	137	139
18	163	157	160	163	155	160	156	149	152	142	137	139
19	162	155	158	159	153	155	154	147	151	143	137	141
20	159	155	156	156	147	154	159	153	156	141	137	139
21	158	154	156	153	143	149	160	156	158	146	139	142
22	154	149	152	156	143	150	160	156	158	148	143	145
23	155	146	151	166	149	158	160	156	158	150	146	148
24	148	139	144	167	155	163	161	158	159	155	148	150
25	145	131	140	177	165	169	163	157	159	156	151	153
26	131	122	126	177	166	173	165	159	163	157	151	153
27	125	119	123	175	166	171	169	163	165	159	152	155
28	124	113	119	172	163	168	172	166	169	157	151	154
29	---	---	---	171	164	168	176	169	174	155	149	152
30	---	---	---	172	165	169	183	175	179	151	148	150
31	---	---	---	176	167	171	---	---	---	151	148	150
MONTH	---	---	---	177	114	150	187	141	162	187	137	158
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	148	144	146	139	132	135	---	---	---	---	---	---
2	149	143	145	137	134	136	---	---	---	---	---	---
3	144	140	142	141	136	138	---	---	---	---	---	---
4	145	139	142	139	135	136	---	---	---	---	---	---
5	142	133	137	139	135	137	---	---	---	---	---	---
6	138	132	134	139	136	137	---	---	---	---	---	---
7	136	130	132	139	135	136	---	---	---	---	---	---
8	132	126	129	137	134	135	---	---	---	---	---	---
9	131	127	129	---	---	---	---	---	---	---	---	---
10	130	125	127	---	---	---	---	---	---	---	---	---
11	129	122	125	147	138	142	---	---	---	---	---	---
12	128	124	126	145	135	139	---	---	---	---	---	---
13	131	127	128	139	135	137	---	---	---	---	---	---
14	131	126	128	140	135	138	---	---	---	---	---	---
15	131	124	127	141	136	138	---	---	---	---	---	---
16	128	121	125	143	136	138	---	---	---	---	---	---
17	127	124	125	140	136	138	---	---	---	---	---	---
18	127	125	126	140	136	138	---	---	---	---	---	---
19	128	124	126	141	136	139	---	---	---	---	---	---
20	132	127	128	147	138	142	---	---	---	---	---	---
21	133	128	130	143	138	140	---	---	---	---	---	---
22	133	129	131	145	139	142	---	---	---	153	147	149
23	134	130	132	151	141	145	---	---	---	157	144	147
24	135	130	133	144	141	142	---	---	---	147	143	145
25	135	130	133	145	141	143	---	---	---	144	142	143
26	134	130	132	146	141	143	---	---	---	145	142	143
27	134	130	132	146	142	144	---	---	---	150	143	147
28	135	131	133	---	---	---	---	---	---	147	142	144
29	138	131	134	---	---	---	---	---	---	147	142	145
30	137	132	135	---	---	---	---	---	---	147	143	145
31	---	---	---	---	---	---	---	---	---	---	---	---
MONTH	149	121	132	---	---	---	---	---	---	---	---	---

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

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

## 14301000 NEHALEM RIVER NEAR FOSS, OR

DRAINAGE AREA. - - 667 mi<sup>2</sup>

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

GAGE.--Water-stage recorder. Datum of gage is 32.60 ft above sea level (State Highway Department bench mark).  
Prior to Nov. 11, 1939, nonrecording gage.

REMARKS.--No estimated daily discharges. Records good. No regulation. Several small diversions for irrigation and domestic use upstream from station.

AVERAGE DISCHARGE.--55 years, 2,618 ft<sup>3</sup>/s, 53.34 in/yr, 1,897,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 53,400 ft<sup>3</sup>/s Jan. 9, 1990, gage height, 25.07 ft; minimum discharge, 34 ft<sup>3</sup>/s Aug. 29-31, 1967.

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 19,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 10	1430	*14.400	*12.14				

Minimum discharge, 60 ft<sup>3</sup>/s Sept. 28-30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	82	100	4280	4430	1190	7650	1680	773	438	340	126	83
2	79	97	3450	5340	1120	6620	1500	745	420	341	122	81
3	79	140	2300	5210	1070	6800	1380	718	399	332	118	129
4	78	149	2750	6850	1010	6400	1290	819	385	320	116	174
5	77	145	2470	9120	961	5510	1220	821	375	338	115	156
6	81	127	2020	9300	914	4630	1430	780	397	334	115	139
7	87	120	2540	7410	882	3880	1820	703	605	313	113	119
8	91	121	3930	6180	845	3300	3650	654	670	295	132	128
9	90	113	8910	5640	845	2820	4990	616	597	274	166	149
10	87	107	13300	5100	833	2520	4780	588	523	256	184	174
11	86	104	11600	5510	818	2250	3940	564	460	238	158	181
12	92	101	9210	5450	786	1970	3400	545	433	226	139	161
13	93	101	6790	5070	1530	1760	2950	529	464	218	134	149
14	94	103	5190	4480	2460	1580	2570	520	746	211	124	142
15	180	105	4070	3880	3430	1440	2250	515	950	206	114	136
16	233	114	3260	3310	6060	1390	2010	541	874	202	109	124
17	243	131	2660	2820	7780	1790	1810	552	765	196	106	113
18	239	143	2230	2440	7290	2960	1630	536	708	186	103	103
19	181	139	1910	2150	6500	3450	1450	508	645	180	101	96
20	150	140	1670	1920	5740	3710	1320	484	584	171	101	92
21	132	153	1440	1740	5460	5490	1240	468	536	165	101	87
22	121	198	1270	1720	5510	6200	1150	452	494	157	113	81
23	117	234	1160	1730	7980	5860	1090	435	466	149	111	73
24	124	200	1070	1810	11400	4960	1040	418	446	145	109	71
25	120	179	995	1880	11800	4130	1000	403	423	142	104	68
26	118	160	936	1900	10700	3480	943	393	415	141	102	65
27	110	138	887	1760	9860	3020	906	382	406	139	100	63
28	105	150	836	1630	8880	2640	850	379	378	134	98	61
29	105	201	789	1480	---	2310	809	447	359	134	94	60
30	101	616	780	1360	---	2060	791	495	348	135	89	62
31	102	---	888	1260	---	1870	---	451	---	131	86	---
TOTAL	3677	4629	105591	119880	123654	114450	56889	17234	15709	6749	3603	3320
MEAN	119	154	3406	3867	4416	3692	1896	556	524	218	116	111
MAX	243	616	13300	9300	11800	7650	4990	821	950	341	184	181
MIN	77	97	780	1260	786	1390	791	379	348	131	86	60
AC - FT	7290	9180	209400	237800	245300	227000	112800	34180	31160	13390	7150	6590
CFSM	.18	.23	5.11	5.80	6.62	5.54	2.84	.83	.79	.33	.17	.17
IN.	.21	.26	5.89	6.69	6.90	6.38	3.17	.96	.88	.38	.20	.19

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 1994, BY WATER YEAR (WY)

MEAN	770	3588	5948	6149	5705	4258	2706	1231	606	271	147	208
MAX	2948	9256	11390	12450	12490	8696	6124	3028	1591	747	314	877
(WY)	1948	1974	1956	1971	1949	1956	1991	1948	1968	1983	1968	1959
MIN	69.9	154	599	596	1066	1171	1149	520	250	137	62.5	63.6
(WY)	1953	1994	1977	1977	1977	1992	1941	1989	1992	1967	1967	1967

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1940 - 1994
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ANNUAL TOTAL	565281		575385			
ANNUAL MEAN	1549		1576		2618	
HIGHEST ANNUAL MEAN					4235	1974
LOWEST ANNUAL MEAN					1063	1977
HIGHEST DAILY MEAN	13300	Dec 10	13300	Dec 10	42400	Jan 9 1990
LOWEST DAILY MEAN	77	Oct 5	60	Sep 29	36	Aug 29 1967
ANNUAL SEVEN-DAY MINIMUM	80	Sep 30	64	Sep 24	38	Aug 26 1967
ANNUAL RUNOFF (AC-FT)	1121000		1141000		1897000	
ANNUAL RUNOFF (CFSM)	2.32		2.36		3.93	
ANNUAL RUNOFF (INCHES)	31.53		32.09		53.34	
10 PERCENT EXCEEDS	3940		5200		7100	
50 PERCENT EXCEEDS	888		508		1110	
90 PERCENT EXCEEDS	107		101		125	





NESTUCCA RIVER BASIN

327

14302800 MCGUIRE LAKE NEAR FAIRDALE, OR

LOCATION.--Lat 45°18'30", long 123°24'30", in NW 1/4 SE 1/4 sec.15, T.3 S., R.6 W., Yamhill County, Hydrologic Unit 17100203, on control tower in reservoir on Nestucca River, 0.3 mi upstream from Walker Creek, and 5.0 mi southwest of Fairdale.

DRAINAGE AREA.--2.85 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1970 to current year.

GAGE.--Nonrecording gage. Datum of gage is sea level.

REMARKS.--Reservoir is formed by earthfill dam with ungated spillway. Capacity of reservoir is 3,840 acre-ft between elevations 1,810.0 ft and 1,865.5 ft. Dead storage negligible. Under normal operation, reservoir is filled in the spring (April or May) and drained when fall rains start. There is no planned storage during winter months; however, during periods of heavy runoff, inflow may be greater than capacity of outlet tunnel and there may be temporary storage. Water is used during summer months for municipal supply of city of McMinnville.

COOPERATION.--Elevation and capacity table furnished by city of McMinnville, Water and Light Department.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 3,890 acre-ft Mar. 12 1972, Feb. 19, Mar. 28, 1974, elevation, 1,865.8 ft; no contents most of time during winter months.

EXTREMES FOR CURRENT YEAR.--Maximum contents observed, 3,820 acre-ft June 14, elevation, 1,865.3 ft; no contents observed several days in January.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept.30.....	1,859.5	3,030	-
Oct. 31.....	1,854.9	2,500	-530
Nov. 30.....	1,847.6	1,790	-710
Dec. 31.....	1,814.8	96	-1,694
CAL YR 1993.....	-	-	+50
Jan. 31.....	1,814.1	82	-14
Feb. 28.....	1,845.1	1,590	+1,508
Mar. 31.....	1,857.5	2,790	+1,200
Apr. 30.....	1,863.6	3,570	+780
May 31.....	1,865.0	3,770	+200
June 30.....	1,865.1	3,780	+10
July 31.....	1,861.7	3,310	-470
Aug. 31.....	1,856.5	2,680	-630
Sept.30.....	1,851.4	2,150	-530
WTR YR 1994.....	-	-	-880

## NESTUCCA RIVER BASIN

14302900 NESTUCCA RIVER NEAR FAIRDALE, OR

LOCATION.--Lat 45°18'40", long 123°25'05", in SW 1/4 NW 1/4 sec.15, T.3 S., R.6 W., Yamhill County, Hydrologic Unit 17100203, on right bank 100 ft upstream from former Meadow Lake, 0.4 mi downstream from Walker Creek, 5.3 mi southwest of Fairdale, and at mile 49.3.

DRAINAGE AREA.--6.18 mi<sup>2</sup>.

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

GAGE.--Water-stage recorder. Datum of gage is 1,778.99 ft above sea level (levels by city of McMinnville).

REMARKS.--No estimated daily discharges. Records fair. Flow regulated since March 1969 by McGuire Lake about 1 mi upstream from gage (station 14302800). During winter months lake is empty except when inflow exceeds capacity of outlet tunnel.

AVERAGE DISCHARGE.--34 years (water years 1961-94), 30.4 ft<sup>3</sup>/s, 66.80 in/yr, 22,020 acre-ft/yr, adjusted for storage and diversion.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 876 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 10.43 ft; minimum discharge, 0.41 ft<sup>3</sup>/s Sept. 11, 1986.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 196 ft<sup>3</sup>/s Feb. 24, gage height, 4.54 ft; minimum discharge, 0.70 ft<sup>3</sup>/s Aug. 27, 31.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.82	6.4	62	82	7.6	38	15	6.9	7.3	4.6	1.2	.82
2	.83	6.4	33	80	7.3	36	13	6.6	6.6	4.5	1.3	.81
3	.82	7.0	24	85	6.9	33	12	9.7	6.1	4.2	1.3	1.9
4	.82	6.8	29	106	6.6	29	11	17	6.3	4.1	1.3	1.6
5	.83	6.7	22	108	6.3	25	11	11	6.2	4.1	1.3	1.1
6	.87	6.7	20	100	6.1	21	20	9.6	10	4.0	1.2	1.0
7	.92	6.5	47	98	5.9	18	21	8.7	13	3.6	1.3	.96
8	.98	6.4	70	91	5.8	16	20	8.1	10	2.3	1.5	.93
9	.91	6.5	142	77	6.4	15	56	7.7	8.3	2.1	1.7	2.9
10	.87	6.7	161	65	5.7	14	45	7.2	7.3	2.0	1.4	5.4
11	.87	6.7	158	69	5.6	12	34	6.9	6.5	1.9	1.3	4.4
12	1.0	6.7	125	55	5.5	11	29	6.6	6.1	1.9	1.2	4.2
13	1.0	6.7	107	45	19	10	23	6.5	9.1	1.8	1.2	4.1
14	1.0	6.7	98	38	15	9.3	19	6.4	19	1.8	1.1	4.0
15	2.4	6.9	90	32	22	9.2	17	7.0	16	1.8	1.1	4.0
16	1.6	7.1	84	28	34	10	15	8.1	15	1.7	1.1	4.0
17	1.3	7.3	80	25	39	16	13	7.0	13	1.6	1.1	4.0
18	1.1	7.0	77	22	34	24	12	6.6	11	1.6	1.1	4.0
19	1.1	6.9	74	20	29	22	11	7.0	10	1.5	1.0	3.9
20	1.1	6.9	72	18	26	30	11	7.2	9.0	1.4	1.1	3.8
21	3.2	7.2	69	18	26	41	10	7.4	8.1	1.4	1.1	3.8
22	6.7	9.3	67	21	25	32	9.6	7.4	7.4	1.3	1.2	3.9
23	6.9	10	64	26	95	27	9.5	6.6	7.0	1.2	1.1	3.5
24	7.2	10	62	29	170	28	9.0	6.0	6.5	1.3	1.0	2.9
25	6.9	9.9	60	24	104	25	11	5.9	6.1	1.4	.97	2.8
26	6.9	9.8	57	22	77	24	8.5	5.9	5.9	1.3	.93	2.8
27	6.9	10	54	20	61	23	7.8	5.9	5.6	1.2	.87	2.9
28	6.5	10	51	15	49	22	7.6	6.6	5.2	1.2	.87	2.9
29	6.4	13	47	9.4	---	20	7.3	11	4.9	1.3	.92	3.0
30	6.4	24	46	8.7	---	18	7.3	9.5	4.7	1.4	.95	3.0
31	6.4	---	47	8.1	---	17	---	8.0	---	1.3	.85	---
TOTAL	91.54	248.2	2199	1445.2	900.7	675.5	525.6	242.0	257.2	66.8	35.56	89.32
MEAN	2.95	8.27	70.9	46.6	32.2	21.8	17.5	7.81	8.57	2.15	1.15	2.98
MAX	7.2	24	161	108	170	41	56	17	19	4.6	1.7	5.4
MIN	.82	6.4	20	8.1	5.5	9.2	7.3	5.9	4.7	1.2	.85	1.77
AC-FT	182	492	4360	2870	1790	1340	1040	480	510	132	71	177
MEAN†	4.75	29.6	48.5	51.7	25.2	49.4	57.6	25.5	11.0	4.50	1.63	0.86
CFSM†	0.77	4.79	7.85	8.37	4.08	7.99	9.32	4.13	1.78	0.73	0.26	0.14
IN.†	0.89	5.34	9.04	9.65	4.25	9.23	10.41	4.76	1.99	0.84	0.30	0.15
AC-FT†	292	1760	2980	3180	1400	3040	3430	1570	656	277	100	51

CAL YR 1993 TOTAL 7575.33 MEAN 20.8 MAX 161 MIN .76 AC-FT 15030 MEAN† 19.5 CFSM† 3.16 IN.† 43.06 AC-FT† 14190  
WTR YR 1994 TOTAL 6776.62 MEAN 18.6 MAX 170 MIN .81 AC-FT 13440 MEAN† 25.9 CFSM† 4.19 IN.† 56.87 AC-FT† 18740

† Adjusted for storage and diversion from McGuire Lake.

## NESTUCCA RIVER BASIN

329

14303200 TUCCA CREEK NEAR BLAINE, OR

LOCATION.--Lat 45°19'28", long 123°32'43", in SE 1/4 NW 1/4 sec.9, T.3 S., R.7 W., Tillamook County, Hydrologic Unit 17100203, on right bank at road bridge, 80 ft upstream from mouth, and 8 mi northeast of Blaine.

DRAINAGE AREA.--3.09 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1983 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,400 ft above sea level, from topographic map.

REMARKS.--No estimated daily discharges. Records good.

AVERAGE DISCHARGE.--11 years (water years 1984-94), 14.3 ft<sup>3</sup>/s, 62.92 in/yr, 10,370 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 266 ft<sup>3</sup>/s Dec. 9, 1987, gage height, 3.66 ft; minimum discharge, 0.46 ft<sup>3</sup>/s Sept. 30, Oct. 1, 2, 1987.

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 180 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 24	1450	*198	*3.24	No other peak greater than base discharge.			
Minimum discharge, 0.85 ft <sup>3</sup> /s Oct. 5, 6.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.92	1.1	40	17	6.8	42	13	6.2	3.6	5.0	2.0	1.4
2	.93	1.0	22	28	6.6	36	12	6.0	3.5	4.8	2.0	1.4
3	.93	1.9	14	44	6.4	33	12	6.0	3.4	4.4	1.9	3.8
4	.93	1.4	15	58	6.2	30	11	7.5	3.4	4.3	1.9	2.3
5	.91	1.2	13	72	6.0	27	10	6.3	3.4	4.2	1.9	1.8
6	1.0	1.2	11	65	5.9	24	14	6.0	4.6	4.0	1.9	1.6
7	1.2	1.2	22	50	5.7	21	15	5.7	6.6	3.8	2.0	1.5
8	1.1	1.2	31	40	5.4	19	23	5.5	5.4	3.6	2.3	1.5
9	1.1	1.2	58	39	5.7	17	37	5.3	5.0	3.5	2.3	1.8
10	1.0	1.2	87	41	5.4	15	42	5.1	4.7	3.4	2.0	1.8
11	1.0	1.2	102	48	5.3	13	36	5.0	4.4	3.2	1.9	1.6
12	1.2	1.2	67	46	5.2	12	30	4.8	4.4	3.1	1.8	1.5
13	1.2	1.2	45	38	9.0	11	24	4.8	5.8	3.1	1.8	1.4
14	1.2	1.2	33	31	8.4	10	20	4.7	11	3.0	1.8	1.3
15	2.7	1.5	25	26	11	9.8	17	4.9	12	3.0	1.7	1.4
16	1.6	1.5	21	22	18	10	15	5.2	13	2.9	1.7	1.3
17	1.3	1.6	18	18	28	13	14	4.9	12	2.8	1.7	1.3
18	1.2	1.5	15	16	31	19	13	4.6	11	2.7	1.6	1.3
19	1.2	1.4	13	14	29	20	11	4.4	10	2.6	1.6	1.3
20	1.1	1.3	12	12	27	23	11	4.3	9.2	2.6	1.6	1.3
21	1.1	2.1	10	11	27	28	9.8	4.2	8.2	2.4	1.6	1.2
22	1.0	2.3	9.3	10	27	28	9.1	4.0	7.7	2.3	1.7	1.2
23	1.2	1.8	8.5	10	86	25	8.7	3.8	7.1	2.2	1.7	1.1
24	1.5	1.5	8.0	11	181	23	8.2	3.7	6.6	2.2	1.5	1.1
25	1.2	1.4	7.6	9.7	136	21	8.6	3.7	6.3	2.3	1.5	1.1
26	1.1	1.4	7.2	8.8	81	19	7.5	3.6	6.0	2.2	1.5	1.1
27	1.1	1.7	6.8	8.3	59	19	7.2	3.6	5.7	2.2	1.5	1.1
28	1.0	1.7	6.4	8.0	49	18	6.8	3.6	5.3	2.1	1.5	1.1
29	1.0	2.8	6.1	7.6	---	17	6.7	4.7	5.1	2.1	1.5	1.1
30	1.0	10	7.1	7.3	---	16	6.5	3.9	4.9	2.1	1.4	1.1
31	1.1	---	8.4	7.1	---	15	---	3.7	---	2.0	1.4	---
TOTAL	36.02	52.9	749.4	823.8	878.0	633.8	459.1	149.7	199.3	94.1	54.2	43.8
MEAN	1.16	1.76	24.2	26.6	31.4	20.4	15.3	4.83	6.64	3.04	1.75	1.46
MAX	2.7	10	102	72	181	42	42	7.5	13	5.0	2.3	3.8
MIN	.91	1.0	6.1	7.1	5.2	9.8	6.5	3.6	3.4	2.0	1.4	1.1
AC-FT	71	105	1490	1630	1740	1260	911	297	395	187	108	87
CFSM	.38	.57	7.82	8.60	10.1	6.62	4.95	1.56	2.15	.98	.57	.47
IN.	.43	.64	9.02	9.92	10.57	7.63	5.53	1.80	2.40	1.13	.65	.53

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1984 - 1994, BY WATER YEAR (WY)

	MEAN	3.35	26.0	24.1	29.4	27.4	22.9	17.0	9.67	6.63	2.95	1.70	1.55
MAX	8.96	50.1	37.2	48.0	53.5	39.9	33.4	18.7	12.0	4.47	2.30	2.48	
(WY)	1985	1985	1988	1990	1990	1987	1991	1984	1990	1984	1984	1985	
MIN	.95	1.76	15.9	12.2	10.3	6.59	9.28	4.02	2.40	1.65	1.11	.91	
(WY)	1988	1994	1987	1985	1993	1992	1990	1989	1992	1992	1986	1987	

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1984 - 1994

ANNUAL TOTAL	4247.19	4174.12	
ANNUAL MEAN	11.6	11.4	14.3
HIGHEST ANNUAL MEAN			17.9
LOWEST ANNUAL MEAN			10.5
HIGHEST DAILY MEAN	102	181	218
LOWEST DAILY MEAN	.91	.91	.55
ANNUAL SEVEN-DAY MINIMUM	.93	.97	.63
ANNUAL RUNOFF (AC-FT)	8420	8280	10370
ANNUAL RUNOFF (CFSM)	3.77	3.70	4.63
ANNUAL RUNOFF (INCHES)	51.13	50.25	62.92
10 PERCENT EXCEEDS	29	28	34
50 PERCENT EXCEEDS	7.1	5.0	7.7
90 PERCENT EXCEEDS	1.2	1.2	1.3

LOCATION.--Lat 44°42'55", long 123°53'10", in NW 1/4 SW 1/4 sec.11, T.10 S., R.10 W., Lincoln County, Hydrologic Unit 17100204, on right bank, 1.8 mi downstream from Baker Creek, 1.5 mi east of Siletz, and at mile 42.6.

PERIOD OF RECORD.--October 1905 to November 1911, January to May 1912, January to June 1924, November 1924 to current year. Prior to December 1905 monthly discharge only, published in WSP 1318.

GAGE.--Water-stage recorder. Datum of gage is 102.32 ft above sea level. Oct. 1, 1905, to Sept 30, 1938, nonrecording gage at various sites within 2.5 mi downstream at different datums.

REMARKS.--No estimated daily discharges. Records good. Slight regulation from logponds. Small diversions upstream from station for irrigation. Continuous water-quality records for the period February 1972 to September 1985 have been collected at this location.

EXTREMES FOR PERIOD OF RECORD (1905-12, 1924-38).--Maximum discharge, 34,600 ft<sup>3</sup>/s Nov. 22, 1909, gage height, 24.6 ft, site and datum then in use; minimum observed discharge, 51 ft<sup>3</sup>/s Dec. 6, 7, 1929.

EXTREMES FOR PERIOD OF RECORD (1938-94).--Maximum discharge, 32,200 ft<sup>3</sup>/s Jan. 28, 1965, gage height, 27.32 ft, present site and datum; minimum discharge, 47 ft<sup>3</sup>/s Oct. 20, 21, 29, 1987.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Nov. 20, 1921, reached a stage of 31.6 ft, at site 2.5 mi downstream at different datum, from floodmark, discharge, 40,800 ft<sup>3</sup>/s, from rating curve extended above 17,000 ft<sup>3</sup>/s.

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 24	1630	*18,300	*17.77	No other peak greater than base discharge.			
Minimum discharge, 65 ft <sup>3</sup> /s Sept. 28, 29.							

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	72	84	4970	3060	591	3820	984	496	402	337	136	85
2	72	83	2460	4180	567	3380	900	485	375	348	133	82
3	72	94	1270	7970	541	3600	830	481	356	321	130	135
4	72	114	1670	7560	518	3160	773	746	356	303	129	183
5	72	98	1300	7540	495	2560	737	652	348	298	128	125
6	75	90	1010	5290	479	2100	1080	571	463	291	127	102
7	87	86	2600	3620	468	1760	1390	526	764	277	123	92
8	91	84	4020	3320	445	1500	3810	495	717	263	125	91
9	81	83	4710	3320	470	1320	4670	464	616	252	153	110
10	76	82	5120	3120	459	1240	3980	442	548	241	138	167
11	77	83	6600	3630	437	1080	2920	424	496	231	128	203
12	103	87	4830	3140	422	969	2360	408	462	227	122	142
13	109	86	3300	2540	886	889	1890	393	563	221	116	110
14	107	85	2800	2080	1080	821	1620	379	925	212	114	100
15	203	82	2210	1730	1000	777	1400	377	1170	208	112	98
16	250	98	1800	1470	1530	793	1240	498	976	204	108	93
17	154	100	1490	1280	2690	1110	1110	651	838	198	106	87
18	122	104	1270	1130	2610	1890	1010	502	737	190	105	85
19	109	99	1100	1020	2240	1900	924	463	657	184	104	83
20	101	92	970	927	1990	1670	848	456	597	177	104	79
21	96	101	868	861	2710	2420	806	442	548	172	104	77
22	92	217	785	882	2870	2220	748	413	517	167	105	73
23	91	207	716	1020	6540	2080	705	390	492	164	103	71
24	120	151	662	989	15100	2060	671	373	464	162	98	69
25	115	125	616	924	10700	1930	667	354	435	163	95	69
26	100	114	584	855	6390	1700	613	344	420	162	92	69
27	92	116	551	796	5310	1510	582	332	398	156	90	68
28	88	125	518	745	4840	1370	551	327	374	150	89	66
29	86	180	492	698	---	1240	531	509	357	146	89	68
30	84	312	611	656	---	1190	531	466	347	145	88	75
31	84	---	1220	621	---	1090	---	405	---	140	86	---
TOTAL	3153	3462	63123	76974	74378	55149	40881	14264	16718	6710	3480	2957
MEAN	102	115	2036	2483	2656	1779	1363	460	557	216	112	98.6
MAX	250	312	6600	7970	15100	3820	4670	746	1170	348	153	203
MIN	72	82	492	621	422	777	531	327	347	140	86	66
AC-FT	6250	6870	125200	152700	147500	109400	81090	28290	33160	13310	6900	58700
CFSM	.50	.57	10.1	12.3	13.2	8.1	6.75	2.28	2.76	1.07	.56	.4

MEAN	708	2398	3260	3243	2913	2236	1499	835	497	225	131	197
MAX	3412	6207	7828	7664	6055	4560	3560	2579	1602	602	419	1138
(WY)	1927	1907	1934	1953	1949	1932	1937	1933	1906	1910	1968	1959
MIN	50.1	72.4	401	518	752	557	387	233	144	99.7	64.5	58.6
(WY)	1988	1930	1977	1977	1973	1941	1926	1939	1928	1992	1992	1965

## WATER YEARS 1906 - 1994

ANNUAL TOTAL	389057		361249				
ANNUAL MEAN	1066		990			1499	
HIGHEST ANNUAL MEAN						2337	1974
LOWEST ANNUAL MEAN						660	1977
HIGHEST DAILY MEAN	7500	Mar 23	15100	Feb 24	30700		Nov 25 1927
LOWEST DAILY MEAN	72	Oct 1	66	Sep 28	47		Oct 20 1987
ANNUAL SEVEN-DAY MINIMUM	73	Sep 29	69	Sep 23	48		Oct 16 1987
ANNUAL RUNOFF (AC-FT)	771700		716500		1086000		
ANNUAL RUNOFF (CFSM)	5.28		4.90		7.42		
ANNUAL RUNOFF (INCHES)	71.65		66.53		100.86		
10 PERCENT EXCEEDS	2790		2700		3790		
50 PERCENT EXCEEDS	622		456		750		
90 PERCENT EXCEEDS	87		86		104		



ALSEA RIVER BASIN

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14306340 EAST FORK LOBSTER CREEK NEAR ALSEA, OR

LOCATION.--Lat 44°14'53", long 123°38'07", in NE 1/4 SE 1/4 sec.22, T.15 S., R.8 W., Benton County, Hydrologic Unit 17100205, on left bank 500 ft upstream from mouth, and 9 mi south of Alsea.

DRAINAGE AREA.--5.70 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1983 to current year.

REVISED RECORDS.--WDR OR-87-2: 1984(M,P), 1985(M,P), 1986(M,P).

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 680 ft above sea level, from topographic map.

REMARKS.--No estimated daily discharges. Records fair except those below 10 ft<sup>3</sup>/s, which are poor. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--11 years, 21.0 ft<sup>3</sup>/s, 50.13 in/yr, 15,240 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 652 ft<sup>3</sup>/s Nov. 2, 1984, gage height, 3.81 ft, from rating curve extended above 260 ft<sup>3</sup>/s; maximum gage height, 3.86 ft, Dec. 9, 1987, from crest-stage gage; minimum discharge, 0.17 ft<sup>3</sup>/s Sept. 27, 28, Oct. 2, 1987.

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

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 24	1100	*249	*3.03				

Minimum discharge, 0.47 ft<sup>3</sup>/s Sept. 2, 3.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.54	.80	44	21	14	53	40	7.2	4.8	3.6	1.1	.54
2	.54	.80	15	33	14	48	37	7.1	4.3	3.4	1.1	.48
3	.54	1.1	7.4	61	13	53	34	7.2	4.2	3.1	1.0	1.0
4	.58	1.5	19	84	13	56	32	8.6	4.4	2.9	1.0	1.3
5	.62	1.1	14	109	13	48	29	8.2	4.4	2.9	1.1	.92
6	.70	.93	9.3	73	12	42	37	6.8	9.0	2.8	1.1	.77
7	.85	.90	38	54	12	37	47	6.3	15	2.6	1.0	.62
8	.90	.90	86	51	12	34	71	6.3	12	2.4	1.1	.66
9	.81	.90	67	58	12	31	86	6.2	9.0	2.2	1.1	.93
10	.80	.90	91	53	12	29	75	5.5	7.6	2.2	1.0	1.5
11	.97	.92	143	50	12	26	55	5.5	6.7	2.0	1.0	1.5
12	2.4	1.0	70	45	11	24	44	5.5	5.6	2.0	.81	1.3
13	1.4	1.0	44	39	16	22	38	5.2	6.4	2.0	.80	.97
14	1.1	1.0	37	36	20	21	34	5.2	8.5	2.0	.80	.88
15	2.1	1.0	33	33	18	20	29	5.7	11	2.0	.79	.80
16	2.1	1.0	27	28	18	20	25	9.4	9.4	1.9	.70	.79
17	1.3	1.6	23	25	36	22	22	7.2	8.4	1.9	.70	.70
18	1.2	2.0	22	23	48	36	19	6.4	7.1	1.8	.70	.70
19	1.1	1.4	21	21	49	39	17	6.0	6.8	1.8	.70	.70
20	.92	1.3	20	20	45	38	16	5.9	5.9	1.7	.70	.70
21	.90	1.4	19	19	62	57	15	5.9	5.8	1.7	.70	.62
22	.81	3.4	17	19	58	49	13	5.5	5.5	1.6	.70	.61
23	.80	3.0	15	21	125	48	12	5.2	5.4	1.5	.70	.54
24	.80	2.0	14	23	198	51	11	4.7	5.0	1.5	.62	.54
25	.84	1.7	12	23	121	48	11	4.5	4.5	1.6	.62	.54
26	.90	1.3	9.1	21	78	42	9.5	4.2	4.5	1.5	.55	.54
27	.82	1.3	8.2	19	69	39	8.9	4.1	4.2	1.4	.54	.54
28	.80	1.6	7.7	18	62	36	8.1	3.8	3.9	1.4	.54	.54
29	.80	1.9	7.4	17	--	33	7.8	6.1	3.6	1.2	.54	1.1
30	.80	2.8	8.2	16	--	35	7.6	5.4	3.6	1.2	.54	1.4
31	.80	--	12	15	--	42	--	4.8	--	1.2	.54	--
TOTAL	30.54	42.45	960.3	1128	1173	1179	890.9	185.6	196.5	63.0	24.89	24.73
MEAN	.99	1.41	31.0	36.4	41.9	38.0	29.7	5.99	6.55	2.03	.80	.82
MAX	2.4	3.4	143	109	198	57	86	9.4	15	3.6	1.1	1.5
MIN	.54	.80	7.4	15	11	20	7.6	3.8	3.6	1.2	.54	.48
AC-FT	61	84	1900	2240	2330	2340	1770	368	390	125	49	49
CFSM	.17	.25	5.43	6.38	7.35	6.67	5.21	1.05	1.15	.36	.14	.14
IN.	.20	.28	6.27	7.36	7.66	7.69	5.81	1.21	1.28	.41	.16	.16

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1984 - 1994, BY WATER YEAR (WY)

MEAN	3.00	37.0	37.2	44.6	45.6	34.4	24.3	13.5	9.64	2.57	1.26	1.15
MAX	9.39	115	65.1	64.7	96.5	62.1	49.5	27.8	21.3	3.88	1.82	2.05
(WY)	1985	1985	1988	1990	1986	1989	1993	1984	1985	1984	1990	1986
MIN	.39	1.41	17.6	16.0	13.4	11.5	10.4	5.99	1.83	1.40	.52	.66
(WY)	1988	1994	1990	1985	1993	1992	1987	1994	1992	1992	1992	1987

SUMMARY STATISTICS

	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1984 - 1994
ANNUAL TOTAL	6965.53	5898.91	
ANNUAL MEAN	19.1	16.2	21.0
HIGHEST ANNUAL MEAN			29.1
LOWEST ANNUAL MEAN			16.2
HIGHEST DAILY MEAN	204	198	546
LOWEST DAILY MEAN	.54	.48	.25
ANNUAL SEVEN-DAY MINIMUM	.54	.53	.29
ANNUAL RUNOFF (AC-FT)	13820	11700	15240
ANNUAL RUNOFF (CFSM)	3.35	2.84	3.69
ANNUAL RUNOFF (INCHES)	45.46	38.50	50.13
10 PERCENT EXCEEDS	45	48	52
50 PERCENT EXCEEDS	12	5.7	9.9
90 PERCENT EXCEEDS	.80	.70	.90

## ALSEA RIVER BASIN

14306500 ALSEA RIVER NEAR TIDEWATER, OR

LOCATION.--Lat 44°23'10", long 123°49'50", in NW 1/4 NW 1/4 sec.6, T.14 S., R.9 W., Lincoln County, Hydrologic Unit 17100205, on right bank 0.9 mi downstream from Grass Creek, 2.5 mi upstream from Scott Creek, 3.8 mi southeast of Tidewater, and at mile 21.0.

DRAINAGE AREA.--334 mi<sup>2</sup>.

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

GAGE.--Water-stage recorder. Datum of gage is 48.16 ft above sea level. Prior to Nov. 16, 1939, nonrecording gage at present site and datum.

REMARKS.--No estimated daily discharges. Records good. No regulation. Diversion for irrigation upstream from station. Continuous water-quality records for the period October 1979 to September 1981 have been collected at this location.

AVERAGE DISCHARGE.--55 years, 1,457 ft<sup>3</sup>/s, 59.25 in/yr, 1,055,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 41,800 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 27.44 ft; minimum discharge, 45 ft<sup>3</sup>/s Sept. 26, 27, 1965.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood on or about Feb. 3, 1890, reached a stage of 29.5 ft, from floodmark (discharge not determined).

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 13,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 24	1930	*10,400	*13.06				
Minimum discharge, 61 ft <sup>3</sup> /s Sept. 28, 29.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	87	87	1460	677	627	2460	1180	543	302	209	109	69
2	84	86	1200	919	601	2180	1090	531	286	208	108	68
3	84	91	482	2280	580	2120	1010	523	277	205	106	79
4	84	105	653	3030	556	2030	938	594	280	197	103	111
5	85	103	624	4760	536	1820	887	546	285	194	102	98
6	88	94	440	3510	519	1620	1080	497	412	193	103	84
7	95	89	1120	2490	507	1450	1330	468	671	187	101	76
8	95	87	3150	2210	491	1310	2050	447	545	176	100	74
9	92	86	3320	2310	498	1200	3290	429	436	170	102	96
10	91	86	3200	2270	503	1130	2900	413	374	165	100	125
11	93	90	6970	2260	479	1030	2310	397	337	161	96	144
12	115	92	3950	2020	457	947	1940	386	314	157	95	115
13	145	92	2360	1730	637	887	1640	376	332	152	92	97
14	118	91	1840	1520	951	840	1450	367	408	149	90	87
15	130	90	1550	1340	807	813	1300	378	451	147	89	82
16	142	97	1290	1180	880	833	1180	546	408	144	88	80
17	133	102	1090	1070	1900	991	1070	484	366	141	86	76
18	115	114	940	976	2460	1340	990	418	342	140	85	73
19	106	114	835	904	2160	1640	922	387	320	134	83	72
20	101	101	753	841	1930	1410	862	380	298	131	83	71
21	97	101	688	794	2810	1990	819	374	285	127	83	68
22	94	154	636	822	3200	2080	772	356	281	125	83	66
23	93	200	590	995	4500	2000	738	337	276	122	83	64
24	98	155	553	1050	8170	2080	720	325	265	121	82	62
25	101	122	527	995	7410	1890	708	311	251	122	77	62
26	96	104	503	900	4560	1640	666	302	246	123	74	62
27	91	114	480	826	3490	1440	634	291	240	122	72	62
28	89	113	454	772	2910	1290	602	290	230	116	72	61
29	88	122	433	725	---	1160	579	354	221	112	72	65
30	87	148	442	685	---	1150	575	356	214	112	72	75
31	87	---	529	652	---	1300	---	308	---	112	71	---
TOTAL	3104	3230	43062	47513	55129	46071	36232	12714	9953	4674	2762	2424
MEAN	100	108	1389	1533	1969	1486	1208	410	332	151	89.1	80.8
MAX	145	200	6970	4760	8170	2460	3290	594	671	209	109	144
MIN	84	86	433	652	457	813	575	290	214	112	71	61
AC-FT	6160	6410	85410	94240	109300	91380	71870	25220	19740	9270	5480	4810
CFSM	.30	.32	4.16	4.59	5.89	4.45	3.62	1.23	.99	.45	.27	.24
IN.	.35	.36	4.80	5.29	6.14	5.13	4.04	1.42	1.11	.52	.31	.27

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 1994, BY WATER YEAR (WY)

MEAN	368	1724	3187	3476	3197	2470	1502	796	407	192	118	129
MAX	2521	6058	7419	7874	6586	5144	3203	1848	1053	363	234	452
(WY)	1948	1974	1965	1953	1949	1961	1963	1963	1993	1983	1968	1941
MIN	62.0	108	182	211	607	604	550	331	178	116	65.6	60.1
(WY)	1988	1994	1977	1977	1977	1941	1977	1966	1966	1992	1966	1965

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1940 - 1994

ANNUAL TOTAL	402988	266868	1457
ANNUAL MEAN	1104	731	2541
HIGHEST ANNUAL MEAN			431
LOWEST ANNUAL MEAN			1977
HIGHEST DAILY MEAN	7540	8170	36100
LOWEST DAILY MEAN	84	61	47
ANNUAL SEVEN-DAY MINIMUM	86	63	51
ANNUAL RUNOFF (AC-FT)	799300	529300	1055000
ANNUAL RUNOFF (CFSM)	3.31	2.19	4.36
ANNUAL RUNOFF (INCHES)	44.88	29.72	59.25
10 PERCENT EXCEEDS	2680	2010	3730
50 PERCENT EXCEEDS	716	356	635
90 PERCENT EXCEEDS	95	84	98

## 14307620 SIUSLAW RIVER NEAR MAPLETON, OR

LOCATION.--Lat 44°03'45", long 123°52'55", in SW 1/4 NW 1/4 sec.27, T.17 S., R.10 W., Lane County, Hydrologic Unit 17100206, on right bank 250 ft above Shoemaker Creek, 2.5 mi northwest of Mapleton, and at mile 23.7.

DRAINAGE AREA.--588 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1967 to September 1994 (discontinued).

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 41 ft above sea level, from topographic map.

REMARKS.--Records fair except discharges below 400 ft<sup>3</sup>/s, which are poor. No regulation or diversions upstream from station.

AVERAGE DISCHARGE.--27 years, 1,985 ft<sup>3</sup>/s, 45.88 in/yr, 1,438,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 49,400 ft<sup>3</sup>/s Jan. 21, 1972, gage height, 28.45 ft; minimum discharge, 45 ft<sup>3</sup>/s Aug. 18, 19, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of December 1964 reached a stage of about 28 ft, from information by local residents (discharge not determined).

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 15,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 24	1600	*11,900	*12.94				

Minimum discharge, 68 ft<sup>3</sup>/s Sept. 28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	115	132	2640	e1500	e1200	3300	2680	797	426	251	e118	e74
2	113	130	2190	e3000	e1100	2960	2390	778	400	250	e116	e98
3	111	141	1130	e5200	e1100	3030	2010	766	383	243	e114	e120
4	128	151	1380	e5600	e1100	3500	1750	867	410	232	e110	e180
5	151	149	1260	e7400	e1000	3370	1610	811	410	231	e106	e150
6	145	143	954	e5600	e1000	2820	1810	748	582	226	e104	e130
7	144	138	1580	e4100	e1000	2410	2230	699	817	219	e104	e120
8	142	136	e4500	e3600	e950	2130	3290	662	733	210	e110	e110
9	136	140	e4700	e4100	e950	1920	4710	626	620	202	e130	e120
10	129	137	e4100	e4000	e950	1800	4970	599	529	191	e124	e200
11	131	141	e10000	e3900	e950	1630	3920	576	457	184	e114	e260
12	185	143	e6600	e3500	e900	1490	3130	556	434	176	e108	e200
13	215	143	e4000	e3000	e1000	1380	2570	539	473	169	e100	e160
14	192	140	e3000	e2600	e1500	1290	2220	520	595	166	e98	e140
15	200	140	e2500	e2300	e1500	1230	1950	542	661	160	e98	130
16	233	140	e2100	e2000	e2300	1220	1750	787	598	157	e94	118
17	209	165	e1800	e1800	e3400	1350	1600	722	540	153	e92	111
18	188	195	e1500	e1700	e3000	1730	1480	650	496	145	e92	106
19	174	187	e1300	e1600	e2600	2040	1370	595	456	142	e90	105
20	166	173	e1200	e1500	e2400	1810	1280	574	417	138	e90	102
21	158	179	e1100	e1400	e3400	2540	1210	553	392	137	e92	97
22	152	222	e1000	e1400	e4600	3000	1140	525	366	135	e90	89
23	152	277	e950	e1700	6170	2970	1090	493	357	137	e90	84
24	160	e240	e900	e1800	10500	3000	1060	469	339	136	e88	82
25	160	e220	e850	e1900	8870	2630	1040	446	320	139	e84	81
26	149	e215	e800	e1900	6090	2210	1010	427	311	138	e84	82
27	144	196	e750	e1800	4700	1910	946	407	298	130	e80	78
28	141	198	e725	e1600	3900	1690	896	403	282	124	e78	75
29	139	210	e700	e1500	--	1530	856	505	268	122	e78	101
30	136	262	e725	e1400	--	1590	837	487	258	e120	e76	152
31	135	--	e900	e1300	--	2300	--	435	--	e120	e76	--
TOTAL	4833	5183	67834	85700	78130	67780	58805	18564	13628	5283	3028	3655
MEAN	156	173	2188	2765	2790	2186	1960	599	454	170	97.7	122
MAX	233	277	10000	7400	10500	3500	4970	867	817	251	130	260
MIN	111	130	700	1300	900	1220	837	403	258	120	76	74
AC-FT	9590	10280	134500	170000	155000	134400	116600	36820	27030	10480	6010	7250
CFSM	.27	.29	3.72	4.70	4.75	3.72	3.33	1.02	.77	.29	.17	.21
IN.	.31	.33	4.29	5.42	4.94	4.29	3.72	1.17	.86	.33	.19	.23

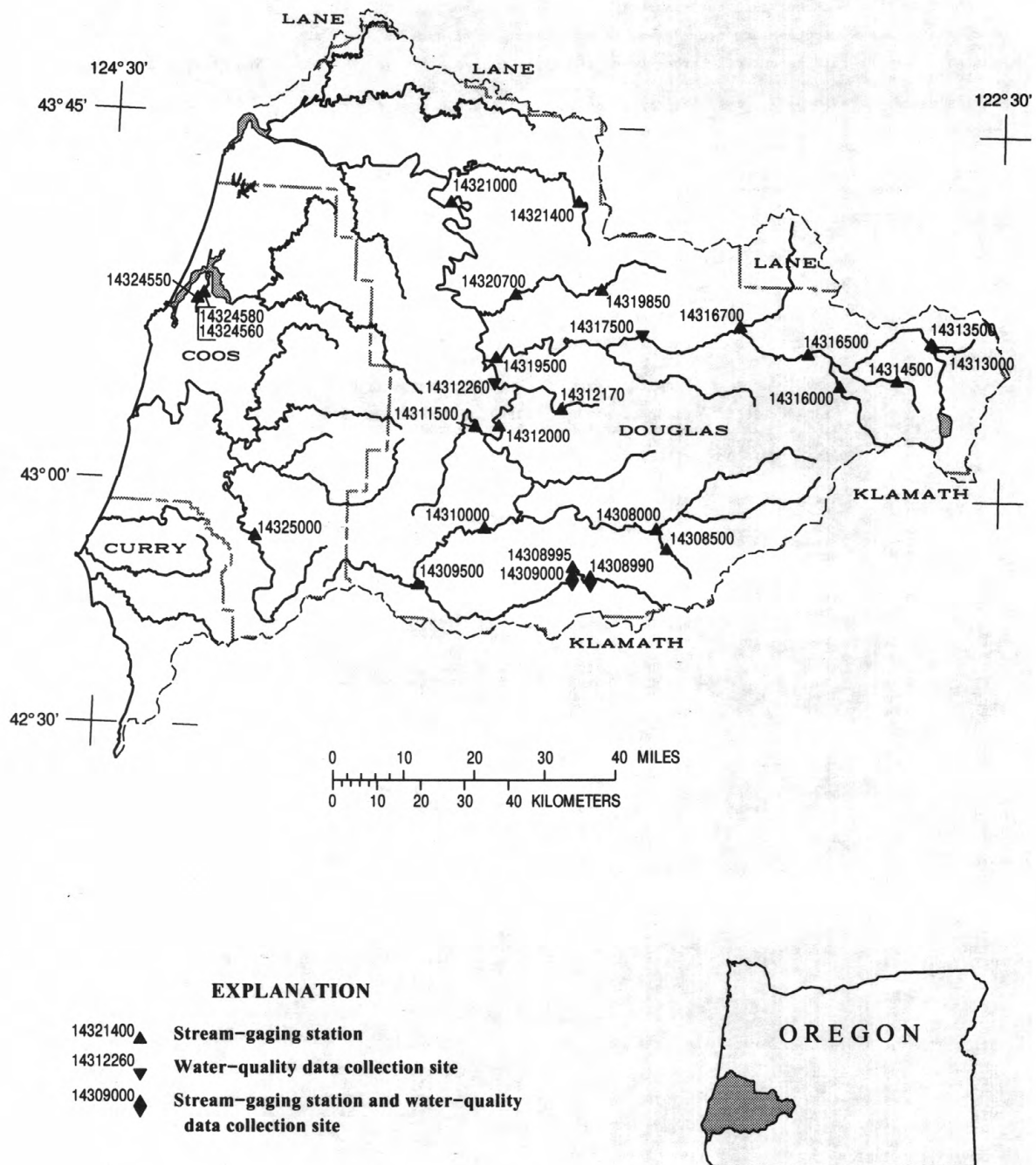
## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 1994, BY WATER YEAR (WY)

	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	1994
MEAN	379	2204	4566	4734	4258	3370	2152	1063	602	272	159	175															
MAX	1219	7819	9787	10060	9084	6819	4445	2101	1466	628	321	356															
(WY)	1969	1974	1982	1970	1986	1974	1982	1984	1993	1983	1968	1971															
MIN	64.3	173	261	300	876	1119	686	541	280	127	77.9	86.8															
(WY)	1988	1994	1977	1977	1977	1992	1977	1985	1992	1977	1973	1987															

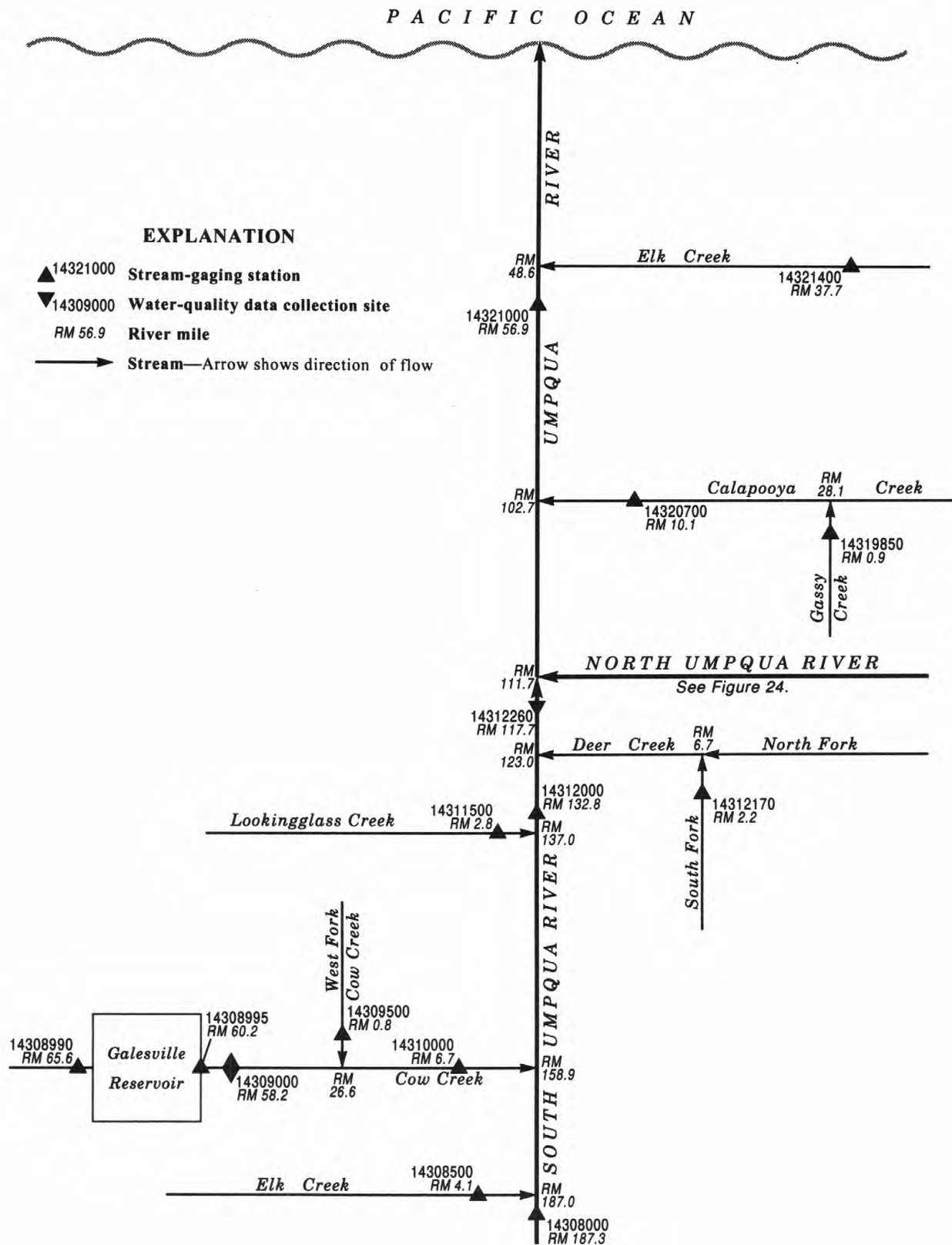
## SUMMARY STATISTICS FOR 1993 CALENDAR YEAR FOR 1994 WATER YEAR WATER YEARS 1968 - 1994

	1993	1994	1968-1994
ANNUAL TOTAL	624692	412423	
ANNUAL MEAN	1711	1130	1985
HIGHEST ANNUAL MEAN			3711
LOWEST ANNUAL MEAN			576
HIGHEST DAILY MEAN	12200	Mar 18	45900
LOWEST DAILY MEAN	111	Oct 3	45
ANNUAL SEVEN-DAY MINIMUM	117	Sep 27	47
ANNUAL RUNOFF (AC-FT)	1239000	818000	1438000
ANNUAL RUNOFF (CFSM)	2.91	1.92	3.38
ANNUAL RUNOFF (INCHES)	39.52	26.09	45.88
10 PERCENT EXCEEDS	4170	3000	5190
50 PERCENT EXCEEDS	1100	505	866
90 PERCENT EXCEEDS	142	107	130

e Estimated



**Figure 28.** Location of surface-water and water-quality stations in the Umpqua, Coos and Coquille River Basins.



**Figure 29.** Schematic diagram showing gaging stations in the Umpqua and the South Fork Umpqua River Basins.



## UMPQUA RIVER BASIN

14308000 SOUTH UMPQUA RIVER AT TILLER, OR

LOCATION.--Lat 42°55'50", long 122°56'50", in NE 1/4 sec.33, T.30 S., R.2 W., Douglas County, Hydrologic Unit 17100302, Umpqua National Forest, on left bank 0.3 mi upstream from bridge on State Highway 227 at Tiller, 0.3 mi upstream from Elk Creek, and at mile 187.31.

DRAINAGE AREA.--449 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1910 to December 1911, October 1939 to current year. Monthly discharge only for some periods, published in WSP 1318. Prior to December 1911, published as South Fork of Umpqua River at Tiller.

REVISED RECORDS.--WSP 1448: 1911(M), 1912, drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 991.8 ft above sea level (river-profile survey). Prior to Oct. 1, 1939, nonrecording gage at site 0.2 mi downstream at different datum.

REMARKS.--No estimated daily discharges. Records good. No regulation. Small diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--56 years, (water years 1911, 1940-94), 1,009 ft<sup>3</sup>/s, 30.54 in/yr, 731,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 60,200 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 25.72 ft; minimum discharge observed, 20 ft<sup>3</sup>/s Sept. 3, 4, 1911.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 7,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 27	0600	*4,290	*6.61				

Minimum discharge, 30 ft<sup>3</sup>/s Sept. 24-28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	60	60	232	176	347	2650	1570	526	238	111	54	36
2	59	60	606	427	322	2270	1250	483	213	109	52	36
3	59	60	231	1200	306	1940	1050	453	194	106	51	37
4	58	60	260	916	286	1920	890	495	189	102	50	38
5	58	61	280	1860	269	1560	783	547	189	100	49	41
6	58	62	191	1830	258	1270	913	509	394	97	49	39
7	62	61	198	1250	262	1060	1310	486	631	95	48	36
8	64	60	2660	1100	253	912	1450	465	559	94	47	34
9	63	60	1630	2640	240	812	1670	440	422	91	47	34
10	62	58	823	2340	318	763	2120	408	343	87	46	40
11	61	58	833	1930	328	696	1790	377	300	84	45	49
12	68	59	1150	1660	309	626	1420	352	267	82	44	47
13	85	60	730	1270	298	579	1190	322	242	79	44	43
14	80	60	577	1140	323	554	1030	296	235	78	43	41
15	100	59	480	1010	369	539	906	290	228	76	42	39
16	178	58	394	832	382	545	839	318	215	75	42	38
17	120	58	320	687	611	519	805	321	198	74	41	37
18	92	61	268	599	1020	499	779	329	192	72	40	35
19	82	61	232	542	877	523	766	311	179	70	40	34
20	77	59	205	496	742	464	723	326	169	68	41	34
21	75	57	186	465	703	475	680	337	160	66	41	33
22	72	72	167	476	726	508	626	354	155	64	40	33
23	70	86	151	638	801	497	561	327	149	64	40	32
24	69	70	183	764	2520	501	570	304	141	64	40	31
25	68	62	174	814	2730	545	537	285	137	62	39	30
26	67	64	149	671	3400	540	513	268	133	60	38	31
27	65	69	137	583	3980	522	509	252	129	58	36	30
28	63	81	129	514	3230	510	485	237	124	57	36	31
29	63	113	123	458	---	511	455	231	120	54	36	87
30	62	257	123	415	---	1150	541	214	114	54	36	105
31	61	---	138	377	---	2010	---	206	---	54	36	---
TOTAL	2281	2126	13960	30080	26210	28470	28731	11069	6959	2407	1333	1211
MEAN	73.6	70.9	450	970	936	918	958	357	232	77.6	43.0	40.4
MAX	178	257	2660	2640	3980	2650	2120	547	631	111	54	105
MIN	58	57	123	176	240	464	455	206	114	54	36	30
AC-FT	4520	4220	27690	59660	51990	56470	56990	21960	13800	4770	2640	2400
CFSM	.16	.16	1.00	2.16	2.08	2.05	2.13	.80	.52	.17	.10	.09
IN.	.19	.18	1.16	2.49	2.17	2.36	2.38	.92	.58	.20	.11	.10

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1911 - 1994, BY WATER YEAR (WY)

	198	1045	1923	2013	1967	1734	1389	1050	519	154	77.4	75.8
MEAN	198	1045	1923	2013	1967	1734	1389	1050	519	154	77.4	75.8
MAX	1791	3976	7480	4513	4907	4776	2756	2093	1643	301	206	364
(WY)	1951	1974	1965	1972	1986	1972	1993	1963	1953	1953	1976	1986
MIN	34.5	48.2	66.6	89.6	95.1	328	433	231	108	49.5	29.9	38.9
(WY)	1988	1940	1977	1977	1977	1992	1968	1992	1992	1940	1940	1992

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1911 - 1994
ANNUAL TOTAL	406389	154837	
ANNUAL MEAN	1113	424	1009
HIGHEST ANNUAL MEAN			1762
LOWEST ANNUAL MEAN			268
HIGHEST DAILY MEAN	7880	Mar 17	36500
LOWEST DAILY MEAN	57	Nov 21	20
ANNUAL SEVEN-DAY MINIMUM	59	Nov 10	26
ANNUAL RUNOFF (AC-FT)	806100	307100	731000
ANNUAL RUNOFF (CFSM)	2.48	.94	2.25
ANNUAL RUNOFF (INCHES)	33.67	12.83	30.54
10 PERCENT EXCEEDS	2650	1080	2390
50 PERCENT EXCEEDS	499	198	502
90 PERCENT EXCEEDS	63	41	58

14308500 ELK CREEK NEAR DREW, OR

LOCATION.--Lat 42°53'25", long 122°55'00", in SW 1/4 sec.11, T.31 S., R.2 W., Douglas County, Hydrologic Unit 17100302, on right bank 100 ft downstream from Dixon Creek, 0.1 mi upstream from Drew Creek, 1.3 mi northwest of Drew, 3.3 mi southeast of Tiller, and at mile 4.1.

DRAINAGE AREA.--54.4 mi<sup>2</sup>.

PERIOD OF RECORD.--September 1954 to September 1982, October 1986 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,279.25 ft above sea level.

REMARKS.--No estimated daily discharges. Records good. No regulation. Several diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--36 years (water years 1955-82, 1987-94), 76.3 ft<sup>3</sup>/s, 19.06 in/yr, 55,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,880 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 10.61 ft, from rating curve extended above 2,900 ft<sup>3</sup>/s on basis of slope-area measurement at gage height 10.34 ft; maximum gage height, 10.80 ft Jan. 15, 1974; no flow at times several years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage, 11.8 ft, from floodmarks, probably for flood in January or November 1953, discharge, about 11,000 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 8	1200	*591	*5.06				

Minimum discharge, no flow all or part of many days July to September.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.57	1.1	5.4	11	18	133	104	51	7.7	1.3	.02	.00
2	.60	1.2	6.7	15	16	105	76	42	6.3	1.2	.00	.00
3	.58	1.2	4.6	15	16	85	61	35	5.8	1.2	.21	.00
4	.58	1.3	8.7	18	16	75	48	33	5.8	1.0	.21	.00
5	.61	1.3	8.8	67	15	62	42	31	5.9	1.1	.16	.00
6	.79	1.3	5.5	109	14	51	49	27	9.4	1.1	.09	.00
7	.77	1.3	14	69	13	43	57	22	8.2	.91	.03	.00
8	.86	1.3	434	90	12	37	52	19	6.6	.86	.00	.00
9	.95	1.3	189	150	11	32	63	16	5.8	.79	.00	.00
10	1.1	1.3	81	125	19	29	83	15	5.1	.69	.00	.00
11	1.3	1.3	84	92	23	25	76	13	4.6	.63	.00	.00
12	1.9	1.4	102	73	21	22	64	12	4.2	.62	.00	.00
13	1.9	1.5	64	58	19	19	52	11	4.0	.64	.00	.07
14	2.4	1.4	51	48	21	17	44	11	4.4	.47	.00	.39
15	3.3	1.4	53	42	25	16	37	11	4.5	.44	.00	.40
16	4.3	1.4	45	35	25	18	31	12	4.1	.42	.00	.31
17	2.7	1.5	35	29	44	18	27	14	3.9	.32	.00	.27
18	1.9	1.6	26	24	82	18	23	12	3.9	.26	.00	.22
19	1.6	1.6	21	21	69	23	21	11	3.6	.20	.00	.22
20	1.5	1.5	17	18	54	19	19	10	3.0	.15	.00	.20
21	1.4	1.5	16	16	61	20	17	9.8	2.8	.15	.00	.18
22	1.3	2.6	15	17	72	26	16	9.5	2.8	.29	.00	.15
23	1.3	3.3	20	36	73	28	15	8.6	2.7	.31	.00	.12
24	1.3	2.0	20	60	91	29	19	7.9	2.4	.19	.00	.12
25	1.3	1.6	20	68	130	28	22	7.2	2.3	.11	.00	.13
26	1.3	1.4	19	49	239	26	44	6.9	2.3	.14	.00	.13
27	1.2	1.8	19	40	194	23	50	6.7	2.0	.26	.00	.10
28	1.2	2.6	16	33	166	21	47	6.4	1.5	.21	.00	.14
29	1.1	4.2	7.5	27	---	19	38	6.3	1.3	.15	.00	.25
30	1.1	8.6	7.7	23	---	161	54	5.8	1.3	.09	.00	.49
31	1.1	---	8.8	20	---	178	---	5.7	---	.05	.00	---
TOTAL	43.81	56.8	1424.7	1498	1559	1406	1351	488.8	128.2	16.25	0.72	3.89
MEAN	1.41	1.89	46.0	48.3	55.7	45.4	45.0	15.8	4.27	.52	.023	.13
MAX	4.3	8.6	434	150	239	178	104	51	9.4	1.3	.21	.49
MIN	.57	1.1	4.6	11	11	16	15	5.7	1.3	.05	.00	.00
AC-FT	87	113	2830	2970	3090	2790	2680	970	254	32	1.4	7.7
CFSM	.03	.03	.84	.89	1.02	.83	.83	.29	.08	.01	.00	.00
IN.	.03	.04	.97	1.02	1.07	.96	.92	.33	.09	.01	.00	.00

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1955 - 1994, BY WATER YEAR (WY)

	MEAN	7.38	66.0	160	201	157	154	97.4	50.2	18.3	3.94	1.56	1.84
MAX	62.8	449	651	644	382	356	193	164	106	10.8	10.2	18.7	
(WY)	1963	1974	1965	1974	1958	1974	1956	1963	1993	1978	1976	1978	
MIN	.62	1.89	3.11	4.94	5.05	15.0	20.1	6.94	1.96	.52	.008	.043	
(WY)	1988	1994	1977	1977	1977	1992	1990	1987	1987	1994	1992	1992	

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1955 - 1994
ANNUAL TOTAL	28097.84	7977.17	
ANNUAL MEAN	77.0	21.9	76.3
HIGHEST ANNUAL MEAN			180
LOWEST ANNUAL MEAN			16.0
HIGHEST DAILY MEAN	1780	434	6670
LOWEST DAILY MEAN	.57	.00	.00
ANNUAL SEVEN-DAY MINIMUM	.60	.00	.00
ANNUAL RUNOFF (AC-FT)	55730	15820	55300
ANNUAL RUNOFF (CFSM)	1.42	.40	1.40
ANNUAL RUNOFF (INCHES)	19.21	5.45	19.06
10 PERCENT EXCEEDS	188	62	189
50 PERCENT EXCEEDS	21	6.3	18
90 PERCENT EXCEEDS	1.2	.00	.88

## UMPQUA RIVER BASIN

## 14308990 COW CREEK ABOVE GALESVILLE RESERVOIR, NEAR AZALEA, OR

LOCATION.--Lat 42°49'24", long 123°07'29", in SW 1/4 NW 1/4 sec.1, T.32 S., R.4 W., Douglas County, Hydrologic Unit 17100302, on left bank, about 600 ft upstream from bridge on Houck Ranch Road (BLM), 1.1 mi downstream from Sugar Creek, 3.2 mi south of Galesville Dam, 6.9 mi northeast of Azalea, and at mile 65.6

DRAINAGE AREA.--64.7 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1985 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,900 ft above sea level, from topographic map.

REMARKS.--Records good. No regulation or diversion upstream from station. Continuous water-quality records for the period November 1985 to September 1989 have been collected at this location.

AVERAGE DISCHARGE.--9 years, 58.0 ft<sup>3</sup>/s, 12.18 in/yr, 42,040 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 3,560 ft<sup>3</sup>/s Jan. 20, 1993, gage height 8.48 ft (from outside highwater mark); minimum discharge, 3.5 ft<sup>3</sup>/s Dec. 26, 1989, result of freezeup.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge since at least 1927 occurred Jan. 15, 1974. Stage and discharge not known at this site, but was 10,600 ft<sup>3</sup>/s at site 7.4 mi downstream.

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

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 8	1400	*795	*4.02				

Minimum discharge, 3.8 ft<sup>3</sup>/s Sept. 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.6	10	18	25	e28	108	52	35	20	8.9	5.7	4.9
2	9.3	10	24	30	e26	93	45	32	16	8.9	5.5	5.4
3	9.3	10	16	29	e24	82	41	31	15	8.7	5.4	5.8
4	9.3	11	28	30	e22	75	38	32	15	8.6	5.3	5.7
5	9.3	11	24	60	e22	65	35	38	15	8.6	5.8	5.5
6	9.3	11	17	80	24	57	40	35	19	8.4	5.7	4.9
7	9.6	11	41	59	25	52	46	31	17	8.3	5.5	4.7
8	9.6	11	562	79	25	47	43	29	15	8.0	5.5	4.7
9	9.6	12	191	134	24	44	45	27	14	7.6	5.4	5.4
10	9.6	11	94	105	31	42	57	25	13	7.1	5.2	6.4
11	9.8	10	101	80	31	38	57	24	13	7.1	5.1	6.5
12	12	11	108	66	29	35	51	23	12	7.1	5.1	6.2
13	13	11	61	56	28	33	46	22	12	6.9	5.1	5.9
14	14	11	53	52	32	32	42	21	12	6.9	5.0	5.5
15	15	11	50	47	35	31	39	22	13	6.8	5.3	5.3
16	19	11	48	42	35	33	37	24	13	6.9	5.0	5.1
17	15	11	39	38	65	34	34	26	12	7.0	5.0	4.8
18	12	11	33	35	84	34	32	24	12	6.7	5.0	4.7
19	12	11	e28	32	64	38	31	21	12	6.7	5.3	4.8
20	11	11	e26	30	54	33	30	21	11	6.7	5.2	4.8
21	11	12	e23	29	57	33	28	20	11	6.3	5.2	4.8
22	11	14	e21	28	58	34	27	20	11	6.0	5.2	4.6
23	11	15	e19	42	56	34	27	18	11	6.4	5.0	4.3
24	11	13	e20	61	63	34	29	17	10	6.3	5.0	4.2
25	11	14	e19	60	77	32	32	17	10	6.1	4.9	4.3
26	11	13	e19	47	150	31	35	16	10	6.0	4.8	4.5
27	11	13	e20	42	138	30	35	16	10	5.8	4.7	4.5
28	10	13	19	39	124	28	34	16	9.8	5.6	4.6	5.2
29	10	19	18	36	---	28	32	16	9.3	5.5	4.7	17
30	10	30	19	33	---	57	36	15	9.0	5.9	4.9	9.3
31	10	---	22	e30	---	68	---	15	---	6.0	4.8	---
TOTAL	344.3	373	1781	1556	1431	1415	1156	729	382.1	217.8	159.9	169.7
MEAN	11.1	12.4	57.5	50.2	51.1	45.6	38.5	23.5	12.7	7.03	5.16	5.66
MAX	19	30	562	134	150	108	57	38	20	8.9	5.8	17
MIN	9.3	10	16	25	22	28	27	15	9.0	5.5	4.6	4.2
AC-FT	683	740	3530	3090	2840	2810	2290	1450	758	432	317	337
CFSM	.17	.19	.89	.78	.79	.71	.60	.36	.20	.11	.08	.09
IN.	.20	.21	1.02	.89	.82	.81	.66	.42	.22	.13	.09	.10

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1986 - 1994, BY WATER YEAR (WY)

	1986	1987	1988	1989	1990	1991	1992	1993	1994
MEAN	11.3	36.7	63.4	120	141	141	74.7	49.9	31.2
MAX	17.1	102	155	251	408	315	200	104	81.6
(WY)	1987	1988	1989	1990	1991	1992	1993	1994	1995
MIN	6.41	12.2	18.2	45.2	51.1	34.2	32.5	20.8	12.7
(WY)	1988	1989	1990	1991	1992	1993	1994	1995	1996

SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1986 - 1994

ANNUAL TOTAL	33517.0	9714.8	58.0
ANNUAL MEAN	91.8	26.6	103
HIGHEST ANNUAL MEAN			26.6
LOWEST ANNUAL MEAN			1710
HIGHEST DAILY MEAN	1700	562	4.2
LOWEST DAILY MEAN	9.3	4.2	4.5
ANNUAL SEVEN-DAY MINIMUM	9.4	4.5	4.5
ANNUAL RUNOFF (AC-FT)	66480	19270	42040
ANNUAL RUNOFF (CFSM)	1.42	.41	.90
ANNUAL RUNOFF (INCHES)	19.27	5.59	12.18
10 PERCENT EXCEEDS	208	56	134
50 PERCENT EXCEEDS	43	16	27
90 PERCENT EXCEEDS	11	5.2	7.1

e Estimated

UMPQUA RIVER BASIN

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14308995 GALESVILLE RESERVOIR NEAR AZALEA, OR

LOCATION.--Lat 42°50'56", long 123°10'40", in NE 1/4 sec.28, T.31 S., R.4 W., Douglas County, Hydrologic Unit 17100302, on the upstream face of Galesville dam to the right side of the spillway section, 1.2 mi downstream from McGinnis Creek, 5.6 mi northeast of Azalea, and at mile 60.2.

DRAINAGE AREA.--74.3 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1985 to current year.

GAGE.--Water-stage recorder. Datum of gage is sea level (levels by Douglas County).

REMARKS.--Reservoir is formed by a roller compacted concrete dam; storage began Oct. 7, 1985. Capacity, 42,220 acre-ft between elevations 1,780.0 ft (bottom of evacuation outlet) and 1,881.5 ft (crest of spillway). Dead storage, 1,800 acre-ft below elevation 1,780.0 ft. Reservoir is used for irrigation, power generation, flood control, and recreation. Figures given herein represent total contents.

COOPERATION.--Capacity table furnished by Douglas County Water Resources Department.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 41,790 acre-ft May 9, 10, 1993, elevation, 1,881.36 ft; minimum contents, 7,240 acre-ft Jan. 9, 10, 1991, elevation, 1,805.03 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 25,260 acre-ft Oct. 1, elevation, 1,851.72 ft; minimum contents, 10,460 acre-ft Sept. 30, elevation, 1,815.58 ft.

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

1,780	1,800	1,820	11,960	1,860	29,480
1,790	3,590	1,830	15,660	1,870	34,970
1,800	5,890	1,840	19,820	1,880	40,930
1,810	8,700	1,850	24,420	1,885	44,130

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1851.50	1843.81	1839.93	1841.02	1841.38	1842.48	1842.44	1841.62	1838.77	1834.51	1828.41	1821.57
2	1851.27	1843.60	1839.87	1840.99	1841.33	1842.63	1842.42	1841.58	1838.64	1834.37	1828.17	1821.31
3	1851.04	1843.43	1839.78	1840.95	1841.28	1842.76	1842.40	1841.53	1838.51	1834.21	1827.94	1821.06
4	1850.82	1843.28	1839.76	1840.90	1841.19	1842.82	1842.38	1841.50	1838.39	1834.06	1827.73	1820.80
5	1850.58	1843.14	1839.67	1840.97	1841.11	1842.85	1842.34	1841.47	1838.28	1833.91	1827.53	1820.55
6	1850.36	1843.00	1839.58	1841.09	1841.04	1842.84	1842.32	1841.43	1838.18	1833.76	1827.33	1820.31
7	1850.15	1842.86	1839.64	1841.12	1840.99	1842.83	1842.29	1841.38	1838.06	1833.62	1827.11	1820.09
8	1849.95	1842.72	1841.69	1841.22	1840.91	1842.80	1842.29	1841.31	1837.93	1833.47	1826.90	1819.88
9	1849.74	1842.58	1842.03	1841.58	1840.86	1842.78	1842.30	1841.24	1837.80	1833.31	1826.70	1819.67
10	1849.55	1842.44	1841.91	1841.81	1840.81	1842.76	1842.30	1841.16	1837.66	1833.15	1826.49	1819.40
11	1849.37	1842.31	1842.06	1841.92	1840.75	1842.75	1842.30	1841.06	1837.52	1832.98	1826.28	1819.20
12	1849.20	1842.18	1842.21	1841.96	1840.70	1842.73	1842.28	1840.96	1837.36	1832.82	1826.06	1819.00
13	1849.04	1842.04	1842.22	1841.97	1840.63	1842.70	1842.26	1840.85	1837.21	1832.65	1825.85	1818.81
14	1848.93	1841.90	1842.22	1841.97	1840.58	1842.66	1842.24	1840.74	1837.06	1832.50	1825.64	1818.63
15	1848.75	1841.76	1842.20	1841.96	1840.57	1842.62	1842.23	1840.65	1836.93	1832.33	1825.43	1818.44
16	1848.56	1841.58	1842.17	1841.94	1840.55	1842.62	1842.20	1840.56	1836.78	1832.18	1825.22	1818.24
17	1848.32	1841.46	1842.14	1841.86	1840.70	1842.60	1842.17	1840.48	1836.64	1832.01	1825.01	1818.05
18	1848.04	1841.33	1842.13	1841.84	1840.87	1842.60	1842.13	1840.40	1836.50	1831.85	1824.80	1817.85
19	1847.75	1841.19	1841.99	1841.81	1840.92	1842.58	1842.08	1840.29	1836.35	1831.64	1824.59	1817.65
20	1847.46	1841.05	1841.94	1841.77	1840.92	1842.55	1842.03	1840.19	1836.19	1831.37	1824.38	1817.45
21	1847.18	1840.92	1841.87	1841.74	1840.98	1842.54	1841.97	1840.08	1836.04	1831.13	1824.17	1817.25
22	1846.90	1840.84	1841.81	1841.68	1841.00	1842.54	1841.90	1839.98	1835.89	1830.90	1823.96	1817.06
23	1846.61	1840.71	1841.72	1841.62	1841.03	1842.49	1841.86	1839.86	1835.73	1830.66	1823.75	1816.85
24	1846.33	1840.57	1841.65	1841.66	1841.07	1842.48	1841.82	1839.74	1835.57	1830.41	1823.54	1816.65
25	1846.02	1840.44	1841.57	1841.67	1841.21	1842.45	1841.79	1839.61	1835.42	1830.17	1823.33	1816.45
26	1845.71	1840.30	1841.50	1841.63	1841.62	1842.41	1841.77	1839.47	1835.27	1829.92	1823.12	1816.23
27	1845.39	1840.18	1841.40	1841.61	1841.98	1842.37	1841.75	1839.34	1835.12	1829.65	1822.88	1816.00
28	1845.05	1840.07	1841.31	1841.58	1842.26	1842.31	1841.72	1839.22	1834.97	1829.40	1822.62	1815.87
29	1844.71	1840.06	1841.21	1841.55	--	1842.27	1841.68	1839.09	1834.82	1829.15	1822.36	1815.78
30	1844.38	1839.97	1841.14	1841.48	--	1842.36	1841.65	1838.97	1834.66	1828.90	1822.10	1815.58
31	1844.06	--	1841.06	1841.44	--	1842.42	--	1838.86	--	1828.66	1821.83	--
MAX	1851.50	1843.81	1842.22	1841.97	1842.26	1842.85	1842.44	1841.62	1838.77	1834.51	1828.41	1821.57
MIN	1844.06	1839.97	1839.58	1840.90	1840.55	1842.27	1841.65	1838.86	1834.66	1828.66	1821.83	1815.58
(†)	21640	19810	20290	20460	20820	20890	20550	19320	17540	15130	12600	10460
(‡)	-3620	-1830	+480	+170	+360	+70	-340	-1230	-1780	-2410	-2530	-2140

CAL YR 1993 MAX 1881.36 MIN 1826.39 AC-FT† +6350  
WTR YR 1994 MAX 1851.50 MIN 1815.58 AC-FT‡ -14800

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

## UMPUA RIVER BASIN

14309000 COW CREEK NEAR AZALEA, OR

LOCATION.--Lat 42°49'30", long 123°10'40", in N-1/2 sec.4, T.32 S., R.4 W., Douglas County, Hydrologic Unit 17100302, on right bank 0.8 mi upstream from Whitehorse Creek, 4.5 mi northeast of Azalea, and at mile 58.2.

DRAINAGE AREA.--78.0 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1926 to September 1928 (no winter records), April 1929 to December 1931, April 1932 to current year.

REVISED RECORDS.--WSP 984: 1933-36. WSP 1154: 1946(M), 1948(M). WSP 1448: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,694.32 ft above sea level (Douglas County Road Department bench mark). Prior to July 19, 1949, nonrecording gage at same site and datum.

REMARKS.--Records excellent. Flow regulated since Oct. 7, 1985 by Galesville Reservoir (station 14308995). Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--64 years (water years 1930-31, 1933-94), 106 ft<sup>3</sup>/s, 18.45 in/yr, 76,800 acre-ft/yr, adjusted for storage.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,600 ft<sup>3</sup>/s Jan. 15, 1974, gage height, 16.40 ft, from high-water mark in well; minimum discharge, 1.1 ft<sup>3</sup>/s Aug. 12, 1981, but may have been less during period of no gage-height record Sept. 4-30, 1970.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 161 ft<sup>3</sup>/s Dec. 10, gage height, 2.17 ft; minimum discharge, 19 ft<sup>3</sup>/s Apr. 1, result of regulation.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e64	e68	43	43	45	67	59	42	41	35	49	48
2	e65	e58	42	45	41	66	56	41	41	35	47	48
3	e64	e50	42	45	41	66	51	41	42	35	43	48
4	e64	e44	52	50	46	66	46	44	41	35	42	48
5	e65	e42	46	71	44	66	50	46	41	35	40	48
6	e62	e42	40	67	46	65	61	44	41	35	40	45
7	e60	e42	51	68	42	60	57	42	41	35	40	39
8	e58	e42	86	67	41	60	51	41	41	34	41	39
9	e57	41	118	67	42	53	55	41	41	35	40	40
10	e57	41	115	67	59	50	65	41	41	35	40	52
11	e57	42	88	66	53	44	64	41	41	35	40	39
12	e57	42	84	66	42	42	58	41	40	35	43	37
13	e58	41	73	65	54	42	54	41	41	35	39	34
14	e59	41	67	60	53	42	50	42	41	35	39	34
15	e61	41	67	56	45	42	45	44	41	35	40	35
16	e65	50	61	53	50	43	44	44	41	35	40	35
17	e72	42	50	59	43	43	43	44	42	35	40	35
18	e78	42	42	43	71	44	42	42	41	35	39	35
19	e80	41	65	42	72	46	41	42	41	44	39	35
20	e80	42	44	42	67	42	41	42	40	57	40	35
21	e76	43	43	42	68	43	41	41	40	50	39	35
22	e78	44	42	45	69	42	41	41	40	50	39	35
23	e78	43	42	64	67	47	42	43	40	50	39	35
24	e78	42	43	66	69	42	42	41	39	50	39	35
25	e81	42	42	66	69	42	43	41	39	50	39	35
26	e85	42	43	60	69	42	44	41	39	50	39	37
27	e85	41	44	52	68	42	43	41	39	51	42	39
28	e87	41	44	49	67	42	41	41	37	50	49	40
29	e88	46	44	46	---	42	42	40	37	50	49	40
30	e87	53	45	53	---	57	46	40	36	50	48	40
31	e81	---	44	44	---	67	---	41	---	49	48	---
TOTAL	2187	1331	1752	1729	1569	1557	1458	1297	1206	1280	1291	1180
MEAN	70.5	44.4	56.5	55.8	56.0	50.2	48.6	41.8	40.2	41.3	41.6	39.3
MAX	88	68	118	71	72	67	65	46	42	57	49	52
MIN	57	41	40	42	41	42	41	40	36	34	39	34
AC-FT	4340	2640	3480	3430	3110	3090	2890	2570	2390	2540	2560	2340
MEAN†	11.7	13.6	64.4	58.5	62.5	51.4	42.9	21.8	10.3	2.11	0.49	3.36
CFSM†	0.15	0.17	0.83	0.75	0.80	0.66	0.56	0.28	0.13	0.03	0.01	0.04
IN.†	0.17	0.19	0.95	0.87	0.83	0.76	0.61	0.32	0.15	0.03	0.01	0.05
AC-FT†	720	810	3960	3600	3470	3160	2550	1340	610	130	30	200

CAL YR 1993 TOTAL 33002 MEAN 90.4 MAX 450 MIN 37 AC-FT 65460 MEAN† 99.2 CFSM† 1.27 IN.† 17.27 AC-FT† 71810  
WTR YR 1994 TOTAL 17837 MEAN 48.9 MAX 118 MIN 34 AC-FT 35380 MEAN† 28.4 CFSM† 0.36 IN.† 4.95 AC-FT† 20580

† Adjusted for change in contents in Galesville Reservoir.

e Estimated



UMPQUA RIVER BASIN  
14309000 COW CREEK NEAR AZALEA, OR--Continued  
WATER-QUALITY RECORDS

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PERIOD OF DAILY RECORD.--

DISSOLVED OXYGEN: November 1985 to current year.

INSTRUMENTATION.--Water-quality monitor since November 1985.

EXTREMES FOR PERIOD OF DAILY RECORD.--

DISSOLVED OXYGEN: Maximum recorded, 15.1 mg/L Feb. 7, 1989, caused by operation of bypass valve at dam; minimum, 0.9 mg/L July 30, 1988.

EXTREMES FOR CURRENT YEAR.--

DISSOLVED OXYGEN: Maximum recorded, 11.9 mg/L Jan. 17; minimum recorded, 4.9 mg/L July 17-19, 29.

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	6.7	5.6	6.2	7.5	6.9	7.3	8.8	8.2	8.6	9.0	8.3	8.7
2	6.8	5.5	6.3	7.7	7.2	7.4	9.1	8.3	8.9	9.1	8.7	8.9
3	6.8	5.7	6.3	7.6	7.3	7.5	9.0	8.5	8.8	9.3	8.8	9.0
4	6.7	5.1	6.2	7.8	7.4	7.6	9.0	8.1	8.6	9.3	8.0	8.8
5	6.7	5.1	6.0	7.7	7.4	7.5	10.7	8.8	9.5	8.7	7.9	8.3
6	6.8	5.9	6.4	7.7	7.0	7.5	9.0	8.8	8.9	8.8	8.2	8.6
7	---	---	---	8.0	7.5	7.7	9.0	8.2	8.7	11.5	8.5	9.1
8	---	---	---	7.9	7.6	7.7	---	---	---	9.2	8.4	8.7
9	---	---	---	7.9	7.5	7.7	9.8	8.2	8.9	9.4	9.0	9.2
10	---	---	---	7.8	7.5	7.7	8.4	8.2	8.3	9.5	9.1	9.3
11	---	---	---	7.8	7.4	7.6	8.3	7.9	8.1	9.5	8.9	9.2
12	---	---	---	7.6	7.4	7.5	8.6	7.9	8.3	9.6	9.0	9.2
13	---	---	---	7.8	7.4	7.6	8.6	8.3	8.4	9.5	9.1	9.3
14	7.1	6.2	6.8	7.8	7.5	7.6	8.6	8.3	8.5	9.6	9.2	9.4
15	6.7	5.9	6.4	8.3	7.6	8.0	8.7	8.4	8.6	10.0	8.0	9.7
16	6.7	5.9	6.3	10.1	8.2	8.8	9.1	8.5	8.8	10.0	9.5	9.8
17	6.6	5.8	6.2	8.5	8.2	8.4	9.2	8.7	9.0	11.9	9.9	10.8
18	6.8	6.0	6.5	8.6	8.3	8.4	9.1	8.8	9.0	10.2	9.8	10.0
19	6.7	6.1	6.5	8.7	8.4	8.5	11.3	8.8	10.1	10.2	9.7	10.0
20	8.5	6.2	7.0	10.0	8.3	8.7	9.3	9.0	9.1	10.2	9.6	10.0
21	8.5	6.2	7.4	8.6	8.3	8.5	9.3	9.1	9.2	9.9	9.5	9.7
22	6.9	5.4	6.6	8.6	8.3	8.5	9.2	9.0	9.1	10.0	8.7	9.7
23	6.9	6.3	6.8	8.7	8.5	8.6	9.2	8.8	9.0	9.7	8.5	9.2
24	7.5	6.2	6.8	8.7	8.5	8.6	9.1	8.8	8.9	9.5	8.3	9.1
25	7.0	5.9	6.5	8.8	8.6	8.6	9.0	8.7	8.8	9.8	9.2	9.5
26	7.2	5.9	6.8	8.7	8.5	8.6	8.9	8.6	8.7	10.0	9.4	9.7
27	7.2	7.0	7.1	8.8	8.5	8.7	8.8	8.5	8.7	10.1	9.2	9.9
28	7.3	6.7	7.0	8.8	8.5	8.7	9.0	8.6	8.8	10.2	9.1	9.7
29	7.1	6.5	6.9	8.7	7.3	8.3	9.0	8.7	8.9	10.2	9.6	9.9
30	7.2	6.8	7.1	8.8	7.7	8.3	11.1	8.6	9.4	11.6	9.6	10.1
31	7.2	6.6	7.1	---	---	---	11.2	8.7	10.3	10.1	9.4	9.8
MONTH	---	---	---	10.1	6.9	8.1	---	---	---	11.9	7.9	9.4

## UMPQUA RIVER BASIN

14309000 COW CREEK NEAR AZALEA, OR--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY				MARCH			APRIL			MAY		
1	11.6	9.6	10.0	10.3	9.7	10.1	10.3	9.4	9.9	---	---	---
2	10.2	9.8	9.9	10.4	9.6	10.0	10.0	9.5	9.8	---	---	---
3	10.5	9.6	10.0	10.6	9.4	10.0	10.3	9.6	9.9	---	---	---
4	11.8	9.8	10.2	10.6	9.6	10.1	9.9	9.5	9.7	---	---	---
5	10.2	9.9	10.0	9.9	8.2	9.4	10.0	9.6	9.9	---	---	---
6	11.7	9.8	10.2	10.8	9.4	10.4	10.3	9.7	10.0	---	---	---
7	10.0	9.7	9.9	11.1	9.8	10.4	10.2	9.4	10.1	---	---	---
8	9.9	9.0	9.3	11.4	10.1	10.9	9.9	9.3	9.7	---	---	---
9	10.3	9.3	9.9	10.6	9.8	10.2	9.9	9.5	9.8	---	---	---
10	11.7	9.1	9.8	10.7	9.5	10.1	10.2	9.8	10.0	---	---	---
11	10.3	9.0	9.7	10.6	9.8	10.2	10.4	9.9	10.2	---	---	---
12	10.3	9.8	10.1	10.6	9.9	10.2	10.4	9.8	10.1	---	---	---
13	10.2	9.1	9.7	10.3	9.6	10.0	10.4	9.6	10.1	---	---	---
14	10.3	9.4	9.9	10.4	9.6	10.1	10.3	9.8	10.1	---	---	---
15	10.2	9.4	10.0	10.2	9.3	9.9	10.2	9.8	10.0	---	---	---
16	10.3	9.8	10.1	10.3	9.7	10.0	10.3	9.8	10.0	---	---	---
17	10.0	8.8	9.6	10.4	9.7	10.0	10.4	9.8	10.1	---	---	---
18	10.0	8.9	9.6	10.1	9.4	9.8	10.4	9.9	10.1	---	---	---
19	10.1	9.7	9.8	10.1	9.7	9.9	10.2	9.7	10.0	---	---	---
20	10.1	8.1	9.4	10.2	9.4	9.8	9.9	9.1	9.6	---	---	---
21	9.6	8.3	9.3	10.3	9.7	10.0	9.8	9.2	9.5	---	---	---
22	9.8	8.3	9.5	10.6	9.9	10.2	9.4	8.9	9.2	---	---	---
23	10.1	9.2	9.8	10.9	9.9	10.3	9.4	8.9	9.1	---	---	---
24	10.1	8.8	9.5	10.4	9.7	10.2	9.5	8.9	9.2	---	---	---
25	9.9	9.4	9.7	10.5	9.7	10.2	9.4	8.7	9.1	---	---	---
26	10.0	9.1	9.8	10.5	10.0	10.3	9.7	9.1	9.5	---	---	---
27	10.1	9.1	9.7	10.5	9.9	10.2	9.7	9.0	9.5	---	---	---
28	10.4	9.7	10.1	10.4	9.7	10.0	9.7	9.3	9.4	---	---	---
29	---	---	---	10.2	9.8	10.0	---	---	---	---	---	---
30	---	---	---	10.3	9.9	10.1	---	---	---	---	---	---
31	---	---	---	10.3	9.8	10.0	---	---	---	---	---	---
MONTH	11.8	8.1	9.8	11.4	8.2	10.1	---	---	---	---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE				JULY			AUGUST			SEPTEMBER		
1	---	---	---	6.4	5.5	5.7	5.5	5.3	5.4	6.0	5.8	5.9
2	9.1	7.8	8.0	6.6	5.6	6.3	5.7	5.4	5.5	5.9	5.6	5.8
3	8.9	7.6	7.9	6.6	6.2	6.4	5.7	5.5	5.6	5.9	5.7	5.8
4	8.8	6.6	7.9	6.6	6.2	6.4	6.6	5.5	5.7	6.0	5.5	5.8
5	7.8	7.5	7.6	6.5	5.3	5.8	6.0	5.6	5.8	6.0	5.5	5.8
6	9.1	7.7	8.0	5.6	5.3	5.4	6.0	5.7	5.8	6.0	5.6	5.8
7	9.2	7.8	8.6	6.3	5.2	5.5	6.1	5.8	5.9	6.0	5.5	5.8
8	9.2	7.7	8.7	6.3	5.8	6.1	6.3	5.9	6.1	6.0	5.8	5.9
9	9.2	7.7	8.9	6.2	5.9	6.0	7.2	5.9	6.4	6.2	5.9	6.0
10	9.0	7.7	8.2	6.2	5.9	6.1	7.3	5.9	6.7	6.0	5.8	5.9
11	10.4	7.7	8.6	6.1	5.8	6.0	7.1	5.9	6.2	6.0	5.6	5.9
12	9.1	8.6	8.9	6.2	5.8	6.0	6.5	6.0	6.2	6.0	5.8	5.9
13	8.9	7.5	8.0	6.1	5.7	5.9	6.4	5.8	6.2	6.0	5.7	5.9
14	8.8	7.6	7.7	6.1	5.6	5.8	6.3	5.8	6.1	6.2	5.6	5.9
15	7.9	7.6	7.7	6.2	5.6	5.8	6.3	5.8	6.1	6.1	5.5	5.9
16	7.8	6.6	7.5	6.0	5.5	5.8	6.3	5.8	6.1	6.1	5.4	5.9
17	6.9	6.6	6.8	6.0	4.9	5.5	6.2	5.2	5.9	6.0	5.6	5.9
18	7.8	6.7	6.8	5.9	4.9	5.1	5.6	5.2	5.4	6.0	5.6	5.9
19	6.8	6.5	6.7	5.3	4.9	5.1	5.6	5.2	5.4	6.0	5.6	5.9
20	6.7	6.5	6.6	5.4	5.1	5.2	5.7	5.2	5.5	6.0	5.6	5.9
21	6.7	6.2	6.6	6.0	5.0	5.4	5.7	5.3	5.5	6.8	5.4	5.8
22	6.9	6.3	6.6	6.0	5.1	5.3	5.7	5.3	5.5	5.9	5.4	5.7
23	6.7	6.4	6.6	5.4	5.0	5.3	5.7	5.2	5.5	5.9	5.5	5.7
24	6.9	6.5	6.7	5.4	5.2	5.3	5.7	5.3	5.5	8.0	5.5	6.1
25	6.9	6.6	6.8	5.6	5.1	5.4	5.7	5.3	5.5	11.3	8.0	9.5
26	6.9	6.4	6.7	5.7	5.2	5.5	5.7	5.3	5.5	11.5	11.2	11.3
27	6.9	6.3	6.6	5.7	5.3	5.5	5.6	5.3	5.5	11.6	11.0	11.4
28	6.7	6.2	6.5	6.4	5.3	5.8	5.7	5.4	5.5	11.6	11.4	11.5
29	6.7	5.6	6.5	5.6	4.9	5.3	5.8	5.4	5.6	11.6	11.5	11.5
30	6.6	5.5	5.7	6.3	5.1	5.3	5.9	5.5	5.7	11.6	11.4	11.5
31	---	---	---	5.5	5.2	5.3	6.0	5.5	5.8	---	---	---
MONTH	---	---	---	6.6	4.9	5.7	7.3	5.2	5.8	11.6	5.4	6.9

LOCATION.--Lat 42°48'15", long 123°36'35", in SW 1/4 NE 1/4 sec.11, T.32 S., R.8 W., Douglas County, Hydrologic Unit 17100302, on left bank 1.6 mi downstream from Bear Creek, 11 mi northwest of Glendale, and at mile 0.8.

PERIOD OF RECORD.--August 1955 to current year.

REVISED RECORDS.--WSP 1738: 1956, drainage area (former site). WSP 1935: 1956.

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

AVERAGE DISCHARGE.--39 years, 253 ft<sup>3</sup>/s, 39.50 in/yr, 183,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD: Maximum discharge, 15,700 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 18.59 ft, from floodmark, from rating curve extended above 2,600 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; minimum discharge, 3.0 ft<sup>3</sup>/s Aug. 29 to Sept. 1, 1992.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 8	0300	*2,480	*7.01				

Minimum discharge, 4.2 ft<sup>3</sup>/s many days August and September.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.4	7.8	61	53	93	232	88	47	31	13	5.5	4.2
2	7.3	7.7	114	58	86	201	81	46	30	13	5.5	4.3
3	7.0	7.4	49	56	82	236	76	44	29	13	5.4	4.6
4	7.0	7.6	139	63	76	242	70	50	28	12	5.1	5.0
5	7.0	7.8	100	341	71	210	67	59	28	12	5.1	5.1
6	7.0	7.8	57	451	68	180	77	53	30	12	5.1	5.0
7	7.0	7.8	535	291	68	155	90	48	32	11	5.1	4.7
8	7.0	7.8	1890	398	66	137	95	44	29	11	5.1	4.5
9	7.0	7.8	678	720	61	123	221	41	26	10	5.3	4.9
10	7.0	8.0	633	458	79	116	251	38	25	9.5	5.4	6.8
11	8.0	8.2	1270	327	86	100	210	37	24	9.1	5.1	8.2
12	13	8.5	775	240	78	90	166	35	22	8.9	5.1	8.1
13	12	9.1	402	191	82	84	135	34	22	9.1	5.1	7.1
14	11	9.2	280	162	177	79	116	33	22	8.7	5.0	6.4
15	10	9.2	213	139	169	75	101	42	22	8.7	4.8	6.0
16	11	9.2	172	118	148	76	e93	130	24	8.7	4.8	5.5
17	12	9.2	144	105	974	72	e87	113	23	8.6	4.8	5.3
18	11	10	120	95	811	74	e80	88	22	7.8	4.8	4.8
19	10	11	104	88	475	87	e72	73	21	7.8	4.8	4.8
20	9.7	10	91	82	344	76	e67	63	20	7.4	4.8	4.8
21	9.6	9.6	81	77	448	123	e60	57	19	7.0	4.8	4.6
22	9.2	13	73	86	476	161	57	53	19	6.6	4.8	4.2
23	8.7	16	66	295	453	151	55	48	19	6.6	4.8	4.2
24	8.7	13	61	474	511	177	58	44	18	6.6	4.8	4.2
25	8.7	10	57	347	465	197	60	40	17	6.6	4.7	4.2
26	8.7	9.3	55	239	372	184	61	39	17	6.5	4.4	4.2
27	8.7	12	53	182	313	162	57	38	16	6.2	4.2	4.2
28	8.7	16	49	151	266	140	54	34	15	5.9	4.2	4.4
29	8.3	72	46	129	---	119	51	34	14	5.5	4.2	7.0
30	7.8	69	47	112	---	111	50	33	14	5.5	4.2	7.8
31	7.8	---	52	101	---	98	---	31	---	5.5	4.2	---
TOTAL	273.3	411.0	8467	6629	7398	4268	2806	1569	678	269.8	151.0	159.1
MEAN	8.82	13.7	273	214	264	138	93.5	50.6	22.6	8.70	4.87	5.30
MAX	13	72	1890	720	974	242	251	130	32	13	5.5	8.2
MIN	7.0	7.4	46	53	61	72	50	31	14	5.5	4.2	4.2
AC-FT	542	815	16790	13150	14670	8470	5570	3110	1340	535	300	316
CFSM	.10	.16	3.14	2.46	3.04	1.58	1.08	.58	.26	.10	.06	.06
IN.	.12	.18	3.62	2.84	3.17	1.83	1.20	.67	.29	.12	.06	.07

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1956 - 1994, BY WATER YEAR (WY)

MEAN	42.7	291	572	634	563	480	269	113	41.0	17.7	10.2	13.0
MAX	254	1470	1669	1496	1660	934	840	476	99.4	29.5	16.0	56.9
(WY)	1963	1974	1956	1970	1958	1983	1982	1963	1993	1983	1983	1986
MIN	5.19	13.7	13.3	24.2	66.0	91.6	56.2	38.3	17.8	8.70	3.85	3.89
(WY)	1988	1994	1977	1977	1977	1992	1990	1987	1992	1994	1992	1992

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1956 - 1994
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ANNUAL TOTAL	90130.8		33079.2			
ANNUAL MEAN	247		90.6		253	
HIGHEST ANNUAL MEAN					499	1974
LOWEST ANNUAL MEAN					60.2	1977
HIGHEST DAILY MEAN	5280	Jan 20	1890	Dec 8	11000	Dec 22 1964
LOWEST DAILY MEAN	7.0	Oct 3	4.2	Aug 27	3.0	Aug 31 1992
ANNUAL SEVEN-DAY MINIMUM	7.0	Oct 3	4.2	Aug 27	3.2	Aug 26 1992
ANNUAL RUNOFF (AC-FT)	178800		65610		183000	
ANNUAL RUNOFF (CFSM)	2.84		1.04		2.91	
ANNUAL RUNOFF (INCHES)	38.58		14.16		39.50	
10 PERCENT EXCEEDS	602		225		657	
50 PERCENT EXCEEDS	78		33		66	
90 PERCENT EXCEEDS	8.2		5.0		8.6	

e Estimated

## UMPQUA RIVER BASIN

14310000 COW CREEK NEAR RIDDLE, OR

LOCATION.--Lat 42°55'25", long 123°25'40", in NE 1/4 sec.32, T.30 S., R.6 W., Douglas County, Hydrologic Unit 17100302, on left bank 0.4 mi upstream from Council Creek, 3.8 mi southwest of Riddle, and at mile 6.7.

DRAINAGE AREA.--456 mi<sup>2</sup>.

PERIOD OF RECORD.--September 1954 to current year.

REVISED RECORDS.--WSP 1935: 1956(M).

GAGE.--Water-stage recorder. Datum of gage is 682.60 ft above sea level.

REMARKS.--No estimated daily discharges. Records good. Regulated since Oct. 7, 1985 by Galesville Reservoir (station 14308995). Many small diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--31 years (water years 1955-85), 903 ft<sup>3</sup>/s, 654,200 acre-ft/yr.  
9 years (water years 1986-94), 503 ft<sup>3</sup>/s, 364,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 38,400 ft<sup>3</sup>/s Jan. 15, 1974, gage height, 28.17 ft; minimum discharge, 7.4 ft<sup>3</sup>/s Aug. 17-19, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Oct. 29, 1950, reached a stage of about 28.5 ft, present site and datum, from slope-area measurement, discharge, 41,100 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,920 ft<sup>3</sup>/s Dec. 8, gage height, 7.40 ft; minimum discharge, 32 ft<sup>3</sup>/s Sept. 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	85	116	169	145	274	812	302	194	109	60	49	47
2	86	109	282	155	255	712	281	183	109	59	47	49
3	86	98	180	153	238	684	266	175	105	57	46	52
4	86	92	254	158	226	672	247	184	104	56	44	53
5	84	87	333	509	217	592	232	205	105	55	43	54
6	84	81	203	1240	208	518	248	198	106	55	43	53
7	85	79	569	833	214	463	290	181	114	53	43	52
8	85	79	3900	750	209	415	284	167	111	51	42	50
9	84	79	2290	1950	196	387	355	157	102	49	42	47
10	85	79	1290	1440	234	366	448	149	97	47	43	51
11	88	78	2410	1000	322	331	429	141	92	45	42	60
12	93	79	2070	709	310	296	381	136	89	44	41	65
13	97	79	1120	546	286	275	337	132	87	43	41	57
14	104	79	785	462	394	267	304	131	89	45	43	52
15	107	79	608	402	438	256	276	136	91	43	41	46
16	107	78	493	349	403	261	254	231	91	43	41	44
17	107	81	414	308	1980	261	235	257	90	43	41	42
18	107	89	344	287	2840	247	220	220	92	42	40	41
19	109	89	292	256	1740	282	208	191	92	42	41	39
20	112	85	267	236	1210	264	199	175	87	39	42	39
21	114	84	232	223	1300	286	190	165	83	46	40	37
22	112	93	207	231	1700	369	182	158	83	55	39	35
23	110	111	186	512	1490	365	177	148	82	54	39	35
24	112	97	172	1150	1540	388	187	140	78	54	39	34
25	110	88	164	1130	1460	397	191	131	75	52	38	35
26	111	84	160	763	1250	383	206	121	74	51	38	35
27	115	88	155	554	1090	351	205	119	72	52	38	35
28	115	95	150	441	929	319	199	116	67	49	37	36
29	117	127	144	377	---	291	189	112	64	48	38	50
30	120	262	137	329	---	297	193	112	62	48	43	69
31	120	---	145	302	---	304	---	110	---	49	44	---
TOTAL	3137	2844	20125	17900	22953	12111	7715	4975	2702	1529	1288	1394
MEAN	101	94.8	649	577	820	391	257	160	90.1	49.3	41.5	46.5
MAX	120	262	3900	1950	2840	812	448	257	114	60	49	69
MIN	84	78	137	145	196	247	177	110	62	39	37	34
AC-FT	6220	5640	39920	35500	45530	24020	15300	9870	5360	3030	2550	2760

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1986 - 1994, BY WATER YEAR (WY)

	1986	1987	1988	1989	1990	1991	1992	1993	1994
MEAN	92.8	351	714	1263	1296	1055	591	297	174
MAX	162	956	1532	2481	3226	2184	1833	516	380
(WY)	1990	1989	1988	1993	1986	1989	1993	1991	1993
MIN	55.4	88.5	210	577	439	282	194	147	81.0
(WY)	1989	1988	1990	1994	1988	1992	1990	1987	1992

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1986 - 1994
ANNUAL TOTAL	278930	98673	503
ANNUAL MEAN	764	270	842
HIGHEST ANNUAL MEAN			270
LOWEST ANNUAL MEAN			1993
HIGHEST DAILY MEAN	14500	3900	14500
LOWEST DAILY MEAN	78	34	16
ANNUAL SEVEN-DAY MINIMUM	79	35	17
ANNUAL RUNOFF (AC-FT)	553300	195700	364500
10 PERCENT EXCEEDS	1910	560	1270
50 PERCENT EXCEEDS	267	117	191
90 PERCENT EXCEEDS	94	43	57

## UMPQUA RIVER BASIN

345

14311500 LOOKINGGLASS CREEK AT BROCKWAY, OR

LOCATION.--Lat 43°07'50", long 123°27'50", in SE 1/4 SE 1/4 sec.13, T.28 S., R.7 W., Douglas County, Hydrologic Unit 17100302, on left bank 1.7 mi northwest of Brockway and at mile 2.85.

DRAINAGE AREA.--158 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1955 to current year.

REVISED RECORDS.--WSP 2135: Drainage area (former site).

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 540 ft above sea level, from topographic map. Prior to Oct. 5, 1967, water-stage recorder at site 2.3 mi downstream at different datum. Oct. 5, 1967, to Oct. 5, 1976, water-stage recorder, at datum 1.00 ft lower.

REMARKS.--No estimated daily discharges. Records good except those below 1 ft<sup>3</sup>/s, which are fair. Some regulation since January 1980 by Ben Irving Reservoir 17 mi upstream on Berry Creek, capacity, 11,200 acre-ft. Many diversions by pumping for irrigation upstream from station. Discharge not adjusted for storage or release from Ben Irving Reservoir as losses from reservoir at times exceed natural flow.

AVERAGE DISCHARGE.--24 years (water years 1956-79), 282 ft<sup>3</sup>/s, 204,300 acre-ft/yr; 14 years (water years 1981-94), 204 ft<sup>3</sup>/s, 147,800 acre-ft/yr. Data for the 1980 water year not included due to construction and initial filling of Ben Irving Reservoir.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 35,000 ft<sup>3</sup>/s Dec. 26, 1955, gage height, 24.93 ft, site and datum then in use, from rating curve extended above 7,200 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; maximum gage height, 25.28 ft Dec. 23, 1964 (backwater from South Umpqua River, site and datum then in use); no flow at times each year prior to January 1980, and Aug. 6, 7, 1987.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 923 ft<sup>3</sup>/s Feb. 18, gage height, 5.05 ft; minimum discharge, 0.11 ft<sup>3</sup>/s June 30.

 DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.6	13	20	28	54	240	84	31	9.9	6.6	5.8	13
2	8.5	12	43	34	51	212	75	30	9.5	6.4	5.2	14
3	9.0	13	25	50	49	409	68	30	7.9	6.6	5.6	16
4	8.5	13	22	58	47	401	62	31	8.2	7.7	5.0	16
5	9.0	13	34	410	44	321	59	32	7.3	7.6	5.3	15
6	9.0	12	25	488	44	261	78	30	8.2	6.7	6.4	14
7	10	5.7	25	282	51	219	104	27	9.2	6.2	9.4	14
8	9.8	4.0	408	336	48	186	109	25	9.1	3.9	9.4	13
9	11	3.8	315	675	45	162	125	23	6.8	4.7	9.8	17
10	11	4.0	229	486	92	153	153	21	5.4	4.8	11	20
11	11	4.9	648	355	134	128	147	20	4.1	5.0	11	20
12	12	4.7	466	256	124	110	128	19	2.9	5.0	11	18
13	14	4.6	262	203	122	98	109	18	2.4	4.9	12	17
14	17	4.5	168	169	181	90	95	17	1.4	4.5	13	17
15	15	4.7	119	140	170	82	83	18	2.7	3.5	11	15
16	15	4.6	89	116	154	81	73	27	3.4	2.0	10	15
17	15	4.9	72	98	451	76	66	26	2.2	1.7	9.6	14
18	15	5.2	61	87	822	74	61	23	6.6	2.1	9.8	15
19	14	5.2	53	79	558	87	55	20	5.6	1.9	11	14
20	14	5.2	48	71	383	76	51	17	4.7	10	12	14
21	14	5.0	43	66	562	101	47	16	3.3	16	12	14
22	14	6.9	39	66	701	138	44	16	4.5	21	11	14
23	14	13	36	94	582	150	42	15	5.7	21	11	14
24	14	13	34	105	645	140	41	13	4.1	18	11	14
25	14	9.2	32	103	545	124	40	11	3.4	20	11	14
26	14	7.5	31	90	436	108	39	11	3.8	11	11	14
27	14	7.0	30	80	345	94	37	10	2.8	1.2	12	19
28	13	7.0	28	73	285	84	35	9.2	2.7	1.6	14	22
29	13	8.4	26	66	---	74	33	9.5	1.6	3.5	14	28
30	13	15	26	62	---	105	33	6.7	1.30	5.8	13	27
31	13	---	27	57	---	102	---	10	---	5.6	13	---
TOTAL	386.4	234.0	3484	5283	7725	4686	2176	612.4	149.70	226.5	316.4	491
MEAN	12.5	7.80	112	170	276	151	72.5	19.8	4.99	7.31	10.2	16.4
MAX	17	15	648	675	822	409	153	32	9.9	21	14	28
MIN	8.5	3.8	20	28	44	74	33	6.7	1.30	1.2	5.0	13
AC-FT	766	464	6910	10480	15320	9290	4320	1210	297	449	628	974

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1981 - 1994, BY WATER YEAR (WY)

	MEAN	26.0	211	518	434	574	348	243	67.0	22.1	8.06	7.14	10.6
MAX	86.3	809	1961	1036	1544	965	826	149	73.1	21.9	13.0	23.3	23.3
(WY)	1987	1985	1982	1982	1983	1983	1982	1988	1993	1983	1983	1986	1986
MIN	7.74	7.80	33.0	122	133	54.6	38.4	15.1	4.99	3.06	4.10	5.37	5.37
(WY)	1988	1994	1990	1981	1988	1992	1990	1987	1994	1985	1982	1987	1987

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1981 - 1994
ANNUAL TOTAL	71041.4	25770.40	204
ANNUAL MEAN	195	70.6	451
HIGHEST ANNUAL MEAN			70.6
LOWEST ANNUAL MEAN			9670
HIGHEST DAILY MEAN	2770 Jan 20	822 Feb 18	9670 Feb 18 1983
LOWEST DAILY MEAN	1.2 Aug 6	.30 Jun 30	.03 Jul 16 1985
ANNUAL SEVEN-DAY MINIMUM	2.6 Aug 1	2.7 Jun 24	.17 Jul 11 1985
ANNUAL RUNOFF (AC-FT)	140900	51120	147800
10 PERCENT EXCEEDS	553	174	561
50 PERCENT EXCEEDS	40	17	40
90 PERCENT EXCEEDS	5.8	4.8	5.2



## UMPQUA RIVER BASIN

14312000 SOUTH UMPQUA RIVER NEAR BROCKWAY, OR

LOCATION.--Lat 43°08'00", long 123°23'50", in SW 1/4 sec.15, T.28 S., R.6 W., Douglas County, Hydrologic Unit 17100302, on right bank 10 ft upstream from Winston Bridge on State Highway 99, 2.5 mi northeast of Brockway, 4.2 mi downstream from Lookingglass Creek, and at mile 132.8.

DRAINAGE AREA.--1,670 mi<sup>2</sup>.

PERIOD OF RECORD.--December 1905 to June 1912, October 1923 to September 1926, January 1942 to current year. Monthly discharge only for some periods, published in WSP 1318.

REVISED RECORDS.--WSP 1248: 1946(M), 1948(M), 1951. WSP 1448: Drainage area. WDR OR 72-1: 1965(M).

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 462.52 ft above sea level (State Highway Department bench mark). Prior to June 24, 1949, nonrecording gage at several sites within 400 ft of present site at various datums. June 24, 1949, to Oct. 1, 1970, at datum 461.84 ft above sea level (State Highway Department bench mark).

REMARKS.--No estimated daily discharges. Records excellent. Regulation from Ben Irving Reservoir, since January 1980, on Berry Creek during summer months. Many small diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--60 years (water years 1907-11, 1924-26, 1943-94), 2,743 ft<sup>3</sup>/s, 22.31 in/yr, 1,987,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 125,000 ft<sup>3</sup>/s Dec. 23, 1964, gage height, 34.28 ft; minimum discharge, 16 ft<sup>3</sup>/s Aug. 23, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Feb. 21, 1927, reached a stage of about 31.2 ft, present site and datum, discharge, 89,500 ft<sup>3</sup>/s. Discharge for flood of February 1890, which reached a stage 1.9 ft higher, according to local resident who lived nearby at time of both floods, has been found to be in error and should not be used.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 20,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 9	0030	*10,100	*10.56				

Minimum discharge, 59 ft<sup>3</sup>/s Aug. 28, Sept. 25, 26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	176	243	683	469	964	4930	2970	1030	405	181	88	69
2	169	235	763	517	892	4260	2400	971	426	183	86	71
3	169	228	945	1020	836	3970	2030	904	402	176	81	79
4	167	219	623	1520	790	3750	1760	876	379	169	76	85
5	168	210	867	2340	747	3320	1540	947	373	165	75	87
6	169	208	765	4920	719	2790	1520	977	376	161	72	89
7	172	200	613	3510	729	2390	1900	902	563	155	79	89
8	175	194	4910	2760	730	2090	2250	845	808	148	88	89
9	181	189	6850	4730	696	1880	2430	798	699	138	83	92
10	195	186	3150	5820	822	1750	2990	753	572	129	78	104
11	197	189	3840	4240	1190	1600	3140	706	496	122	79	109
12	202	195	4750	3660	1220	1440	2620	665	448	112	79	123
13	214	194	3140	2870	1130	1310	2230	634	410	108	79	141
14	268	194	2190	2400	1230	1230	1940	596	391	103	80	130
15	278	193	1780	2150	1400	1170	1700	580	385	97	81	116
16	292	187	1490	1850	1380	1180	1530	609	381	96	79	105
17	368	189	1270	1570	2310	1200	1430	751	359	85	70	93
18	349	195	1080	1380	5600	1120	1360	737	353	88	67	84
19	291	203	922	1240	4330	1200	1290	696	347	81	69	82
20	274	204	804	1130	3260	1180	1250	639	324	79	73	74
21	270	199	740	1050	3210	1120	1180	626	298	88	76	70
22	265	217	660	1010	4070	1290	1110	620	285	95	78	68
23	255	255	604	1180	3720	1380	1030	622	285	111	76	66
24	253	297	541	2030	4370	1350	996	577	269	110	71	64
25	250	253	514	2580	6070	1360	1010	533	251	116	68	64
26	244	223	511	2130	5940	1370	986	497	249	110	66	64
27	244	214	509	1730	6480	1290	993	468	242	92	62	69
28	249	226	480	1470	5930	1220	980	457	226	79	63	71
29	245	272	457	1290	---	1160	932	440	205	80	68	93
30	241	440	442	1150	---	1290	927	427	193	83	65	123
31	244	---	439	1040	---	3200	---	404	---	86	65	---
TOTAL	7234	6651	47332	66756	70765	59790	50424	21287	11400	3626	2320	2663
MEAN	233	222	1527	2153	2527	1929	1681	687	380	117	74.8	88.8
MAX	368	440	6850	5820	6480	4930	3140	1030	808	183	88	141
MIN	167	186	439	469	696	1120	927	404	193	79	62	64
AC-FT	14350	13190	93880	132400	140400	118600	100000	42220	22610	7190	4600	5280
CFSM	.14	.13	.91	1.29	1.51	1.15	1.01	.41	.23	.07	.04	.05
IN.	.16	.15	1.05	1.49	1.58	1.33	1.12	.47	.25	.08	.05	.06

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1906 - 1994, BY WATER YEAR (WY)

	472	2732	5466	6719	6259	4753	3187	1925	885	263	134	147
MEAN	472	2732	5466	6719	6259	4753	3187	1925	885	263	134	147
MAX	6045	13590	19540	16010	15370	10950	7378	6909	3312	576	392	587
(WY)	1951	1974	1956	1956	1958	1974	1963	1953	1953	1953	1993	1986
MIN	103	190	184	262	341	882	589	446	142	52.6	40.2	69.3
(WY)	1988	1953	1977	1977	1977	1992	1926	1926	1926	1926	1973	1967

SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1906 - 1994

ANNUAL TOTAL	932450	350248	
ANNUAL MEAN	2555	960	
HIGHEST ANNUAL MEAN			2743
LOWEST ANNUAL MEAN			5567
HIGHEST DAILY MEAN	22400	Jan 21	90200
LOWEST DAILY MEAN	167	Oct 4	17
ANNUAL SEVEN-DAY MINIMUM	170	Oct 2	18
ANNUAL RUNOFF (AC-FT)	1850000	694700	1987000
ANNUAL RUNOFF (CFSM)	1.53	.57	1.64
ANNUAL RUNOFF (INCHES)	20.77	7.80	22.31
10 PERCENT EXCEEDS	6040	2600	6680
50 PERCENT EXCEEDS	1080	448	1070
90 PERCENT EXCEEDS	218	79	112

## UMPQUA RIVER BASIN

347

14312170 SOUTH FORK DEER CREEK NEAR DIXONVILLE, OR

LOCATION.--Lat 43°10'16", long 123°13'23", in NW 1/4 NW 1/4 sec.6, T.28 S., R.4 W., Douglas County, Hydrologic Unit 17100302, on left bank, 900 ft upstream from bridge on Douglas County Road Number 83, 2.6 mi southeast of Dixonville, and 2.2 mi upstream from confluence of north and south forks.

DRAINAGE AREA.--15.2 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1989 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 700 ft above sea level, from topographic map.

REMARKS.--No estimated daily discharges. Records good are fair. No regulation. Minor diversion for irrigation upstream from station. Several measurements of water temperature were made during the year.

AVERAGE DISCHARGE.--5 years, 14.8 ft<sup>3</sup>/s, 13.20 in/yr, 10,720 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 392 ft<sup>3</sup>/s Jan. 20, 1993, gage height, 3.63 ft; minimum discharge, 0.38 ft<sup>3</sup>/s Aug. 26-29, 1992.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 220 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 5	1230	*119	*2.58				

Minimum discharge, 0.48 ft<sup>3</sup>/s, Sept. 26, 27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.1	1.2	5.1	4.8	6.9	25	29	15	3.5	1.4	.77	.83
2	1.0	1.4	5.3	5.1	6.6	21	21	11	2.9	1.6	.75	.81
3	1.0	1.4	3.5	6.2	6.4	21	17	9.6	2.9	1.6	.71	.82
4	1.1	1.6	6.7	7.9	6.1	18	14	9.2	2.8	1.6	.75	.85
5	1.2	1.5	6.2	75	5.9	16	12	8.0	2.8	1.5	.77	.77
6	1.2	1.5	5.1	58	6.2	14	14	7.0	4.0	1.4	.73	.74
7	1.4	1.5	16	35	6.8	12	12	6.3	3.6	1.3	.74	.72
8	1.2	1.4	93	43	6.8	11	12	5.8	3.0	1.3	.79	.84
9	1.2	1.4	46	51	6.9	10	12	5.4	2.7	1.2	.75	1.1
10	1.2	1.3	34	38	17	9.8	12	4.9	2.4	1.2	.74	1.2
11	1.3	1.4	82	30	20	8.6	11	4.4	2.4	1.1	.76	1.3
12	1.5	1.8	65	23	18	7.9	10	4.2	2.4	1.1	.73	1.1
13	1.4	1.5	34	19	19	7.4	9.2	3.9	2.5	1.1	.80	1.0
14	2.0	1.5	24	16	28	7.1	8.3	3.9	2.7	1.1	.81	.91
15	2.1	1.5	19	13	24	6.7	7.7	4.5	2.6	1.2	.81	.86
16	1.9	1.5	15	11	20	8.6	7.3	4.6	2.4	1.1	.82	.82
17	1.3	1.6	12	10	32	7.4	6.8	5.5	2.4	1.1	.85	.70
18	1.2	1.8	10	9.3	38	8.5	6.4	4.7	2.4	1.0	.85	.77
19	1.2	1.5	9.0	8.5	30	9.3	6.1	4.3	2.2	1.0	.84	.77
20	1.2	1.4	8.0	7.8	24	8.2	5.8	4.2	1.9	1.0	.84	.69
21	1.1	1.4	7.3	7.3	37	8.4	5.7	3.9	1.9	.87	.85	.66
22	1.1	3.3	6.7	7.8	40	8.4	5.3	3.7	2.1	.86	.83	.61
23	1.1	2.0	6.3	9.8	36	8.7	5.6	3.5	2.0	.90	.75	.58
24	1.3	1.5	6.0	16	40	8.4	6.5	3.3	1.9	.92	.68	.57
25	1.1	1.3	5.9	15	40	7.8	6.2	3.1	1.7	.94	.63	.61
26	1.1	1.3	5.7	12	41	7.2	6.1	3.1	1.6	.85	.62	.55
27	1.1	1.9	5.4	11	37	6.7	8.7	3.0	1.6	.84	.63	.51
28	1.0	2.4	5.1	9.6	31	6.4	7.0	3.1	1.6	.86	.67	.60
29	1.0	5.9	5.0	8.6	---	6.3	8.1	3.0	1.5	.89	.75	1.2
30	1.0	5.4	5.0	7.9	---	42	22	3.0	1.5	.93	.77	.67
31	1.1	---	4.9	7.3	---	43	---	3.0	---	.85	.79	---
TOTAL	38.7	56.1	562.2	583.9	630.6	390.8	314.8	162.1	71.9	34.61	23.58	24.16
MEAN	1.25	1.87	18.1	18.8	22.5	12.6	10.5	5.23	2.40	1.12	.76	.81
MAX	2.1	5.9	93	75	41	43	29	15	4.0	1.6	.85	1.3
MIN	1.0	1.2	3.5	4.8	5.9	6.3	5.3	3.0	1.5	.84	.62	.51
AC-FT	77	111	1120	1160	1250	775	624	322	143	69	47	48
CFSM	.08	.12	1.19	1.24	1.48	.83	.69	.34	.16	.07	.05	.05
IN.	.09	.14	1.37	1.43	1.54	.95	.77	.40	.18	.08	.06	.06

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1990 - 1994, BY WATER YEAR (WY)

	1990	1991	1992	1993	1994	1990	1991	1992	1993	1994
MEAN	2.29	11.1	27.5	29.9	27.4	25.9	25.5	14.1	9.35	2.46
MAX	3.31	20.0	70.4	66.9	46.5	54.5	64.9	32.6	32.2	5.00
(WY)	1991	1992	1993	1993	1990	1991	1993	1991	1993	1993
MIN	1.25	1.87	2.98	14.5	14.8	6.25	6.74	3.48	2.40	1.12
(WY)	1994	1994	1990	1992	1992	1990	1992	1992	1994	1994

## SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1990 - 1994

ANNUAL TOTAL	8795.3	2893.45	
ANNUAL MEAN	24.1	7.93	
HIGHEST ANNUAL MEAN			14.8
LOWEST ANNUAL MEAN			29.5
HIGHEST DAILY MEAN	252	93	252
LOWEST DAILY MEAN	1.0	.51	.50
ANNUAL SEVEN-DAY MINIMUM	1.1	.58	.55
ANNUAL RUNOFF (AC-FT)	17450	5740	10720
ANNUAL RUNOFF (CFSM)	1.58	.52	.97
ANNUAL RUNOFF (INCHES)	21.48	7.07	13.20
10 PERCENT EXCEEDS	68	21	40
50 PERCENT EXCEEDS	10	3.1	5.6
90 PERCENT EXCEEDS	1.4	.79	1.0

## UMPUA RIVER BASIN

14312260 SOUTH UMPQUA RIVER NEAR ROSEBURG, OR  
(National stream quality accounting network station)

LOCATION.--Lat 43°13'23", long 123°24'48", in SW 1/4 NE 1/4 sec.16, T.27 S., R.6 W., Douglas County, Hydrologic Unit 17100302, on left bank, 3.7 mi west of Roseburg, and at mile 117.7.

DRAINAGE AREA.--1,798 mi<sup>2</sup>.

PERIOD OF RECORD.--Water years 1970 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1970 to current year.

pH: August 1971 to current year.

WATER TEMPERATURE: October 1970 to current year.

DISSOLVED OXYGEN: October 1970 to current year.

INSTRUMENTATION.--Water-quality monitor from October 1970 to current year.

REMARKS.--Water-discharge records for South Umpqua River near Brockway (station 14312000) are used for computation of weighted averages or suspended-sediment loads. Some samples were analyzed by different methods and may have data with different levels of detection.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum, 423 microsiemens Sept. 18, 1971; minimum, 37 microsiemens Feb. 18, 1983.

pH: Maximum, 10.0 units Sept. 8, 9, 1971; minimum, 5.0 units Sept. 29, 1971.

WATER TEMPERATURE: Maximum, 35.0°C July 16, 1976; minimum, 0.0°C on several days in water years 1973, 1974, 1989, 1991.

DISSOLVED OXYGEN: Maximum, 18.5 mg/L Aug. 24, 1986; minimum, 0.2 mg/L Sept. 25, 1990.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum recorded, 206 microsiemens Sept. 27, but may have been higher during periods of no record; minimum recorded, 77 microsiemens Feb. 28, but may have been lower during periods of no record.

pH: Maximum recorded, 9.2 units several days in July, but may have been higher during periods of no record; minimum recorded, 6.9 units several days in July and August, but may have been lower during periods of no record.

WATER TEMPERATURE: Maximum recorded, 29.5°C July 20; minimum recorded, 3.0°C Dec. 24-29.

DISSOLVED OXYGEN: Maximum recorded, 14.4 mg/L Nov. 16, June 1, but may have been higher during periods of no record; minimum recorded, 1.3 mg/L June 12, but may have been lower during periods of no record.

## WATER-QUALITY DATA

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 WATER (DEG C)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOC- CI, KF AGAR (COLS. PER 100 ML)	HARD- NESS, TOTAL (MG/L AS CaCO3)
OCT 1993												
28...	1315	244	173	8.0	13.0	0.6	10.4	756	100	28	K3	66
NOV												
30...	1030	386	187	7.6	5.5	--	11.8	760	94	160	410	74
DEC												
17...	1100	1280	116	7.5	6.5	5.6	11.6	760	95	20	28	45
JAN 1994												
19...	1230	1230	111	7.3	6.0	--	12.0	754	97	20	55	44
FEB												
08...	0900	740	144	8.0	3.0	1.9	12.9	757	96	36	40	53
MAR												
08...	1300	2080	100	7.8	8.5	--	11.8	759	101	K11	20	40
APR												
05...	1145	1530	106	7.7	11.0	2.3	9.3	757	85	K14	K15	42
MAY												
17...	1330	788	122	9.0	18.0	--	11.4	753	122	K8	K7	48
JUN												
28...	1630	224	141	9.1	25.5	0.4	13.3	754	164	K4	K5	49
AUG												
02...	1100	89	175	8.1	24.5	--	8.0	755	97	--	--	54
15...	1630	83	182	9.3	26.5	0.6	10.3	757	129	K8	K3	58
SEP												
07...	1015	92	188	7.8	21.0	--	9.1	756	103	530	K8	--

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)
OCT 1993												
28...	15	6.9	9.0	22	0.5	1.3	63	77	0	8.0	11	0.2
NOV												
30...	17	7.7	8.1	19	0.4	1.2	65	79	0	9.1	13	0.1
DEC												
17...	10	4.9	5.7	21	0.4	0.7	42	51	0	6.0	5.5	<0.1
JAN 1994												
19...	10	4.5	5.3	21	0.3	0.8	40	49	0	5.3	5.5	<0.1
FEB												
08...	12	5.5	6.1	20	0.4	0.6	52	64	0	6.6	7.9	<0.1
MAR												
08...	9	4.1	4.6	20	0.3	0.9	40	49	0	4.4	4.2	<0.1
APR												
05...	10	4.2	5.0	20	0.3	0.6	43	52	0	4.3	4.1	<0.1
MAY												
17...	11	5.0	6.3	22	0.4	0.6	46	49	4	5.6	6.1	<0.1
JUN												
28...	11	5.3	8.1	26	0.5	0.8	47	40	8	6.3	9.2	<0.1
AUG												
02...	11	6.4	12	32	0.7	1.5	51	62	0	8.2	15	<0.1
15...	12	6.8	13	30	0.7	6.7	51	43	10	8.6	16	<0.1
SEP												
07...	--	--	--	--	--	--	55	67	0	--	--	--

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

WATER-QUALITY DATA

[illegible]

## WATER-QUALITY DATA

[illegible]



UMPQUA RIVER BASIN

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14312260 SOUTH UMPQUA RIVER NEAR ROSEBURG, OR--Continued

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	173	166	170	179	174	177	199	186	194	158	153	156
2	174	166	170	181	174	177	192	187	190	158	153	155
3	174	166	171	180	176	178	---	---	---	158	153	155
4	176	167	172	182	177	180	---	---	---	153	131	141
5	178	170	174	183	178	181	158	145	153	130	113	121
6	179	173	176	182	176	180	145	141	143	113	95	103
7	181	174	178	183	177	180	147	140	144	95	92	93
8	183	175	179	184	178	181	---	---	---	106	94	98
9	184	177	181	185	179	182	---	---	---	106	97	103
10	185	177	181	187	181	184	102	81	90	97	80	85
11	184	178	181	190	182	186	110	99	105	88	81	84
12	185	180	183	193	185	190	105	94	98	89	87	88
13	185	180	183	195	188	192	97	94	96	93	88	90
14	186	182	184	198	191	194	106	97	102	97	92	94
15	187	184	186	199	193	196	110	105	108	99	97	98
16	185	183	184	200	193	197	114	110	112	101	99	100
17	185	181	183	201	194	198	117	114	116	104	101	102
18	181	178	180	201	195	198	120	117	118	108	104	106
19	---	---	---	201	194	198	124	120	122	112	108	110
20	---	---	---	202	195	199	128	123	125	114	110	112
21	---	---	---	200	195	198	131	127	129	117	114	115
22	---	---	---	201	195	198	134	129	131	121	117	119
23	---	---	---	199	192	194	136	132	134	129	120	125
24	181	177	179	201	194	198	140	136	137	126	120	124
25	---	---	---	199	193	195	144	140	141	120	102	110
26	---	---	---	203	195	198	147	144	145	103	100	101
27	---	---	---	204	198	202	147	143	145	105	101	103
28	---	---	---	204	198	201	150	147	148	108	105	---
29	177	172	175	201	194	198	151	147	149	---	---	---
30	178	172	176	198	186	191	152	148	150	---	---	---
31	179	173	176	---	---	---	158	151	154	---	---	---
MONTH	---	---	---	204	174	191	---	---	---	---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	---	---	---	82	79	81	105	94	98	120	116	117
2	---	---	---	85	82	83	98	94	96	119	116	117
3	---	---	---	95	85	91	101	98	99	117	114	115
4	---	---	---	93	92	93	104	101	102	118	113	115
5	---	---	---	92	91	91	108	104	106	117	114	116
6	---	---	---	95	91	92	115	108	112	118	114	116
7	---	---	---	98	94	96	116	111	114	117	115	116
8	---	---	---	101	98	99	111	102	107	116	113	115
9	140	136	138	105	101	103	102	95	98	116	112	114
10	150	138	143	110	104	107	95	90	93	116	113	115
11	150	144	147	112	109	110	90	82	85	116	113	115
12	144	142	143	112	110	111	86	81	83	116	113	115
13	143	140	141	115	111	113	89	85	87	117	113	116
14	145	140	142	117	114	115	93	89	91	119	115	117
15	142	137	140	119	116	117	97	93	95	120	116	118
16	137	131	135	125	118	121	100	97	99	125	119	121
17	133	129	131	125	121	123	103	100	102	124	121	122
18	127	92	104	---	---	---	105	102	104	124	120	122
19	96	92	94	---	---	---	106	104	105	125	121	123
20	100	96	98	---	---	---	107	105	106	125	121	122
21	108	100	105	---	---	---	108	105	106	121	117	119
22	108	102	104	---	---	---	108	106	107	122	118	120
23	103	101	102	---	---	---	109	107	108	122	118	120
24	104	100	102	---	---	---	112	107	110	122	118	120
25	100	83	90	---	---	---	112	110	111	123	117	120
26	85	83	84	115	114	115	114	111	112	123	119	121
27	84	78	82	114	113	114	115	111	113	123	118	121
28	79	77	78	114	112	113	115	112	114	124	118	122
29	---	---	---	114	112	113	117	114	116	126	119	123
30	---	---	---	128	113	120	122	113	118	128	121	125
31	---	---	---	130	105	120	---	---	---	129	123	126
MONTH	---	---	---	---	---	---	122	81	103	129	112	119

14312260 SOUTH UMPQUA RIVER NEAR ROSEBURG, OR--Continued

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

[illegible]

UMPQUA RIVER BASIN

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14312260 SOUTH UMPQUA RIVER NEAR ROSEBURG, OR--Continued

PH, WATER, WHOLE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	8.8	7.1	8.4	7.6	7.9	7.5	8.0	7.6	---	---	7.5	7.4
2	8.8	7.1	8.4	7.6	7.8	7.5	7.9	7.6	---	---	7.5	7.4
3	8.8	7.0	8.2	7.6	---	---	7.9	7.6	---	---	7.5	7.4
4	8.7	7.0	8.3	7.1	---	---	7.9	7.6	---	---	7.6	7.4
5	8.6	7.1	8.3	7.5	7.7	7.5	7.7	7.5	---	---	7.7	7.5
6	8.3	7.1	8.4	7.5	7.7	7.5	7.5	7.5	---	---	7.7	7.5
7	8.6	7.1	8.4	7.6	7.6	7.4	7.5	7.5	---	---	7.7	7.5
8	8.6	7.1	8.1	7.6	---	---	7.5	7.5	8.2	---	7.7	7.5
9	8.6	7.1	8.3	7.6	---	---	7.5	7.5	8.1	7.6	7.8	7.5
10	8.6	7.1	8.3	7.6	7.3	7.2	7.5	7.4	7.9	7.6	7.9	7.5
11	8.3	7.2	8.2	7.6	7.4	7.3	7.5	7.4	7.9	7.6	7.9	7.5
12	8.4	7.2	8.4	7.6	7.4	7.4	7.5	7.4	8.0	7.6	8.0	7.5
13	8.4	7.2	8.3	7.6	7.4	7.4	7.5	7.4	7.9	7.6	8.1	7.5
14	8.1	7.2	8.4	7.6	7.5	7.4	7.6	7.4	7.9	7.6	8.1	7.6
15	7.7	7.2	8.5	7.7	7.5	7.5	7.5	7.4	8.0	7.6	8.2	7.6
16	7.9	7.2	8.5	7.7	7.5	7.5	7.5	7.4	8.0	7.6	8.2	7.6
17	7.9	7.2	8.2	7.6	7.6	7.1	7.6	7.4	7.9	7.6	8.2	7.6
18	7.8	7.2	8.5	7.6	7.6	7.5	7.6	7.5	7.6	7.4	---	---
19	---	7.2	8.2	7.6	7.7	7.6	7.6	7.4	7.5	7.4	---	---
20	---	---	8.5	7.7	7.7	7.6	7.6	7.4	7.6	7.5	---	---
21	---	---	8.4	7.7	7.7	7.6	7.5	7.4	7.6	7.5	---	---
22	---	---	8.3	7.7	7.7	7.6	7.5	7.4	7.5	7.5	---	---
23	8.3	---	8.2	7.7	7.8	7.6	7.6	7.4	7.6	7.5	---	---
24	8.2	7.5	8.2	7.7	7.8	7.6	7.6	7.4	7.6	7.5	---	---
25	---	---	8.3	7.7	7.8	7.6	7.5	7.4	7.5	7.4	---	---
26	8.3	---	8.2	7.7	7.8	7.7	7.6	7.4	7.5	7.4	8.3	7.7
27	---	---	8.1	7.7	7.9	7.7	7.6	7.5	7.4	7.4	8.3	7.7
28	8.3	---	8.0	7.7	7.9	7.7	7.8	7.5	7.4	7.4	8.2	7.7
29	8.3	7.6	7.9	7.7	7.9	7.7	---	---	---	---	8.1	7.7
30	8.4	7.6	8.1	7.1	7.9	7.6	---	---	---	---	7.8	7.5
31	8.4	7.6	---	---	7.8	7.6	---	---	---	---	7.6	7.5
MONTH	---	---	8.5	7.1	---	---	---	---	---	---	---	---
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	7.5	7.4	8.0	7.7	8.8	7.2	9.1	7.1	9.1	7.1	8.7	7.1
2	7.7	7.4	8.0	7.6	8.8	7.2	9.1	7.0	9.0	7.0	8.8	7.1
3	7.9	7.4	7.9	7.6	8.8	7.3	9.2	7.1	9.0	7.0	8.7	7.1
4	7.9	7.4	8.0	7.5	8.8	7.2	9.2	7.1	8.9	7.0	8.9	7.1
5	7.9	7.5	8.0	7.6	8.7	7.2	9.1	7.1	9.0	7.0	8.9	7.1
6	7.9	7.5	8.1	7.6	8.7	7.3	9.2	7.2	9.0	7.0	8.9	7.1
7	8.0	7.6	8.1	7.6	8.7	7.2	9.2	7.1	8.7	7.0	8.8	7.1
8	7.8	7.5	8.2	7.5	8.4	7.5	9.2	7.1	8.9	7.1	---	7.1
9	7.9	7.5	8.3	7.5	8.4	7.3	9.2	7.1	9.0	7.0	8.5	---
10	7.9	7.4	8.3	7.4	8.5	7.3	9.2	7.0	9.0	7.0	8.4	7.1
11	7.9	7.4	8.3	7.4	8.6	7.2	---	7.0	8.9	7.0	8.3	7.1
12	7.8	7.3	8.3	7.4	8.6	7.1	---	---	9.0	7.0	8.4	7.1
13	8.0	7.3	8.4	7.4	8.5	7.1	---	---	9.0	7.0	8.6	7.1
14	8.0	7.4	8.5	7.4	8.5	7.1	9.1	---	8.9	7.0	8.6	7.1
15	8.0	7.4	8.3	7.3	8.7	7.2	9.1	7.1	8.7	6.9	8.7	7.3
16	8.0	7.4	8.5	7.4	8.8	7.2	9.1	7.1	8.3	6.9	8.7	7.2
17	7.9	7.4	8.3	7.0	8.6	7.2	9.1	7.1	7.5	6.9	8.8	7.2
18	7.9	7.4	8.3	7.4	8.8	7.2	9.0	7.1	---	6.9	8.5	7.2
19	8.0	7.4	8.1	7.4	8.9	7.2	9.0	7.1	---	---	8.7	7.2
20	8.1	7.5	8.2	7.3	9.0	7.2	8.9	7.0	---	---	8.7	7.2
21	8.0	7.5	8.4	7.3	8.8	7.2	8.8	7.0	---	---	8.7	7.2
22	8.0	7.5	8.4	7.3	8.9	7.2	8.1	6.9	8.6	6.9	8.6	7.2
23	7.8	7.5	8.4	7.3	8.9	7.1	8.8	6.9	8.7	6.9	8.7	7.2
24	8.1	7.5	8.5	7.3	9.0	7.2	8.5	6.9	8.8	6.9	8.6	7.2
25	8.0	7.7	8.5	7.2	8.9	7.1	8.9	7.0	8.7	6.9	8.6	7.2
26	8.0	7.6	8.5	7.2	9.1	7.2	8.9	7.0	7.8	6.9	8.6	7.2
27	8.0	7.6	8.6	7.2	9.1	7.2	8.9	7.0	---	---	8.6	7.2
28	8.1	7.7	8.6	7.2	9.1	7.1	9.0	7.0	---	---	8.0	7.2
29	8.0	7.5	8.7	7.2	9.1	7.1	8.6	7.0	---	---	8.0	7.1
30	8.0	7.5	8.7	7.2	9.1	7.1	9.0	7.1	---	---	8.2	7.1
31	---	---	8.6	7.1	---	---	9.1	7.1	---	---	---	---
MONTH	8.1	7.3	8.7	7.0	9.1	7.1	---	---	---	---	---	---

## UMPQUA RIVER BASIN

14312260 SOUTH UMPQUA RIVER NEAR ROSEBURG, OR--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

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

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

UMPQUA RIVER BASIN

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14312260 SOUTH UMPQUA RIVER NEAR ROSEBURG, OR--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	21.5	18.5	20.0	25.5	21.5	23.5	27.0	23.5	25.0	23.0	21.5	22.5
2	21.5	18.5	20.0	25.0	22.0	23.5	26.5	23.5	25.0	22.0	20.0	21.5
3	21.0	18.5	19.5	25.5	21.0	23.0	27.0	23.5	25.5	22.5	21.0	21.5
4	21.0	18.5	19.5	24.5	21.5	23.0	26.0	24.0	25.0	23.0	19.5	21.5
5	20.5	18.5	19.5	24.0	21.0	22.5	26.5	23.0	25.0	23.5	20.0	22.0
6	20.0	18.0	19.0	25.5	20.5	23.0	27.0	23.0	25.0	24.0	20.5	22.5
7	20.0	17.0	18.5	26.5	21.5	24.0	25.5	23.5	24.0	23.5	20.5	22.0
8	21.0	18.5	19.5	27.0	23.0	25.0	25.0	21.5	23.5	---	20.5	---
9	21.5	19.5	20.5	27.5	23.0	25.0	26.0	22.0	24.0	21.0	---	---
10	23.5	20.5	22.0	27.0	23.0	25.0	26.0	23.0	24.5	20.5	19.0	20.0
11	24.5	21.5	23.0	---	22.5	---	25.5	22.5	24.0	20.5	19.0	19.5
12	24.5	21.5	23.0	---	---	---	26.0	23.0	24.5	20.5	18.0	19.0
13	23.0	21.0	22.0	---	---	---	27.0	23.0	25.0	21.0	17.5	19.5
14	21.5	20.0	20.5	26.5	---	---	26.5	23.5	25.0	21.0	18.0	19.5
15	21.5	19.0	20.5	26.0	23.0	24.5	27.0	23.5	25.5	22.0	19.0	20.5
16	22.5	19.0	20.5	27.5	23.5	25.5	27.0	23.5	25.0	23.0	19.0	21.0
17	21.0	19.5	20.0	28.0	24.5	26.0	26.5	23.0	25.0	23.0	20.0	21.5
18	22.0	18.5	20.0	27.5	24.0	26.0	---	23.0	---	22.0	20.5	21.5
19	23.0	18.5	21.0	28.5	24.5	26.5	---	---	---	23.0	20.0	21.5
20	24.0	19.5	22.0	29.5	26.0	27.5	---	---	---	23.5	20.5	22.0
21	22.0	20.5	21.5	29.0	26.5	28.0	---	---	---	24.0	20.5	22.5
22	22.0	20.5	21.0	28.0	26.0	27.0	24.5	21.5	23.0	24.0	20.5	22.5
23	22.5	20.0	21.0	29.0	24.5	26.5	25.0	22.0	23.5	23.5	20.5	22.0
24	23.5	19.0	21.5	27.5	25.0	25.5	25.5	22.0	23.5	23.0	20.5	22.0
25	22.0	20.0	21.0	27.5	23.0	25.5	25.0	22.0	23.5	23.5	20.5	22.0
26	23.5	20.0	21.5	28.0	24.0	26.0	25.5	22.0	23.5	23.5	20.5	22.0
27	24.5	20.0	22.5	28.0	24.5	26.0	---	22.5	---	23.5	20.0	22.0
28	25.5	21.0	23.5	27.5	24.5	26.0	---	---	---	22.5	20.5	21.0
29	25.5	21.5	23.5	26.0	23.5	24.5	---	---	---	21.0	20.0	20.5
30	25.0	22.0	23.5	26.5	22.5	24.5	---	---	---	22.0	20.0	20.5
31	---	---	---	27.0	23.0	25.0	---	---	---	---	---	---
MONTH	25.5	17.0	21.0	---	---	---	---	---	---	---	---	---

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER				NOVEMBER			DECEMBER			JANUARY		
1	11.3	6.2	8.3	12.2	9.5	10.6	11.7	11.0	11.4	12.8	12.0	12.4
2	11.4	5.9	8.1	12.4	9.7	10.8	11.9	10.9	11.3	12.3	11.6	12.0
3	11.3	5.6	7.9	12.1	9.9	10.7	---	---	---	12.4	11.5	11.8
4	11.0	5.6	7.8	12.4	9.8	10.9	12.2	---	---	12.1	11.2	11.7
5	10.7	6.0	7.8	12.6	10.1	11.0	---	---	---	11.7	11.2	11.4
6	9.9	5.9	7.5	12.7	10.0	11.1	12.2	11.4	11.9	11.7	11.2	11.5
7	10.7	6.1	7.9	12.7	10.4	11.3	11.5	10.5	11.1	11.7	11.5	11.6
8	10.9	6.3	8.2	12.2	10.6	11.2	---	---	---	11.7	11.4	11.5
9	10.9	6.7	8.4	12.8	10.7	11.5	---	---	---	11.7	11.3	11.5
10	10.9	6.8	8.3	13.0	10.7	11.5	11.0	10.6	10.8	11.6	11.2	11.4
11	10.2	6.9	8.0	12.6	10.7	11.6	10.6	10.2	10.5	12.2	11.2	11.5
12	10.5	6.7	8.1	13.3	11.2	12.0	10.8	10.5	10.7	12.2	11.8	12.1
13	10.5	6.9	8.2	13.3	11.2	11.9	11.0	10.8	10.9	12.1	11.8	11.9
14	9.8	6.9	8.0	13.4	11.2	12.0	11.3	10.9	11.1	12.0	11.7	11.8
15	9.0	6.6	7.6	13.8	11.2	12.2	11.3	11.0	11.1	12.1	11.7	11.9
16	9.7	6.8	7.9	14.4	11.3	12.3	11.8	11.1	11.3	12.7	11.7	12.0
17	9.5	7.1	8.1	12.7	11.0	11.6	11.9	11.4	11.6	12.4	11.8	12.0
18	9.7	7.1	8.1	13.2	10.8	11.7	11.9	11.5	11.7	12.2	11.7	11.9
19	---	---	---	12.8	10.7	11.6	12.1	11.7	11.9	12.4	11.7	12.0
20	---	---	---	13.3	11.1	11.9	12.4	11.9	12.2	12.6	12.0	12.3
21	---	---	---	13.1	11.0	11.8	13.2	12.2	12.6	12.6	12.2	12.3
22	---	---	---	12.6	10.9	11.5	13.0	12.4	12.8	12.4	11.7	12.1
23	11.5	---	---	12.9	11.1	11.8	13.2	12.6	12.9	12.2	11.5	11.7
24	10.9	8.8	9.6	14.1	11.5	12.4	13.5	12.6	12.9	11.6	11.2	11.4
25	---	---	---	13.5	11.9	12.6	13.2	12.5	12.9	11.8	11.2	11.4
26	11.9	---	---	13.8	12.1	12.7	13.0	12.4	12.7	12.1	11.4	11.8
27	---	---	---	13.6	12.1	12.6	13.1	12.5	12.7	12.8	11.8	12.2
28	12.2	---	---	13.2	11.7	12.2	13.3	12.5	12.9	---	---	---
29	12.4	10.0	10.8	12.3	11.1	11.7	13.3	12.6	12.9	---	---	---
30	12.3	9.7	10.7	13.0	11.1	11.8	12.9	12.4	12.6	---	---	---
31	12.0	9.5	10.5	---	---	---	13.1	12.2	12.5	---	---	---
MONTH	---	---	---	14.4	9.5	11.7	---	---	---	---	---	---



OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY				MARCH			APRIL			MAY		
1	---	---	---	11.6	11.0	11.3	9.9	8.9	9.4	10.4	8.2	9.3
2	---	---	---	11.3	10.8	11.0	12.3	9.1	10.3	10.5	7.7	9.0
3	---	---	---	11.2	9.8	10.3	11.3	9.8	10.5	9.9	7.3	8.3
4	---	---	---	10.8	10.2	10.5	11.3	9.3	10.1	8.9	6.3	7.6
5	---	---	---	11.3	10.5	10.8	9.7	8.4	9.1	8.7	6.1	7.2
6	---	---	---	12.1	11.0	11.4	10.2	8.5	9.3	10.4	5.9	7.6
7	---	---	---	12.5	11.3	11.8	11.0	8.8	9.8	10.0	6.9	8.4
8	---	---	---	13.4	10.6	11.9	10.5	8.9	9.6	9.7	6.2	7.7
9	---	---	---	12.5	11.1	12.0	10.5	8.8	9.6	9.3	5.8	7.4
10	12.4	11.2	11.8	11.6	10.2	10.9	10.5	8.6	9.5	8.8	5.5	6.5
11	13.2	11.5	12.4	13.2	9.8	11.1	10.0	8.8	9.3	8.5	4.9	6.5
12	13.4	11.9	12.6	12.5	10.7	11.5	10.4	8.4	9.1	8.1	4.7	6.2
13	13.2	11.7	12.4	11.9	9.9	10.8	10.5	8.3	9.3	9.2	4.9	6.9
14	12.4	10.9	11.9	11.7	9.7	10.6	10.0	8.2	9.1	11.2	5.2	7.6
15	12.4	11.1	11.8	13.0	9.6	10.9	10.1	7.9	9.0	10.4	6.6	8.3
16	12.3	10.8	11.5	11.6	9.5	10.5	9.6	7.5	8.6	11.8	7.1	9.3
17	11.4	10.7	11.0	11.1	8.3	9.9	9.1	7.6	8.4	11.6	7.4	9.2
18	11.4	11.0	11.2	---	---	---	10.0	7.2	8.5	11.0	7.4	9.0
19	12.1	11.3	11.7	---	---	---	9.4	7.1	8.2	10.2	6.8	8.3
20	12.3	11.6	11.9	---	---	---	9.3	7.0	8.1	12.9	6.9	9.2
21	12.3	11.1	11.7	---	---	---	9.5	6.7	7.9	11.8	7.2	9.2
22	12.2	11.3	11.8	---	---	---	9.3	7.0	8.0	11.2	6.4	8.6
23	12.2	11.5	11.9	---	---	---	9.0	6.9	7.8	10.5	5.7	7.9
24	12.0	10.9	11.6	---	---	---	10.0	7.6	8.6	11.4	5.3	7.7
25	11.4	10.7	11.1	12.7	---	---	11.3	7.5	9.0	9.7	4.5	6.9
26	11.3	10.7	11.0	11.9	9.6	10.6	10.9	8.4	9.5	9.8	3.9	6.2
27	11.8	11.2	11.5	11.2	9.3	10.2	11.1	8.6	9.7	11.0	4.2	7.2
28	11.9	11.2	11.5	10.8	8.6	9.6	10.9	8.6	9.7	11.0	4.2	6.8
29	---	---	---	10.7	8.2	9.4	10.8	8.2	9.4	11.9	4.4	7.3
30	---	---	---	9.2	8.2	8.7	11.1	8.4	9.5	11.8	4.2	7.9
31	---	---	---	9.4	8.4	8.9	---	---	---	12.8	4.5	7.8
MONTH	---	---	---	---	---	---	12.3	6.7	9.1	12.9	3.9	7.9

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE				JULY			AUGUST			SEPTEMBER		
1	14.4	4.7	9.1	---	---	---	---	---	---	---	---	---
2	14.1	4.3	8.7	---	---	---	---	---	---	---	---	---
3	13.3	4.1	8.1	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	---	---	---
5	12.9	4.1	8.3	---	---	---	---	---	---	---	---	---
6	13.8	4.2	8.5	---	---	---	---	---	---	---	---	---
7	13.8	4.4	8.7	---	---	---	---	---	---	---	---	---
8	10.8	5.9	8.0	---	---	---	---	---	---	10.1	---	---
9	10.3	4.8	7.2	---	---	---	---	---	---	10.5	---	---
10	9.6	2.7	6.1	---	---	---	---	---	---	10.1	5.5	7.8
11	9.4	2.3	5.5	---	---	---	---	---	---	10.1	5.5	7.6
12	9.3	1.3	5.1	---	---	---	---	---	---	10.7	5.7	7.9
13	10.0	2.2	5.7	---	---	---	---	---	---	11.2	6.1	8.4
14	10.6	2.5	6.5	---	---	---	---	---	---	11.4	6.7	8.7
15	12.3	2.8	7.3	---	---	---	---	---	---	11.2	6.3	8.4
16	13.0	3.6	7.7	---	---	---	---	---	---	11.1	6.0	8.3
17	11.1	2.6	5.8	---	---	---	---	---	---	11.2	5.5	8.1
18	14.1	2.5	7.7	---	---	---	---	---	---	9.9	5.3	7.3
19	12.8	2.8	7.2	---	---	---	---	---	---	10.7	5.4	7.8
20	---	---	---	---	---	---	---	---	---	11.0	5.3	8.0
21	---	---	---	---	---	---	---	---	---	10.9	5.8	8.2
22	---	---	---	---	---	---	---	---	---	10.7	5.8	8.1
23	---	---	---	---	---	---	---	---	---	10.6	5.9	8.1
24	---	---	---	---	---	---	---	---	---	10.5	6.0	8.1
25	---	---	---	---	---	---	---	---	---	10.3	5.8	8.1
26	---	---	---	---	---	---	---	---	---	10.1	5.9	7.9
27	---	---	---	---	---	---	---	---	---	10.2	5.8	8.0
28	---	---	---	---	---	---	---	---	---	8.5	5.8	7.2
29	---	---	---	---	---	---	---	---	---	9.0	6.3	7.6
30	---	---	---	---	---	---	---	---	---	9.5	5.8	7.6
31	---	---	---	---	---	---	---	---	---	---	---	---
MONTH	---	---	---	---	---	---	---	---	---	---	---	---



## UMPQUA RIVER BASIN

14313000 LEMOLO LAKE NEAR TOKETEE FALLS, OR

LOCATION.--Lat 43°19'10", long 122°11'20", in SE 1/4 NW 1/4 sec.11, T.26 S., R.5 E., Douglas County, Hydrologic Unit 17100301, at Lemolo No. 1 diversion dam on North Umpqua River, 0.8 mi downstream from Lake Creek, 13.0 mi east of town of Toketee Falls, and at mile 93.01.

DRAINAGE AREA.--170 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1954 to current year. Prior to October 1960, published as Lemolo Reservoir near Toketee Falls.

GAGE.--Nonrecording gage. Datum of gage is sea level (levels by Pacific Power).

REMARKS.--Lake is formed by Lemolo No 1 diversion dam. Storage began July 15, 1954. Usable capacity for normal operation, 12,520 acre-ft between elevations 4,097.0 ft and 4,148.5 ft. Dead storage below 4,097.0 ft, 1,040 acre-ft. Water is used for power generation. Figures given herein represent total contents.

COOPERATION.--Gage readings furnished by Pacific Power.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 14,000 acre-ft Dec. 24, 1964, elevation, 4,149.5 ft; minimum observed, 11 acre-ft Mar. 5, 1955, elevation, 4,055.4 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents observed, 13,560 acre-ft July 10, 14, elevation, 4,148.35 ft; minimum observed, 2,520 acre-ft Dec. 20, elevation, 4,111.0 ft.

## MONTHEND ELEVATION AND CONTENTS AT 0900, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	4,143.2	11,430	--
Oct. 31.....	4,135.6	8,750	-2,680
Nov. 30.....	4,135.4	8,680	-70
Dec. 31.....	4,112.6	2,770	-5,910
CAL YR 1993.....	--	--	-1,430
Jan. 31.....	4,115.3	3,240	+470
Feb. 28.....	4,115.9	3,350	+110
Mar. 31.....	4,130.8	7,230	+3,880
Apr. 30.....	4,140.0	10,240	+3,010
May 31.....	4,144.8	12,040	+1,800
June 30.....	4,147.8	13,270	+1,230
July 31.....	4,146.0	12,520	-750
Aug. 31.....	4,146.1	12,560	+40
Sept. 30.....	4,143.4	11,500	-1,060
WTR YR 1994.....	--	--	+70

## UMPQUA RIVER BASIN

359

14313500 NORTH UMPQUA RIVER BELOW LEMOLO LAKE, NEAR TOKETEE FALLS, OR

LOCATION.--Lat 43°19'20", long 122°11'40", in NW 1/4 NW 1/4 sec.11, T.26 S., R.5 E., Douglas County, Hydrologic Unit 17100301, Umpqua National Forest, on right bank 0.4 mi downstream from Lemolo Lake, 13 mi east of town of Toketee Falls, and at mile 92.6.

DRAINAGE AREA.--170 mi<sup>2</sup> (see REMARKS).

PERIOD OF RECORD.--October 1927 to December 1945, March 1946 to current year. Records since October 1983 are equivalent to earlier records if diversion to Lemolo No. 1 power canal is added to flow past station. Published as "below Lake Creek" prior to October 1952, as "below Lake Creek, near Toketee Falls" October 1952 to September 1953, and as "below Lemolo Reservoir near Toketee Falls" October 1953 to September 1960.

REVISED RECORDS.--WSP 1448: Drainage area. WDR OR-75-1: 1964(M).

GAGE.--Water-stage recorder. Elevation of gage is 4,025 ft above sea level, from river-profile map. Prior to July 15, 1954, at site 1 mi upstream at datum about 65 ft higher. July 15, 1954, to Sept. 25, 1955, at site 400 ft upstream at datum 14.11 ft higher.

REMARKS.--No estimated daily discharges. Records excellent. Flow regulated since 1954 by Lemolo Lake (station 14313000); also slightly regulated by Diamond Lake. Records given herein do not include flow in Lemolo No. 1 power canal which, beginning July 1955, diverts 0.4 mi upstream from station for power generation with return flow 4.3 mi downstream.

AVERAGE DISCHARGE.--55 years (1928-83), 423 ft<sup>3</sup>/s, 33.79 in/yr, 306,500 acre-ft/yr, adjusted for storage.

EXTREMES FOR PERIOD OF RECORD.--River only, maximum discharge, 4,600 ft<sup>3</sup>/s Dec. 25, 1964, from rating curve extended above 450 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; gage height, 9.20 ft, from floodmark; minimum discharge, 6.4 ft<sup>3</sup>/s July 17, 1954.

Combined flow, maximum discharge, 4,680 ft<sup>3</sup>/s Dec. 25, 1964, from river rating curve extended above 450 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; minimum daily, 9.7 ft<sup>3</sup>/s May 13, 1955.

EXTREMES FOR CURRENT YEAR.--River only, maximum discharge, 537 ft<sup>3</sup>/s July 8, gage height, 6.53 ft; minimum discharge, 31 ft<sup>3</sup>/s Dec. 20, 21, Feb. 3.

 DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	37	34	36	33	32	33	37	38	37	37	38	37
2	37	34	35	33	32	33	38	38	37	37	38	37
3	37	34	35	33	32	33	38	38	37	38	38	37
4	37	113	35	34	33	33	38	39	37	37	38	37
5	36	106	35	33	33	33	38	38	37	37	38	37
6	36	36	35	32	33	33	39	37	38	37	38	37
7	36	36	35	32	33	34	38	38	38	37	39	37
8	36	36	36	32	33	34	38	38	38	177	39	37
9	36	36	35	32	33	34	39	38	38	242	39	37
10	36	36	35	32	33	35	38	38	39	242	39	37
11	36	36	35	32	33	35	38	38	39	268	39	37
12	36	91	34	32	33	35	38	38	39	286	39	37
13	35	36	33	32	33	35	38	37	39	286	39	37
14	35	36	33	32	33	35	38	37	39	285	39	36
15	35	36	155	32	33	35	38	37	39	286	39	36
16	35	36	128	32	33	36	38	37	39	284	38	36
17	35	36	32	32	33	36	38	37	39	285	37	37
18	35	36	32	32	32	36	38	37	40	284	36	36
19	35	36	32	32	32	36	38	37	39	284	37	36
20	35	36	31	32	32	36	38	37	39	284	37	36
21	35	36	32	32	32	36	38	37	39	282	43	36
22	35	36	33	32	32	36	37	37	39	282	43	36
23	35	35	33	32	32	41	36	37	40	283	44	36
24	35	35	33	32	32	44	37	37	40	115	44	36
25	35	35	33	32	32	43	39	37	42	37	44	36
26	34	35	33	32	32	43	39	37	42	38	44	36
27	34	35	33	32	32	43	38	37	42	38	42	36
28	184	35	33	32	32	41	38	37	39	38	40	36
29	197	35	33	32	---	39	38	37	37	38	38	36
30	34	35	33	32	---	36	38	37	37	38	37	36
31	34	---	33	32	---	37	---	37	---	38	37	---
TOTAL	1408	1268	1259	998	910	1129	1139	1159	1164	4980	1220	1094
MEAN	45.4	42.3	40.6	32.2	32.5	36.4	38.0	37.4	38.8	161	39.4	36.5
MAX	197	113	155	34	33	44	39	39	42	286	44	37
MIN	34	34	31	32	32	33	36	37	37	37	36	36
AC-FT	2790	2520	2500	1980	1800	2240	2260	2300	2310	9880	2420	2170

CAL YR 1993 TOTAL 22811 MEAN 62.5 MAX 860 MIN 31 AC-FT 45250  
WTR YR 1994 TOTAL 17728 MEAN 48.6 MAX 286 MIN 31 AC-FT 35160

## UMPQUA RIVER BASIN

14314500 CLEARWATER RIVER ABOVE TRAP CREEK, NEAR TOKETEE FALLS, OR

LOCATION.--Lat 43°14'40", long 122°17'10", in SW 1/4 sec.1, T.27 S., R.4 E., Douglas County, Hydrologic Unit 17100301, Umpqua National Forest, on right bank 900 ft downstream from Clearwater No. 1 diversion dam, 0.4 mi upstream from Trap Creek, 8.7 mi east of town of Toketee Falls, and at mile 7.8.

DRAINAGE AREA.--41.6 mi<sup>2</sup>. (See REMARKS.)

PERIOD OF RECORD.--October 1927 to December 1945, March 1946 to current year. Records since October 1983 are equivalent to earlier records if diversion to Clearwater No. 1 power canal is added to flow past station. Monthly discharge only December 1927 to March 1928, published in WSP 1318. Prior to October 1952, published as "above Trap Creek."

REVISED RECORDS.--WSP 1124: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 3,862.84 ft above sea level (levels by Pacific Power & Light Co.). Prior to Dec. 1, 1953, at two sites about 0.4 mi downstream at different datums.

REMARKS.--No estimated daily discharges. Records excellent. Records after September 1983 do not include flow in Clearwater No. 1 power canal, completed in June 1953, which diverts 900 ft upstream from station for generation of power and returns water to Clearwater River 2.5 mi downstream from station.

AVERAGE DISCHARGE.--55 years (1928-83), 173 ft<sup>3</sup>/s, 125,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--River only, maximum discharge, 848 ft<sup>3</sup>/s Dec. 23, 1964, gage height, 7.19 ft; maximum gage height, 7.87 ft Dec. 23, 1964, log jam; minimum discharge, 0.08 ft<sup>3</sup>/s Sept. 21, 1977, result of beavers plugging release gate at diversion dam 900 ft upstream.

Combined flow, maximum discharge, 1,020 ft<sup>3</sup>/s Dec. 23, 1964; minimum daily, 91 ft<sup>3</sup>/s Nov. 4-6, 1931.

EXTREMES FOR CURRENT YEAR.--River only, maximum discharge, 134 ft<sup>3</sup>/s Jan. 7, gage height, 4.00 ft; minimum discharge, 5.4 ft<sup>3</sup>/s Mar. 3.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.3	6.5	11	5.9	7.4	7.8	7.3	6.0	6.7	5.6	6.0	6.2
2	6.3	6.8	11	6.2	6.4	7.3	7.7	6.0	6.7	5.6	6.6	6.0
3	6.3	7.8	7.0	6.4	6.3	5.8	7.7	6.0	7.4	5.6	6.5	5.7
4	6.2	7.5	6.4	6.4	6.3	6.0	7.4	6.5	7.1	5.6	6.5	6.0
5	6.3	6.5	6.1	6.4	6.3	5.8	6.6	7.3	6.4	5.8	6.3	6.8
6	6.5	6.5	6.0	39	6.7	5.8	6.8	10	6.8	6.4	6.0	6.9
7	8.3	6.5	6.6	102	8.2	5.8	6.9	11	7.0	6.3	6.1	6.7
8	7.7	6.5	9.6	7.5	120	5.6	6.8	7.3	7.0	5.7	6.3	6.6
9	6.3	6.5	6.2	7.0	9.7	5.8	7.0	9.3	6.5	5.6	6.8	6.0
10	6.3	6.5	5.7	7.0	6.7	6.2	6.9	13	6.0	5.8	6.7	5.9
11	6.8	6.8	5.8	8.2	6.7	6.1	6.9	7.5	6.0	6.4	6.6	6.5
12	8.4	7.9	5.8	7.9	6.7	5.6	7.6	6.6	6.0	6.4	6.3	11
13	8.0	7.7	5.7	6.5	6.5	5.6	6.9	6.5	6.1	5.7	5.9	47
14	6.7	6.5	6.0	6.5	6.5	5.6	6.4	6.5	6.4	5.6	6.0	113
15	7.2	6.5	6.5	6.5	6.5	5.9	6.7	6.5	6.8	5.6	5.8	113
16	7.7	6.5	6.2	6.3	6.5	7.1	7.0	6.5	6.5	5.6	11	113
17	6.6	7.0	5.8	6.3	7.2	6.7	7.1	6.3	6.0	5.6	6.6	113
18	6.5	7.9	5.8	6.3	7.9	6.1	7.0	6.3	5.9	5.9	6.5	113
19	6.5	7.4	5.9	6.7	7.5	5.9	7.3	6.6	5.8	6.7	6.4	112
20	6.5	6.9	6.0	7.7	6.5	5.8	7.7	7.3	6.0	6.6	6.2	112
21	6.7	7.9	6.1	7.4	6.4	6.0	10	7.0	6.7	6.2	6.0	112
22	7.9	7.7	5.8	6.5	6.6	6.0	12	6.6	6.5	5.8	6.6	112
23	7.5	6.6	5.6	7.2	7.5	6.5	8.8	7.3	5.9	6.0	6.7	112
24	6.5	6.5	5.6	7.2	7.6	6.4	7.4	7.1	5.8	6.0	6.7	111
25	6.5	6.5	5.6	6.8	6.6	5.8	7.9	6.5	5.8	5.9	6.5	111
26	6.7	6.5	5.6	7.0	6.7	5.8	7.4	6.4	5.7	6.1	6.1	111
27	7.7	6.5	5.6	7.9	6.7	5.9	6.3	6.3	5.9	6.8	6.0	111
28	7.3	6.5	5.8	7.6	6.9	6.4	6.2	6.3	6.4	6.7	6.0	72
29	6.3	7.0	6.2	6.5	---	6.5	6.1	6.3	6.3	6.7	6.0	6.0
30	6.5	6.8	6.1	6.8	---	7.0	6.2	6.3	5.7	6.4	6.2	6.4
31	6.5	---	5.8	8.0	---	7.2	---	6.5	---	5.8	6.1	---
TOTAL	213.5	207.2	198.9	341.6	307.5	191.8	220.0	221.6	189.8	186.5	200.0	1780.7
MEAN	6.89	6.91	6.42	11.0	11.0	6.19	7.33	7.15	6.33	6.02	6.45	59.4
MAX	8.4	7.9	11	102	120	7.8	12	13	7.4	6.8	11	113
MIN	6.2	6.5	5.6	5.9	6.3	5.6	6.1	6.0	5.7	5.6	5.8	5.7
AC-FT	423	411	395	678	610	380	436	440	376	370	397	3530

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1984 - 1994, BY WATER YEAR (WY)

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
MEAN	14.9	6.23	7.52	7.09	9.18	11.8	14.1	46.7	12.0	22.2	11.2
MAX	76.8	9.10	22.9	14.5	23.8	37.7	34.5	124	41.5	88.3	59.4
(WY)	1988	1985	1984	1984	1986	1986	1985	1984	1984	1993	1994
MIN	4.91	5.04	4.96	5.43	5.32	5.56	5.98	5.10	5.56	5.43	5.02
(WY)	1989	1988	1989	1987	1990	1988	1991	1992	1992	1990	1987

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1984 - 1994

ANNUAL TOTAL	7310.6	4259.1	
ANNUAL MEAN	20.0	11.7	
HIGHEST ANNUAL MEAN			14.4
LOWEST ANNUAL MEAN			26.4
HIGHEST DAILY MEAN	172	Jul 22	5.85
LOWEST DAILY MEAN	5.6	Dec 23	1987
ANNUAL SEVEN-DAY MINIMUM	5.7	Dec 22	303
ANNUAL RUNOFF (AC-FT)	14500	8450	May 23 1984
10 PERCENT EXCEEDS	55	8.1	2.0
50 PERCENT EXCEEDS	7.3	6.5	3.2
90 PERCENT EXCEEDS	6.0	5.8	Aug 19 1986
			Aug 15 1986
			10440
			24
			6.0
			5.2



## 14316000 FISH CREEK AT BIG CAMAS RANGER STATION, NEAR TOKETEE FALLS, OR

LOCATION.--Lat 43°13'50", long 122°26'45", in SE 1/4 sec.10, T.27 S., R.3 E., Douglas County, Hydrologic Unit 17100301, Umpqua National Forest, 0.2 mi upstream from Camas Creek, 0.7 mi east of Big Camas ranger station, 3.2 mi south of town of Toketee Falls, and at mile 4.7.

DRAINAGE AREA.--68.8 mi<sup>2</sup> (see REMARKS).

PERIOD OF RECORD.--October 1947 to current year. Records since October 1983 are equivalent to earlier records if diversion to Fish Creek power canal is added to flow past station. Prior to October 1952, published as "at Big Camas ranger station."

REVISED RECORDS.--WSP 1448: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,858.52 ft above sea level (levels by Pacific Power & Light Co.). Prior to July 10, 1951, water-stage recorder and July 10 to Aug. 10, 1951, nonrecording gage at site 1,000 ft upstream at datum 13.72 ft higher. Aug. 11 to Nov. 3, 1951, nonrecording gage at site 200 ft downstream at different datum. Nov. 4, 1951, to Sept. 30, 1956, water-stage recorder at present site at datum 1.92 ft higher.

REMARKS.--No estimated daily discharges. Records good. Several measurements of water temperature were made during the year. Records given herein do not include flow in Fish Creek power canal (diversion began June 18, 1952), which diverts water 2 mi upstream from station for power generation at Fish Creek powerplant; diversion discharged to North Umpqua River 600 ft downstream from Toketee powerplant.

AVERAGE DISCHARGE.--36 years (1947-83), 237 ft<sup>3</sup>/s, 46.78 in/yr, 171,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--River only, maximum discharge, 12,100 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 13.9 ft, from floodmark; minimum discharge, 2.3 ft<sup>3</sup>/s Sept. 25, 1957.

Combined flow, maximum discharge, 12,100 ft<sup>3</sup>/s Dec. 22, 1964; minimum daily, 19 ft<sup>3</sup>/s July 30, 1979, result of diversion dam manipulation.

EXTREMES FOR CURRENT YEAR.--River only, maximum discharge, 330 ft<sup>3</sup>/s Jan. 2, gage height, 4.24 ft; minimum discharge, 7.6 ft<sup>3</sup>/s Feb. 5.

 DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	13	87	47	14	110	89	49	60	33	30	35
2	14	13	39	121	14	132	84	40	36	35	29	35
3	14	13	23	227	13	178	75	39	29	31	29	36
4	14	13	30	192	12	240	56	104	33	29	29	36
5	13	12	18	148	11	175	41	100	46	29	28	34
6	15	12	16	62	9.5	112	50	98	107	28	27	34
7	16	12	41	36	14	71	45	109	119	26	27	33
8	14	11	195	40	18	49	53	113	72	32	27	33
9	13	11	54	52	17	39	80	104	51	37	26	35
10	13	11	35	37	19	38	83	89	39	35	26	35
11	13	12	44	32	14	30	81	79	34	35	25	25
12	20	15	26	27	15	26	81	62	32	33	25	25
13	20	14	20	24	16	24	70	41	31	31	24	26
14	32	14	19	25	18	25	59	30	39	31	24	25
15	31	13	20	25	20	29	57	33	31	30	24	25
16	27	14	24	22	21	33	83	39	30	29	28	24
17	12	14	29	19	54	29	118	30	32	28	31	24
18	13	14	39	18	34	29	153	33	28	27	31	23
19	12	13	33	17	26	26	190	51	28	27	30	23
20	11	14	25	16	22	24	180	53	74	26	30	19
21	13	16	34	17	21	24	164	60	102	25	30	13
22	13	16	65	23	17	19	120	46	68	25	30	16
23	13	14	99	72	19	17	94	35	33	25	29	16
24	12	19	119	53	43	18	80	32	31	27	29	16
25	12	35	116	30	43	20	62	30	29	24	29	16
26	12	41	22	21	77	20	53	27	28	23	28	16
27	14	37	20	18	119	23	49	29	25	27	28	16
28	14	26	19	20	98	31	44	32	31	32	28	20
29	14	46	18	20	---	48	45	25	35	32	29	75
30	14	32	21	17	---	113	73	31	34	31	35	22
31	13	---	23	15	---	115	---	38	---	31	35	---
TOTAL	476	540	1373	1493	818.5	1867	2512	1681	1367	914	880	811
MEAN	15.4	18.0	44.3	48.2	29.2	60.2	83.7	54.2	45.6	29.5	28.4	27.0
MAX	32	46	195	227	119	240	190	113	119	37	35	75
MIN	11	11	16	15	9.5	17	41	25	25	23	24	13
AC-FT	944	1070	2720	2960	1620	3700	4980	3330	2710	1810	1750	1610
CFSM	.22	.26	.64	.70	.42	.88	1.22	.79	.66	.43	.41	.39
IN.	.26	.29	.74	.81	.44	1.01	1.36	.91	.74	.49	.48	.44

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1984 - 1994, BY WATER YEAR (WY)

MEAN	27.9	84.5	109	113	130	201	213	206	136	33.2	36.9	28.5
MAX	78.8	252	408	223	545	581	434	505	366	51.5	74.5	74.4
(WY)	1987	1985	1984	1986	1986	1993	1989	1993	1984	1984	1985	1986
MIN	11.7	17.2	42.2	32.0	29.2	31.0	83.7	36.4	28.9	26.6	23.3	13.5
(WY)	1984	1990	1993	1992	1990	1992	1994	1992	1987	1990	1992	1990

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1984 - 1994
ANNUAL TOTAL	62767	14732.5	110
ANNUAL MEAN	172	40.4	188
HIGHEST ANNUAL MEAN			40.4
LOWEST ANNUAL MEAN			188
HIGHEST DAILY MEAN	1980	240	2840
LOWEST DAILY MEAN	11	9.5	5.9
ANNUAL SEVEN-DAY MINIMUM	12	12	6.8
ANNUAL RUNOFF (AC-FT)	124500	29220	79430
ANNUAL RUNOFF (CFSM)	2.50	.59	1.59
ANNUAL RUNOFF (INCHES)	33.94	7.97	21.65
10 PERCENT EXCEEDS	514	88	273
50 PERCENT EXCEEDS	39	29	42
90 PERCENT EXCEEDS	13	14	15

LOCATION.--Lat 43°17'45", long 122°32'10", in NW 1/4 sec.24, T.26 S., R.2 E., Douglas County, Hydrologic Unit 17100301, Umpqua National Forest, on left bank 0.6 mi upstream from Copeland Creek, 4.7 mi west of town of Tokete Falls, and at mile 67.2.

PERIOD OF RECORD.--September 1949 to current year. Monthly discharge only September 1949, published in WSP 1318.  
Prior to October 1952, published as "above Copeland Creek."

GAGE.--Water-stage recorder. Elevation of gage is 1,580 ft above sea level, from river-profile map. Prior to Aug. 1, 1976, on right bank at same datum.

REMARKS.--No estimated daily discharges. Records excellent. Considerable fluctuation caused by powerplants upstream; flow slightly regulated by Diamond Lake and by Lemolo Lake (station 14313000). No diversion upstream from station. Several measurements of water temperature were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 40,700 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 19.1 ft, from floodmark, from rating curve extended above 7,200 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; minimum discharge, 345 ft<sup>3</sup>/s July 24, 1992; minimum daily, 565 ft<sup>3</sup>/s Sept. 13, 1959.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,860 ft<sup>3</sup>/s Dec. 8, gage height, 6.50 ft; minimum discharge, 599 ft<sup>3</sup>/s many days in September.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	908	770	1040	816	891	1540	1070	1120	920	723	677	608
2	839	768	1040	1160	897	1590	1150	1010	904	749	641	602
3	834	767	870	1620	893	1490	1130	1030	870	705	635	601
4	833	783	1030	1270	830	1540	1090	1170	805	715	635	601
5	827	752	996	1590	805	1450	946	1190	824	747	635	606
6	813	746	970	1330	809	1280	1110	1170	1080	705	636	602
7	788	761	1080	1110	797	1120	1060	1160	1180	700	633	604
8	795	783	1700	1160	754	1180	1170	1150	978	662	621	606
9	787	777	1340	1350	834	1180	1470	1180	988	645	606	603
10	800	787	1280	1370	827	1060	1620	1160	941	700	606	608
11	864	777	1280	1270	841	1060	1490	1130	925	698	606	607
12	810	749	1260	1280	817	1070	1430	1090	875	714	609	605
13	803	748	1180	1210	763	1090	1380	1040	881	720	607	603
14	828	760	1140	1190	777	1040	1300	990	907	722	609	602
15	819	738	1200	1130	797	1090	1220	981	911	695	607	608
16	893	779	1200	1100	845	1100	1270	1020	863	682	606	603
17	856	777	924	1020	897	1010	1300	1020	839	679	605	602
18	801	768	916	925	973	1050	1330	987	869	700	606	603
19	800	760	920	992	942	1060	1460	989	856	709	604	605
20	776	751	930	1010	922	1010	1440	1060	805	713	604	606
21	772	750	798	938	906	1030	1410	1080	770	673	606	606
22	765	753	801	979	838	1020	1330	1070	802	669	607	606
23	799	852	734	1020	896	997	1240	1040	787	708	608	606
24	771	848	700	1100	1160	1100	1240	1020	741	763	609	607
25	768	750	731	1100	1210	1100	1190	973	763	735	609	604
26	768	728	754	1020	1370	869	1150	937	762	699	609	605
27	768	732	788	928	1600	867	1160	971	762	678	607	606
28	759	777	779	922	1520	857	1030	946	764	713	608	607
29	732	840	733	920	---	904	1090	931	728	658	606	744
30	736	910	749	914	---	1190	1130	953	716	629	606	675
31	770	---	744	850	---	1140	---	921	---	641	604	---
TOTAL	24882	23241	30607	34594	26411	35084	37406	32489	25816	21649	19067	18351
MEAN	803	775	987	1116	943	1132	1247	1048	861	698	615	612
MAX	908	910	1700	1620	1600	1590	1620	1190	1180	763	677	744
MIN	732	728	700	816	754	857	946	921	716	629	604	601
AC-FT	49350	46100	60710	68620	52390	69590	74190	64440	51210	42940	37820	36400

MEAN	932	1273	1736	1753	1785	1755	1852	2000	1657	1067	883	847
MAX	1568	2298	5163	3418	3254	4221	2876	3191	2933	1652	1178	1107
(WY)	1951	1951	1965	1956	1958	1722	1952	1956	1974	1953	1972	1972
MIN	667	754	803	788	670	873	1065	855	700	664	598	612
(WY)	1993	1988	1977	1977	1977	1977	1968	1992	1992	1992	1992	1994

ANNUAL TOTAL	557317		329597				
ANNUAL MEAN	1527		903			1460	
HIGHEST ANNUAL MEAN						2080	1956
LOWEST ANNUAL MEAN						897	1977
HIGHEST DAILY MEAN	6640	Mar 18	1700	Dec 8		24300	Dec 22 1964
LOWEST DAILY MEAN	700	Dec 24	601	Sep 3		565	Sep 13 1959
ANNUAL SEVEN-DAY MINIMUM	746	Dec 23	603	Sep 2		587	Sep 2 1992
ANNUAL RUNOFF (AC-FT)	1105000		653800			1058000	
10 PERCENT EXCEEDS	2940		1240			2390	
50 PERCENT EXCEEDS	1070		839			1220	
90 PERCENT EXCEEDS	770		607			761	

UMPQUA RIVER BASIN

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14316700 STEAMBOAT CREEK NEAR GLIDE, OR

LOCATION---Lat 43°21'00", long 122°43'40", in N 1/2 sec.32, T.25-1/2 S., R.1 E., Douglas County, Hydrologic Unit 17100301, in Umpqua National Forest, on right bank in Canton Creek Forest Service Park, 200 ft downstream from Canton Creek, 19 mi northeast of Glide, and at mile 0.5.

DRAINAGE AREA--227 mi<sup>2</sup>.

PERIOD OF RECORD--Annual maximum, water year 1956, June 1956 to current year.

GAGE--Water-stage recorder. Datum of gage is 1,128.55 ft above sea level (levels by Federal Highway Administration). October 1955 to June 1956, nonrecording gage at site 100 ft upstream at same datum.

REMARKS--No estimated daily discharges. Records excellent. No regulation or diversion upstream from station. Several measurements of water temperature were made during the year.

AVERAGE DISCHARGE--38 years, 714 ft<sup>3</sup>/s, 42.75 in/yr, 517,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD--Maximum discharge, 51,000 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 25.6 ft, from floodmark, from rating curve extended above 13,000 ft<sup>3</sup>/s on basis of slope-area measurement at 17.96 ft; minimum discharge, 30 ft<sup>3</sup>/s Sept. 15-17, 1973.

EXTREMES FOR CURRENT YEAR--Peak discharges greater than base discharge of 8,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 24	1300	*3,920	*6.39				

Minimum discharge, 27 ft<sup>3</sup>/s Sept. 24-28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	45	42	595	436	207	1760	1100	284	163	86	44	29
2	43	42	551	1290	197	1470	826	261	143	85	43	30
3	43	42	208	2610	188	1340	646	247	129	83	42	32
4	43	46	326	1510	179	1480	528	289	126	80	42	38
5	43	46	300	2180	171	1130	456	313	128	78	41	37
6	43	45	184	1800	168	861	594	285	346	77	41	34
7	48	43	592	1120	172	687	986	268	580	75	40	32
8	48	43	2360	1140	163	575	1230	251	407	72	40	31
9	47	42	1480	2550	164	504	2190	232	298	69	39	33
10	46	41	802	1920	211	463	2360	215	242	65	39	42
11	45	41	896	1500	212	411	1620	202	209	63	38	49
12	62	42	994	1260	206	364	1150	191	188	61	38	48
13	71	42	581	956	218	333	892	178	175	60	37	42
14	57	42	467	833	338	316	718	169	196	58	37	37
15	65	41	393	684	404	305	603	175	215	57	36	34
16	94	41	322	543	417	312	545	224	206	56	35	33
17	73	42	266	447	594	300	506	215	181	55	34	32
18	60	44	224	387	779	314	469	222	167	52	34	31
19	55	44	197	347	664	348	443	232	153	52	34	31
20	52	43	176	315	562	321	397	285	142	51	34	30
21	50	43	160	292	522	431	368	262	133	49	33	29
22	49	73	148	288	488	471	330	234	126	48	33	29
23	48	67	135	350	703	416	307	208	120	52	33	28
24	48	51	127	422	3300	385	321	191	113	56	32	28
25	48	45	127	460	2360	459	313	177	109	53	32	27
26	46	47	124	378	2280	452	310	167	106	49	31	27
27	45	55	119	325	2540	427	320	157	101	47	31	27
28	44	80	113	289	2050	402	306	153	97	46	31	29
29	43	157	108	260	---	376	284	152	92	45	30	60
30	43	224	109	238	---	629	311	140	89	45	29	54
31	42	---	138	220	---	1200	---	134	---	45	29	---
TOTAL	1589	1696	13322	27350	20457	19242	21429	6713	5480	1870	1112	1043
MEAN	51.3	56.5	430	882	731	621	714	217	183	60.3	35.9	34.8
MAX	94	224	2360	2610	3300	1760	2360	313	580	86	44	60
MIN	42	41	108	220	163	300	284	134	89	45	29	27
AC-FT	3150	3360	26420	54250	40580	38170	42500	13320	10870	3710	2210	2070
CFSM	.23	.25	1.89	3.89	3.22	2.73	3.15	.95	.80	.27	.16	.15
IN.	.26	.28	2.18	4.48	3.35	3.15	3.51	1.10	.90	.31	.18	.17

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1957 - 1994, BY WATER YEAR (WY)

MEAN	164	871	1419	1451	1367	1256	972	610	276	96.4	60.1	66.8
MAX	536	2887	5391	3415	3195	2774	2017	1337	780	193	158	260
(WY)	1957	1974	1965	1970	1986	1972	1993	1963	1984	1983	1976	1986
MIN	31.5	56.5	62.5	108	142	211	287	165	87.5	56.6	35.9	34.8
(WY)	1988	1994	1977	1977	1977	1992	1968	1992	1992	1973	1994	1994

SUMMARY STATISTICS

	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1957 - 1994
ANNUAL TOTAL	287410	121303	
ANNUAL MEAN	787	332	714
HIGHEST ANNUAL MEAN			1253
LOWEST ANNUAL MEAN			239
HIGHEST DAILY MEAN	7330	Mar 18	33000
LOWEST DAILY MEAN	41	Nov 10	27
ANNUAL SEVEN-DAY MINIMUM	41	Nov 10	28
ANNUAL RUNOFF (AC-FT)	570100	240600	517500
ANNUAL RUNOFF (CFSM)	3.47	1.46	3.15
ANNUAL RUNOFF (INCHES)	47.10	19.88	42.75
10 PERCENT EXCEEDS	2020	844	1690
50 PERCENT EXCEEDS	331	157	323
90 PERCENT EXCEEDS	46	35	47

## UMPQUA RIVER BASIN

14316800 NORTH UMPQUA RIVER BELOW STEAMBOAT CREEK, NEAR GLIDE, OR

LOCATION.--Lat 43°19'18", long 122°48'30", in SW 1/4 NW 1/4 sec.10, T.26 S., R.1 W., Douglas County, Hydrologic Unit 17100301, Umpqua National Forest, on right bank, about 4.0 mi downstream from Steamboat Creek, 12 mi northeast of Glide, and at mile 48.1.

DRAINAGE AREA.--865 mi<sup>2</sup>.

PERIOD OF RECORD.--Water years 1993 to current year.

REMARKS.--Unpublished records of daily discharge are available in files of Public Works Department, Douglas County Natural Resources Division.

## WATER-QUALITY DATA

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 WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	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)
DEC 1993 08...	1220	5750	41	7.5	6.5	11.9	724	102	17	4.5	1.3	2.8
DATE	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	SULFATE, DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	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)
DEC 1993 08...	26	0.3	0.4	1.7	1.3	0.1	15	44	39	0.06	683	0.015
DATE	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC 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)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C)	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	ANTI-MONY, DIS-SOLVED (UG/L AS SB)	ARSENIC, DIS-SOLVED (UG/L AS AS)
DEC 1993 08...	0.001	<0.2	<0.2	0.015	0.051	0.029	0.021	3.4	0.6	150	<1	<1
DATE	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM, DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY, DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	
DEC 1993 08...	4	<1	<1	<1	<1	2	100	<1	2	<0.1	<1	
DATE	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	URANIUM NATURAL, DIS-SOLVED (UG/L AS U)	ZINC, DIS-SOLVED (UG/L AS ZN)	DIAZ-INON D10 SRG WAT FLT 0.7 U GF, REC PERCENT	TERBUTH YLAZINE SURROGT WAT FLT 0.7 U GF, REC PERCENT	HCH ALPHA D6 SRG WAT FLT 0.7 U GF, REC PERCENT	PROP-CHLOR, WATER, DISS, REC (UG/L)	BUTYL-ATE, WATER, DISS, REC (UG/L)	SI-MAZINE, WATER, DISS, REC (UG/L)	
DEC 1993 08...	1	<1	<1	<1	16	120	140	94	<0.007	<0.002	<0.005	

UMPQUA RIVER BASIN

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14316800 NORTH UMPQUA RIVER BELOW STEAMBOAT CREEK, NEAR GLIDE, OR--Continued

WATER-QUALITY DATA

DATE	PRO-METON, WATER, DISS, REC (UG/L)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L)	CYANA- ZINE, WATER, DISS, REC (UG/L)	FONOFOS, WATER, DISS, REC (UG/L)	ALPHA BHC, DIS- SOLVED (UG/L)	P, P' DDE, DISSOLV (UG/L)	CHLOR- PYRIFOS, DIS- SOLVED (UG/L)	LINDANE, DIS- SOLVED (UG/L)	DI- ELDRIN DIS- SOLVED (UG/L)	METO- LACHLOR WATER DISSOLV (UG/L)	MALA- THION, DIS- SOLVED (UG/L)
DEC 1993 08...	<0.003	<0.002	<0.004	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	<0.004	<0.005
DATE	PARA- THION, DIS- SOLVED (UG/L)	DI- AZINON, DIS- SOLVED (UG/L)	ATRA- ZINE, WATER, DISS, REC (UG/L)	ALA- CHLOR, WATER, DISS, REC, (UG/L)	METRI- BUZIN, SENCOR, WATER DISSOLV (UG/L)	2,6-DI- ETHYL ANILINE, WAT FLT GF, REC (UG/L)	TRI- FLUR- ALIN, WAT FLT GF, REC (UG/L)	DIMETH- OATE, WATER FLTRD GF, REC (UG/L)	ETHAL- FLUR- ALIN, WAT FLT GF, REC (UG/L)	PHORATE, WATER FLTRD GF, REC (UG/L)	TER- BACIL, WATER FLTRD GF, REC (UG/L)
DEC 1993 08...	<0.006	<0.002	<0.001	<0.002	<0.004	<0.003	<0.002	<0.004	<0.004	<0.002	<0.007
DATE	LIN- URON, WATER FLTRD 0.7 U GF, REC (UG/L)	METHYL PARA- THION, WAT FLT 0.7 U GF, REC (UG/L)	EPTC, WATER FLTRD 0.7 U GF, REC (UG/L)	PEB- ULATE, WATER FLTRD 0.7 U GF, REC (UG/L)	TEBU- THIURON, WATER FLTRD 0.7 U GF, REC (UG/L)	MOL- INATE, WATER FLTRD 0.7 U GF, REC (UG/L)	ETHO- PROP, WATER FLTRD 0.7 U GF, REC (UG/L)	BEN- FLUR- ALIN, WAT FLD 0.7 U GF, REC (UG/L)	CARBO- FURAN, WATER FLTRD 0.7 U GF, REC (UG/L)	TER- BUFOS, WATER FLTRD 0.7 U GF, REC (UG/L)	PRON- AMIDE, WATER FLTRD 0.7 U GF, REC (UG/L)
DEC 1993 08...	<0.002	<0.002	<0.002	<0.004	<0.010	<0.003	<0.003	<0.002	<0.003	<0.007	<0.018
DATE	DISUL- FOTON, WATER FLTRD 0.7 U GF, REC (UG/L)	TRIAL- LATE, WATER FLTRD 0.7 U GF, REC (UG/L)	PRO- PANIL, WATER FLTRD 0.7 U GF, REC (UG/L)	CAR- BARYL, WATER FLTRD 0.7 U GF, REC (UG/L)	THIO- BENCARB, WATER FLTRD 0.7 U GF, REC (UG/L)	DCPA, WATER FLTRD 0.7 U GF, REC (UG/L)	PENDI- METH- ALIN, WAT FLT GF, REC (UG/L)	NAPROP- AMIDE, WATER FLTRD 0.7 U GF, REC (UG/L)	PRO- PARGITE, WATER FLTRD 0.7 U GF, REC (UG/L)	METHYL AZIN- PHOS, WAT FLT GF, REC (UG/L)	PER- METHRIN CIS, WAT FLT GF, REC (UG/L)
DEC 1993 08...	<0.017	<0.001	<0.004	<0.003	<0.002	<0.006	<0.004	<0.004	<0.013	<0.001	<0.005



UMPQUA RIVER BASIN

14317500 NORTH UMPQUA RIVER ABOVE ROCK CREEK, NEAR GLIDE, OR.

LOCATION.--Lat 43°19'51", long 123°00'07", near line between SE 1/4 SW 1/4 sec.1, T.26 S., R.3 W., Douglas County, Hydrologic Unit 17100301, on right bank, 0.1 mi upstream from Rock Creek, 5.1 mi northeast of Glide, and at mile 35.8.

DRAINAGE AREA. -- 886 mi<sup>2</sup>.

PERIOD OF RECORD.--November 1992 to current year.

PERIOD OF DAILY RECORD. - -

SPECIFIC CONDUCTANCE: November 1992 to current year.

pH: November 1992 to current year.

WATER TEMPERATURE: November 1992 to current year.

DISSOLVED OXYGEN: November 1992 to current year.

INSTRUMENTATION.--Water-quality monitor and data logger since November 1992.

EXTREMES FOR PERIOD OF RECORD. --

SPECIFIC CONDUCTANCE: Maximum recorded, 77 microsiemens Nov. 25, 1993; minimum recorded, 36 microsiemens Apr. 2, 1993.

pH: Maximum, 8.5 units Sept. 15, 1993, July 31, Aug. 1, 1994; minimum recorded, 6.9 units May 24, 1993.

WATER TEMPERATURE: Maximum, 23.0°C July 21, 1994; minimum, 0.5°C Nov. 26, 1993.

DISSOLVED OXYGEN: Maximum, 14.7 mg/L Dec. 24, 1993; minimum, 7.9 mg/L July 7, 1994.

EXTREMES FOR CURRENT YEAR. - -

SPECIFIC CONDUCTANCE: Maximum recorded, 77 microsiemens Nov. 25; minimum recorded, 37 microsiemens Jan. 3, 9, 10.

pH: Maximum, 8.5 units July 31, Aug. 1; minimum 7.1 units Feb. 24

WATER TEMPERARURE: Maximum, 23.0°C July 21; minimum, 0.5°C Nov. 26.

DISSOLVED OXYGEN: Maximum, 14.7 mg/L Dec. 24; minimum, 7.9 mg/L July 7.

## WATER-QUALITY DATA

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 WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	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)
DEC 1993												
09...	1230	3660	42	7.5	6.5	12.2	724	104	17	4.5	1.3	2.8
JUL 1994												
06...	1650	E804	64	8.1	17.5	10.0	738	108	20	5.2	1.8	4.4
07...	1725	--	65	8.5	19.5	9.5	738	107	--	--	--	--
08...	0740	--	64	7.3	17.5	8.9	738	96	--	--	--	--
SEP												
13...	1545	601	65	8.1	14.0	10.7	741	106	22	5.5	2.0	5.4
14...	0740	--	69	7.5	12.5	10.0	741	96	--	--	--	--

[illegible][illegible][illegible]

## WATER-QUALITY DATA

[illegible]



SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

[illegible]

## UMPQUA RIVER BASIN

14317500 NORTH UMPQUA RIVER ABOVE ROCK CREEK, NEAR GLIDE, OR--Continued

PH, WATER, WHOLE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH		
1	8.0	7.6	7.8	7.6	7.6	7.4	7.7	7.5	7.6	7.5	---	---
2	8.0	7.6	7.8	7.5	7.5	7.4	7.5	7.4	7.6	7.5	---	---
3	8.0	7.6	7.8	7.6	7.6	7.4	7.4	7.2	7.6	7.5	---	---
4	8.2	7.6	7.9	7.6	7.7	7.5	7.5	7.3	7.6	7.5	---	---
5	8.1	7.6	7.8	7.6	7.7	7.5	7.4	7.4	7.6	7.5	---	---
6	8.0	7.6	7.8	7.6	7.7	7.5	7.5	7.4	7.6	7.5	---	---
7	8.1	7.5	7.8	7.6	7.6	7.5	7.5	7.4	7.6	7.5	---	---
8	7.9	7.5	7.8	7.6	7.5	7.3	7.5	7.4	7.7	7.5	---	---
9	8.0	7.5	7.8	7.6	7.4	7.3	7.4	7.4	7.6	7.5	---	---
10	8.0	7.5	7.8	7.6	7.5	7.4	7.5	7.4	7.7	7.5	7.7	---
11	8.0	7.5	7.8	7.6	7.5	7.4	7.5	7.4	7.7	7.5	7.6	7.5
12	8.0	7.5	7.8	7.6	7.5	7.4	7.5	7.4	7.7	7.5	7.6	7.5
13	8.0	7.5	7.8	7.6	7.6	7.4	7.5	7.4	7.6	7.5	7.7	7.5
14	8.1	7.5	7.7	7.6	7.6	7.5	7.6	7.4	7.7	7.5	7.7	7.5
15	7.9	7.5	7.8	7.6	7.7	7.5	7.6	7.4	7.7	7.5	7.6	7.4
16	8.0	7.5	7.8	7.6	7.6	7.5	7.6	7.5	7.7	7.5	7.7	7.5
17	7.9	7.5	7.7	7.6	7.6	7.5	7.6	7.5	7.6	7.5	7.8	7.5
18	7.8	7.5	---	---	7.6	7.5	7.6	7.5	7.6	7.4	7.7	7.5
19	7.8	7.5	7.7	7.6	7.6	7.5	7.6	7.5	7.6	7.4	7.7	7.5
20	7.9	7.5	7.7	7.6	7.6	7.5	7.6	7.5	7.6	7.4	7.7	7.5
21	7.9	7.5	7.7	7.6	7.6	7.5	7.6	7.5	7.6	7.5	7.7	7.5
22	7.9	7.5	7.7	7.6	7.6	7.5	7.7	7.4	7.6	7.4	7.7	7.5
23	7.9	7.5	7.7	7.6	7.6	7.5	7.7	7.5	7.6	7.4	7.7	7.5
24	8.0	7.5	7.7	7.6	7.6	7.5	7.7	7.5	7.4	7.1	7.6	7.5
25	7.7	7.5	7.7	7.6	7.7	7.5	7.6	7.5	7.4	7.3	7.7	7.5
26	7.7	7.5	7.6	7.5	7.7	7.5	7.7	7.5	7.5	7.4	7.7	7.6
27	7.9	7.5	7.6	7.5	7.6	7.5	7.7	7.5	7.5	7.3	7.7	7.5
28	7.7	7.5	7.6	7.4	7.7	7.5	7.6	7.5	---	---	7.7	7.5
29	7.7	7.4	7.6	7.4	7.7	7.5	7.6	7.5	---	---	7.8	7.5
30	7.8	7.5	7.7	7.5	7.6	7.5	7.6	7.5	---	---	7.7	7.5
31	7.9	7.5	---	---	7.6	7.5	7.6	7.5	---	---	7.7	7.5
MONTH	8.2	7.4	---	---	7.7	7.3	7.7	7.2	---	---	---	---

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER		
1	7.7	7.5	7.9	7.4	8.1	7.4	8.4	7.5	8.5	7.7	8.2	7.6
2	7.7	7.5	7.9	7.4	8.1	7.4	8.4	7.5	8.4	7.6	8.3	7.6
3	7.8	7.5	7.8	7.4	8.0	7.4	8.3	7.6	8.4	7.6	8.2	7.6
4	7.7	7.5	7.8	7.4	8.1	7.4	8.3	7.5	8.4	7.5	8.0	7.6
5	7.7	7.4	7.8	7.4	7.9	7.4	8.4	7.6	8.4	7.6	8.0	7.6
6	7.7	7.4	7.8	7.3	7.8	7.4	8.3	7.6	8.3	7.6	8.1	7.5
7	7.7	7.4	7.8	7.3	7.8	7.4	8.3	7.5	8.4	7.6	8.1	7.6
8	7.6	7.4	7.9	7.4	7.9	7.4	8.3	7.5	8.4	7.6	8.1	7.6
9	7.5	7.4	7.9	7.3	7.9	7.4	8.4	7.5	8.3	7.6	8.2	7.6
10	7.5	7.4	7.9	7.3	7.9	7.3	8.4	7.5	8.3	7.6	8.2	7.6
11	7.6	7.4	8.0	7.3	8.1	7.3	8.4	7.5	8.4	7.6	8.2	7.6
12	7.7	7.4	7.9	7.4	8.1	7.4	8.4	7.5	8.4	7.6	8.0	7.6
13	7.7	7.4	8.0	7.4	8.0	7.4	8.4	7.5	8.3	7.6	8.0	7.2
14	7.7	7.4	8.0	7.4	8.1	7.4	8.4	7.5	8.3	7.6	7.9	7.5
15	7.7	7.4	7.8	7.4	8.0	7.4	8.4	7.5	8.3	7.5	7.9	7.5
16	7.8	7.4	8.0	7.4	8.0	7.4	8.4	7.5	8.3	7.6	7.8	7.5
17	7.7	7.4	7.9	7.4	7.7	7.4	8.4	7.5	8.3	7.6	8.0	7.5
18	7.8	7.4	7.9	7.4	8.0	7.4	8.4	7.5	8.2	7.6	7.9	7.5
19	7.8	7.4	7.7	7.3	8.0	7.4	8.4	7.5	8.3	7.6	7.9	7.5
20	7.7	7.4	7.9	7.5	8.1	7.4	8.4	7.5	8.3	7.6	7.9	7.5
21	7.7	7.4	7.9	7.4	8.2	7.5	8.4	7.5	8.3	7.6	7.9	7.5
22	7.8	7.4	7.8	7.4	8.3	7.5	8.3	7.5	8.2	7.6	8.0	7.5
23	7.7	7.4	7.8	7.4	8.2	7.5	8.4	7.5	8.2	7.6	7.9	7.5
24	7.8	7.4	---	---	8.2	7.5	8.4	7.5	8.2	7.6	8.0	7.5
25	7.7	7.4	---	---	8.2	7.5	8.4	7.6	8.3	7.6	7.9	7.5
26	7.7	7.4	---	---	8.2	7.5	8.3	7.5	8.2	7.6	7.9	7.5
27	7.8	7.4	---	---	8.2	7.5	8.4	7.5	8.3	7.6	7.9	7.5
28	7.8	7.4	---	---	8.2	7.5	8.4	7.5	8.2	7.6	7.9	7.5
29	7.8	7.4	---	---	8.3	7.5	8.4	7.5	8.1	7.6	7.9	7.5
30	7.9	7.4	---	---	8.3	7.5	8.4	7.6	8.1	7.6	7.9	7.5
31	---	---	---	---	---	---	8.5	7.6	8.2	7.6	---	---
MONTH	7.9	7.4	---	---	8.3	7.3	8.5	7.5	8.5	7.5	8.3	7.2



UMPQUA RIVER BASIN

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14317500 NORTH UMPQUA RIVER ABOVE ROCK CREEK, NEAR GLIDE, OR--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

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

## UMPUA RIVER BASIN

14317500 NORTH UMPQUA RIVER ABOVE ROCK CREEK, NEAR GLIDE, OR--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE			JULY			AUGUST			SEPTEMBER			
1	15.5	13.5	14.5	20.0	17.0	18.5	20.5	17.5	19.0	17.0	15.5	16.0
2	15.5	14.5	15.0	20.0	17.5	18.5	20.5	17.5	19.0	16.5	14.0	15.5
3	15.0	14.0	14.0	19.5	17.0	18.0	21.0	18.0	19.5	16.0	14.5	15.5
4	15.5	13.5	14.5	19.5	16.5	18.0	20.0	18.5	19.0	16.5	14.0	15.5
5	14.5	13.5	14.5	18.0	16.0	17.0	20.5	18.0	19.0	16.5	14.5	15.5
6	13.5	12.0	13.0	18.0	14.5	16.0	20.5	17.5	19.0	16.5	14.5	15.5
7	12.5	11.0	12.0	20.0	16.0	17.5	19.5	17.5	18.5	16.5	14.5	15.5
8	13.5	11.0	12.0	21.0	17.0	19.0	19.0	17.0	18.0	16.0	14.5	15.0
9	15.0	12.5	13.5	21.5	18.0	19.5	19.5	16.5	18.0	14.5	13.5	14.0
10	16.5	14.0	15.5	21.0	18.0	19.5	19.5	16.5	18.0	14.5	13.0	14.0
11	17.5	16.0	16.5	21.0	17.5	19.0	19.5	17.0	18.5	13.5	12.5	13.0
12	17.5	16.0	16.5	20.5	17.0	18.5	19.5	17.0	18.5	14.0	12.0	13.0
13	16.5	15.0	16.0	20.5	17.0	18.5	20.0	17.5	18.5	14.5	12.5	13.5
14	15.0	14.0	14.5	20.5	17.0	18.5	20.0	17.5	19.0	14.0	12.0	13.0
15	15.0	13.5	14.0	20.5	17.0	18.5	20.0	17.5	19.0	14.5	12.0	13.5
16	15.5	13.0	14.0	21.5	17.5	19.0	19.5	17.0	18.5	15.0	12.5	14.0
17	14.5	12.5	14.0	21.5	18.0	20.0	19.5	17.0	18.0	15.0	13.0	14.5
18	15.5	12.5	14.0	21.5	18.5	20.0	18.5	17.0	17.5	15.5	13.0	14.0
19	16.5	14.0	15.0	22.0	18.5	20.0	19.0	16.5	18.0	15.5	13.5	15.0
20	17.5	15.0	16.0	22.5	19.0	20.5	18.5	16.5	17.5	15.5	13.5	14.5
21	17.0	16.0	16.5	23.0	20.0	21.0	18.0	16.5	17.5	16.0	13.5	15.0
22	17.0	16.0	16.5	21.5	20.0	20.5	18.5	16.0	17.5	15.5	13.5	14.5
23	17.5	16.0	17.0	22.0	18.0	20.0	18.5	16.0	17.0	15.5	13.5	14.5
24	18.5	15.5	17.0	20.5	19.0	19.5	18.0	16.0	17.0	15.0	13.5	14.5
25	17.0	15.0	16.0	20.5	17.5	19.0	17.5	15.5	16.5	15.0	13.0	14.0
26	18.0	14.5	16.0	21.0	18.0	19.5	17.5	15.0	16.5	15.0	13.0	14.0
27	19.0	16.0	17.0	21.5	18.0	19.5	17.5	15.0	16.5	15.0	13.0	14.0
28	20.0	16.5	17.5	21.0	18.5	19.5	17.5	15.5	16.5	14.5	13.5	14.0
29	20.0	17.0	18.0	20.0	18.0	19.0	17.5	15.5	16.5	14.0	13.5	14.0
30	19.5	17.5	18.5	20.5	17.5	19.0	17.5	15.0	16.5	14.5	13.0	14.0
31	---	---	---	20.5	17.5	19.0	17.5	15.5	16.5	---	---	---
MONTH	20.0	11.0	15.5	23.0	14.5	19.0	21.0	15.0	18.0	17.0	12.0	14.5

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	11.1	10.8	10.9	12.1	11.2	11.8	12.4	12.0	12.2	12.3	12.0	12.2
2	11.3	10.8	11.0	12.3	11.9	12.0	12.4	11.4	12.0	12.1	11.8	12.0
3	11.4	10.9	11.2	12.4	12.0	12.1	12.4	11.8	12.1	12.1	11.0	11.4
4	11.3	10.8	11.0	12.2	11.6	12.0	12.7	12.0	12.2	12.3	10.7	11.8
5	11.2	10.8	11.0	12.0	11.6	11.8	12.4	12.0	12.2	12.3	10.6	11.6
6	11.2	10.7	11.0	12.1	11.7	11.8	12.6	12.0	12.4	11.1	9.6	10.4
7	11.2	11.0	11.1	11.9	11.5	11.7	12.4	11.9	12.1	11.4	9.4	10.4
8	11.5	11.0	11.2	12.1	11.6	11.8	12.4	11.2	11.8	11.0	10.1	10.5
9	11.7	11.0	11.4	11.8	11.4	11.7	12.7	11.1	---	10.6	---	---
10	11.4	10.9	11.1	11.8	11.3	11.6	12.5	12.0	---	---	---	---
11	11.0	10.7	10.8	11.5	11.2	11.3	12.3	11.8	12.0	---	---	---
12	11.0	10.7	10.8	11.4	11.0	11.2	12.6	12.1	12.4	---	---	---
13	11.2	10.5	10.9	11.5	10.9	11.2	12.7	12.2	12.5	---	---	---
14	11.3	10.7	11.1	11.8	11.4	11.6	12.7	12.2	12.4	---	---	---
15	11.2	10.7	11.0	11.9	11.5	11.7	12.8	12.3	12.6	---	---	---
16	11.5	10.9	11.2	11.7	11.2	11.5	13.1	12.5	12.8	---	---	---
17	11.5	11.0	11.3	11.5	11.0	11.3	13.5	12.8	13.2	---	---	---
18	11.8	11.3	11.5	---	---	---	13.9	13.3	13.6	---	---	---
19	12.0	11.4	11.6	12.1	10.7	11.2	14.1	13.4	13.7	---	---	---
20	11.8	11.1	11.4	12.3	10.8	11.7	14.1	13.6	13.8	13.7	---	---
21	11.4	10.9	11.1	12.5	11.9	12.1	14.4	13.6	14.0	13.5	13.0	13.3
22	11.3	10.9	11.1	13.0	12.5	12.7	14.6	13.8	14.2	13.0	12.7	12.8
23	11.3	10.9	11.1	---	---	---	14.5	14.1	14.3	12.7	12.2	12.5
24	11.4	10.8	11.1	13.7	12.1	13.3	14.7	14.3	14.5	12.6	12.2	12.4
25	11.3	10.7	11.0	13.9	13.5	13.7	14.6	14.1	14.4	13.0	12.4	12.7
26	11.5	10.9	11.2	14.1	13.3	13.8	14.2	13.4	13.9	13.2	12.8	13.0
27	11.9	11.4	11.6	13.7	13.1	13.4	13.7	13.3	13.5	13.2	12.9	13.1
28	11.9	11.3	11.6	13.3	12.8	13.0	13.5	13.1	13.3	13.5	13.0	13.3
29	11.7	11.1	11.4	12.9	12.0	12.6	13.3	12.9	13.1	13.8	13.3	13.5
30	11.6	11.1	11.3	12.7	12.1	12.4	13.1	12.5	12.7	13.9	13.5	13.7
31	11.7	10.9	11.3	---	---	---	12.5	12.0	12.4	14.0	13.6	13.8
MONTH	12.0	10.5	11.2	---	---	---	14.7	11.1	---	---	---	---

UMPQUA RIVER BASIN

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14317500 NORTH UMPQUA RIVER ABOVE ROCK CREEK, NEAR GLIDE, OR--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY				MARCH			APRIL			MAY		
1	14.0	13.7	13.8	---	---	---	---	---	---	11.2	10.5	10.9
2	13.9	13.7	13.8	---	---	---	---	---	---	11.2	10.7	10.9
3	14.0	13.6	13.8	---	---	---	---	---	---	11.1	10.4	10.8
4	13.9	13.6	13.7	---	---	---	---	---	---	11.1	10.6	10.8
5	13.9	13.6	13.7	---	---	---	12.3	11.7	12.1	11.0	10.4	10.7
6	13.7	13.4	13.6	---	---	---	12.3	11.9	12.1	10.8	10.1	10.5
7	13.5	13.0	13.3	---	---	---	12.4	11.9	12.1	10.5	9.9	10.2
8	13.4	13.0	13.2	---	---	---	12.3	11.9	12.1	10.3	9.8	10.0
9	13.5	13.2	13.4	---	---	---	12.5	11.9	12.1	10.2	9.7	10.0
10	13.3	13.1	13.2	12.2	---	---	12.6	11.8	12.2	10.1	9.8	9.9
11	13.4	13.2	13.3	12.5	11.8	12.2	12.4	11.7	12.1	10.3	9.7	10.0
12	13.4	13.1	13.2	12.7	12.1	12.5	12.4	11.9	12.1	10.6	10.0	10.3
13	13.1	12.9	13.0	12.7	12.2	12.4	12.5	11.9	12.2	10.9	10.3	10.7
14	13.0	12.7	12.9	12.7	12.1	12.4	12.2	11.7	12.0	11.4	10.5	10.9
15	12.7	12.4	12.6	12.4	11.8	12.1	12.1	11.4	11.8	11.5	11.0	11.1
16	12.4	11.9	12.2	12.3	11.7	12.0	11.8	11.1	11.5	11.5	10.8	11.3
17	12.0	11.6	11.8	12.4	11.8	12.1	11.4	10.8	11.1	11.4	10.8	11.1
18	12.5	12.0	12.3	12.7	11.8	12.3	11.5	11.0	11.3	11.3	10.7	11.0
19	12.6	12.0	12.4	12.8	12.3	12.6	11.4	10.8	11.2	11.1	10.6	10.8
20	12.6	12.2	12.4	13.0	12.3	12.6	11.2	10.4	10.9	---	---	---
21	12.5	12.1	12.3	12.6	11.9	12.3	11.2	10.7	11.0	---	---	---
22	12.8	12.4	12.6	12.8	12.1	12.4	11.5	10.9	11.2	---	---	---
23	12.7	12.4	12.6	12.9	12.5	12.7	11.6	11.2	11.4	---	---	---
24	12.6	11.8	12.2	12.7	12.2	12.5	11.8	11.1	11.5	---	---	---
25	11.8	9.2	10.7	12.7	12.1	12.4	11.5	10.9	11.2	---	---	---
26	9.6	---	---	12.6	11.8	12.3	11.6	10.9	11.3	---	---	---
27	---	---	---	12.1	11.5	11.8	11.6	11.1	11.4	---	---	---
28	---	---	---	11.8	11.2	11.5	11.5	10.7	11.1	---	---	---
29	---	---	---	11.5	11.0	11.3	11.1	10.6	10.9	---	---	---
30	---	---	---	---	---	---	11.1	10.5	10.9	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE				JULY			AUGUST			SEPTEMBER		
1	10.5	10.1	10.3	9.1	8.5	8.8	9.3	8.6	9.0	10.0	9.5	9.8
2	10.3	10.0	10.1	9.0	8.6	8.8	9.5	8.7	9.1	10.1	9.6	9.9
3	10.3	9.9	10.1	9.0	8.4	8.8	9.2	8.5	8.9	9.9	9.6	9.8
4	10.3	9.9	10.1	8.8	8.1	8.6	9.1	8.7	8.9	10.0	9.4	9.7
5	10.2	9.7	10.0	8.7	8.4	8.6	9.2	8.6	8.9	9.9	9.3	9.7
6	10.6	9.9	10.4	9.1	8.4	8.7	9.3	8.7	9.0	9.8	9.3	9.6
7	10.8	10.1	10.5	8.6	7.9	8.3	9.1	8.7	8.9	9.7	9.2	9.4
8	10.7	9.9	10.3	8.9	8.1	8.5	9.3	8.8	9.1	9.7	9.2	9.5
9	10.2	9.4	9.9	9.0	8.4	8.7	9.3	8.8	9.1	9.8	9.4	9.6
10	9.7	9.1	9.4	9.2	8.5	8.9	9.3	8.7	9.0	9.8	9.5	9.6
11	9.3	8.9	9.1	9.2	8.4	8.8	9.3	8.7	9.0	9.9	9.5	9.7
12	9.2	8.9	9.1	9.1	8.6	8.8	9.2	8.4	8.9	9.8	9.4	9.6
13	9.4	9.1	9.3	9.2	8.7	9.0	9.1	8.5	8.8	9.8	9.4	9.6
14	9.8	9.3	9.6	9.4	8.8	9.1	9.3	8.7	9.0	9.9	9.5	9.7
15	10.4	9.7	10.1	9.4	8.7	9.0	9.2	8.8	9.0	10.0	9.3	9.7
16	10.4	9.8	10.2	9.1	8.3	8.8	9.3	8.8	9.0	9.9	9.3	9.6
17	10.4	9.9	10.2	9.1	8.4	8.8	9.5	8.9	9.2	9.8	9.1	9.5
18	10.5	9.5	10.1	8.9	8.4	8.7	9.7	9.1	9.4	9.6	9.1	9.4
19	10.0	9.5	9.7	8.8	8.1	8.5	9.6	9.0	9.4	9.6	9.0	9.3
20	9.6	9.1	9.4	8.6	8.0	8.3	9.6	8.9	9.3	9.9	9.1	9.4
21	9.3	9.0	9.2	8.4	8.0	8.2	9.4	8.9	9.2	9.7	9.0	9.3
22	9.3	8.9	9.1	8.6	8.2	8.4	9.3	8.7	9.0	9.4	9.1	9.2
23	9.4	8.8	9.0	8.9	8.2	8.6	9.1	8.7	8.9	9.4	9.1	9.3
24	9.5	8.9	9.2	8.9	8.3	8.7	9.1	8.8	9.0	9.5	9.3	9.4
25	9.4	9.0	9.2	9.2	8.7	9.0	9.4	8.9	9.2	9.7	9.3	9.5
26	9.4	8.8	9.1	9.1	8.6	8.8	9.3	8.8	9.1	9.9	9.4	9.7
27	9.3	8.7	9.0	9.0	8.3	8.7	9.3	8.8	9.1	9.9	9.5	9.7
28	9.0	8.6	8.8	9.1	8.4	8.8	9.2	8.8	9.0	9.8	9.5	9.7
29	9.2	8.5	8.9	9.1	8.7	8.9	9.5	8.9	9.3	9.9	9.7	9.8
30	8.9	8.5	8.8	9.0	8.4	8.8	9.7	9.2	9.4	9.9	9.5	9.7
31	---	---	---	9.1	8.5	8.9	9.6	9.2	9.5	---	---	---
MONTH	10.8	8.5	9.6	9.4	7.9	8.7	9.7	8.4	9.1	10.1	9.0	9.6

## UMPQUA RIVER BASIN

14319500 NORTH UMPQUA RIVER AT WINCHESTER, OR

LOCATION.--Lat 43°16'20", long 123°24'40", in NW 1/4 NE 1/4 sec.33, T.26 S., R.6 W., Douglas County, Hydrologic Unit 17100301, on left bank 300 ft downstream from county bridge, 3.0 mi west of Winchester, and at mile 1.8.

DRAINAGE AREA.--1,344 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1908 to December 1913, October 1923 to September 1929, August 1954 to current year. Prior to December 1908, monthly discharge only, published in WSP 1318.

REVISED RECORDS.--WSP 1448: 1909-12, drainage area. WDR OR-65-1: 1954(M). WDR OR-72-1: 1965(M).

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 372.97 ft above sea level (Douglas County Road Department bench mark). Oct. 1, 1908, to Dec. 31, 1913, and Oct. 1, 1923, to Sept. 30, 1929, nonrecording gage at site 4.8 mi upstream at different datums. Aug. 27, 1954, to Aug. 12, 1965, water-stage recorder on right bank at same datum.

REMARKS.--Records good. Occasional regulation caused by upstream powerplants; slight regulation by Lemolo Lake and Diamond Lake. Several small diversions for irrigation upstream from station. Continuous water-quality records for water years 1967-69, 1971-91, have been collected at this site.

AVERAGE DISCHARGE.--51 years (water years 1909-13, 1924-29, 1955-94), 3,667 ft<sup>3</sup>/s, 37.07 in/yr, 2,656,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 150,000 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 34.2 ft, from floodmark; minimum discharge, 235 ft<sup>3</sup>/s Aug. 27, 1987, result of regulation at Winchester Dam 5.2 mi upstream.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Oct. 29, 1950, reached a stage of 23.2 ft, from floodmark, at site 4.8 mi upstream at different datum, discharge, 88,000 ft<sup>3</sup>/s. Flood of Nov. 23, 1953, reached a stage of 28.4 ft, from floodmarks, present site and datum, discharge, 93,300 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 20,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 24	2000	*11,500	*7.37				

Minimum discharge, 306 ft<sup>3</sup>/s Aug. 21, 22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1010	960	1500	1220	1580	6910	5240	2080	1370	967	729	e693
2	1010	973	3460	2320	1590	6270	4110	1960	1380	966	766	691
3	933	969	1880	6900	1550	5950	3580	1810	1310	985	732	686
4	925	961	1620	4930	1510	6090	3010	1870	1260	933	719	705
5	932	950	2170	7610	1410	5220	2660	2100	1190	929	715	712
6	929	870	1710	7900	1380	4290	2840	2030	1370	963	713	704
7	924	847	1580	5300	1450	3620	2930	1950	1220	913	712	688
8	904	859	7110	4210	1370	3110	4180	1880	2190	895	707	689
9	903	885	7380	7390	1330	2950	5870	1840	1790	842	694	715
10	895	876	4210	8070	1700	2710	8090	1830	1650	799	670	725
11	909	886	4360	6100	1780	2480	6930	1770	1520	862	671	754
12	1000	876	5660	5590	1690	2310	5280	1720	1440	856	671	763
13	977	844	3720	4460	1640	2220	4370	1660	1380	867	670	751
14	973	840	2930	3840	2000	2130	3750	1590	1400	870	669	728
15	998	853	2540	3410	2210	2040	3260	1560	1460	871	668	714
16	1060	824	2360	2960	2190	2120	2980	1650	1460	848	663	714
17	1150	885	2110	2620	2550	2160	2850	1710	1360	828	656	703
18	1020	894	1730	2290	3710	1970	2740	1700	1320	814	725	698
19	948	879	1610	2080	3440	2310	2710	1650	1310	829	722	693
20	933	861	1550	2050	3020	2140	2670	1670	1260	844	744	689
21	898	849	1490	1950	3210	2160	2570	1750	1180	841	677	692
22	892	920	1310	1860	3190	2530	2430	1730	1140	796	549	696
23	872	1030	1270	2140	3050	2430	2270	1670	1160	788	730	689
24	914	1030	1160	2510	7870	2320	2200	1590	1120	837	727	683
25	882	990	1120	2770	9190	2370	2210	1540	1060	911	730	689
26	876	863	1140	2490	7820	2380	2150	1460	1080	872	728	689
27	871	857	1150	2170	9480	2130	2080	1430	1070	816	726	686
28	865	920	1170	1950	8270	2060	2090	1430	1050	783	722	693
29	844	1050	1120	1840	---	1990	1930	1400	1030	820	722	785
30	816	1630	1070	1760	---	2860	2050	1390	984	768	721	995
31	834	---	1120	1670	---	5600	---	1380	---	727	e707	---
TOTAL	28897	27931	74310	114360	91180	97830	103030	52800	40584	26640	21905	21512
MEAN	932	931	2397	3689	3256	3156	3434	1703	1353	859	707	717
MAX	1150	1630	7380	8070	9480	6910	8090	2100	2290	985	872	995
MIN	816	824	1070	1220	1330	1970	1930	1380	984	727	549	683
AC-FT	57320	55400	147400	226800	180900	194000	204400	104700	80500	52840	43450	42670
CFSM	.69	.69	1.78	2.74	2.42	2.35	2.56	1.27	1.01	.64	.53	.53
IN.	.80	.77	2.06	3.17	2.52	2.71	2.85	1.46	1.12	.74	.61	.60

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1909 - 1994, BY WATER YEAR (WY)

	1356	4117	6076	6555	6147	5604	4773	3762	2446	1329	995	985
MEAN	1356	4117	6076	6555	6147	5604	4773	3762	2446	1329	995	985
MAX	2752	12550	23640	15220	13250	12880	8881	7147	4992	2824	1578	1689
(WY)	1963	1974	1965	1965	1986	1972	1993	1963	1984	1913	1976	1986
MIN	683	931	1005	1125	1019	1681	1605	1401	913	717	635	708
(WY)	1988	1994	1977	1977	1977	1992	1926	1926	1926	1926	1992	1929

SUMMARY STATISTICS

	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1909 - 1994
ANNUAL TOTAL	1440714	700979	
ANNUAL MEAN	3947	1920	3667
HIGHEST ANNUAL MEAN			6116
LOWEST ANNUAL MEAN			1639
HIGHEST DAILY MEAN	25000	Mar 18	117000
LOWEST DAILY MEAN	816	Oct 30	549
ANNUAL SEVEN-DAY MINIMUM	855	Oct 25	667
ANNUAL RUNOFF (AC-FT)	2858000	1390000	2656000
ANNUAL RUNOFF (CFSM)	2.94	1.43	2.73
ANNUAL RUNOFF (INCHES)	39.88	19.40	37.07
10 PERCENT EXCEEDS	8620	4000	7410
50 PERCENT EXCEEDS	2590	1370	2400
90 PERCENT EXCEEDS	912	714	879

e Estimated

## UMPQUA RIVER BASIN

375

14319850 GASSY CREEK NEAR NONPAREIL, OR

LOCATION.--Lat 43°25'02", long 123°07'14", in NW 1/4 NE 1/4 sec.12, T.25 S., R.4 W., Douglas County, Hydrologic Unit 17100303, on right bank 0.9 mi upstream from confluence with Calapooya Creek, and 4.2 mi northeast of community of Nonpareil.

DRAINAGE AREA.--9.19 mi<sup>2</sup>.

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

GAGE.--Water-stage recorder. Elevation of gage is 790 ft above sea level, from topographic map.

REMARKS.--No estimated daily discharges. Records good. No diversion upstream from station. Several measurements of water temperature were made during the year.

AVERAGE DISCHARGE.--6 years, 11.8 ft<sup>3</sup>/s, 17.44 in/yr, 8,550 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,190 ft<sup>3</sup>/s Jan. 10, 1989, gage height, 3.61 ft, from rating curve extended above 340 ft<sup>3</sup>/s; no flow on many days most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 240 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 5	2000	*84	*2.13				

No flow July 23 to Sept. 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.25	.28	2.9	4.6	4.7	24	43	6.7	2.1	.41	.00	.00
2	.22	.30	2.7	8.0	4.3	19	27	5.8	1.9	.41	.00	.00
3	.22	.33	.99	16	3.7	31	19	4.9	1.6	.41	.00	.00
4	.19	.37	2.7	17	3.7	39	14	5.9	1.5	.35	.00	.00
5	.23	.36	2.0	53	3.7	28	11	5.7	1.6	.33	.00	.00
6	.24	.35	1.1	52	3.4	21	16	5.0	1.9	.30	.00	.00
7	.36	.37	5.7	29	3.7	16	19	4.2	2.1	.27	.00	.00
8	.37	.37	34	28	3.2	12	20	3.7	1.5	.25	.00	.00
9	.35	.37	23	45	3.0	10	23	3.3	1.2	.21	.00	.00
10	.31	.37	19	38	7.1	8.9	29	3.0	1.0	.18	.00	.00
11	.28	.42	48	28	9.0	7.2	26	2.6	.91	.16	.00	.00
12	.37	.56	37	21	8.8	6.2	20	2.4	.85	.15	.00	.00
13	.37	.51	18	16	9.9	5.6	15	2.3	.97	.14	.00	.00
14	.36	.49	11	12	5.1	5.1	12	2.4	1.3	.13	.00	.00
15	.47	.51	9.4	9.7	14	4.6	9.6	3.2	1.7	.12	.00	.00
16	.62	.54	8.5	8.2	11	5.8	8.0	4.5	1.4	.12	.00	.00
17	.51	.59	7.1	7.3	25	6.3	7.1	5.1	1.2	.11	.00	.00
18	.44	.66	5.7	6.7	44	8.9	6.1	4.9	1.1	.10	.00	.00
19	.40	.66	4.6	5.3	30	13	5.4	4.6	.98	.08	.00	.00
20	.37	.61	3.8	4.4	22	11	4.6	4.2	.84	.06	.00	.00
21	.41	.59	3.2	4.1	29	12	4.2	3.6	.78	.05	.00	.00
22	.40	1.3	2.8	4.1	34	15	3.8	3.3	.89	.03	.00	.00
23	.38	1.3	2.4	8.2	31	16	3.5	2.8	.96	.00	.00	.00
24	.37	.77	2.2	19	52	15	3.8	2.3	.77	.00	.00	.00
25	.36	.60	2.1	24	46	12	4.2	2.0	.66	.00	.00	.00
26	.33	.54	2.0	17	37	9.8	4.5	2.1	.65	.00	.00	.00
27	.34	.56	1.9	11	37	8.1	5.8	2.3	.56	.00	.00	.00
28	.31	.80	1.7	8.9	31	7.1	5.7	2.0	.49	.00	.00	.00
29	.29	1.3	1.6	8.1	---	6.2	4.9	2.0	.44	.00	.00	.00
30	.28	1.8	1.7	6.2	---	33	7.5	1.9	.42	.00	.00	.00
31	.28	---	1.8	5.4	---	59	---	1.7	---	.00	.00	---
TOTAL	10.68	18.58	270.59	525.2	527.2	475.8	382.7	110.4	34.27	4.37	0.00	0.00
MEAN	.34	.62	8.73	16.9	18.8	15.3	12.8	3.56	1.14	.14	.000	.000
MAX	.62	1.8	48	53	52	59	43	6.7	2.1	.41	.00	.00
MIN	.19	.28	.99	4.1	3.0	4.6	3.5	1.7	.42	.00	.00	.00
AC-FT	21	37	537	1040	1050	944	759	219	68	8.7	.00	.00
CFSM	.04	.07	.95	1.84	2.05	1.67	1.39	.39	.12	.02	.00	.00
IN.	.04	.08	1.10	2.13	2.13	1.93	1.55	.45	.14	.02	.00	.00

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1988 - 1994, BY WATER YEAR (WY)

	MEAN	MAX	MIN	WY	1988	1989	1990	1991	1992	1993	1994
MEAN	.62	11.1	20.4	27.7	21.0	24.9	20.3	9.08	5.85	.72	.28
MAX	1.50	25.9	47.2	52.3	43.5	43.4	50.3	23.7	26.6	2.42	1.38
MIN	.14	.62	2.93	10.8	11.6	4.18	5.44	2.01	.73	.14	.000
WY	1989	1994	1990	1992	1992	1992	1990	1992	1992	1994	1992

SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1988 - 1994

ANNUAL TOTAL	6064.77	2359.79	11.8
ANNUAL MEAN	16.6	6.47	20.4
HIGHEST ANNUAL MEAN			6.47
LOWEST ANNUAL MEAN			450
HIGHEST DAILY MEAN	170	59	Jan 10 1989
LOWEST DAILY MEAN	.19	.00	Aug 15 1989
ANNUAL SEVEN-DAY MINIMUM	.23	.00	Aug 15 1989
ANNUAL RUNOFF (AC-FT)	12030	4680	8550
ANNUAL RUNOFF (CFSM)	1.81	.70	1.28
ANNUAL RUNOFF (INCHES)	24.55	9.55	17.44
10 PERCENT EXCEEDS	45	21	35
50 PERCENT EXCEEDS	5.7	1.7	3.2
90 PERCENT EXCEEDS	.37	.00	.00



## UMPQUA RIVER BASIN

14320700 CALAPOOYA CREEK NEAR OAKLAND, OR

LOCATION.--Lat 43°24'10", long 123°21'45", in NW 1/4 sec.13, T.25 S., R.6 W., Douglas County, Hydrologic Unit 17100303, near center of span on downstream side of highway bridge, 0.9 mi downstream from Williams Creek, 2.5 mi northwest of Sutherlin, 3.5 mi southwest of Oakland, and at mile 10.1

DRAINAGE AREA.--210 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1955 to September 1973, October 1986 to current year. Records for the years 1974-86 are available at the Douglas County Water Resources Dept. in Roseburg.

GAGE.--Water-stage recorder. Datum of gage is 371.26 ft above sea level. Prior to June 22, 1968, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Records good. Diversion upstream from station for municipal supply of cities of Sutherlin and Oakland. Small diversions by pumping for irrigation upstream from station.

AVERAGE DISCHARGE.--26 years (water years 1956-73, 1987-94), 442 ft<sup>3</sup>/s, 28.57 in/yr, 319,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,600 ft<sup>3</sup>/s Nov. 23, 1961, gage height, 21.55 ft; no flow Sept. 9-11, 1966, Sept. 8, 1988, all or part of several days in August 1994.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,300 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 5	2030	*1,760	*6.20				

Minimum discharge, no flow all or part of several days in August.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	16	63	87	157	770	966	171	55	21	1.7	1.1
2	12	17	181	171	144	632	674	152	53	20	.57	.71
3	12	17	85	509	134	1070	499	140	46	20	.31	4.7
4	12	18	97	456	125	1180	391	147	45	19	.54	6.6
5	12	21	133	1310	115	896	337	153	44	19	.12	9.7
6	15	20	83	1310	111	690	474	129	56	16	1.0	10
7	17	19	102	807	131	550	517	111	82	16	1.6	7.4
8	19	19	671	751	115	452	519	99	69	16	5.2	3.7
9	18	18	591	1190	107	385	657	91	58	14	1.1	3.8
10	18	18	482	1070	200	359	875	83	50	13	1.6	11
11	17	18	1160	880	245	296	814	77	45	10	3.8	15
12	20	18	1040	688	217	257	636	72	42	10	1.4	15
13	21	19	518	542	243	230	507	67	40	7.9	.73	14
14	21	19	347	443	423	210	413	64	62	7.3	.80	12
15	23	18	292	365	362	193	349	75	78	7.7	.84	11
16	30	18	243	304	315	204	304	127	76	12	.33	7.3
17	28	19	201	260	525	203	266	121	65	12	.00	5.8
18	22	21	170	233	943	207	237	114	60	9.9	.00	7.2
19	20	25	147	207	700	292	212	98	54	8.1	.77	4.7
20	19	22	128	185	536	243	192	91	48	7.0	1.7	1.8
21	18	20	112	169	814	287	178	87	43	3.6	1.6	2.0
22	18	26	99	175	896	354	164	80	41	3.8	3.9	3.2
23	17	43	90	301	781	356	151	70	41	2.2	3.0	1.7
24	17	29	83	402	1430	324	156	63	38	6.2	2.5	3.1
25	18	23	78	422	1390	288	161	58	35	5.5	3.0	1.1
26	18	20	75	331	1190	258	157	53	33	5.2	2.7	.67
27	18	21	71	275	1110	234	177	50	31	2.9	4.1	.75
28	17	23	65	239	931	215	180	49	28	2.5	2.8	.23
29	17	33	61	209	---	195	159	51	25	.63	.45	16
30	16	60	61	186	---	527	189	52	23	.97	.38	24
31	16	---	66	170	---	1150	---	47	---	1.9	.73	---
TOTAL	558	678	7595	14647	14390	13507	11511	2842	1466	301.30	49.27	205.26
MEAN	18.0	22.6	245	472	514	436	384	91.7	48.9	9.72	1.59	6.84
MAX	30	60	1160	1310	1430	1180	966	171	82	21	5.2	24
MIN	12	16	61	87	107	193	151	47	23	.63	.00	.23
AC-FT	1110	1340	15060	29050	28540	26790	22830	5640	2910	598	98	407
CFSM	.09	.11	1.17	2.25	2.45	2.07	1.83	.44	.23	.05	.01	.03
IN.	.10	.12	1.35	2.59	2.55	2.39	2.04	.50	.26	.05	.01	.04

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1956 - 1994, BY WATER YEAR (WY)

	60.9	450	1024	1127	891	840	481	276	113	28.1	11.4	13.5
MEAN	60.9	450	1024	1127	891	840	481	276	113	28.1	11.4	13.5
MAX	329	1240	3856	2296	2229	1912	1342	912	595	73.1	41.9	35.0
(WY)	1957	1962	1956	1956	1961	1961	1963	1963	1993	1993	1993	1971
MIN	6.48	22.6	104	120	290	142	164	58.0	19.9	9.05	1.59	3.06
(WY)	1988	1994	1990	1963	1973	1992	1987	1966	1992	1973	1994	1991

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1956 - 1994
ANNUAL TOTAL	154450	67749.83	
ANNUAL MEAN	423	186	442
HIGHEST ANNUAL MEAN			905
LOWEST ANNUAL MEAN			186
HIGHEST DAILY MEAN	3490	Apr 4	15200
LOWEST DAILY MEAN	12	Sep 30	.00
ANNUAL SEVEN-DAY MINIMUM	12	Sep 29	.50
ANNUAL RUNOFF (AC-FT)	306400	134400	319900
ANNUAL RUNOFF (CFSM)	2.02	.88	2.10
ANNUAL RUNOFF (INCHES)	27.36	12.00	28.57
10 PERCENT EXCEEDS	1160	545	1160
50 PERCENT EXCEEDS	181	60	140
90 PERCENT EXCEEDS	18	2.5	8.5

UMPQUA RIVER BASIN

377

14321000 UMPQUA RIVER NEAR ELKTON, OR

LOCATION.--Lat 43°35'10", long 123°33'15", in NW 1/4 sec.8, T.23 S., R.7 W., Douglas County, Hydrologic Unit 17100303, on left bank 3.5 mi south of Elkton, 8.3 mi upstream from Elk Creek, and at mile 56.9.

DRAINAGE AREA.--3,683 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1905 to current year.

REVISED RECORDS.--WSP 1184: 1927(M), 1938(M), 1943(M), 1946(M). WSP 1448: 1911-13, drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 90.42 ft above sea level. Prior to June 29, 1972, at site 2,400 ft downstream at same datum. See WSP 1931 or 2135 for history of changes prior to June 29, 1972.

REMARKS.--No estimated daily discharges. Water-discharge records good. Regulation by powerplants on North Umpqua River ordinarily does not affect discharge at this station. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--89 years, 7,336 ft<sup>3</sup>/s, 27.06 in/yr, 5,315,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 265,000 ft<sup>3</sup>/s Dec. 23, 1964, gage height, 51.95 ft, from floodmarks; minimum discharge observed, 640 ft<sup>3</sup>/s July 18, 1926.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least December 1861, that of Dec. 23, 1964.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 52,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 9	1230	*20,000	*11.46				

Minimum discharge, 746 ft<sup>3</sup>/s Aug. 23.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1300	1250	2070	1750	2950	14100	10500	3280	1800	1280	948	977
2	1330	1330	2540	1930	2770	12300	8620	3310	1770	1260	938	974
3	1350	1350	4220	4860	2680	12000	7100	3090	1790	1240	952	972
4	1290	1350	2980	8600	2570	12600	6060	2910	1750	1260	957	972
5	1260	1330	2530	8460	2460	11400	5270	3030	1680	1240	928	974
6	1260	1310	3010	15100	2320	9500	4910	3260	1640	1210	916	979
7	1260	1280	2730	12500	2300	7960	5840	3140	1800	1230	914	968
8	1260	1240	4040	9070	2390	6810	7040	2950	2850	1210	911	966
9	1250	1230	17400	11000	2280	6060	7980	2780	2870	1170	911	960
10	1250	1250	11200	16600	2310	5720	11000	2680	2470	1140	904	995
11	1270	1250	9800	13300	3140	5160	12300	2590	2180	1080	898	1000
12	1310	1260	12400	11300	3470	4720	10100	2460	1980	1100	888	1010
13	1360	1260	10500	9550	3400	4330	8260	2360	1870	1110	883	1020
14	1340	1240	7150	7800	3760	4100	7030	2260	1790	1100	881	1000
15	1360	1220	5610	6830	4450	3870	6120	2210	1790	1100	883	996
16	1420	1240	4800	6030	4490	3750	5390	2280	1850	1100	886	980
17	1450	1230	4260	5240	4650	3870	4980	2390	1850	1090	892	958
18	1550	1250	3620	4620	8600	3860	4690	2500	1750	1060	900	936
19	1530	1270	3060	4060	10700	3800	4450	2480	1680	1050	914	919
20	1410	1260	2740	3710	8540	4140	4370	2360	1660	1040	1070	906
21	1360	1260	2540	3550	7760	4050	4210	2360	1610	1060	959	893
22	1330	1280	2370	3320	9580	4460	4030	2400	1540	1050	969	889
23	1310	1320	2120	3440	9180	4880	3790	2350	1480	1050	872	879
24	1300	1440	2020	4170	10600	4670	3550	2280	1480	1010	951	873
25	1330	1440	1880	5620	18400	4500	3510	2150	1460	1030	1000	867
26	1300	1420	1800	5910	15800	4460	3530	2050	1390	1100	995	871
27	1290	1330	1800	5030	16700	4240	3370	1930	1390	1110	996	870
28	1290	1280	1800	4300	16700	3920	3350	1880	1380	1050	1000	867
29	1280	1330	1790	3820	---	3700	3270	1890	1350	999	997	896
30	1280	1450	1740	3470	---	3740	3110	1850	1330	990	991	937
31	1250	---	1690	3200	---	7320	---	1820	---	995	984	---
TOTAL	41130	38950	138210	208140	184950	189990	177730	77280	53230	34514	29088	28304
MEAN	1327	1298	4458	6714	6605	6129	5924	2493	1774	1113	938	943
MAX	1550	1450	17400	16600	18400	14100	12300	3310	2870	1280	1070	1020
MIN	1250	1220	1690	1750	2280	3700	3110	1820	1330	990	872	867
AC-FT	81580	77260	274100	412800	366800	376800	352500	153300	105600	68460	57700	56140
CFSM	.36	.35	1.21	1.82	1.79	1.66	1.61	.68	.48	.30	.25	.26
IN.	.42	.39	1.40	2.10	1.87	1.92	1.80	.78	.54	.35	.29	.29

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1906 - 1994, BY WATER YEAR (WY)

	MEAN	1878	7025	13040	15560	14940	12240	9525	6410	3752	1723	1174	1194
MAX	14200	29500	51220	34900	32800	27100	20480	15800	9526	5063	1867	3475	
(WY)	1951	1974	1965	1956	1907	1972	1937	1921	1953	1913	1976	1920	
MIN	857	832	1238	1440	1365	2909	2432	1934	1053	742	703	740	
(WY)	1930	1930	1977	1977	1977	1992	1926	1934	1926	1926	1931	1931	

SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1906 - 1994

ANNUAL TOTAL	2679660	1201516	7336	
ANNUAL MEAN	7342	3292	13360	
HIGHEST ANNUAL MEAN			2321	1977
LOWEST ANNUAL MEAN			2321	1977
HIGHEST DAILY MEAN	42900	Mar 18	18400	Feb 25
LOWEST DAILY MEAN	1220	Nov 15	867	Sep 25
ANNUAL SEVEN-DAY MINIMUM	1240	Nov 11	874	Sep 22
ANNUAL RUNOFF (AC-FT)	5315000		2383000	
ANNUAL RUNOFF (CFSM)	1.99		.89	
ANNUAL RUNOFF (INCHES)	27.07		12.14	
10 PERCENT EXCEEDS	16700		8340	17100
50 PERCENT EXCEEDS	4170		1820	3910
90 PERCENT EXCEEDS	1300		960	1050

## UMPQUA RIVER BASIN

14321400 ELK CREEK NEAR ELKHEAD, OR

LOCATION.--Lat 43°35'45", long 123°11'35", in NW 1/4 SE 1/4 sec.5, T.23 S., R.4 W., Douglas County, Hydrologic Unit 17100303, on right bank downstream side of Milltown Hill Bridge, 1.5 mi upstream from Adams Creek, 4.0 mi north of Elkhead, and at mile 37.7.

DRAINAGE AREA.--28.7 mi<sup>2</sup>.

PERIOD OF RECORD.--January to August 1968 (gage heights and discharge measurements only), September 1968 to June 1972, October 1986 to current year.

REVISED RECORDS.--WDR OR-93-OR-1: 1991-92, 1991-92 (M).

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 463.99 ft above sea level (Douglas County Highway Department bench mark). Prior to Sept. 1, 1968, nonrecording gage at site 20 ft upstream at datum 1.70 ft lower.

REMARKS.--No estimated daily discharges. Records for flows greater than 10 ft<sup>3</sup>/s good, those below fair.

AVERAGE DISCHARGE.--11 years (water years 1969-71, 1987-94), 45.9 ft<sup>3</sup>/s, 21.72 in/yr, 33,250 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,320 ft<sup>3</sup>/s Jan. 10, 1988, gage height, 6.77 ft, from crest-stage gage; maximum gage height, 7.74 ft Dec 21, 1969; minimum discharge, 0.15 ft<sup>3</sup>/s Aug. 28, 1994.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 820 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 11	1700	*259	*3.84				

Minimum discharge, 0.15 ft<sup>3</sup>/s Aug. 28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	2.3	14	19	21	68	110	15	7.8	3.0	.71	.22
2	1.8	2.3	18	33	20	56	74	14	6.8	3.1	.66	.24
3	1.7	2.5	8.5	76	18	121	55	13	6.2	3.2	.62	.37
4	1.6	2.7	13	62	17	141	44	14	6.3	2.8	.63	.47
5	1.7	2.9	13	164	16	101	37	14	6.6	2.6	.64	.39
6	2.0	2.9	8.9	135	15	75	58	12	7.2	2.6	.62	.34
7	2.4	2.9	21	83	16	59	68	11	9.4	2.5	.56	.30
8	2.3	3.0	125	76	15	48	73	10	7.3	2.5	.61	.32
9	2.3	3.0	80	123	15	40	110	9.5	6.2	2.0	.69	.44
10	2.3	3.0	99	108	21	36	115	8.7	5.6	1.9	.61	.67
11	2.3	3.0	200	85	26	31	90	8.4	5.2	1.7	.58	.80
12	2.6	3.4	138	64	24	27	70	8.2	5.0	1.6	.55	.75
13	2.8	3.4	68	52	31	24	54	7.5	5.2	1.5	.49	.60
14	2.7	3.2	44	44	57	22	44	7.5	6.0	1.5	.49	.46
15	2.7	3.0	34	37	47	21	37	11	8.0	1.4	.49	.39
16	3.4	3.0	27	32	38	21	32	27	6.9	1.4	.45	.36
17	3.4	3.3	23	28	64	20	28	20	5.9	1.4	.41	.39
18	2.9	3.9	20	25	101	25	25	18	5.9	1.2	.36	.33
19	2.7	3.9	18	23	77	34	22	15	5.3	1.1	.37	.33
20	2.6	3.4	16	21	61	29	20	14	4.8	1.1	.37	.32
21	2.6	3.4	15	20	104	34	19	13	4.5	1.0	.38	.31
22	2.6	5.8	14	20	130	40	18	11	4.6	.94	.35	.27
23	2.6	7.1	13	37	110	42	16	9.9	4.7	.98	.31	.26
24	2.5	4.7	12	60	209	38	16	8.8	4.4	.93	.33	.23
25	2.4	3.9	11	59	180	33	17	8.2	4.1	.94	.34	.26
26	2.4	3.6	11	46	138	28	16	7.6	4.2	.94	.32	.30
27	2.4	3.5	10	38	112	25	16	7.3	4.1	.88	.26	.33
28	2.4	3.6	9.6	32	86	22	15	6.9	3.6	.73	.26	.33
29	2.3	5.4	9.2	29	---	20	14	6.9	3.3	.68	.27	1.1
30	2.3	7.7	9.1	25	---	66	18	6.9	3.1	.80	.27	1.0
31	2.3	---	9.4	23	---	138	---	6.7	---	.86	.23	---
TOTAL	74.6	109.7	1111.7	1679	1769	1485	1331	351.0	168.2	49.78	14.23	12.88
MEAN	2.41	3.66	35.9	54.2	63.2	47.9	44.4	11.3	5.61	1.61	.46	.43
MAX	3.4	7.7	200	164	209	141	115	27	9.4	3.2	.71	1.1
MIN	1.6	2.3	8.5	19	15	20	14	6.7	3.1	.68	.23	.22
AC-FT	148	218	2210	3330	3510	2950	2640	696	334	99	28	26
CFSM	.08	.13	1.25	1.89	2.20	1.67	1.55	.39	.20	.06	.02	.01
IN.	.10	.14	1.44	2.18	2.29	1.92	1.73	.45	.22	.06	.02	.02

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 1994, 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	1994
MEAN	5.59	52.4	106	139	89.5	85.9	56.4	28.2	15.3	4.02	1.82	1.88															
MAX	16.3	113	194	253	191	184	133	67.9	71.7	7.72	5.21	4.01															
(WY)	1969	1969	1969	1970	1969	1972	1993	1991	1993	1993	1993	1971															
MIN	1.51	3.66	15.6	35.4	31.1	19.2	21.0	8.16	3.27	1.61	.46	.43															
(WY)	1988	1994	1990	1992	1988	1992	1987	1987	1992	1994	1994	1994															

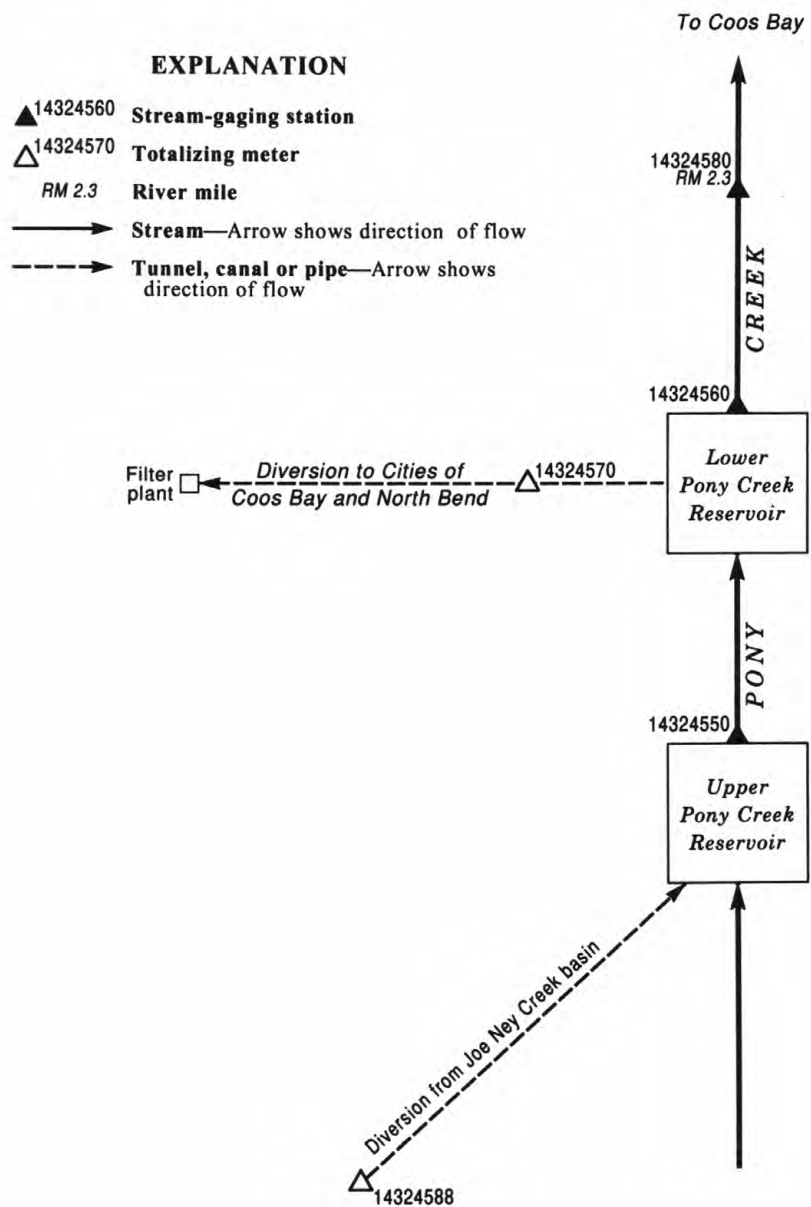
SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1968 - 1994

ANNUAL TOTAL	17324.5	8156.09	
ANNUAL MEAN	47.5	22.3	
HIGHEST ANNUAL MEAN			45.9
LOWEST ANNUAL MEAN			69.4
HIGHEST DAILY MEAN	418	209	1400
LOWEST DAILY MEAN	1.6	.22	.22
ANNUAL SEVEN-DAY MINIMUM	1.7	.25	.25
ANNUAL RUNOFF (AC-FT)	34360	16180	33230
ANNUAL RUNOFF (CFSM)	1.65	.78	1.60
ANNUAL RUNOFF (INCHES)	22.46	10.57	21.71
10 PERCENT EXCEEDS	135	68	126
50 PERCENT EXCEEDS	18	7.3	17
90 PERCENT EXCEEDS	2.3	.43	1.5



**Figure 31.** Schematic diagram showing gaging stations and diversions in the Pony Creek Basin.

## COOS RIVER BASIN

## 14324580 PONY CREEK AT COOS BAY, OR

LOCATION.--Lat 43°22'44", long 124°14'29", in NE 1/4 NE 1/4 sec.28, T.25 S., R.13 W., Coos County, Hydrologic Unit 17100304, at spillway for Lower Pony Creek Reservoir, in Coos Bay, and at mile 2.3.

DRAINAGE AREA.--3.88 mi<sup>2</sup>.

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

REVISED RECORDS.--WDR OR-93-1: Drainage Area.

GAGE.--Water-stage recorder. Datum of gage is sea level (Coos Bay-North Bend Water Board bench mark). Oct. 1, 1982 to September 30, 1987, gage at site 500 ft downstream at same datum. July 1975 to Sept. 30, 1982 and Oct. 1, 1987 to Sept. 30, 1992, at site 0.1 mi downstream, at datum 12.23 ft above sea level.

REMARKS.--Records good. Records prior to 1993 were computed for site at the lower end of culvert under Ocean Boulevard. Flow regulated by Upper and Lower Pony Creek Reservoirs (stations 14324550 and 14324560), diversion upstream from station from Lower Pony Creek Reservoir to municipal water supply of Coos Bay-North Bend (station 14323570) and diversion into the basin from Joe Ney Creek (station 14324590). Approximately 5.5 ft<sup>3</sup>/s is diverted to the Coos Bay-North Bend water treatment plant, maximum capacity, 10.8 ft<sup>3</sup>/s.

COOPERATION.--Data for diversion from Joe Ney Creek into Pony Creek (14324590), and diversion from Lower Pony Creek Reservoir to City of Coos Bay (14324570) provided by Coos Bay-North Bend Water Board.

AVERAGE DISCHARGE.--19 years, 9.59 ft<sup>3</sup>/s, 33.39 in/yr, 6,950 acre-ft/yr, adjusted for Joe Ney diversion into Pony Creek, Coos Bay-North Bend diversion, and change in contents in Upper and Lower Pony Creek Reservoirs.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 181 ft<sup>3</sup>/s Dec. 6, 1981, gage height, 6.19 ft; no flow many days each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 30 ft<sup>3</sup>/s Feb. 24, gage height, 38.92 ft; minimum discharge, no flow many days during year.

MONTHLY DISCHARGE OF PONY CREEK, JOE NEY CREEK DIVERSION, PONY CREEK DIVERSION AND MONTHLY CHANGE IN CONTENTS OF RESERVOIRS NEAR COOS BAY, OR, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

	14324588 Diversion from Joe Ney Creek into Pony Creek (acre-feet)	14324580 Pony Creek at Coos Bay (acre-feet)	14324570 Diversion from Lower Pony Creek Reservoir to City of Coos Bay (acre-feet)	14324560 Lower Pony Creek Reservoir Change in Contents (acre-feet)	14324550 Upper Pony Creek Reservoir Change in Contents (acre-feet)	Pony Creek adjusted for diversion and change in contents (acre-feet) (inches)
October.....	0	0	304.7	-34.5	-179.0	91.2 0.44
November.....	0	0	284.7	-6.1	-168.0	110.6 0.53
December.....	0	0	303.0	-35.1	+567.0	834.9 4.02
CAL YR 1993...	0	2,794.3	3,760.8	-123.7	+235.0	6,666.4 32.06
January.....	0	0	289.2	+58.3	+301.0	648.5 3.12
February.....	0	393.1	260.7	+76.5	+96.0	826.3 3.97
March.....	0	488.1	276.4	-10.2	-17.0	737.3 3.55
April.....	0	98.5	296.2	-7.8	-4.0	382.9 1.84
May.....	0	6.6	374.3	-128.7	-10.0	242.2 1.16
June.....	0	0	372.2	+4.3	-232.0	144.5 0.69
July.....	0	0	458.9	-12.5	-402.0	44.4 0.21
August.....	-18.2	0	472.5	+11.1	-524.0	-58.6 -0.28
September.....	-91.1	0	330.1	-19.9	-227.0	-7.9 -0.04
WTR YR 1994...	-109.3	986.4	4,022.9	-104.6	-799.0	3,996.4 19.22

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	10	2.5	.04	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	11	1.1	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	18	.22	.04	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	19	.63	1.3	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	15	.97	1.4	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	11	2.1	.56	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	9.1	3.4	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	7.8	4.8	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	7.4	6.2	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	9.2	6.8	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	7.3	6.3	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	6.0	5.1	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	4.7	3.9	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	4.3	2.0	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	4.0	.92	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	5.2	.09	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	4.8	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	5.1	.13	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	3.2	7.4	.35	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	14	6.2	.02	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	27	6.8	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	26	9.9	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	25	13	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	29	10	.02	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	26	8.3	.20	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	19	6.3	.28	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	16	4.9	.81	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	13	3.8	.64	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	3.4	.15	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	3.6	.02	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	3.6	---	.00	---	.00	.00	---
TOTAL	0.00	0.00	0.00	0.00	198.20	246.1	49.65	3.34	0.00	0.00	0.00	0.00
MEAN	.000	.000	.000	.000	7.08	7.94	1.65	.11	.000	.000	.000	.000
MAX	.00	.00	.00	.00	29	19	6.8	1.4	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	3.4	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	393	488	98	6.6	.00	.00	.00	.00

CAL YR 1993 TOTAL 1408.77 MEAN 3.86 MAX 64 MIN .00 AC-FT 2790  
WTR YR 1994 TOTAL 497.29 MEAN 1.36 MAX 29 MIN .00 AC-FT 986



## 14325000 SOUTH FORK COQUILLE RIVER AT POWERS, OR

LOCATION.--Lat 42°53'30", long 124°04'10", in SE 1/4 sec.12, T.31 S., R.12 W., Coos County, Hydrologic Unit 17100305, on left bank 0.6 mi downstream from highway bridge at Powers, 0.9 mi upstream from Woodward Creek, and at mile 64.5.

DRAINAGE AREA.--169 mi<sup>2</sup>.

PERIOD OF RECORD.--September 1916 to September 1926, October 1928 to current year.

REVISED RECORDS.--WSP 1184: 1946(M). WSP 1448: 1917-18(M), 1919, 1920(M), 1925.

GAGE.--Water-stage recorder. Datum of gage is 197.42 ft above sea level. Prior to Nov. 17, 1938, nonrecording gage at various sites within 1 mi of present site at different datums.

REMARKS.--No estimated daily discharges. Records good. No regulation. Small diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--75 years (water years 1917-26, 1930-94), 773 ft<sup>3</sup>/s, 62.11 in/yr, 559,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 48,900 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 26.51 ft, from floodmarks, from rating curve extended above 19,000 ft<sup>3</sup>/s on basis of contracted-opening measurement at gage height 18.14 ft and slope-area measurement of peak flow; minimum discharge, 8.2 ft<sup>3</sup>/s Oct. 7, 1991, but may have been less during period of estimated discharge Oct. 8-21, 1991.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 9,300 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 11	0630	*7,970	*8.71				

Minimum discharge, 9.5 ft<sup>3</sup>/s Sept. 27, 28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26	24	626	280	358	909	398	299	162	71	34	26
2	25	24	612	391	324	791	358	273	146	69	34	26
3	25	24	256	562	298	1170	325	257	136	68	34	27
4	25	25	603	666	274	1200	295	356	137	64	34	29
5	25	25	459	1430	254	923	278	424	133	64	34	28
6	25	25	287	1500	240	751	311	351	225	62	33	24
7	26	25	1920	1030	231	632	403	302	293	60	34	23
8	26	24	4920	1390	222	544	663	269	231	58	35	21
9	25	24	2590	2290	204	483	1620	241	184	56	36	26
10	25	24	3210	1610	242	456	1530	218	159	54	35	36
11	33	24	6580	1170	247	401	1140	200	143	51	35	41
12	46	29	3140	884	220	357	853	185	131	50	36	36
13	42	28	1750	714	308	325	686	171	129	48	36	27
14	37	27	1430	603	666	301	574	160	141	47	35	22
15	34	26	1160	513	516	281	494	245	135	47	35	20
16	37	25	932	445	466	310	432	943	132	45	36	18
17	39	28	753	393	2760	289	382	827	121	44	34	16
18	35	34	619	352	2310	350	341	654	116	43	34	16
19	32	31	520	318	1570	433	311	531	107	42	33	15
20	30	29	446	290	1230	371	285	450	101	40	33	15
21	29	27	386	274	1560	725	269	391	100	39	32	14
22	28	41	337	339	1340	804	247	343	99	38	32	13
23	28	63	299	1400	1160	768	247	301	96	39	30	13
24	28	44	269	2050	1420	826	292	269	90	39	30	12
25	28	36	245	1350	1320	800	332	243	86	38	29	12
26	27	32	228	941	1220	776	387	224	84	36	29	12
27	26	33	210	735	1160	754	436	208	80	36	28	11
28	25	38	193	609	1020	690	414	191	76	35	26	11
29	25	149	180	517	---	586	363	184	75	35	27	15
30	24	258	190	452	---	524	337	174	72	34	26	15
31	24	---	223	401	---	455	---	161	---	34	25	---
TOTAL	910	1246	35573	25899	23140	18985	15003	10045	3920	1486	1004	620
MEAN	29.4	41.5	1148	835	826	612	500	324	131	47.9	32.4	20.7
MAX	46	258	6580	2290	2760	1200	1620	943	293	71	36	41
MIN	24	24	180	274	204	281	247	160	72	34	25	11
AC-FT	1800	2470	70560	51370	45900	37660	29760	19920	7780	2950	1990	1230
CFSM	.17	.25	6.79	4.94	4.89	3.62	2.96	1.92	.77	.28	.19	.12
IN.	.20	.27	7.83	5.70	5.09	4.18	3.30	2.21	.86	.33	.22	.14

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1917 - 1994, BY WATER YEAR (WY)

	MEAN	205	1009	1680	1763	1624	1328	914	451	174	61.5	34.7	45.6
MAX	1945	4232	5361	4244	4151	3818	2451	1568	699	186	101	384	
(WY)	1951	1974	1965	1970	1958	1938	1963	1953	1937	1947	1947	1978	
MIN	11.1	15.8	44.1	97.3	209	330	203	78.3	50.8	27.7	17.4	12.1	
(WY)	1988	1937	1977	1977	1977	1934	1990	1939	1924	1926	1939	1987	

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1917 - 1994

ANNUAL TOTAL	295594	137831	773
ANNUAL MEAN	810	378	1374
HIGHEST ANNUAL MEAN			237
LOWEST ANNUAL MEAN			237
HIGHEST DAILY MEAN	11500	6580	34900
LOWEST DAILY MEAN	24	11	9.5
ANNUAL SEVEN-DAY MINIMUM	24	12	9.8
ANNUAL RUNOFF (AC-FT)	586300	273400	559700
ANNUAL RUNOFF (CFSM)	4.79	2.23	4.57
ANNUAL RUNOFF (INCHES)	65.07	30.34	62.11
10 PERCENT EXCEEDS	1940	974	1980
50 PERCENT EXCEEDS	386	180	256
90 PERCENT EXCEEDS	28	25	26

## ELK RIVER BASIN

14327250 ELK RIVER ABOVE ANVIL CREEK, NEAR PORT ORFORD, OR

LOCATION.--Lat 42°44'14", long 124°24'16", in SW 1/4 SE 1/4 sec.6, T.33 S., R.14 W., Curry County, Hydrologic Unit 17100306, on left bank, 400 ft downstream from Oregon Fish and Wildlife Commission property, and at mile 11.0.

DRAINAGE AREA.--83.4 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1993 to September 1994. Operated by Oregon Water Resources Department January 1977 to September 1993.

GAGE.--Water-stage recorder. Elevation of gage is 504 ft above sea level.

REMARKS.--Records good. Slight regulation by fish hatchery 400 ft upstream from station.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 11	0500	*5,260	*7.84	No other peak greater than base discharge.			
Minimum discharge, 18 ft <sup>3</sup> /s Sept. 26.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42	39	907	e210	320	740	268	217	173	114	58	36
2	42	39	479	e290	297	644	251	208	166	112	57	36
3	42	38	228	e500	278	1350	237	216	160	111	56	51
4	42	38	399	e620	261	1380	225	554	183	110	56	44
5	42	36	302	e1200	245	1010	217	471	183	108	55	39
6	42	37	247	e1400	235	791	250	373	304	105	53	37
7	43	37	1380	e950	225	648	299	317	340	103	53	35
8	42	37	2220	e1300	215	552	596	281	283	99	54	42
9	42	37	1100	e1800	214	486	1120	255	242	96	52	62
10	42	39	2020	e1500	213	435	950	236	217	93	51	56
11	57	39	4220	e1090	200	382	707	221	200	90	50	46
12	66	42	1760	e800	189	345	548	208	189	88	48	41
13	53	38	1090	e680	277	318	455	199	210	87	47	38
14	49	37	1130	e560	369	297	389	191	199	85	45	36
15	58	37	996	e470	302	284	344	322	187	85	44	34
16	55	37	783	e420	299	291	313	791	178	84	43	33
17	48	48	622	e360	1510	267	289	610	170	82	43	32
18	45	48	e540	e330	1230	363	269	458	164	79	43	31
19	44	42	e440	299	883	364	252	376	157	77	42	31
20	43	39	e365	278	763	323	238	326	151	75	42	30
21	42	40	e310	275	971	550	235	293	147	73	41	29
22	41	63	e270	407	924	609	218	272	144	73	41	28
23	41	65	e235	1430	909	583	219	250	139	71	40	28
24	42	49	e200	1710	1400	587	219	234	135	72	39	28
25	42	44	e180	1090	1190	546	299	221	131	70	38	27
26	41	42	e170	771	1030	490	288	210	128	68	38	27
27	40	43	e150	610	978	437	282	199	124	66	37	27
28	39	44	e140	511	872	383	267	191	121	64	37	29
29	39	130	e130	443	---	338	249	197	118	62	36	32
30	38	121	e140	390	---	315	234	183	116	61	36	30
31	39	---	e155	350	---	287	---	177	---	59	36	---
TOTAL	1383	1425	23308	23044	16799	16395	10727	9257	5359	2622	1411	1075
MEAN	44.6	47.5	752	743	600	529	358	299	179	84.6	45.5	35.8
MAX	66	130	4220	1800	1510	1380	1120	791	340	114	58	62
MIN	38	36	130	210	189	267	217	177	116	59	36	27
AC-FT	2740	2830	46230	45710	33320	32520	21280	18360	10630	5200	2800	2130
CFSM	.63	.67	10.6	10.5	8.49	7.48	5.06	4.22	2.53	1.20	.64	.51
IN.	.73	.75	12.26	12.12	8.84	8.63	5.64	4.87	2.82	1.38	.74	.57

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1994 - 1994, BY WATER YEAR (WY)

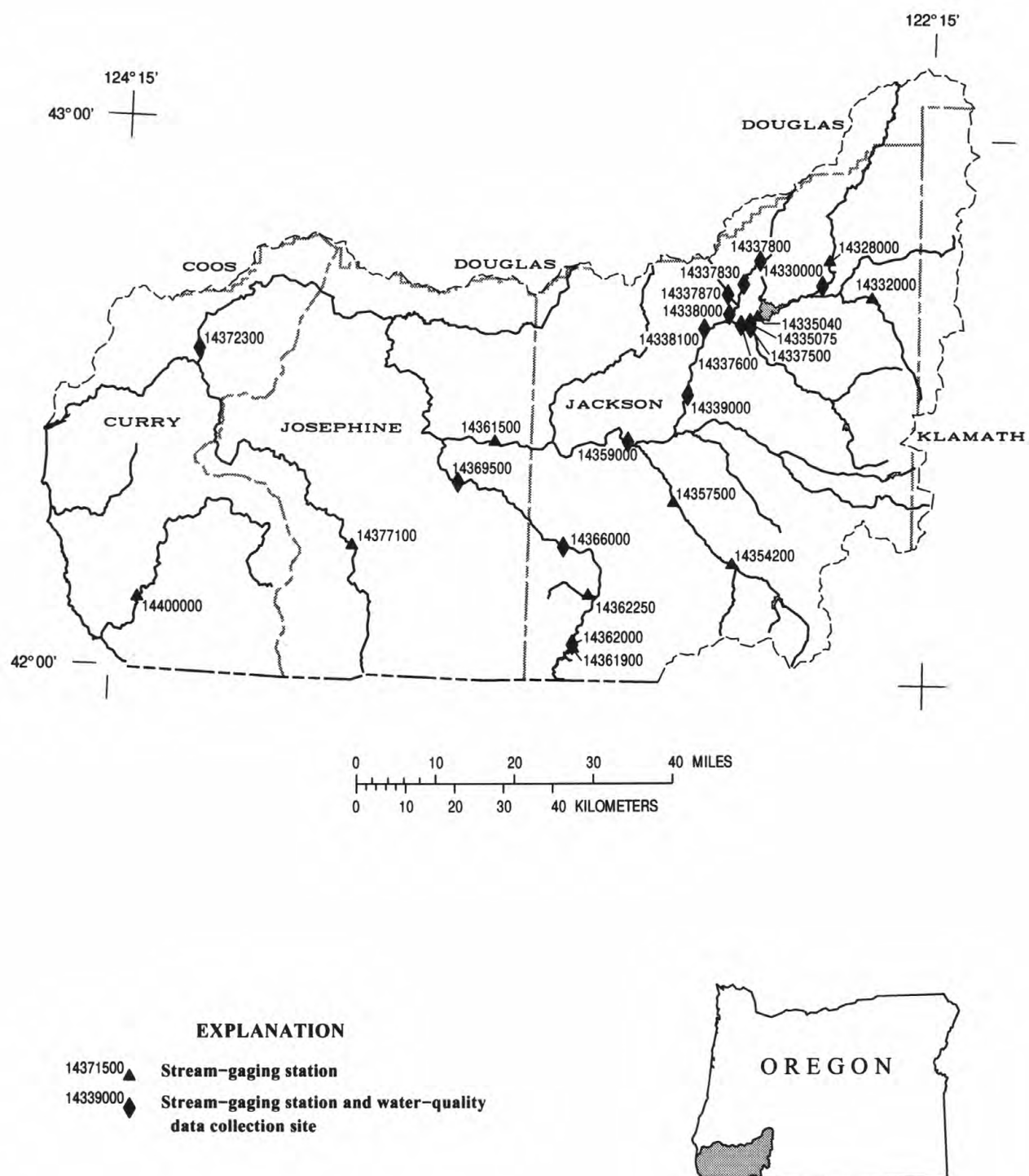
	MEAN	44.6	47.5	752	743	600	529	358	299	179	84.6	45.5	35.8
MAX	44.6	47.5	752	743	600	529	358	299	179	84.6	45.5	35.8	
(WY)	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994
MIN	44.6	47.5	752	743	600	529	358	299	179	84.6	45.5	35.8	
(WY)	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994

SUMMARY STATISTICS

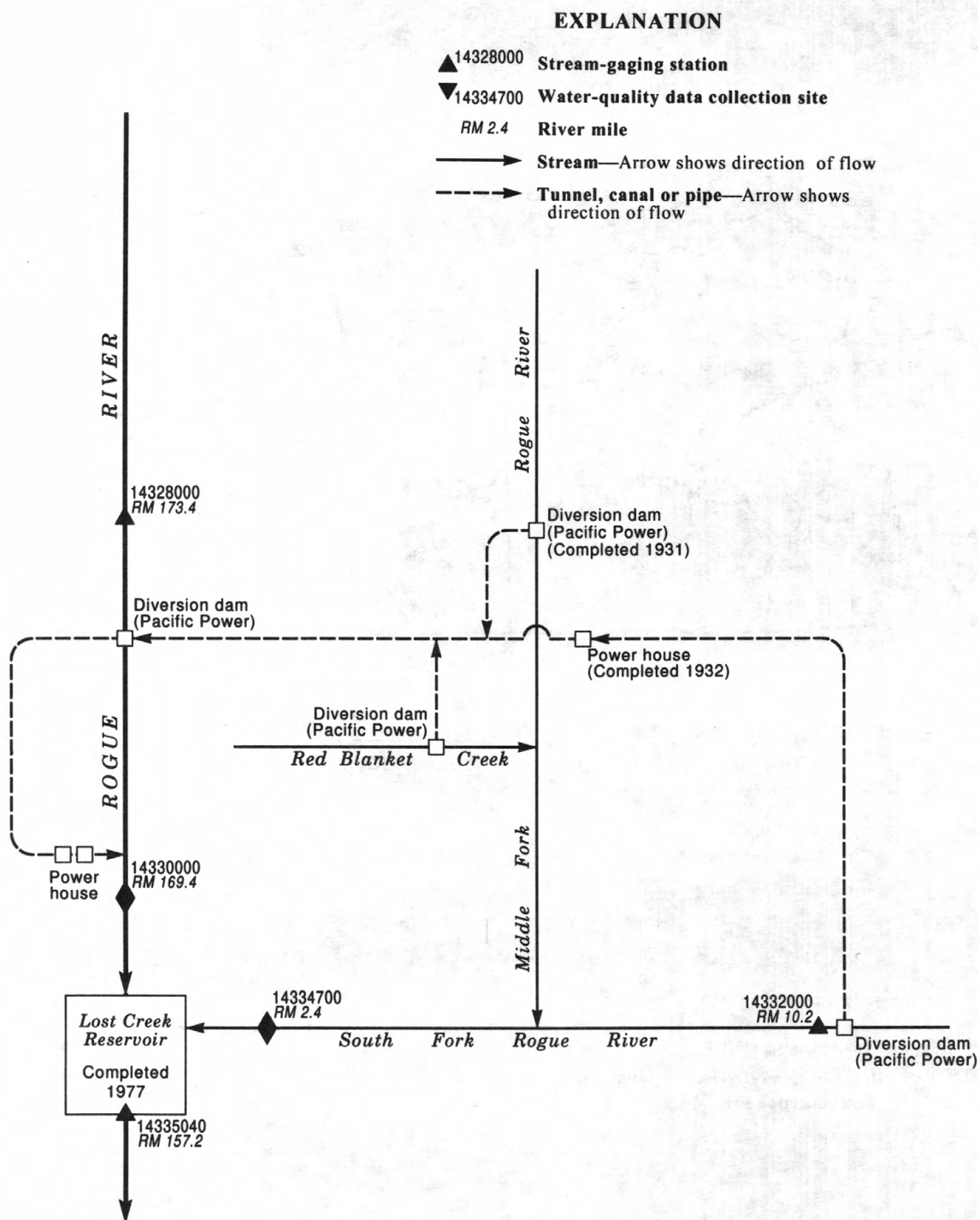
FOR 1994 WATER YEAR

ANNUAL TOTAL	112805
ANNUAL MEAN	309
HIGHEST DAILY MEAN	4220
LOWEST DAILY MEAN	27
ANNUAL SEVEN-DAY MINIMUM	28
ANNUAL RUNOFF (AC-FT)	223700
ANNUAL RUNOFF (CFSM)	4.37
ANNUAL RUNOFF (INCHES)	59.35
10 PERCENT EXCEEDS	829
50 PERCENT EXCEEDS	187
90 PERCENT EXCEEDS	38

e Estimated



**Figure 32.** Location of surface-water and water-quality stations in the Rogue and Chetco River Basins.



**Figure 33.** Schematic diagram showing gaging stations in the Rogue River Basin, upstream from Lost Creek Reservoir.

ROGUE RIVER BASIN

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14328000 ROGUE RIVER ABOVE PROSPECT, OR

LOCATION.--Lat 42°46'30", long 122°29'55", in SE 1/4 NE 1/4 sec.19, T.32 S., R.3 E., Jackson County, Hydrologic Unit 17100307, Rogue River National Forest, on left bank 1.4 mi upstream from Pacific Power and Light Co. diversion dam, 1.8 mi northwest of Prospect, and at mile 173.4.

DRAINAGE AREA.--312 mi<sup>2</sup>.

PERIOD OF RECORD.--January 1908 to February 1912, October 1923 to current year. Monthly discharge only for some periods, published in WSP 1318. Prior to October 1925, published as "near Prospect."

REVISED RECORDS.--WSP 1248: 1925, 1927(M). WSP 1738: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 2,620 ft above sea level, from river-profile map. Prior to Feb. 17, 1912, nonrecording gage at several sites within a few hundred feet upstream at various datums.

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

AVERAGE DISCHARGE.--74 years (water years 1909-11, 1924-94), 813 ft<sup>3</sup>/s, 35.40 in/yr, 589,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,400 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 11.55 ft, from floodmark, from rating curve extended above 9,000 ft<sup>3</sup>/s on basis of slope-area measurement at 16,600 ft<sup>3</sup>/s; minimum observed discharge, 200 ft<sup>3</sup>/s Nov. 20, 1931.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,700 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Apr. 20	0230	*1,150	*2.65				

Minimum discharge, 296 ft<sup>3</sup>/s several days in September.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	440	422	570	457	511	946	964	789	575	395	329	309
2	440	422	653	571	493	997	950	761	542	394	328	309
3	440	422	453	846	482	1020	945	748	527	389	326	316
4	440	422	463	777	471	1120	907	849	521	388	326	320
5	443	422	430	880	466	1060	866	864	522	383	326	311
6	469	422	413	696	466	975	893	838	665	383	326	309
7	456	422	456	615	476	897	907	862	654	379	323	309
8	449	419	832	612	456	856	901	872	589	373	322	305
9	446	417	679	708	442	836	992	865	554	372	322	308
10	446	417	599	700	460	857	1020	843	534	367	322	322
11	447	417	670	671	439	844	996	823	521	366	319	320
12	475	417	591	652	421	805	982	797	514	362	318	318
13	455	417	523	614	422	789	950	745	502	361	318	311
14	467	412	504	612	428	802	928	710	515	358	318	309
15	494	407	476	622	428	826	919	704	502	356	318	306
16	567	403	446	598	428	851	969	721	488	356	318	304
17	481	405	409	572	475	815	999	686	487	351	318	304
18	461	405	400	555	486	786	1040	654	477	350	314	302
19	450	402	444	548	466	753	1100	647	460	346	313	300
20	446	402	436	545	458	715	1100	663	452	345	313	300
21	446	399	415	549	458	705	1080	674	446	344	313	300
22	442	422	399	613	450	678	1020	671	440	342	313	298
23	440	415	395	821	449	654	953	634	430	345	313	296
24	438	373	394	846	543	637	928	624	424	361	313	296
25	432	419	388	740	616	639	887	622	418	347	313	296
26	428	457	388	681	799	634	851	614	417	340	310	296
27	428	444	388	632	1020	649	817	594	412	337	309	296
28	428	434	385	597	949	681	789	570	406	335	309	314
29	428	477	383	569	---	753	779	565	401	335	309	488
30	427	513	386	547	---	953	834	551	399	332	309	354
31	422	---	410	525	---	1030	---	542	---	331	309	---
TOTAL	13971	12647	14778	19971	14458	25563	28266	22102	14794	11123	9837	9426
MEAN	451	422	477	644	516	825	942	713	493	359	317	314
MAX	567	513	832	880	1020	1120	1100	872	665	395	329	488
MIN	422	373	383	457	421	634	779	542	399	331	309	296
AC-FT	27710	25090	29310	39610	28680	50700	56070	43840	29340	22060	19510	18700
CFSM	1.44	1.35	1.53	2.06	1.65	2.64	3.02	2.29	1.58	1.15	1.02	1.01
IN.	1.67	1.51	1.76	2.38	1.72	3.05	3.37	2.64	1.76	1.33	1.17	1.12

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1908 - 1994, BY WATER YEAR (WY)

	MEAN	451	694	899	898	942	983	1183	1335	971	542	436	417
MAX	957	2062	3368	2158	2092	2820	1888	2263	2564	1010	659	602	
(WY)	1951	1910	1965	1970	1958	1972	1966	1952	1933	1953	1976	1972	
MIN	256	292	313	292	325	480	649	456	335	253	222	230	
(WY)	1993	1932	1931	1937	1937	1977	1926	1992	1931	1931	1931	1931	

SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1908 - 1994

ANNUAL TOTAL	337721	196936	813
ANNUAL MEAN	925	540	1268
HIGHEST ANNUAL MEAN			411
LOWEST ANNUAL MEAN			1931
HIGHEST DAILY MEAN	4830	1120	16000
LOWEST DAILY MEAN	372	296	210
ANNUAL SEVEN-DAY MINIMUM	387	297	216
ANNUAL RUNOFF (AC-FT)	669900	390600	589000
ANNUAL RUNOFF (CFSM)	2.97	1.73	2.61
ANNUAL RUNOFF (INCHES)	40.27	23.48	35.40
10 PERCENT EXCEEDS	1980	875	1470
50 PERCENT EXCEEDS	570	456	626
90 PERCENT EXCEEDS	415	314	356



## ROGUE RIVER BASIN

14330000 ROGUE RIVER BELOW PROSPECT, OR

LOCATION.--Lat 42°43'50", long 122°30'55", in SE 1/4 NW 1/4 sec.6, T.33 S., R.3 E., Jackson County, Hydrologic Unit 17100307, on right bank 600 ft downstream from Prospect No. 1 powerplant, 1.4 mi downstream from Mill Creek, 2.0 mi southwest of Prospect, 2.1 mi upstream from South Fork Rogue River, and at mile 169.4.

DRAINAGE AREA.--379 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1913 to September 1930, October 1968 to current year.

REVISED RECORDS.--WSP 1518: 1914-23, 1924(M), 1925, 1928.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 1,964.56 ft above sea level (Pacific Power and Light Co. bench mark). Prior to September 1927 nonrecording gage at site 1,000 ft upstream, above powerplants, at different datum, also concurrent nonrecording gage on headrace to obtain equivalent combined flow.

REMARKS.--Water-discharge records good. Fluctuations caused by powerplant 600 ft upstream from station. Small diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--43 years (water years 1914-30, 1969-94), 1,286 ft<sup>3</sup>/s, 931,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,900 ft<sup>3</sup>/s Jan. 18, 1971, gage height, 7.62 ft, from high-water mark; minimum discharge, 166 ft<sup>3</sup>/s Sept. 29, 1992, result of regulation by upstream diversion gates.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1890, 12.4 ft Dec. 22, 1964, from floodmarks, discharge, 25,000 ft<sup>3</sup>/s, from records for station upstream from Prospect (station 14328000) and for station downstream from South Fork Rogue River near Prospect (station 14335000) after adjusting for estimated intervening tributary inflow.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,930 ft<sup>3</sup>/s Apr. 21, gage height 2.92 ft; minimum discharge, 233 ft<sup>3</sup>/s Sept. 13, result of regulation by upstream diversion gates.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	840	809	989	923	970	1550	1480	1450	1100	e835	693	627
2	842	800	1130	1040	946	1610	1470	1410	1050	e830	690	629
3	834	813	903	1400	935	1630	1460	1400	1070	e825	691	642
4	834	818	929	1290	919	1730	1410	1490	1060	e820	686	640
5	842	813	877	1440	910	1630	1370	1510	1060	e810	688	633
6	882	811	849	1210	910	1510	1420	1490	1260	e810	681	623
7	863	810	914	1110	925	1400	1530	1510	1240	804	680	621
8	844	806	1380	1120	894	1360	1540	1500	1150	787	678	623
9	842	805	1190	1250	887	1330	1600	1500	973	789	672	625
10	846	809	1090	1240	914	1370	1660	1460	1080	780	669	642
11	860	809	1170	1200	862	1330	1630	1460	1060	777	665	635
12	893	808	1080	1160	860	1290	1600	1420	1040	764	661	634
13	866	804	987	1120	866	1270	1560	1360	1020	761	661	619
14	883	800	973	1130	877	1290	1520	1320	1040	745	657	622
15	933	793	933	1130	877	1320	1520	1280	916	733	657	619
16	1010	805	902	1090	872	1350	1580	1300	969	749	655	623
17	893	805	857	1060	940	1300	1620	1250	887	737	652	620
18	867	804	832	1030	943	1260	1710	1230	975	727	641	620
19	863	789	856	1010	914	1220	1810	1260	963	735	650	624
20	851	793	859	1020	902	1170	1820	1280	837	728	645	624
21	847	787	841	1030	918	1170	1770	1300	828	727	647	620
22	844	825	832	1120	897	1140	1680	1290	832	723	643	617
23	837	800	823	1360	913	1110	1600	1220	849	731	640	613
24	834	743	824	1400	1060	1090	1570	1070	814	742	637	612
25	827	766	825	1260	1140	1090	1520	1080	900	714	635	611
26	826	808	829	1190	1380	1090	1470	1090	891	709	636	615
27	822	834	826	1130	1660	1100	1430	1180	878	706	633	613
28	822	829	815	1080	1570	1140	1400	1150	e865	699	630	641
29	818	889	812	1050	---	1200	1400	1140	e850	700	630	852
30	815	925	825	1020	---	1480	1500	1110	e845	698	626	700
31	818	---	859	990	---	1580	---	1060	---	696	632	---
TOTAL	26498	24310	28811	35603	27661	41110	46650	40570	29302	23391	20361	19039
MEAN	855	810	929	1148	988	1326	1555	1309	977	755	657	635
MAX	1010	925	1380	1440	1660	1730	1820	1510	1260	835	693	852
MIN	815	743	812	923	860	1090	1370	1060	814	696	626	611
AC-FT	52560	48220	57150	70620	54870	81540	92530	80470	58120	46400	40390	37760

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1969 - 1994, 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	1994
MEAN	954	1240	1516	1628	1617	1814	1852	2020	1638	1193	1015	942														
MAX	1342	2100	2736	2894	2722	3627	2668	3282	2923	1660	1356	1267														
(WY)	1985	1974	1982	1974	1986	1972	1989	1971	1974	1971	1984	1984														
MIN	606	810	926	946	946	1045	1272	933	765	717	632	623														
(WY)	1993	1994	1991	1977	1977	1977	1977	1992	1992	1992	1992	1992														

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1969 - 1994

ANNUAL TOTAL	552761	363306	1452
ANNUAL MEAN	1514	995	2053
HIGHEST ANNUAL MEAN			1974
LOWEST ANNUAL MEAN			968
HIGHEST DAILY MEAN	5490	1820	9780
LOWEST DAILY MEAN	743	611	555
ANNUAL SEVEN-DAY MINIMUM	786	614	560
ANNUAL RUNOFF (AC-FT)	1096000	720600	1052000
10 PERCENT EXCEEDS	2790	1480	2220
50 PERCENT EXCEEDS	1150	891	1300
90 PERCENT EXCEEDS	823	642	829

e Estimated

ROGUE RIVER BASIN

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14330000 ROGUE RIVER BELOW PROSPECT, OR--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1969 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: November 1976 to September 1981.

pH: November 1976 to September 1981.

WATER TEMPERATURE: October 1968 to current year.

DISSOLVED OXYGEN: October 1979 to September 1981.

SUSPENDED SEDIMENT DISCHARGE: November 1976 to September 1981 (October to April only, 1980 water year, November to April only, 1981 water year).

INSTRUMENTATION.--Water-quality monitor since November 1976. Automatic pumping sediment sampler November 1976 to April 1981.

REMARKS.--During low flows and warm weather, water temperatures may be influenced by return flows from hydroelectric plant 600 ft upstream.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum, 73 microsiemens Sept. 22, 1980; minimum recorded, 28 microsiemens Jan. 13, 1980, may have been lower during period of missing record Jan. 14-17, 1980.

pH: Maximum recorded, 8.3 units Aug. 10, 1981, may have been higher during period of no record in July and August 1981; minimum, 7.0 units Nov. 30, 1976.

WATER TEMPERATURE: Maximum, 20.5°C July 20, 1979 (result of regulation); minimum, 0.0°C at times most years.

DISSOLVED OXYGEN: Maximum, 13.6 mg/L Dec. 8, 1980, Feb. 21, 1981; minimum, 7.2 mg/L June 21, 1980, result of regulation.

SEDIMENT CONCENTRATION: Maximum daily mean (water years 1977-79), 1,270 mg/L (estimated) Jan. 11, 1979; minimum, 0 mg/L on many days each year. Maximum daily mean (period October 1979 to April 1981), 716 mg/L Oct. 25, 1979; minimum daily mean, 0 mg/L on several days in October and December 1979, Nov. 15-21, 28, Dec. 1, 1980, Jan. 19, 1981.

SEDIMENT DISCHARGE: Maximum daily (water years 1977-79), 17,790 tons Dec. 15, 1977; minimum daily, 0 tons on many days each year. Maximum daily (period October 1979 to April 1981), 5,570 tons Jan. 13, 1980; minimum daily, 0 tons on several days in October and December 1979, Nov. 15-21, 28, Dec. 1, 1980, Jan. 19, 1981.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum recorded, 16.0°C July 21; minimum, 1.0°C several days in November, December, and February.

DAY	TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994											
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	---	---	---	6.0	5.0	5.5	4.0	3.5	3.5	4.0	3.5	3.5
2	---	---	---	5.0	4.0	4.5	3.5	2.5	3.0	3.5	3.0	3.0
3	---	---	---	5.0	4.0	4.5	4.0	3.0	3.5	4.0	3.0	3.5
4	---	---	---	5.0	4.0	4.5	4.0	3.5	4.0	4.5	4.0	4.0
5	---	---	---	4.5	3.5	4.0	3.5	3.0	3.5	4.0	2.0	3.0
6	---	---	---	4.5	3.0	4.0	3.5	3.0	3.0	3.0	1.5	2.5
7	---	---	---	4.0	3.5	3.5	4.0	3.5	3.5	3.0	2.5	2.5
8	---	---	---	4.0	3.0	3.5	3.5	2.5	3.0	3.0	3.0	3.0
9	---	---	---	4.0	3.0	3.5	3.0	2.5	2.5	3.5	3.0	3.0
10	---	---	---	4.5	3.5	4.0	4.5	3.0	4.0	3.5	2.5	3.0
11	---	---	---	4.5	3.5	4.0	4.5	3.5	4.0	4.0	3.0	3.5
12	---	---	---	4.0	4.0	4.0	3.5	3.0	3.0	3.5	3.0	3.0
13	---	---	---	4.0	3.0	3.5	3.0	2.5	3.0	3.5	2.5	3.0
14	---	---	---	3.0	2.5	3.0	3.5	2.5	3.0	3.5	2.5	3.0
15	---	---	---	3.0	2.0	2.5	4.0	3.0	3.5	3.0	2.5	3.0
16	---	---	---	3.5	2.5	3.0	3.5	2.0	3.0	3.0	2.0	2.5
17	---	---	---	4.0	3.0	3.5	2.0	1.0	1.5	3.0	2.0	2.5
18	---	---	---	4.0	3.0	3.5	1.5	1.0	1.0	2.5	2.0	2.5
19	---	---	---	3.0	2.5	3.0	1.5	1.0	1.0	3.0	2.0	2.5
20	---	---	---	2.5	2.0	2.5	1.5	1.0	1.0	3.0	2.0	2.5
21	---	---	---	3.0	2.0	2.5	1.5	1.0	1.0	4.0	2.5	3.5
22	---	---	---	2.5	2.0	2.5	1.5	1.0	1.0	4.5	4.0	4.0
23	---	---	---	2.5	1.5	2.0	1.5	1.0	1.0	4.5	4.0	4.5
24	---	---	---	1.5	1.0	1.5	1.5	1.0	1.5	4.0	3.0	4.0
25	6.5	---	---	1.5	1.0	1.5	2.0	1.0	1.5	3.0	2.5	3.0
26	7.0	5.5	6.0	1.5	1.0	1.5	2.5	1.5	2.0	3.5	2.5	3.0
27	6.5	5.5	6.0	2.0	1.5	2.0	2.5	2.0	2.0	3.0	2.0	2.5
28	7.0	5.5	6.0	3.5	2.0	3.0	2.5	2.0	2.5	2.5	1.5	2.0
29	7.0	6.0	6.5	4.0	3.5	4.0	3.0	2.5	2.5	2.5	1.5	2.0
30	6.5	5.5	6.0	4.0	3.5	3.5	3.5	3.0	3.0	2.5	1.5	2.0
31	6.5	5.5	6.0	---	---	---	3.5	3.0	3.5	2.5	1.5	2.0
MONTH	---	---	---	6.0	1.0	3.5	4.5	1.0	2.5	4.5	1.5	3.0

## ROGUE RIVER BASIN

14330000 ROGUE RIVER BELOW PROSPECT, OR--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	2.0	1.0	1.5	5.5	4.5	5.0	6.5	5.0	6.0	8.0	6.5	7.0
2	2.0	1.0	1.5	5.5	4.5	5.0	6.5	6.0	6.0	8.5	6.5	7.0
3	2.0	1.0	1.5	5.5	5.0	5.0	7.0	6.0	6.5	8.0	7.0	7.5
4	2.0	1.0	1.5	5.5	5.0	5.0	7.0	5.5	6.0	8.5	7.5	8.0
5	2.5	1.0	1.5	5.5	4.5	5.0	6.0	5.0	5.0	8.5	7.5	8.0
6	2.5	1.5	2.0	4.5	3.5	4.0	5.0	4.5	5.0	9.5	7.5	8.5
7	3.0	2.0	2.5	5.0	3.5	4.0	5.0	4.5	4.5	11.0	9.0	9.5
8	3.0	2.0	2.5	5.0	4.0	4.5	5.5	5.0	5.0	11.5	9.5	10.0
9	2.5	2.0	2.0	5.5	4.5	5.0	6.0	5.0	5.5	11.0	9.5	10.0
10	2.5	2.0	2.0	6.0	5.0	5.5	7.0	5.0	6.0	11.5	9.5	10.0
11	3.0	2.0	2.5	5.5	4.0	4.5	7.0	5.5	6.5	11.5	9.5	10.5
12	3.0	2.0	2.5	5.5	3.5	4.5	7.0	6.5	6.5	11.0	9.0	10.0
13	3.0	2.0	2.5	6.0	4.0	5.0	7.0	5.5	6.5	10.5	8.5	9.0
14	4.0	2.5	3.0	6.0	4.5	5.5	7.5	5.5	6.5	9.5	8.0	9.0
15	4.0	3.0	3.5	6.0	5.0	5.5	8.5	6.5	7.0	9.0	7.5	8.5
16	4.5	3.5	4.0	5.5	4.5	5.0	8.0	7.5	7.5	8.0	7.0	7.5
17	4.0	3.0	4.0	5.5	4.0	5.0	8.0	7.5	7.5	8.0	7.0	7.5
18	3.0	2.5	3.0	5.0	4.0	4.5	9.0	7.5	8.0	9.0	6.5	7.5
19	3.0	2.5	3.0	4.5	3.5	4.0	9.5	8.5	9.0	8.0	7.5	7.5
20	3.5	2.5	3.0	4.0	3.0	3.5	9.0	8.0	8.5	9.0	7.0	8.0
21	3.0	2.5	2.5	4.5	4.0	4.0	8.5	7.5	8.5	9.5	8.0	8.5
22	3.0	2.0	2.5	4.0	2.5	3.0	7.5	6.5	7.0	10.5	7.5	9.0
23	3.0	2.5	3.0	3.0	2.0	2.5	7.5	6.5	7.0	11.5	8.0	9.5
24	4.0	3.0	3.5	5.5	3.0	4.0	7.5	6.0	6.5	13.0	9.5	11.0
25	4.0	3.0	3.5	6.0	4.0	5.0	7.0	6.0	6.5	13.5	10.5	12.0
26	4.5	3.5	4.0	6.5	4.0	5.0	6.5	6.0	6.0	11.5	10.0	11.0
27	4.5	4.0	4.0	7.0	4.5	5.5	7.5	6.0	6.5	11.5	8.5	10.0
28	5.5	4.0	4.5	7.0	5.0	6.0	8.5	6.0	7.0	10.0	8.5	9.5
29	---	---	---	7.0	6.0	6.5	8.0	7.0	7.5	11.0	8.5	9.5
30	---	---	---	6.5	5.5	6.0	8.5	7.0	7.5	12.0	8.5	10.0
31	---	---	---	6.0	5.0	5.5	---	---	---	12.0	9.5	11.0
MONTH	5.5	1.0	3.0	7.0	2.0	5.0	9.5	4.5	6.5	13.5	6.5	9.0

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE			JULY			AUGUST			SEPTEMBER			
1	12.0	9.5	10.5	14.5	11.5	13.0	14.5	12.0	13.5	12.0	10.5	11.0
2	12.5	9.5	11.0	15.0	12.0	13.5	14.5	12.0	13.5	11.5	10.0	11.0
3	11.5	9.5	10.5	14.0	11.5	12.5	14.5	12.0	13.5	11.5	10.5	11.0
4	12.0	9.5	11.0	14.0	11.0	12.5	14.5	11.5	13.5	11.5	9.5	10.5
5	11.0	9.5	10.5	13.5	11.0	12.0	14.5	12.0	13.0	11.5	9.5	10.5
6	9.5	8.5	9.0	13.5	10.5	12.0	14.0	11.5	12.5	11.5	9.5	10.5
7	9.5	8.0	8.5	14.5	11.0	12.5	14.0	11.5	12.5	11.5	9.5	10.5
8	11.0	7.5	9.0	15.5	12.0	13.5	13.5	11.5	12.5	11.0	9.5	10.5
9	13.0	9.0	10.5	15.5	13.0	14.0	13.0	11.0	12.0	10.5	9.5	10.0
10	14.0	10.0	11.5	15.0	12.0	13.5	13.5	11.0	12.0	10.0	9.0	9.5
11	14.0	11.0	12.5	15.0	12.0	13.5	14.0	11.5	12.5	9.5	8.5	9.0
12	13.5	11.5	12.5	14.5	11.5	13.0	14.0	11.5	12.5	9.0	8.0	8.5
13	12.5	11.0	11.5	14.5	11.5	13.0	14.0	11.5	12.5	9.5	7.5	8.5
14	11.0	9.0	10.0	14.5	11.5	13.0	14.0	11.5	13.0	9.5	8.0	8.5
15	10.5	8.5	9.5	15.0	12.0	13.5	14.0	11.5	12.5	10.0	8.0	9.0
16	11.0	7.5	9.0	15.0	12.0	13.5	13.5	11.0	12.5	10.5	8.5	9.5
17	11.5	8.5	10.0	15.5	12.5	14.0	13.5	11.0	12.0	10.5	9.0	9.5
18	12.0	8.5	10.0	15.5	12.5	14.0	13.0	11.0	12.0	10.5	9.0	10.0
19	13.0	9.0	11.0	15.5	12.5	14.0	13.0	11.0	12.0	11.5	9.0	10.0
20	14.0	10.0	12.0	15.5	13.0	14.5	13.0	10.5	11.5	11.5	9.5	10.5
21	14.5	11.0	12.5	16.0	13.0	14.5	12.5	10.5	11.5	11.5	9.5	10.5
22	15.0	11.5	13.0	15.5	13.5	14.0	12.5	10.5	11.5	11.0	9.5	10.5
23	14.5	11.5	13.0	14.5	12.5	13.5	12.5	10.0	11.5	11.0	9.5	10.0
24	14.0	10.5	12.0	14.5	12.5	13.5	12.5	10.5	11.5	10.5	9.5	10.0
25	13.5	10.5	12.0	14.5	10.5	13.5	12.5	10.5	11.5	11.0	9.0	10.0
26	13.5	10.5	11.5	14.5	12.0	13.0	12.5	10.5	11.5	11.0	9.5	10.0
27	14.0	10.5	12.0	14.5	12.0	13.5	12.5	10.5	11.5	11.0	9.0	10.0
28	14.5	11.0	13.0	15.0	12.0	13.5	12.5	10.5	11.5	10.5	10.0	10.5
29	15.5	12.0	13.5	14.5	12.0	13.5	12.5	10.5	11.5	10.5	10.0	10.5
30	15.0	12.0	13.5	15.0	12.0	13.5	12.5	10.0	11.0	10.5	9.0	9.5
31	---	---	---	14.5	12.0	13.5	12.5	10.0	11.5	---	---	---
MONTH	15.5	7.5	11.0	16.0	10.5	13.5	14.5	10.0	12.0	12.0	7.5	10.0

ROGUE RIVER BASIN

389

14332000 SOUTH FORK ROGUE RIVER NEAR PROSPECT, OR

LOCATION.--Lat 42°42'30", long 122°23'30", in SE 1/4 SW 1/4 sec.7, T.33 S., R.4 E., Jackson County, Hydrologic Unit 17100307, in Rogue River National Forest, on left bank 0.3 mi downstream from South Fork dam and intake of South Fork power canal, 0.31 mi downstream from Imnaha Creek, 5.6 mi southeast of Prospect, and at mile 10.2.

DRAINAGE AREA.--83.8 mi<sup>2</sup>. Drainage area at site upstream from Imnaha Creek was used October 1931 to September 1949, 61.3 mi<sup>2</sup>; and Imnaha Creek near Prospect, 22.2 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1924 to September 1931, October 1949 to current year. Equivalent records for period October 1931 to September 1949 may be obtained by combining flow of South Fork Rogue River above Imnaha Creek, near Prospect and Imnaha Creek near Prospect. Records for period October 1949 to September 1983 included flow of South Fork power canal.

REVISED RECORDS.--WSP 1318: 1925(M), 1927(M), 1930(M). WSP 1738: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 3,300 ft above sea level, from topographic map. Prior to Sept. 10, 1965, at site 1,000 ft upstream at different datum.

REMARKS.--No estimated daily discharges. Records good. All records given herein do not include flow in South Fork power canal (completed in March 1932) which diverts 1,500 ft upstream from station and returns water to main stem Rogue River upstream from South Fork Rogue River; practically no storage upstream from diversion dam.

AVERAGE DISCHARGE.--59 years (water years 1925-83), 178 ft<sup>3</sup>/s, 129,000 acre-ft/yr (includes flow of South Fork power canal).

EXTREMES FOR PERIOD OF RECORD.--River only, maximum discharge, 7,010 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 11.1 ft, from floodmark, from rating curve extended above 410 ft<sup>3</sup>/s on basis of measurement of flow over dam of 3,180 ft<sup>3</sup>/s; no flow Jan. 31, 1950, Sept. 29, 30, 1967 (entire flow diverted to canal).

Combined flow, maximum discharge, 7,010 ft<sup>3</sup>/s Dec. 22, 1964 (no flow in canal); minimum daily, about 38 ft<sup>3</sup>/s Aug. 1-31, 1931.

EXTREMES FOR CURRENT YEAR.--River only, maximum discharge, 164 ft<sup>3</sup>/s Mar. 4, 5, gage height, 2.52 ft; minimum discharge, 9.9 ft<sup>3</sup>/s May 28, 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	72	65	80	77	85	129	125	19	12	13	12	13
2	71	65	93	84	84	134	124	17	12	13	12	13
3	71	66	73	91	84	142	122	16	11	13	12	13
4	70	66	75	112	83	160	121	21	11	12	12	13
5	72	65	70	128	82	163	119	28	12	12	12	13
6	71	65	69	101	83	154	107	39	17	12	11	13
7	71	65	76	93	83	144	21	44	15	12	11	12
8	70	65	131	97	81	138	20	46	12	12	12	13
9	70	64	97	110	80	135	23	45	11	12	13	14
10	70	64	88	107	82	141	25	38	12	12	12	13
11	71	64	92	104	79	134	26	30	12	12	12	13
12	71	64	84	102	79	121	22	25	12	11	12	14
13	73	64	79	96	79	119	20	19	12	12	12	13
14	78	64	78	96	79	121	20	16	13	12	12	13
15	88	64	76	94	79	123	20	15	12	12	12	13
16	90	64	74	92	79	128	24	15	12	12	12	13
17	77	64	71	90	81	121	29	14	12	12	12	12
18	74	63	71	89	79	120	35	14	12	13	15	12
19	72	63	70	88	78	114	53	14	12	13	14	12
20	71	63	70	86	77	111	64	14	12	12	14	12
21	70	63	70	88	78	112	60	16	12	12	13	13
22	69	65	69	92	77	108	41	17	12	12	13	13
23	69	63	69	99	78	105	31	14	12	12	13	13
24	69	65	69	100	86	103	26	13	12	12	13	13
25	68	63	69	96	90	102	22	12	11	12	13	13
26	68	63	68	94	104	100	20	12	12	12	13	13
27	67	63	68	91	123	100	20	11	12	13	12	13
28	67	65	69	89	129	106	19	10	12	13	13	15
29	67	72	68	88	---	113	18	11	12	12	14	30
30	67	72	69	87	---	133	20	12	12	12	14	13
31	65	---	70	86	---	134	---	12	---	12	13	---
TOTAL	2219	1941	2375	2947	2381	3868	1397	629	365	378	390	406
MEAN	71.6	64.7	76.6	95.1	85.0	125	46.6	20.3	12.2	12.2	12.6	13.5
MAX	90	72	131	128	129	163	125	46	17	13	15	30
MIN	65	63	68	77	77	100	18	10	11	11	11	12
AC-FT	4400	3850	4710	5850	4720	7670	2770	1250	724	750	774	805

CAL YR 1993 TOTAL 39560 MEAN 108 MAX 780 MIN 11 AC-FT 78470  
WTR YR 1994 TOTAL 19296 MEAN 52.9 MAX 163 MIN 10 AC-FT 38270

## ROGUE RIVER BASIN

14335040 LOST CREEK LAKE NEAR MCLEOD, OR

LOCATION.--Lat 42°40'16", long 122°40'25", in SW 1/4 sec.26, T.33 S., R. 1 E., Jackson County, Hydrologic Unit 17100307, in outlet structure of Lost Creek Dam on Rogue River, 1.0 mi northeast of McLeod and at mile 157.2.

DRAINAGE AREA.--686 mi<sup>2</sup>.

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

REVISED RECORDS.--WDR OR-85-2: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is sea level (levels by Corps of Engineers). Prior to Nov. 28, 1977, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by earthfill dam completed in October 1976. Storage began in February 1977. Total capacity, 465,000 acre-ft between elevations 1,551.0 ft and 1,872.0 ft, maximum pool elevation. Elevation of gated spillway crest, 1,823.0 ft. Usable storage, 315,000 acre-ft between elevation 1,751.0 ft and 1,872.0 ft. Water is used for flood control, recreation, power generation, pollution abatement, domestic use and other purposes.

COOPERATION.--Capacity table furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 465,800 acre-ft June 1, 2, 1988, elevation, 1,872.24 ft; minimum contents since first filling, 100,800 acre-ft Oct. 29, 1977, elevation, 1,720.50 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 431,000 acre-ft May 6, elevation, 1,861.87 ft; minimum contents, 217,100 acre-ft Sept. 28, elevation, 1,784.12 ft.

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

1,720	100,100	1,850	393,100
1,750	148,200	1,872	465,000
1,800	254,600	1,899	562,900

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1813.58	1812.06	1811.77	1811.91	1817.90	1823.28	1840.76	1860.22	1853.22	1831.24	1823.38	1800.25
2	1813.52	1812.00	1812.07	1812.08	1817.99	1824.14	1841.40	1860.55	1852.71	1831.04	1823.07	1799.32
3	1813.44	1811.96	1812.13	1812.53	1818.07	1825.05	1842.00	1860.88	1852.06	1830.84	1822.77	1798.40
4	1813.37	1811.92	1812.24	1812.94	1818.14	1826.00	1842.59	1861.30	1851.36	1830.63	1822.46	1797.47
5	1813.31	1811.90	1812.28	1813.58	1818.20	1826.88	1843.17	1861.72	1850.52	1830.41	1822.16	1796.53
6	1813.28	1811.87	1812.30	1813.96	1818.27	1827.62	1843.84	1861.86	1849.53	1830.20	1821.84	1795.59
7	1813.21	1811.84	1812.53	1814.23	1818.35	1828.26	1844.47	1861.74	1848.36	1829.99	1821.53	1794.65
8	1813.13	1811.82	1813.16	1814.54	1818.39	1828.86	1845.12	1861.31	1847.13	1829.76	1821.22	1793.70
9	1813.07	1811.79	1813.02	1815.02	1818.44	1829.43	1845.89	1860.67	1845.87	1829.55	1820.90	1792.77
10	1813.03	1811.77	1812.73	1815.45	1818.55	1830.02	1846.66	1860.21	1844.56	1829.32	1820.54	1791.84
11	1813.01	1811.75	1812.57	1815.82	1818.59	1830.57	1847.40	1860.01	1843.20	1829.08	1819.96	1791.12
12	1813.00	1811.74	1812.26	1816.08	1818.62	1831.08	1848.10	1859.83	1841.82	1828.84	1819.16	1790.51
13	1812.95	1811.73	1812.00	1816.20	1818.67	1831.56	1848.78	1859.72	1840.56	1828.59	1818.25	1789.90
14	1812.96	1811.71	1811.92	1816.31	1818.72	1832.06	1849.42	1859.72	1839.44	1828.33	1817.33	1789.27
15	1813.03	1811.67	1811.87	1816.43	1818.78	1832.57	1850.05	1859.75	1838.29	1828.09	1816.42	1788.64
16	1813.14	1811.65	1811.83	1816.50	1818.82	1833.14	1850.72	1859.83	1837.24	1827.84	1815.51	1788.01
17	1813.13	1811.64	1811.82	1816.54	1818.95	1833.65	1851.43	1859.93	1836.36	1827.59	1814.59	1787.36
18	1813.09	1811.62	1811.83	1816.57	1819.06	1834.18	1852.19	1860.01	1835.60	1827.33	1813.67	1786.73
19	1813.03	1811.58	1811.85	1816.58	1819.15	1834.65	1853.03	1859.98	1834.97	1827.07	1812.75	1786.19
20	1812.97	1811.54	1811.87	1816.59	1819.24	1835.09	1853.88	1859.83	1834.45	1826.79	1811.83	1785.79
21	1812.91	1811.50	1811.88	1816.60	1819.37	1835.52	1854.72	1859.72	1834.05	1826.52	1810.90	1785.51
22	1812.86	1811.52	1811.87	1816.71	1819.47	1835.93	1855.47	1859.38	1833.75	1826.26	1809.96	1785.30
23	1812.79	1811.50	1811.85	1816.99	1819.59	1836.31	1856.14	1858.82	1833.49	1826.01	1809.02	1785.07
24	1812.71	1811.43	1811.84	1817.36	1819.86	1836.68	1856.81	1858.40	1833.22	1825.74	1808.09	1784.86
25	1812.63	1811.37	1811.83	1817.55	1820.24	1837.04	1857.43	1858.09	1832.93	1825.46	1807.13	1784.66
26	1812.53	1811.35	1811.82	1817.68	1820.85	1837.37	1858.00	1857.66	1832.66	1825.16	1806.17	1784.48
27	1812.46	1811.34	1811.82	1817.77	1821.73	1837.72	1858.54	1857.10	1832.37	1824.87	1805.20	1784.23
28	1812.40	1811.34	1811.79	1817.81	1822.48	1838.09	1859.03	1856.25	1832.09	1824.58	1804.21	1784.30
29	1812.31	1811.46	1811.78	1817.83	---	1838.55	1859.48	1855.16	1831.80	1824.28	1803.22	1784.37
30	1812.22	1811.57	1811.78	1817.82	---	1839.32	1859.87	1854.18	1831.49	1823.99	1802.22	1784.27
31	1812.13	---	1811.81	1817.83	---	1840.10	---	1853.64	---	1823.68	1801.21	---
MAX	1813.58	1812.06	1813.16	1817.83	1822.48	1840.10	1859.87	1861.86	1853.22	1831.24	1823.38	1800.25
MIN	1812.13	1811.34	1811.77	1811.91	1817.90	1823.28	1840.76	1853.64	1831.49	1823.68	1801.21	1784.23
(†)	285300	283900	284500	300400	312900	363100	424500	404500	338000	316200	257600	217400
(†)	-4100	-1400	+600	+15900	+12500	+50200	+61400	-20000	-66500	-21800	-58600	-40200

CAL YR 1993 MAX 1871.87 MIN 1790.53 AC-FT† +53700

WTR YR 1994 MAX 1861.86 MIN 1784.23 AC-FT† -72000

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

† Change in contents, in acre-feet.



ROGUE RIVER BASIN

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14335075 ROGUE RIVER AT MCLEOD, OR

LOCATION.--Lat 42°39'35", long 122°41'30", in SW 1/4 NW 1/4 sec.34, T.33 S., R.1 E., Jackson County, Hydrologic Unit 17100307, on right bank 0.3 mi upstream from Big Butte Creek, 0.1 southwest of McLeod, and at mile 155.6.

DRAINAGE AREA.--689 mi<sup>2</sup>.

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

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: November 1976 to September 1981.

pH: November 1976 to September 1981.

WATER TEMPERATURE: November 1976 to current year.

DISSOLVED OXYGEN: November 1976 to September 1981.

SUSPENDED SEDIMENT DISCHARGE: October 1976 to September 1981 (October to April only, 1980 water year, November to April only, 1981 water year).

INSTRUMENTATION.--Water-quality monitor since November 1976. Automatic pumping sediment sampler November 1976 to April 1981.

REMARKS.--Water-discharge records, obtained by subtracting Big Butte Creek near McLeod (station 14337500) from Rogue River near McLeod (station 14337600), were used for computation of daily sediment loads.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum, 76 microsiemens Nov. 11, 1977; minimum, 45 microsiemens Dec. 24, 25, 1977.

pH: Maximum, 9.2 units May 8, 9, 11, 12, 1981; minimum, 6.7 units Nov. 8-13, 1978.

WATER TEMPERATURE: Maximum, 15.5°C June 23, 1985, several days in July and August 1994; minimum, 0.5°C

Jan. 9, 1977; minimum since full operation of Lost Creek Lake, 3.5°C several days in February 1979, February 1985, February and March 1989. The minimum may have been lower during period of missing record Feb. 1-20, 1985.

DISSOLVED OXYGEN: Maximum, 15.7 mg/L Jan. 8, 1977; minimum, 6.8 mg/L Aug. 20, 1977.

SEDIMENT CONCENTRATION: Maximum recorded daily mean, 75 mg/L Dec. 14, 1977; minimum daily, 0 mg/L many days.

SEDIMENT DISCHARGE: Maximum recorded daily, 1,570 tons Dec. 14, 1977; minimum daily, 0 tons many days.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum recorded, 15.5°C several days in July and August; minimum, 4.5°C many days January through March.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	7.5	6.5	7.0	8.0	7.5	7.5	7.0	7.0	7.0	---	---	---
2	7.5	6.5	7.0	8.0	7.0	7.5	7.0	7.0	7.0	---	---	---
3	7.5	6.5	7.0	7.5	7.0	7.5	7.0	7.0	7.0	---	---	---
4	7.5	6.5	7.0	8.0	7.0	7.5	7.0	7.0	7.0	---	---	---
5	7.5	7.0	7.0	8.0	7.0	7.5	7.0	6.5	7.0	---	---	---
6	7.0	7.0	7.0	8.0	7.0	7.5	7.0	6.5	7.0	---	---	---
7	7.5	7.0	7.0	8.0	7.0	7.5	7.0	7.0	7.0	---	---	---
8	7.5	7.0	7.0	8.0	7.0	7.5	7.0	7.0	7.0	---	---	---
9	7.5	6.5	7.0	7.5	7.0	7.5	7.0	7.0	7.0	---	---	---
10	7.5	7.0	7.0	7.5	7.0	7.5	7.0	7.0	7.0	---	---	---
11	7.5	7.0	7.0	7.5	7.0	7.5	7.0	6.5	7.0	---	---	---
12	7.5	7.0	7.5	7.5	7.0	7.5	7.0	6.5	6.5	---	---	---
13	7.5	7.0	7.5	7.5	7.0	7.0	6.5	6.5	6.5	5.5	5.5	5.5
14	7.5	7.0	7.5	7.5	7.0	7.0	7.0	6.5	6.5	5.5	5.0	5.5
15	7.5	7.0	7.5	7.5	7.0	7.0	7.0	6.5	6.5	5.5	5.0	5.5
16	8.0	7.0	7.5	7.5	7.0	7.0	6.5	6.0	6.5	5.5	5.0	5.5
17	8.0	7.0	7.5	7.5	7.0	7.0	6.5	6.0	6.0	5.5	5.0	5.5
18	8.0	7.0	7.5	7.5	7.0	7.0	6.5	6.0	6.0	5.5	5.0	5.0
19	8.0	7.0	7.5	7.5	7.0	7.0	6.5	6.0	6.0	5.5	5.0	5.0
20	8.0	7.0	7.5	7.5	6.5	7.0	6.5	6.0	6.0	5.5	5.0	5.0
21	8.0	7.5	7.5	7.0	6.5	7.0	6.5	5.5	6.0	5.5	5.0	5.5
22	8.0	7.0	7.5	7.0	6.5	7.0	6.0	5.5	6.0	5.5	5.0	5.5
23	8.0	7.5	7.5	7.0	7.0	7.0	6.0	5.5	6.0	5.5	5.0	5.5
24	8.0	7.5	7.5	7.0	6.5	7.0	6.0	5.5	5.5	5.5	5.0	5.0
25	8.0	7.0	7.5	7.5	6.5	7.0	6.0	5.5	5.5	5.5	5.0	5.0
26	8.0	7.0	7.5	7.5	6.5	7.0	6.0	5.5	5.5	5.5	5.0	5.0
27	8.0	7.0	7.5	7.0	7.0	7.0	---	---	---	5.5	5.0	5.0
28	8.0	7.0	7.5	7.5	7.0	7.0	---	---	---	5.5	4.5	5.0
29	8.0	7.5	7.5	7.0	7.0	7.0	---	---	---	5.5	5.0	5.0
30	8.0	7.5	7.5	7.5	7.0	7.0	---	---	---	5.5	5.0	5.0
31	8.0	7.0	7.5	---	---	---	---	---	---	5.5	4.5	5.0
MONTH	8.0	6.5	7.5	8.0	6.5	7.0	---	---	---	---	---	---

## ROGUE RIVER BASIN

14335075 ROGUE RIVER AT MCLEOD, OR--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

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

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE			JULY			AUGUST			SEPTEMBER			
1	10.0	8.5	9.0	12.0	9.5	10.5	15.5	14.5	15.0	11.5	9.5	10.5
2	10.0	8.0	9.0	12.0	10.5	11.5	15.0	12.5	13.5	11.0	9.5	11.0
3	10.0	8.0	9.0	12.0	10.5	11.5	13.5	12.5	13.0	11.5	10.0	11.0
4	9.5	9.0	9.5	12.0	10.5	11.5	13.5	12.5	13.0	11.5	10.0	11.0
5	10.0	8.5	9.5	12.5	10.5	11.5	15.0	12.5	14.0	11.5	10.5	11.5
6	9.5	8.0	8.5	12.5	11.0	11.5	15.0	14.0	14.5	12.0	10.5	11.5
7	9.0	8.0	8.5	12.5	11.0	11.5	15.0	14.0	14.5	12.0	11.0	11.5
8	9.0	8.0	9.0	12.5	11.0	12.0	15.0	14.0	14.5	12.5	11.0	12.0
9	9.5	8.0	9.0	12.5	11.5	12.0	15.0	14.0	14.5	12.0	11.0	12.0
10	9.5	8.5	9.0	12.5	11.0	11.5	15.0	14.0	14.5	12.5	11.0	12.0
11	10.0	8.5	9.5	14.0	11.0	12.5	15.0	14.0	14.5	12.5	11.0	12.0
12	10.0	8.5	9.5	14.0	12.5	13.5	15.0	14.5	15.0	12.5	11.5	12.0
13	10.5	9.0	9.5	14.5	13.0	13.5	15.5	14.5	15.0	12.5	11.5	12.5
14	10.5	9.0	10.0	14.5	13.0	13.5	15.5	14.5	15.0	13.0	11.5	12.5
15	10.5	9.0	10.0	14.5	13.0	14.0	15.5	15.0	15.0	12.5	10.5	11.5
16	10.5	9.0	9.5	14.5	13.0	14.0	15.5	15.0	15.0	11.5	10.5	11.0
17	9.5	8.5	9.5	15.0	13.5	14.0	15.5	15.0	15.5	11.5	11.0	11.0
18	10.0	9.0	9.5	14.5	13.5	14.0	15.5	15.0	15.5	11.5	10.5	11.0
19	10.5	9.0	10.0	15.0	13.5	14.0	15.5	15.0	15.5	12.0	10.5	11.5
20	10.5	9.0	10.0	15.0	13.5	14.5	15.5	13.0	14.5	12.0	10.5	11.5
21	10.5	9.0	10.0	15.0	13.5	14.5	14.0	13.0	13.5	12.0	10.5	11.5
22	11.0	9.5	10.5	14.5	13.5	14.5	14.0	12.0	13.0	11.0	10.0	11.0
23	11.0	9.0	10.5	15.5	14.0	14.5	13.0	12.0	12.5	11.0	10.0	10.5
24	10.5	9.0	10.0	15.5	14.0	14.5	13.0	10.5	12.0	11.0	10.0	10.5
25	10.5	9.0	9.5	15.0	14.0	14.5	12.0	8.5	11.0	11.0	10.0	10.5
26	10.5	9.0	9.5	15.5	14.0	14.5	10.0	8.5	9.5	---	---	---
27	10.5	9.0	10.0	15.5	14.0	14.5	10.0	8.5	9.5	---	---	---
28	10.5	9.0	10.0	15.5	14.0	15.0	10.5	9.0	10.0	---	---	---
29	11.0	9.5	10.0	15.5	14.5	15.0	10.5	9.0	10.0	---	---	---
30	11.0	9.5	10.0	15.5	14.0	15.0	11.0	9.0	10.0	---	---	---
31	---	---	---	15.5	14.5	15.0	11.0	9.0	10.5	---	---	---
MONTH	11.0	8.0	9.5	15.5	9.5	13.5	15.5	8.5	13.5	---	---	---

14337500 BIG BUTTE CREEK NEAR MCLEOD, OR

LOCATION.--Lat 42°39'05", long 122°41'25", in NE 1/4 NW 1/4 sec.3, T.34 S., R.1 E., Jackson County, Hydrologic Unit 17100307, on right bank 225 ft upstream from county road bridge, 0.9 mi south of McLeod, and at mile 0.64.

DRAINAGE AREA.--245 mi<sup>2</sup>.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1945 to September 1957. October 1967 to current year.

REVISED RECORDS.--WSP 1738: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,525.95 ft above sea level. Oct. 9, 1945, to Sept. 30, 1957, nonrecording gage at site 260 ft downstream at datum 0.53 ft higher.

REMARKS.--No estimated daily discharges. Records good. Slight regulation by fish hatchery 600 ft upstream from station. Several diversions in the vicinity of Butte Falls, the two largest being the city of Medford diversion and Eagle Point Irrigation District Canal.

AVERAGE DISCHARGE.--39 years (water years 1946-57, 1968-94), 255 ft<sup>3</sup>/s, 184,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,950 ft<sup>3</sup>/s Dec. 22, 1955, gage height, 12.75 ft, site and datum then in use, from rating curve extended above 3,300 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; minimum discharge, 6.4 ft<sup>3</sup>/s June 23, 24, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Dec. 22, 1964, reached a stage of 18.6 ft, present site, from floodmark by local resident, discharge, 16,800 ft<sup>3</sup>/s, from rating curve, at former site. extended above 9,000 ft<sup>3</sup>/s and field estimate of overflow.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,800 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 8	1300	*466	*4.58				

Minimum discharge, 39 ft<sup>3</sup>/s Aug. 4, 27-31.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	86	60	76	77	75	205	122	69	63	52	42	42
2	116	59	82	85	73	168	101	67	59	53	42	44
3	115	59	70	81	73	150	96	71	57	52	42	45
4	115	59	95	88	73	141	88	73	57	52	41	44
5	118	59	71	148	74	122	88	71	59	52	43	44
6	125	59	68	141	76	108	112	68	72	51	44	43
7	124	59	92	104	80	97	118	60	68	50	44	43
8	124	60	353	111	79	91	105	58	58	51	44	55
9	124	60	129	139	77	86	138	55	56	51	44	45
10	124	61	84	127	140	83	187	54	54	51	50	46
11	125	62	134	125	120	79	151	52	54	50	43	49
12	127	62	169	109	96	75	141	57	54	51	51	47
13	121	62	93	99	94	72	129	57	53	51	43	42
14	125	62	82	93	120	140	118	58	55	53	46	43
15	137	61	78	89	104	139	105	62	59	56	53	44
16	143	61	73	84	97	146	96	62	54	52	43	45
17	132	62	69	81	106	144	93	62	53	52	43	48
18	105	62	65	79	119	147	89	62	53	52	46	49
19	63	62	64	79	108	156	87	61	54	51	47	48
20	63	62	64	78	101	141	82	61	52	51	65	48
21	62	63	62	78	118	141	80	68	54	53	76	48
22	62	71	61	77	120	143	78	66	55	52	67	48
23	61	65	60	89	123	112	78	60	55	48	49	48
24	61	62	60	126	122	69	84	57	52	45	48	68
25	61	61	67	113	148	66	87	55	53	45	45	84
26	61	62	71	95	250	64	84	56	54	44	44	83
27	60	63	62	89	297	63	80	57	52	43	39	83
28	60	65	60	84	269	62	78	56	50	43	39	93
29	60	73	60	80	--	62	73	57	52	42	39	119
30	60	75	62	78	--	176	70	56	52	42	39	101
31	60	--	66	76	--	182	--	59	--	42	40	--
TOTAL	2980	1873	2702	3002	3332	3630	3038	1887	1672	1533	1441	1689
MEAN	96.1	62.4	87.2	96.8	119	117	101	60.9	55.7	49.5	46.5	56.3
MAX	143	75	353	148	297	205	187	73	72	56	76	119
MIN	60	59	60	76	73	62	70	52	50	42	39	42
AC-FT	5910	3720	5360	5950	6610	7200	6030	3740	3320	3040	2860	3350

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1946 - 1994, BY WATER YEAR (WY)

	125	194	382	455	464	497	367	232	137	79.7	67.6	70.1
MEAN	125	194	382	455	464	497	367	232	137	79.7	67.6	70.1
MAX	330	535	1334	1325	1121	1362	723	492	450	148	121	106
(WY)	1951	1974	1956	1956	1982	1972	1974	1953	1953	1948	1956	1948
MIN	64.4	60.2	58.0	64.2	91.7	92.2	73.4	57.0	43.7	36.7	43.0	43.8
(WY)	1982	1988	1977	1977	1977	1992	1977	1968	1968	1968	1992	1988

SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1946 - 1994

ANNUAL TOTAL	79492	28779	255
ANNUAL MEAN	218	78.8	501
HIGHEST ANNUAL MEAN			76.6
LOWEST ANNUAL MEAN			15
HIGHEST DAILY MEAN	1330	Jan 22	7190
LOWEST DAILY MEAN	53	Sep 2	30
ANNUAL SEVEN-DAY MINIMUM	54	Sep 1	30
ANNUAL RUNOFF (AC-FT)	157700	57080	184900
10 PERCENT EXCEEDS	536	127	575
50 PERCENT EXCEEDS	125	64	139
90 PERCENT EXCEEDS	59	45	56

## ROGUE RIVER BASIN

14337500 BIG BUTTE CREEK NEAR MCLEOD, OR--Continued

## WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: August 1970 to current year.

INSTRUMENTATION.--Temperature recorder since August 1970.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum, 24.0°C at times in 1973, 1977, 1979-81, 1990; minimum, 0.0°C at times most years.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 22.5°C July 20, 21; minimum, 1.0°C Nov. 25.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	14.0	10.5	12.0	8.5	6.0	7.0	7.0	6.5	7.0	6.5	5.5	6.0
2	13.5	9.5	11.5	8.0	5.0	6.5	6.5	5.5	6.0	6.0	5.5	6.0
3	13.5	9.5	11.0	7.5	5.0	6.5	6.0	5.5	5.5	7.5	6.0	7.0
4	13.0	10.5	11.5	7.5	5.0	6.5	7.0	5.5	6.0	7.5	6.5	7.0
5	14.0	11.0	12.0	7.0	4.5	6.0	6.0	5.0	5.5	6.5	6.0	6.5
6	12.5	11.5	12.0	7.0	4.0	5.5	6.0	4.5	5.5	6.0	5.0	5.5
7	12.5	10.0	11.0	6.5	4.0	5.5	7.0	6.0	6.5	5.5	4.0	4.5
8	11.5	8.0	9.5	6.5	3.5	5.0	6.5	6.0	6.5	6.5	5.5	6.0
9	11.0	7.5	9.0	6.5	4.5	5.5	7.0	5.5	6.0	7.0	6.0	6.5
10	11.5	9.5	10.5	6.5	5.0	5.5	9.0	7.0	8.0	6.0	5.0	5.5
11	11.5	9.5	10.5	6.5	4.5	5.5	8.0	6.0	7.5	7.0	5.5	6.5
12	12.5	10.5	11.5	7.0	5.5	6.0	6.0	5.0	5.5	6.5	6.0	6.0
13	12.5	10.5	11.5	7.0	5.0	6.0	6.0	4.5	5.5	6.0	5.0	5.5
14	11.5	10.0	10.5	5.5	3.5	4.5	6.5	5.5	6.0	5.5	4.0	5.0
15	11.5	10.5	11.0	5.0	2.5	3.5	7.0	6.0	6.5	5.5	4.0	5.0
16	11.0	9.5	10.5	5.5	3.5	4.5	6.0	3.5	4.5	5.0	4.5	4.5
17	10.0	7.5	9.0	6.0	4.5	5.5	3.5	2.5	3.0	4.5	3.5	4.0
18	10.0	7.0	8.5	7.0	4.5	6.0	3.0	1.5	2.5	4.5	2.5	3.5
19	10.0	6.5	8.5	5.0	3.0	4.0	3.0	1.5	2.5	4.5	2.5	3.5
20	10.0	7.0	8.5	4.5	2.0	3.5	3.5	1.5	2.5	5.0	2.5	4.0
21	11.5	9.0	10.0	4.5	2.0	3.0	3.5	1.5	2.5	8.0	4.5	6.5
22	11.0	8.0	9.5	5.5	4.5	5.0	3.5	1.5	2.5	8.5	7.0	7.5
23	10.5	7.5	9.0	4.5	4.0	4.5	3.0	1.5	2.0	8.5	7.5	8.0
24	11.0	8.0	9.0	4.0	2.0	3.0	3.5	1.5	2.5	7.5	5.5	6.5
25	10.0	7.0	8.5	3.5	1.0	2.5	4.0	2.0	3.0	6.0	4.5	5.5
26	10.0	7.0	8.5	4.0	1.5	2.5	5.0	3.0	4.0	6.5	4.5	5.5
27	9.5	6.5	8.0	6.0	3.5	5.0	4.5	2.5	3.5	5.5	3.5	4.5
28	10.0	7.0	8.5	7.0	5.5	6.5	5.0	3.5	4.0	5.0	2.5	3.5
29	10.5	7.5	9.0	7.5	7.0	7.0	5.5	4.0	4.5	5.0	2.5	3.5
30	9.5	6.5	8.0	7.0	6.0	6.5	5.5	4.5	5.0	5.0	2.5	3.5
31	10.0	7.5	8.5	---	---	---	6.0	5.5	5.5	5.0	2.5	3.5
MONTH	14.0	6.5	10.0	8.5	1.0	5.0	9.0	1.5	5.0	8.5	2.5	5.5

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TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY				MARCH			APRIL			MAY		
1	5.0	2.0	3.5	9.5	7.0	8.5	11.5	7.0	9.5	13.0	9.0	11.5
2	4.5	2.0	3.0	9.5	7.5	8.5	11.5	8.0	9.5	15.0	9.0	12.0
3	4.5	2.0	3.0	10.0	8.0	9.0	12.0	7.5	9.5	13.0	11.0	12.0
4	4.5	2.0	3.0	10.5	8.5	9.5	11.5	6.5	9.0	14.0	11.5	12.5
5	5.0	2.0	3.5	10.0	7.5	8.5	9.5	6.5	8.0	14.5	11.5	13.0
6	5.0	3.0	4.0	8.5	5.5	7.0	10.0	7.5	8.5	18.0	12.0	14.5
7	6.0	5.0	5.5	9.0	4.5	7.0	10.0	7.5	8.5	18.5	13.0	15.5
8	5.5	3.5	4.5	8.5	5.5	7.0	9.0	7.5	8.5	19.5	13.5	16.0
9	6.0	4.0	5.0	10.0	6.0	8.0	10.0	7.5	9.0	19.0	13.0	16.0
10	5.5	3.5	5.0	10.5	8.5	9.0	12.0	8.0	10.0	19.5	13.0	16.0
11	5.5	3.5	4.5	10.0	5.5	7.5	12.5	7.5	10.0	18.5	14.0	16.0
12	5.0	2.5	4.0	10.0	5.0	7.5	12.0	9.0	10.5	17.5	12.0	14.5
13	5.0	2.5	4.0	10.5	6.0	8.0	11.5	8.0	10.0	17.0	11.0	14.0
14	7.0	5.0	6.0	10.0	7.0	8.5	13.0	7.5	10.0	14.5	11.5	13.0
15	7.0	5.0	6.0	10.5	7.0	8.5	14.5	8.0	11.0	13.0	11.0	12.0
16	7.5	5.0	6.5	9.5	7.5	8.0	13.5	10.0	11.5	14.0	10.5	12.0
17	7.5	6.0	7.0	10.0	6.5	8.0	14.5	10.5	12.5	14.5	10.5	12.0
18	6.5	5.0	5.5	8.0	6.0	7.0	15.5	11.0	13.0	15.0	9.0	12.0
19	6.0	4.5	5.0	8.5	5.5	6.5	15.5	12.5	13.5	13.0	11.5	12.0
20	7.0	5.0	6.0	7.5	5.0	6.5	16.5	10.5	13.5	16.0	11.0	13.0
21	6.5	5.0	6.0	7.5	6.0	7.0	14.0	12.0	13.0	15.5	12.0	14.0
22	6.5	4.5	5.5	7.0	5.5	6.0	14.0	10.0	11.5	17.5	11.0	14.0
23	6.5	5.5	6.0	6.0	4.5	5.5	13.0	9.5	11.0	19.0	12.0	15.5
24	8.0	6.0	7.0	10.5	5.0	7.5	13.5	9.5	11.5	20.0	13.5	16.5
25	7.5	6.5	7.0	11.0	6.0	8.5	12.0	9.5	11.0	19.0	14.5	16.5
26	8.0	6.5	7.5	11.5	6.0	9.0	11.0	9.0	10.0	16.0	13.0	14.5
27	8.0	7.0	7.5	12.5	7.0	9.5	12.0	9.0	10.5	17.5	11.0	14.0
28	9.0	7.0	8.0	13.0	7.5	10.5	15.0	8.5	11.5	15.0	12.0	13.5
29	---	---	---	12.5	9.5	11.0	13.5	10.0	11.5	17.0	11.5	14.0
30	---	---	---	11.0	9.0	10.0	15.0	10.0	12.5	18.0	11.5	15.0
31	---	---	---	10.5	8.0	9.5	---	---	---	16.5	14.0	15.0
MONTH	9.0	2.0	5.5	13.0	4.5	8.0	16.5	6.5	10.5	20.0	9.0	14.0
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE				JULY			AUGUST			SEPTEMBER		
1	18.5	12.5	15.5	20.0	14.0	17.0	21.0	14.5	17.5	17.0	12.5	15.0
2	18.0	12.5	15.0	21.5	16.0	18.0	20.5	15.0	18.0	16.0	11.5	13.5</





ROGUE RIVER BASIN

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14337600 ROGUE RIVER NEAR MCLEOD, OR--Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: August 1970 to current year.

INSTRUMENTATION.--Temperature recorder since August 1970.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum, 18.0°C July 17, 18, Aug. 7, 1973; minimum, 0.5°C Jan. 3-5, 14, 15, 1971. Maximum since full operation of Lost Creek Lake, 16.0°C July 30, 31, Aug. 1, 2, 1994; minimum, 3.0°C Feb. 2, 1979, Feb. 6, 7, 1989.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 16.0°C July 30, 31, Aug. 1, 2; minimum, 4.0°C Feb. 3-5.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	8.0	7.5	8.0	8.5	8.0	8.0	7.5	7.0	7.5	6.0	6.0	6.0
2	8.0	7.5	8.0	8.0	7.5	8.0	7.5	7.0	7.0	6.0	6.0	6.0
3	8.0	7.5	8.0	8.0	7.5	8.0	7.0	7.0	7.0	6.0	6.0	6.0
4	8.0	7.5	8.0	8.0	7.5	8.0	7.0	7.0	7.0	6.0	6.0	6.0
5	8.5	8.0	8.0	8.0	7.5	7.5	7.0	7.0	7.0	6.0	6.0	6.0
6	8.5	8.0	8.5	8.0	7.5	7.5	7.0	7.0	7.0	6.0	6.0	6.0
7	8.5	8.0	8.0	7.5	7.5	7.5	7.0	7.0	7.0	6.0	5.5	5.5
8	8.0	7.5	8.0	7.5	7.0	7.5	7.0	7.0	7.0	6.0	5.5	6.0
9	8.0	7.5	8.0	7.5	7.5	7.5	7.0	7.0	7.0	6.0	6.0	6.0
10	8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.0	7.0	6.0	6.0	6.0
11	8.5	8.0	8.0	7.5	7.5	7.5	7.5	7.0	7.5	6.0	5.5	6.0
12	8.5	8.0	8.5	8.0	7.5	7.5	7.0	7.0	7.0	6.0	5.5	6.0
13	8.5	8.0	8.5	7.5	7.5	7.5	7.0	7.0	7.0	6.0	5.5	5.5
14	8.5	8.0	8.5	7.5	7.0	7.5	7.0	7.0	7.0	5.5	5.5	5.5
15	8.5	8.0	8.5	7.5	7.0	7.0	7.0	7.0	7.0	5.5	5.5	5.5
16	8.5	8.0	8.5	7.5	7.0	7.0	7.0	6.5	6.5	5.5	5.5	5.5
17	8.5	8.0	8.0	7.5	7.0	7.5	6.5	6.0	6.5	5.5	5.5	5.5
18	8.0	7.5	8.0	7.5	7.5	7.5	6.0	6.0	6.0	5.5	5.0	5.0
19	8.0	7.5	8.0	7.5	7.0	7.0	6.0	5.5	6.0	5.0	5.0	5.0
20	8.0	8.0	8.0	7.0	6.5	7.0	6.0	5.5	6.0	5.0	5.0	5.0
21	8.5	8.0	8.0	7.0	6.5	7.0	6.0	5.5	6.0	5.5	5.0	5.5
22	8.5	8.0	8.0	7.0	7.0	7.0	6.0	5.5	5.5	5.5	5.5	5.5
23	8.5	8.0	8.0	7.0	7.0	7.0	5.5	5.5	5.5	5.5	5.5	5.5
24	8.5	8.0	8.0	7.0	6.5	6.5	5.5	5.5	5.5	5.5	5.0	5.5
25	8.5	8.0	8.0	6.5	6.0	6.5	5.5	5.5	5.5	5.5	5.0	5.5
26	8.5	8.0	8.0	6.5	6.0	6.5	6.0	5.5	5.5	5.5	5.0	5.5
27	8.5	8.0	8.0	7.0	6.5	7.0	6.0	5.5	5.5	5.0	5.0	5.0
28	8.5	8.0	8.0	7.5	7.0	7.0	6.0	5.5	5.5	5.0	5.0	5.0
29	8.5	8.0	8.5	7.5	7.0	7.5	6.0	5.5	6.0	5.0	5.0	5.0
30	8.5	8.0	8.5	7.5	7.0	7.5	6.0	5.5	6.0	5.0	5.0	5.0
31	8.5	8.0	8.5	---	---	---	6.0	6.0	6.0	5.0	4.5	5.0
MONTH	8.5	7.5	8.0	8.5	6.0	7.5	7.5	5.5	6.5	6.0	4.5	5.5
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	5.0	4.5	4.5	6.0	5.5	6.0	7.5	6.5	7.0	9.5	8.5	9.0
2	5.0	4.5	4.5	6.0	6.0	6.0	7.5	7.0	7.0	9.5	8.5	9.0
3	4.5	4.0	4.5	6.5	6.0	6.0	7.5	6.5	7.0	9.0	8.5	9.0
4	4.5	4.0	4.5	6.5	6.0	6.5	7.5	6.5	7.0	9.5	9.0	9.0
5	4.5	4.0	4.5	6.5	6.0	6.0	7.5	6.5	7.0	9.5	9.0	9.0
6	4.5	4.5	4.5	6.0	5.5	6.0	7.0	6.5	7.0	9.5	8.5	9.0
7	5.0	4.5	5.0	6.0	5.0	5.5	7.0	6.5	7.0	9.0	8.5	9.0
8	5.0	4.5	4.5	6.0	5.5	5.5	7.0	7.0	7.0	9.0	8.0	8.5
9	5.0	4.5	4.5	6.0	5.5	6.0	7.5	6.5	7.0	9.0	8.0	8.5
10	5.0	4.5	5.0	6.5	6.0	6.0	8.0	7.0	7.5	9.0	8.0	8.5
11	5.0	4.5	4.5	6.0	5.5	6.0	8.5	7.0	7.5	9.0	8.5	9.0
12	4.5	4.5	4.5	6.0	5.5	5.5	8.5	8.0	8.5	9.5	8.5	9.0
13	4.5	4.5	4.5	6.5	5.5	6.0	8.5	8.0	8.5	9.5	8.5	9.0
14	5.0	4.5	5.0	6.5	6.0	6.0	9.0	8.0	8.5	9.5	8.5	9.0
15	5.0	5.0	5.0	6.5	6.0	6.5	9.0	8.0	8.5	9.5	8.5	9.0
16	5.0	5.0	5.0	6.5	6.0	6.5	9.0	8.5	9.0	9.5	9.0	9.0
17	5.0	5.0	5.0	6.5	6.0	6.5	9.5	8.5	9.0	9.5	9.0	9.0
18	5.0	5.0	5.0	6.5	6.0	6.0	9.5	8.5	9.0	9.5	8.5	9.0
19	5.0	5.0	5.0	6.5	5.5	6.0	9.5	9.0	9.5	9.5	9.0	9.0
20	5.0	5.0	5.0	6.0	5.5	6.0	10.0	9.0	9.5	9.5	8.5	9.0
21	5.0	5.0	5.0	6.0	6.0	6.0	10.0	9.0	9.5	9.5	9.0	9.5
22	5.0	5.0	5.0	6.0	5.5	6.0	9.5	8.5	9.0	12.5	9.0	10.0
23	5.0	5.0	5.0	6.0	5.5	5.5	9.5	9.0	9.5	13.5	12.5	13.0
24	5.5	5.0	5.0	6.5	5.5	6.0	9.5	9.0	9.0	13.0	12.0	12.5
25	5.5	5.0	5.5	6.5	5.5	6.0	9.5	9.0	9.5	12.0	11.0	11.0
26	6.0	5.5	5.5	6.5	6.0	6.0	9.5	9.0	9.0	11.0	10.5	11.0
27	6.0	5.5	6.0	7.0	6.0	6.5	9.5	8.5	9.0	11.0	10.5	10.5
28	6.0	5.5	6.0	7.0	6.5	6.5	10.0	9.0	9.5	11.0	10.0	10.5
29	---	---	---	7.0	6.5	7.0	10.0	9.0	9.5	10.5	10.0	10.5
30	---	---	---	7.0	7.0	7.0	9.5	9.0	9.0	11.0	10.0	10.5
31	---	---	---	7.5	7.0	7.0	---	---	---	11.0	10.0	10.5
MONTH	6.0	4.0	5.0	7.5	5.0	6.0	10.0	6.5	8.5	13.5	8.0	9.5



ROGUE RIVER BASIN

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14337800 ELK CREEK NEAR CASCADE GORGE, OR

LOCATION.--Lat 42°46'25", long 122°40'15", in NW 1/4 sec.23, T.32 S., R.1 E., Jackson County, Hydrologic Unit 17100307, on right bank 0.1 mi downstream from Sugarpine Creek, 6.5 mi northwest of town of Cascade Gorge, and at mile 10.7.

DRAINAGE AREA.--78.8 mi<sup>2</sup>.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 1,813.83 ft above sea level (levels by Corps of Engineers).

REMARKS.--Water-discharge records good. No regulation. Some diversions upstream from station for irrigation.

AVERAGE DISCHARGE.--21 years, 132 ft<sup>3</sup>/s, 22.79 in/yr, 95,740 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,780 ft<sup>3</sup>/s Jan. 15, 1974, gage height, 8.9 ft, from floodmark; minimum discharge, 0.45 ft<sup>3</sup>/s Aug. 31, Sept. 1, 1992.

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

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 8	1300	*588	*4.40	Feb. 27	0630	*588	*4.40

Minimum discharge, 0.61 ft<sup>3</sup>/s Sept. 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.1	5.7	29	22	48	416	135	45	18	6.3	1.9	1.1
2	4.2	5.9	32	30	46	353	111	41	17	5.9	1.7	1.3
3	3.9	5.7	18	46	43	289	98	41	16	5.6	1.6	1.7
4	3.9	5.9	24	63	36	248	85	44	15	5.0	1.6	2.3
5	4.1	6.1	21	140	29	204	79	45	17	5.3	1.7	1.9
6	4.8	6.1	16	161	27	164	99	42	27	5.3	1.7	1.3
7	5.2	6.0	43	113	27	139	124	38	23	5.1	1.5	1.0
8	5.5	5.9	434	147	26	122	134	35	19	5.0	1.5	.95
9	5.3	5.7	202	324	24	111	175	32	17	4.7	1.5	1.1
10	5.2	5.9	105	259	31	103	219	31	15	4.2	1.5	1.9
11	5.3	5.9	100	217	31	94	197	29	14	3.6	1.4	2.5
12	6.8	6.0	104	175	29	87	160	27	14	3.4	1.2	2.3
13	e7.3	6.1	77	139	28	80	133	26	13	3.8	1.3	1.8
14	e6.9	6.1	66	125	36	77	114	25	13	3.2	1.2	1.6
15	11	6.1	61	111	39	75	101	27	13	3.2	1.1	1.5
16	18	6.0	52	95	40	76	91	29	13	3.4	1.1	1.4
17	10	6.1	41	82	55	74	87	27	12	3.0	1.2	1.2
18	8.1	6.6	34	73	89	70	80	25	12	3.3	1.2	1.3
19	7.5	6.3	e25	64	91	66	77	25	11	3.0	1.2	1.1
20	7.3	6.5	e24	59	83	61	71	25	11	2.9	1.4	.95
21	7.1	7.0	e20	56	97	60	69	28	10	2.4	1.4	.99
22	6.7	7.8	e18	58	108	56	60	27	9.3	2.2	1.5	.91
23	6.6	8.0	e17	85	124	57	55	23	8.7	2.8	1.2	.80
24	6.6	8.0	e16	117	279	57	52	22	8.7	2.7	1.1	.78
25	7.2	8.1	e17	127	348	59	59	20	8.6	2.4	1.1	1.0
26	6.7	8.7	19	104	511	59	65	19	8.3	2.1	1.0	1.0
27	6.5	8.7	18	89	569	56	60	19	7.7	2.3	1.0	.76
28	6.0	11	17	79	501	50	52	18	7.5	2.1	1.2	3.6
29	6.0	19	16	71	---	48	47	18	6.7	2.1	1.1	20
30	5.9	26	15	61	---	134	48	17	6.4	2.2	1.1	7.0
31	5.8	---	18	54	---	173	---	16	---	2.3	1.0	---
TOTAL	205.5	232.9	1699	3346	3395	3718	2937	886	391.9	110.8	41.2	67.04
MEAN	6.63	7.76	54.8	108	121	120	97.9	28.6	13.1	3.57	1.33	2.23
MAX	18	26	434	324	569	416	219	45	27	6.3	1.9	20
MIN	3.9	5.7	15	22	24	48	47	16	6.4	2.1	1.0	.76
AC-FT	408	462	3370	6640	6730	7370	5830	1760	777	220	82	133
CFSM	.08	.10	.70	1.37	1.54	1.52	1.24	.36	.17	.05	.02	.03
IN.	.10	.11	.80	1.58	1.60	1.76	1.39	.42	.19	.05	.02	.03

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1973 - 1994, BY WATER YEAR (WY)

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
MEAN	12.9	131	258	262	294	259	191	116	47.7	12.0	5.20	6.29										
MAX	39.8	656	828	802	713	556	352	300	156	24.1	16.3	33.7										
(WY)	1980	1974	1982	1974	1986	1974	1993	1975	1993	1993	1976	1986										
MIN	2.47	7.76	8.00	11.3	11.2	34.1	54.5	18.3	7.10	3.57	.94	.91										
(WY)	1989	1994	1977	1977	1977	1992	1992	1992	1992	1994	1992	1992										

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1973 - 1994
ANNUAL TOTAL	57970.2	17030.34	
ANNUAL MEAN	159	46.7	
HIGHEST ANNUAL MEAN			132
LOWEST ANNUAL MEAN			292
HIGHEST DAILY MEAN	1700	Jan 20	27.4
LOWEST DAILY MEAN	3.9	Oct 3	5200
ANNUAL SEVEN-DAY MINIMUM	4.1	Sep 29	.52
ANNUAL RUNOFF (AC-FT)	115000		.60
ANNUAL RUNOFF (CFSM)	2.02		95740
ANNUAL RUNOFF (INCHES)	27.37		1.68
10 PERCENT EXCEEDS	433		22.79
50 PERCENT EXCEEDS	57		340
90 PERCENT EXCEEDS	5.7		46
			3.7

e Estimated

## ROGUE RIVER BASIN

14337800 ELK CREEK NEAR CASCADE GORGE, OR--Continued

## WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: August 1973 to October 1976, August 1977 to current year.

INSTRUMENTATION.--Temperature recorder August 1973 to October 1976 and since August 1977.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum recorded, 28.5°C July 29, 30, 1973, Aug. 9-11, 1981; minimum, 0.0°C at times during most winter periods.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum recorded, 27.0°C July 20, 21, but may have been higher during period of missing record in July and August; minimum, 0.0°C several days in November and December.

## TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	14.5	12.0	13.0	---	---	---	4.0	3.0	3.5	4.0	3.0	3.5
2	14.0	11.5	12.5	---	---	---	3.5	2.0	3.0	4.5	3.5	4.0
3	14.0	11.5	12.5	---	---	---	3.0	2.0	2.5	6.0	4.5	5.0
4	14.0	12.5	13.5	---	---	---	4.5	2.5	3.5	6.5	5.0	5.5
5	14.5	13.5	14.0	---	---	---	3.0	2.0	2.5	5.5	4.0	4.5
6	14.5	14.0	14.5	---	---	---	3.5	1.5	2.5	5.5	4.0	4.5
7	14.0	11.5	13.0	---	---	---	4.0	3.0	3.5	5.0	3.5	4.0
8	12.5	9.5	11.0	---	---	---	5.5	4.0	5.0	5.5	4.5	5.0
9	12.0	9.5	11.0	---	---	---	5.5	5.0	5.5	6.5	5.5	6.0
10	13.0	11.5	12.5	---	---	---	7.5	5.5	6.5	6.0	5.0	5.5
11	13.0	11.5	12.5	4.0	3.5	3.5	6.0	4.5	5.5	7.0	6.0	6.0
12	14.0	12.5	13.5	4.0	3.0	3.5	5.0	3.5	4.5	6.0	5.0	5.5
13	13.5	12.5	13.0	4.0	3.0	3.5	4.5	3.0	4.0	5.5	4.5	5.0
14	13.0	11.5	12.5	3.0	2.5	3.0	5.0	3.5	4.0	6.0	4.0	5.0
15	12.5	12.0	12.5	3.0	2.5	2.5	5.0	3.5	4.0	5.5	3.5	4.5
16	12.0	11.0	11.5	3.0	2.5	2.5	3.5	1.5	2.5	4.5	3.0	3.5
17	11.0	9.0	10.0	3.0	2.5	3.0	1.5	.5	1.0	4.0	2.0	3.0
18	10.0	8.5	9.5	3.0	3.0	3.0	.5	.0	.5	4.0	1.5	2.5
19	9.5	8.0	9.0	3.0	2.5	2.5	.5	.0	.0	4.0	1.5	2.5
20	9.5	8.5	9.0	2.5	1.5	2.0	.5	.0	.0	4.0	1.5	2.5
21	10.5	9.5	10.0	2.0	1.5	1.5	.5	.0	.0	6.5	3.5	5.5
22	---	---	---	2.0	1.5	1.5	.5	.0	.0	8.0	6.0	7.0
23	---	---	---	1.5	1.0	1.5	.0	.0	.0	8.0	6.5	7.5
24	---	---	---	1.5	.5	1.0	.5	.0	.0	7.0	4.5	6.0
25	---	---	---	.5	.0	.5	.5	.0	.0	6.0	4.0	5.0
26	---	---	---	.5	.0	.0	1.0	.0	.5	6.0	4.0	4.5
27	---	---	---	.5	.0	.0	1.0	.5	.5	5.0	3.0	3.5
28	---	---	---	2.0	.5	1.0	1.5	.5	1.0	4.0	1.5	2.5
29	---	---	---	3.0	2.0	2.5	2.0	1.0	1.5	4.0	1.0	2.5
30	---	---	---	3.5	2.0	3.0	2.5	2.0	2.5	4.0	1.0	2.0
31	---	---	---	---	---	---	3.0	2.5	3.0	3.5	.5	1.5
MONTH	---	---	---	---	---	---	7.5	.0	2.5	8.0	.5	4.5

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



TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN		MAX	MIN	MEAN		MAX	MIN	MEAN		MAX	MIN	MEAN
		JUNE				JULY				AUGUST				SEPTEMBER	
1	16.0	12.5	14.0		---	---	---						---	---	---
2	16.0	12.5	14.0		---	---	---						---	---	---
3	15.0	12.5	14.0		---	---	---						16.0	14.5	15.0
4	16.0	13.0	14.5		---	---	---						15.5	13.0	14.0
5	15.0	13.5	14.0		---	---	---						15.5	13.0	14.0
6	13.5	12.0	13.0		---	---	---						15.5	13.5	14.5
7	14.0	11.0	12.5		---	---	---						16.0	13.5	15.0
8	15.0	10.5	13.0		---	---	---						15.5	13.5	14.5
9	17.0	12.0	14.5		---	---	---						15.0	13.0	14.0
10	18.0	13.5	16.0		---	---	---						14.5	12.5	13.5
11	18.5	15.0	16.5		---	---	---						14.0	12.0	13.0
12	18.0	15.0	16.5		---	---	---						13.0	10.5	12.0
13	17.5	15.5	16.5		---	---	---						13.5	10.5	12.0
14	15.5	13.0	14.0		---	---	---						13.5	10.0	11.5
15	15.0	12.0	13.5		---	---	---						13.5	10.5	12.0
16	15.5	11.5	13.5		25.0	16.0	20.0						14.5	11.0	13.0
17	14.5	13.0	13.5		26.0	17.0	21.0						---	---	---
18	16.5	12.0	14.0		25.5	16.0	20.0						---	---	---
19	17.5	12.5	15.0		26.0	17.0	21.0						---	---	---
20	19.0	14.0	16.5		27.0	16.5	22.0						---	---	---
21	19.0	15.5	17.0		27.0	19.5	23.0						---	---	---
22	20.0	15.5	17.5		23.5	20.0	21.5						---	---	---
23	19.0	15.5	17.0		24.5	18.0	21.0						14.5	---	---
24	19.0	14.5	16.5		26.0	17.5	21.5						14.5	12.5	13.5
25	18.5	15.0	16.5		25.0	16.0	20.0						15.5	13.0	14.0
26	19.0	14.5	16.5		25.0	15.5	19.5						15.5	13.5	14.5
27	20.0	15.0	17.5		24.5	15.5	19.5						---	---	---
28	21.0	16.0	18.5		---	---	---						---	---	---
29	21.5	17.0	19.0		---	---	---						---	---	---
30	---	---	---		---	---	---						---	---	---
31	---	---	---		---	---	---						---	---	---
MONTH	---	---	---		---	---	---						---	---	---

## ROGUE RIVER BASIN

14337830 ELK CREEK BELOW ALCO CREEK, NEAR TRAIL, OR

LOCATION.--Lat 42°40'46", long 122°42'37", in NW 1/4 sec.4, T.33 S., R.1 E., Jackson County, Hydrologic Unit 17100307, on Corps of Engineers' Land, on right bank 500 ft downstream from Alco Creek, and 7.5 mi northeast of Trail.

DRAINAGE AREA.--111 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1986 to current year (operated as a low-flow station only).

GAGE.--Water-stage recorder. Elevation of gage is 1,680 ft above sea level, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are poor. No regulation. Some diversions upstream from station for irrigation. Operated as a low-flow station only. Discharges above 480 ft<sup>3</sup>/s not estimated.

EXTREMES FOR PERIOD OF RECORD.--Minimum discharge recorded, 0.54 ft<sup>3</sup>/s Sept. 23, 1992, but may have been less during period of estimated discharge during that year.

EXTREMES FOR CURRENT YEAR.--Minimum daily discharge, 0.60 ft<sup>3</sup>/s Aug. 12.DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.7	6.6	26	29	50	---	161	49	17	4.9	.85	e.80
2	3.7	6.7	42	38	46	381	126	46	16	4.3	e.80	e1.0
3	3.1	6.9	23	56	43	299	106	43	15	4.1	e.80	e1.5
4	2.9	7.0	29	68	40	249	90	45	15	3.3	e.80	e2.0
5	3.2	7.4	29	e160	37	203	80	45	15	2.5	e.80	e1.5
6	4.3	7.9	21	e200	35	165	101	43	25	2.5	e.80	e1.0
7	5.3	7.9	36	e140	35	136	138	39	22	2.8	e.70	e.80
8	5.6	7.5	---	e160	34	115	148	37	20	2.8	e.80	e.80
9	5.6	7.4	280	e370	32	101	190	34	17	2.4	e.80	e.80
10	6.9	7.4	128	e310	41	94	254	31	15	2.9	e.70	e1.6
11	7.9	7.5	111	e250	44	84	226	29	12	2.1	e.70	e2.1
12	9.4	7.9	131	e200	40	75	182	26	11	2.0	e.60	e2.0
13	9.8	7.9	92	156	39	68	148	25	11	2.0	e.70	e1.4
14	9.0	7.9	77	e140	47	65	123	24	11	1.8	e.70	e1.3
15	13	7.9	73	e120	54	62	105	23	11	1.6	e.70	e1.2
16	21	7.9	66	e100	55	63	94	26	11	1.6	e.70	e1.0
17	14	8.1	54	e84	65	59	84	26	11	1.8	e.70	e.90
18	11	8.3	44	e70	107	55	77	25	11	1.6	e.70	e1.0
19	10	e6.9	37	e64	116	54	72	24	9.6	1.6	e.70	e.90
20	9.0	e6.4	32	e59	104	49	67	25	8.8	1.6	e.90	e.80
21	8.6	e7.9	28	54	118	48	63	28	7.8	1.6	e.90	e.80
22	8.0	11	27	56	144	48	57	27	7.5	1.5	e1.1	e.80
23	7.6	12	e26	80	159	48	53	23	6.8	1.5	e1.0	e.70
24	7.4	9.1	e25	125	331	47	52	21	6.4	1.3	e.90	e.70
25	7.5	8.5	e23	152	---	48	55	20	6.7	1.3	e.90	e.80
26	8.0	9.8	e22	117	---	48	62	19	7.2	1.2	e.80	e.80
27	7.0	11	e21	97	---	47	59	18	6.7	1.2	e.80	e.70
28	6.9	14	e19	82	---	45	55	18	4.8	1.1	e.80	e2.0
29	6.7	19	e18	71	---	46	49	17	4.4	1.0	e.80	e23
30	6.3	33	e17	62	---	129	51	16	4.9	.96	e.80	e7.0
31	6.6	---	e23	56	---	212	---	16	---	.92	e.80	---
TOTAL	240.0	284.7	---	3726	---	---	3128	888	347.6	63.78	24.55	61.70
MEAN	7.74	9.49	---	120	---	---	104	28.6	11.6	2.06	.79	2.06
MAX	21	33	---	370	---	---	254	49	25	4.9	1.1	23
MIN	2.9	6.4	---	29	---	---	49	16	4.4	.92	.60	.70
AC-FT	476	565	---	7390	---	---	6200	1760	689	127	49	122
CFSM	.07	.09	---	1.08	---	---	.94	.26	.10	.02	.01	.02
IN.	.08	.10	---	1.25	---	---	1.05	.30	.12	.02	.01	.02

e Estimated

14337830 ELK CREEK BELOW ALCO CREEK, NEAR TRAIL, OR--Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: April 1986 to current year.

INSTRUMENTATION.--Temperature recorder since April 1986.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum recorded, 31.5°C June 22, 1992, but may have been higher during period of missing record in August 1992; minimum, 0.0°C at times during most winter periods.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum recorded, 30.0°C July 21; minimum recorded, 0.0°C several days in November, December, and February.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	19.5	13.0	16.0	10.5	6.5	8.5	5.5	5.0	5.0	5.0	3.5	4.0
2	19.0	12.5	15.5	9.5	5.5	7.0	5.5	4.0	4.5	5.0	4.0	4.5
3	19.0	12.5	15.5	8.0	5.0	7.0	5.0	4.0	4.5	6.0	4.5	5.5
4	18.0	14.0	16.0	8.5	5.0	6.5	5.5	4.5	5.0	7.0	5.5	6.0
5	19.5	15.0	17.0	8.5	4.5	6.0	5.0	3.5	4.0	6.0	4.5	5.0
6	17.0	15.0	16.0	8.0	4.0	5.5	5.0	3.5	4.0	5.5	4.0	4.5
7	16.5	12.0	14.0	7.5	3.5	5.5	5.5	4.5	5.0	4.5	3.0	4.0
8	15.5	10.0	12.5	6.5	3.0	5.0	6.5	5.5	6.5	5.5	4.5	5.0
9	14.5	9.5	12.0	6.0	4.0	5.0	7.0	6.0	6.5	6.5	5.5	6.0
10	15.5	12.0	13.5	7.0	4.0	5.5	8.5	6.5	7.5	5.5	4.5	5.0
11	15.0	12.0	13.5	6.0	4.0	5.0	7.5	5.5	7.0	6.5	5.5	6.0
12	16.0	13.5	14.5	6.5	4.5	5.5	6.0	5.0	5.5	6.0	4.5	5.0
13	16.0	13.0	14.5	6.0	3.0	4.5	5.5	4.0	5.0	5.0	4.5	5.0
14	14.5	12.0	13.0	5.5	2.0	3.5	6.0	4.5	5.5	---	---	---
15	14.0	12.5	13.5	4.5	1.5	3.0	6.0	5.0	5.5	---	---	---
16	13.5	11.0	12.5	4.5	2.5	3.5	5.0	2.5	4.0	---	---	---
17	12.5	9.0	10.5	5.0	3.0	4.0	2.5	1.0	2.0	---	---	---
18	12.5	8.0	10.0	6.5	4.0	5.0	2.0	.0	1.0	3.5	---	---
19	12.5	7.5	10.0	5.0	1.5	3.0	1.5	.0	.5	3.5	1.5	2.5
20	12.0	8.0	10.0	4.0	1.0	2.0	1.5	.0	.5	3.5	1.5	2.5
21	13.5	10.0	11.5	2.5	.5	1.5	1.5	.0	.5	6.0	3.5	5.0
22	13.5	9.5	11.0	4.0	2.5	3.0	1.0	.0	.5	7.5	6.0	6.5
23	12.5	8.5	10.5	2.5	1.0	2.0	1.0	.0	.5	7.5	6.5	7.0
24	13.5	9.0	11.0	2.5	.0	1.0	1.0	.0	.5	7.0	5.0	6.0
25	13.0	9.0	10.5	2.0	.0	.5	1.0	.0	.5	5.5	4.0	5.0
26	12.5	8.5	10.5	2.0	.0	1.0	2.5	.5	1.0	5.5	4.0	4.5
27	11.0	8.0	9.5	3.5	1.5	2.5	1.5	.0	1.0	4.5	3.0	4.0
28	12.5	8.0	10.0	4.5	3.0	4.0	3.0	.5	1.5	3.5	1.5	3.0
29	13.0	8.5	10.5	4.5	4.0	4.5	3.0	1.0	2.0	3.5	1.5	2.5
30	11.5	7.5	9.5	5.5	4.0	4.5	3.5	2.0	2.5	3.5	1.0	2.5
31	12.0	8.0	10.0	---	---	---	4.0	3.0	3.5	3.0	.5	2.0
MONTH	19.5	7.5	12.5	10.5	.0	4.0	8.5	.0	3.5	---	---	---
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	3.0	.5	1.5	8.5	6.0	7.0	10.5	5.5	8.0	12.0	8.0	10.0
2	3.0	.0	1.5	8.0	6.5	7.5	10.5	6.5	8.5	14.0	8.0	11.0
3	3.0	.0	1.5	8.5	7.0	7.5	11.5	7.0	9.0	12.0	10.0	11.5
4	3.0	.0	1.0	8.5	7.0	7.5	11.0	5.5	8.5	14.0	10.5	12.0
5	2.5	.0	1.0	8.5	5.5	7.0	8.5	5.0	6.5	14.0	10.5	12.5
6	2.5	.5	1.5	7.5	3.5	5.5	8.5	6.5	7.0	18.0	11.0	14.5
7	4.0	2.5	3.0	8.0	3.5	5.5	8.5	6.0	7.0	19.0	13.0	16.0
8	4.0	1.0	2.5	8.0	4.5	6.5	8.0	6.5	7.0	19.5	13.5	16.5
9	3.5	2.0	3.0	9.0	5.0	7.5	8.5	6.5	7.5	19.0	13.0	16.0
10	4.0	2.5	3.5	9.5	7.0	8.0	11.0	6.5	8.0	20.0	13.5	16.5
11	4.5	2.0	3.0	8.5	4.5	6.5	11.0	6.0	8.5	19.5	14.5	16.5
12	3.5	1.0	2.5	8.5	4.0	6.5	10.5	7.5	9.0	18.5	12.5	15.5
13	3.5	1.5	2.5	9.0	4.5	7.0	11.0	6.5	8.5	18.5	12.0	15.0
14	6.0	3.5	4.5	10.0	5.5	8.0	12.5	6.0	9.0	16.5	11.5	14.0
15	6.0	4.0	5.0	10.5	6.0	8.0	13.5	6.5	10.5	14.0	12.0	12.5
16	6.0	3.5	5.0	8.5	6.5	7.5	13.0	8.5	11.0	14.5	10.5	12.5
17	6.0	4.0	5.5	10.0	5.5	7.5	15.0	10.0	12.5	15.0	10.0	12.5
18	5.5	3.5	4.5	7.5	5.0	6.0	15.5	10.5	13.0	15.5	9.5	12.5
19	5.0	3.0	4.0	8.0	3.5	5.5	16.0	12.0	14.0	13.5	11.5	12.5
20	5.5	3.5	4.5	6.5	3.5	5.0	16.5	10.0	13.5	15.5	11.0	13.0
21	5.0	3.5	4.0	7.0	5.5	6.5	14.5	11.5	13.0	17.0	12.0	14.0
22	5.0	3.0	4.0	5.5	3.5	4.5	13.0	9.5	11.0	18.5	11.0	15.0
23	4.5	4.0	4.5	5.0	2.5	4.0	12.5	9.0	10.5	16.5	13.0	14.5
24	6.5	4.5	5.5	9.5	3.5	6.5	13.5	8.5	11.0	22.0	14.0	18.0
25	6.0	5.0	5.5	10.0	4.5	7.5	12.0	8.5	10.0	21.5	15.0	18.0
26	7.0	5.5	6.5	10.5	4.5	8.0	11.5	8.0	9.5	18.5	14.5	16.5
27	7.0	6.0	6.5	11.5	5.5	9.0	13.5	8.0	10.5	19.5	12.0	15.5
28	8.0	6.0	7.0	12.5	6.5	9.5	14.5	8.0	11.0	16.5	13.0	14.5
29	---	---	---	12.0	9.5	11.0	13.0	9.0	11.5	18.5	12.5	15.5
30	---	---	---	11.0	7.5	9.0	14.5	9.0	11.5	20.0	12.0	16.0
31	---	---	---	9.5	7.0	8.0	---	---	---	17.5	15.0	16.0
MONTH	8.0	.0	3.5	12.5	2.5	7.0	16.5	5.0	10.0	22.0	8.0	14.5

## ROGUE RIVER BASIN

14337830 ELK CREEK BELOW ALCO CREEK, NEAR TRAIL, OR--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	20.0	13.0	16.5	25.0	17.5	21.0	26.0	19.0	22.5	21.0	17.5	19.5
2	20.0	13.5	17.0	27.0	19.0	22.0	26.0	19.5	23.0	20.5	16.0	18.5
3	18.0	14.0	16.0	25.5	16.5	20.5	26.5	20.0	23.0	20.5	17.5	19.0
4	20.5	14.0	17.0	25.5	16.5	20.5	26.0	20.0	23.0	20.5	15.5	18.5
5	17.5	14.5	15.5	24.5	16.5	20.0	25.5	19.0	22.5	21.0	16.0	18.5
6	15.5	12.5	14.0	26.5	15.5	20.5	25.0	18.0	22.0	21.0	17.0	19.5
7	17.0	11.0	14.0	28.0	18.0	22.5	25.5	19.0	22.0	21.5	17.0	19.5
8	19.0	11.0	15.0	29.0	19.5	23.5	24.0	17.5	21.0	20.5	17.0	18.5
9	21.0	13.0	17.0	28.5	19.5	23.5	24.0	17.0	21.0	18.5	16.5	17.5
10	23.0	14.5	19.0	27.5	18.0	22.5	24.5	18.0	21.5	18.0	15.0	16.5
11	23.0	16.5	19.5	27.5	17.5	22.0	24.5	18.5	22.0	17.5	14.5	16.0
12	22.0	16.5	19.5	27.0	17.5	22.0	25.0	18.5	22.0	17.5	13.0	15.5
13	21.0	16.5	18.5	27.0	17.5	22.0	25.0	19.0	22.0	17.5	13.0	15.5
14	18.0	13.5	16.0	27.0	18.0	22.0	25.5	19.5	22.5	17.5	13.0	15.5
15	18.0	12.5	15.0	27.0	18.0	22.5	25.0	19.0	22.0	18.5	14.0	16.5
16	19.0	12.0	15.5	28.0	18.5	23.0	24.0	18.5	21.5	19.0	15.0	17.5
17	16.5	14.0	15.5	29.0	20.0	24.0	24.0	18.0	21.0	19.5	15.5	18.0
18	20.5	13.0	16.5	28.0	20.0	24.0	23.5	18.0	21.0	19.5	16.0	18.0
19	22.0	13.5	17.5	29.0	20.5	24.5	23.0	18.0	20.5	20.0	16.5	18.5
20	24.0	15.5	19.5	29.5	22.0	25.5	23.0	17.5	20.5	20.0	16.5	18.5
21	23.5	17.0	20.0	30.0	23.5	26.5	23.0	18.0	20.5	19.5	16.0	18.5
22	25.0	16.5	20.5	26.5	23.0	25.0	22.5	17.0	20.0	19.5	15.5	18.0
23	23.0	16.0	19.5	28.5	21.0	24.5	23.5	17.5	20.5	19.5	16.0	18.0
24	23.5	15.0	19.0	27.5	22.0	24.5	23.0	18.0	20.5	19.0	16.5	18.0
25	22.5	15.5	19.0	27.0	19.5	23.5	22.5	17.0	20.0	19.0	16.0	18.0
26	23.5	15.0	19.0	27.0	19.5	23.0	22.5	17.5	20.0	19.5	16.0	18.0
27	25.0	16.0	20.0	27.0	19.5	23.5	22.5	17.0	20.0	20.0	16.0	18.0
28	26.5	17.5	21.5	27.0	20.5	23.5	22.5	17.5	20.0	20.0	17.5	18.5
29	27.5	18.5	22.5	26.0	19.5	23.0	22.5	17.5	20.0	18.0	16.0	17.5
30	26.5	18.5	22.0	25.5	18.5	22.0	22.0	16.5	19.5	18.5	15.0	16.5
31	---	---	---	25.5	18.5	22.5	22.0	17.0	20.0	---	---	---
MONTH	27.5	11.0	18.0	30.0	15.5	23.0	26.5	16.5	21.0	21.5	13.0	18.0

14337870 WEST BRANCH ELK CREEK NEAR TRAIL, OR

LOCATION.--Lat 42°42'40", long 122°44'55", in SW 1/4 sec.7, T.33 S., R.1 E., Jackson County, Hydrologic Unit 17100307, on Bureau of Land Management land, on left bank 300 ft upstream from Spot Creek and 5.3 mi northeast of Trail.

DRAINAGE AREA.--14.2 mi<sup>2</sup>.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1973 to September 1976, October 1977 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 1,773.24 ft above sea level (Corps of Engineers bench mark).

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

AVERAGE DISCHARGE.--20 years (water years 1974-76, 1978-94), 18.7 ft<sup>3</sup>/s, 17.92 in/yr, 13,560 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,410 ft<sup>3</sup>/s Jan. 15, 1974, gage height, 5.30 ft, from rating curve extended above 600 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; minimum, 0.18 ft<sup>3</sup>/s Aug. 17-19, 21, 1992 and Sept. 23, 1994.

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

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 8	1200	*112	*2.00				

Minimum discharge, 0.18 ft<sup>3</sup>/s Sept. 23.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.92	1.4	3.3	3.3	3.5	36	12	5.8	1.0	.43	.25	.28
2	.92	1.4	3.3	3.6	3.2	22	8.9	5.0	.91	.43	.25	.31
3	.92	1.4	2.3	3.6	e3.1	15	6.9	4.3	.88	.44	.22	.39
4	.95	1.4	4.0	4.2	e2.9	11	5.8	4.3	.90	.45	.23	.42
5	1.0	1.5	3.1	10	e2.7	9.2	5.0	3.9	1.0	.44	.30	.34
6	1.1	1.5	2.4	12	2.6	7.7	6.0	3.5	1.6	.43	.30	.28
7	1.2	1.5	6.5	8.6	2.6	6.5	7.9	3.1	1.1	.40	.28	.23
8	1.2	1.5	77	15	2.6	5.5	8.6	2.8	1.0	.36	.31	.22
9	1.1	1.5	23	36	2.5	4.9	11	2.4	.87	.34	.33	.28
10	1.3	1.5	9.4	27	3.7	4.7	19	2.0	.78	.31	.32	.44
11	1.4	1.5	9.7	15	3.4	4.3	16	1.8	.75	.31	.30	.46
12	1.6	1.6	11	11	3.1	4.0	12	1.8	.71	.30	.30	.41
13	1.4	1.6	6.8	9.1	3.1	3.8	8.6	1.7	.64	.31	.30	.40
14	1.6	1.6	5.7	7.8	4.0	3.6	7.0	1.5	.79	.31	.29	.35
15	2.4	1.6	5.3	6.7	4.6	3.4	5.7	2.1	.80	.31	.30	.33
16	2.3	1.6	5.1	5.5	4.8	3.7	5.0	2.0	.72	.30	.31	.30
17	1.8	1.6	4.5	4.7	6.2	3.5	4.5	1.8	.72	.27	.30	.27
18	1.6	1.7	3.8	4.2	8.8	3.5	3.9	1.6	.71	.26	.29	.27
19	1.5	1.6	e3.4	3.7	9.5	3.6	3.7	1.5	.64	.26	.31	.27
20	1.5	1.6	e3.1	3.5	8.5	3.4	3.5	1.5	.60	.26	.35	.28
21	1.4	1.6	e2.9	3.2	9.8	3.2	3.2	1.8	.55	.23	.34	.27
22	1.3	1.8	e2.9	3.3	11	3.3	3.1	1.5	.56	.23	.37	.23
23	1.3	1.7	e2.4	4.7	11	3.4	2.9	1.3	.54	.27	.36	.21
24	1.3	1.7	e2.4	8.9	18	3.4	3.1	1.2	.54	.25	.32	.22
25	1.3	1.7	2.3	11	38	3.4	3.8	1.1	.53	.26	.30	.22
26	1.3	1.8	2.3	8.2	71	3.4	5.7	1.1	.52	.25	.27	.24
27	1.2	1.9	2.3	6.8	63	3.4	7.1	1.1	.49	.23	.26	.24
28	1.3	1.9	2.1	5.6	52	3.2	6.7	1.1	.42	.23	.27	.38
29	1.3	3.0	2.0	4.7	---	3.1	5.1	1.0	.41	.24	.28	1.4
30	1.3	3.2	2.2	4.2	---	11	5.6	.96	.41	.26	.30	.93
31	1.3	---	2.6	3.9	---	20	---	.95	---	.29	.26	---
TOTAL	42.01	50.9	219.1	259.0	359.2	220.1	207.3	67.51	22.09	9.66	9.17	10.87
MEAN	1.36	1.70	7.07	8.35	12.8	7.10	6.91	2.18	.74	.31	.30	.36
MAX	2.4	3.2	77	36	71	36	19	5.8	1.6	.45	.37	1.4
MIN	.92	1.4	2.0	3.2	2.5	3.1	2.9	.95	.41	.23	.22	.21
AC-FT	83	101	435	514	712	437	411	134	.44	.19	.18	.22
CFSM	.10	.12	.50	.59	.90	.50	.49	.15	.05	.02	.02	.03
IN.	.11	.13	.57	.68	.94	.58	.54	.18	.06	.03	.02	.03

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1974 - 1994, BY WATER YEAR (WY)

	MEAN	3.09	20.1	35.4	39.3	45.5	37.6	24.2	10.4	5.07	2.16	1.62	1.80
MAX	7.27	102	104	140	100	124	52.4	28.2	17.2	4.94	4.29	4.44	
(WY)	1980	1974	1982	1974	1983	1974	1974	1979	1993	1983	1976	1986	
MIN	.75	1.70	3.45	6.53	9.47	3.18	4.54	1.67	.74	.31	.26	.36	
(WY)	1989	1994	1990	1992	1988	1992	1990	1992	1994	1994	1992	1994	

SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1974 - 1994

ANNUAL TOTAL	6717.71	1476.91	
ANNUAL MEAN	18.4	4.05	
HIGHEST ANNUAL MEAN			18.7
LOWEST ANNUAL MEAN			4.05
HIGHEST DAILY MEAN	329	77	904
LOWEST DAILY MEAN	.92	.21	.20
ANNUAL SEVEN-DAY MINIMUM	.94	.23	.21
ANNUAL RUNOFF (AC-FT)	13320	2930	13560
ANNUAL RUNOFF (CFSM)	1.30	.28	1.32
ANNUAL RUNOFF (INCHES)	17.60	3.87	17.92
10 PERCENT EXCEEDS	54	8.9	48
50 PERCENT EXCEEDS	4.9	1.6	5.0
90 PERCENT EXCEEDS	1.2	.28	.98

e Estimated



## ROGUE RIVER BASIN

14337870 WEST BRANCH ELK CREEK NEAR TRAIL, OR--Continued

## WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: August 1977 to current year.

INSTRUMENTATION.--Temperature recorder since August 1977.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum, 27.0°C Aug. 14, 1992; minimum, 0.0°C at times during most winter periods.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 26.5°C July 21; minimum, 0.0°C several days in December and February.

## TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	15.0	11.0	13.0	7.5	5.5	6.5	5.5	4.5	5.0	4.5	3.5	4.0
2	14.5	10.0	12.5	6.5	4.5	5.5	5.0	3.5	4.5	5.0	4.0	4.5
3	14.5	10.0	12.5	7.5	4.5	6.0	4.5	3.5	4.0	6.0	5.0	5.5
4	14.5	11.5	13.0	6.0	4.5	5.5	5.0	4.0	4.5	6.5	5.5	6.0
5	16.0	12.5	14.0	5.5	4.0	5.0	4.0	3.0	3.5	5.5	4.5	5.0
6	14.0	13.0	13.5	5.0	3.5	4.5	4.5	2.5	3.5	5.5	3.5	4.5
7	13.0	10.0	11.5	5.0	3.0	4.0	5.5	4.0	5.0	4.5	3.0	4.0
8	11.5	8.0	10.0	4.5	2.5	3.5	7.0	5.5	6.5	5.5	4.5	5.0
9	11.0	7.5	10.0	5.5	3.5	4.5	7.0	6.0	6.5	6.5	5.0	5.5
10	12.5	10.5	11.5	5.5	3.5	4.5	8.0	6.5	7.5	5.5	4.5	5.0
11	12.5	10.0	11.5	5.5	3.5	4.5	7.5	5.0	6.5	6.0	5.5	5.5
12	13.0	11.5	12.0	5.0	4.0	4.5	6.0	4.5	5.0	5.5	4.0	5.0
13	13.0	11.0	12.0	4.5	3.0	4.0	5.0	4.0	4.5	4.5	3.5	4.0
14	12.0	10.0	11.0	3.5	2.0	2.5	5.5	4.0	5.0	5.0	3.5	4.0
15	12.0	11.0	11.5	3.0	1.0	2.0	5.5	4.0	5.0	4.5	3.5	4.0
16	11.5	9.0	10.5	4.0	2.0	3.0	4.0	2.0	3.0	3.5	2.5	3.0
17	9.5	7.5	8.5	4.5	3.0	4.0	2.0	1.0	1.5	2.5	1.5	2.0
18	9.0	6.5	8.0	4.5	2.5	3.0	1.0	.0	.5	2.5	1.5	2.0
19	9.0	6.0	8.0	2.5	1.0	2.0	1.0	.0	.5	2.5	1.0	2.0
20	9.5	7.0	8.5	1.5	.5	1.0	1.0	.0	.5	3.0	1.0	2.0
21	11.0	8.5	10.0	2.5	.0	1.5	1.0	.0	.5	5.5	3.0	4.5
22	10.0	8.0	9.5	3.5	2.5	3.0	.5	.0	.5	6.5	5.0	5.5
23	10.0	7.5	9.0	2.5	1.5	2.0	1.0	.0	.5	7.0	6.0	6.0
24	10.0	8.0	9.0	1.5	.0	.5	.5	.0	.5	6.0	4.0	5.0
25	9.5	7.0	8.5	.5	.0	.0	1.0	.0	.5	5.0	4.0	4.5
26	9.5	7.0	8.5	.5	.0	.5	2.0	1.0	1.5	5.0	3.5	4.0
27	9.0	6.5	8.0	3.0	.5	2.0	1.5	.5	1.0	4.0	2.5	3.0
28	9.0	7.0	8.5	5.0	3.0	4.0	2.5	1.0	1.5	3.0	1.5	2.0
29	9.5	7.5	8.5	5.5	4.5	5.0	3.0	1.5	2.0	2.5	1.0	2.0
30	8.5	6.5	8.0	5.0	4.0	5.0	3.5	2.0	3.0	2.5	1.0	2.0
31	9.5	7.5	8.5	---	---	---	4.0	3.0	3.5	2.0	.5	1.5
MONTH	16.0	6.0	10.5	7.5	.0	3.5	8.0	.0	3.0	7.0	.5	4.0

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



## ROGUE RIVER BASIN

14338000 ELK CREEK NEAR TRAIL, OR

LOCATION.--Lat 42°40'30", long 122°44'38", in NE 1/4 sec.30, T.33 S., R.1 E., Jackson County, Hydrologic Unit 17100307, on right bank 3.7 mi northeast of Trail and at mile 1.2.

DRAINAGE AREA.--129 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1945 to current year. Prior to March 1946 monthly discharge only, published in WSP 1318.

REVISED RECORDS.--WDR OR-89-2: Drainage area. WDR OR-92-1: 1989(M), 1990(M), 1991(M).

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 1,493.91 ft above sea level. Prior to July 5, 1946, nonrecording gage at various sites within 1.0 mi of present site at different datums. July 5, 1946, to June 22, 1950, nonrecording gage, and June 23, 1950, to May 23, 1954, water-stage recorder, at site 0.5 mi downstream at datum 25.21 ft lower, May 24, 1954, to Sept. 30, 1988 at site 0.8 mi downstream at datum 37.35 ft lower.

REMARKS.--No estimated daily discharges. Water-discharge records good. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--49 years, 216 ft<sup>3</sup>/s, 156,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 19,200 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 18.84 ft, from rating curve extended above 4,700 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow, site and datum then in use; minimum discharge, 0.01 ft<sup>3</sup>/s Oct. 8, 1987, result of dam construction 1.3 mi upstream.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,700 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 8	1530	*832	*5.26				

Minimum discharge, 0.12 ft<sup>3</sup>/s several days in August and September.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.5	7.2	22	29	51	498	173	57	19	4.5	.30	.12
2	3.5	6.4	39	39	47	388	137	52	17	4.3	.30	.12
3	3.5	6.9	23	53	44	301	115	49	16	3.7	.29	.12
4	3.6	7.1	26	62	41	253	99	50	16	3.1	.27	.12
5	3.6	7.2	29	155	38	208	89	51	17	2.8	.26	.12
6	4.3	7.2	21	218	37	172	106	48	25	1.9	.25	.12
7	5.3	7.3	27	154	37	143	143	44	24	2.3	.25	.12
8	6.0	7.2	566	164	36	123	151	41	21	2.2	.25	.14
9	6.1	7.2	313	415	33	109	191	38	18	2.0	.25	.15
10	6.5	7.1	144	354	43	102	259	35	17	1.7	.23	.21
11	8.1	7.2	117	262	46	93	233	33	14	2.0	.24	.29
12	8.8	7.5	144	210	42	83	190	31	13	1.3	.25	.38
13	9.6	7.6	98	163	41	75	155	30	12	1.2	.25	.58
14	9.0	7.7	81	139	49	71	131	28	12	1.3	.25	.73
15	13	7.7	76	121	57	68	113	27	13	1.0	.23	.77
16	20	7.8	68	100	59	70	101	30	12	.95	.21	.76
17	15	7.8	56	83	65	66	92	30	12	.86	.21	.75
18	12	8.3	46	70	110	62	84	29	12	.80	.20	.77
19	11	7.9	39	62	120	61	78	27	11	.53	.18	.76
20	10	7.9	35	57	109	56	72	27	9.5	.47	.18	.76
21	9.6	7.7	31	53	125	54	68	30	8.6	.40	.18	.76
22	8.4	9.3	27	55	155	54	62	31	8.2	.38	.17	1.0
23	8.4	11	24	78	170	54	58	26	7.4	.39	.16	.98
24	8.2	8.9	24	128	311	54	58	23	7.1	.41	.16	.98
25	8.6	7.5	23	166	431	55	60	22	7.0	.41	.16	.84
26	8.3	8.5	23	126	688	54	69	20	7.6	.41	.15	.65
27	7.5	9.5	21	104	714	52	68	20	7.3	.41	.14	.57
28	7.5	11	20	87	640	51	63	19	5.6	.39	.13	.63
29	7.2	16	19	74	---	49	56	19	4.2	.34	.13	9.6
30	7.2	30	20	64	---	122	59	18	4.4	.33	.15	8.0
31	6.8	---	24	57	---	228	---	18	---	.34	.13	---
TOTAL	250.1	267.6	2226	3902	4339	3829	3333	1003	377.9	43.12	6.51	31.90
MEAN	8.07	8.92	71.8	126	155	124	111	32.4	12.6	1.39	.21	1.06
MAX	20	30	566	415	714	498	259	57	25	4.5	.30	9.6
MIN	3.5	6.4	19	29	33	49	56	18	4.2	.33	.13	.12
AC-FT	496	531	4420	7740	8610	7590	6610	1990	750	86	13	63

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1946 - 1994, BY WATER YEAR (WY)

	MEAN	32.3	188	425	506	501	429	283	159	59.0	14.4	6.46	7.29
MAX	404	1008	1851	1283	1131	1074	565	358	254	36.1	25.1	43.7	
(WY)	1951	1974	1965	1965	1958	1972	1956	1975	1953	1953	1976	1986	
MIN	3.17	8.92	13.1	19.8	23.1	45.4	65.8	21.6	7.42	1.39	.21	.60	
(WY)	1953	1994	1977	1977	1977	1992	1968	1992	1992	1994	1994	1992	

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1946 - 1994

ANNUAL TOTAL	82110.3	19609.13	216	
ANNUAL MEAN	225	53.7	438	1974
HIGHEST ANNUAL MEAN			41.7	1977
LOWEST ANNUAL MEAN			12200	Dec 22 1964
HIGHEST DAILY MEAN	2810	Jan 20		Dec 22 1994
LOWEST DAILY MEAN	3.5	Oct 1	.12	Sep 1 1994
ANNUAL SEVEN-DAY MINIMUM	3.6	Sep 29	.12	Sep 1 1994
ANNUAL RUNOFF (AC-FT)	162900	38890	156300	
10 PERCENT EXCEEDS	590	143	548	
50 PERCENT EXCEEDS	65	19	67	
90 PERCENT EXCEEDS	6.2	.26	4.6	

14338000 ELK CREEK NEAR TRAIL, OR--Continued

## WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: June 1973 to current year.

INSTRUMENTATION.--Temperature recorder since June 1973.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum, 31.5°C July 17, 1979, Aug. 16, 18, 1992; minimum, 0.0°C at times during most winter periods.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 31.0°C July 21; minimum, 0.0°C several days in December.

## TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

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

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





ROGUE RIVER BASIN

411

14338100 ROGUE RIVER AT TRAIL, OR

LOCATION.--Lat 42°38'51", long 122°48'18", in NW 1/4 NE 1/4 sec.3, T.34 S., R.1 W., Jackson County, Hydrologic Unit 17100307, on right bank 0.2 mi upstream from Trail Creek, and at mile 148.9.

DRAINAGE AREA.--Not determined.

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: March 1988 to current year.

INSTRUMENTATION.--Water-quality monitor since March 1988.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum, 19.0°C July 27, 29, 1992; minimum, 2.0°C Feb. 5, 6, 1989, Feb. 14, 15, 1990.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 18.0°C several days in July and August; minimum, 3.5°C Feb. 2-5, 12, 13.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

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

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

## ROGUE RIVER BASIN

14338100 ROGUE RIVER AT TRAIL, OR--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	12.0	8.5	10.0	14.5	10.0	12.0	18.0	14.0	15.5	12.5	9.0	11.0
2	12.0	8.5	10.0	15.5	11.0	13.0	16.0	13.0	14.5	12.0	9.0	10.5
3	11.0	8.0	9.5	15.5	10.5	12.5	16.0	12.0	14.0	12.5	10.0	11.0
4	11.0	9.0	10.0	15.5	10.5	12.5	16.5	12.0	14.0	13.0	9.5	11.0
5	10.0	8.5	9.5	15.0	10.5	12.5	16.5	12.0	14.0	13.0	10.0	11.5
6	9.5	8.0	9.0	15.5	11.0	13.0	17.5	13.5	15.0	13.0	10.0	11.5
7	10.0	8.0	9.0	16.0	11.0	13.0	17.0	13.5	15.0	13.5	10.5	11.5
8	10.5	8.0	9.5	16.0	11.0	13.5	17.0	13.0	14.5	13.0	10.5	11.5
9	11.0	8.0	9.5	16.0	11.5	13.5	17.5	13.5	15.0	12.5	10.5	11.5
10	11.0	8.5	10.0	15.5	10.5	13.0	17.0	13.5	15.0	13.0	11.0	12.0
11	11.5	8.5	10.0	16.5	11.0	13.5	17.0	13.5	15.0	13.0	11.0	12.0
12	11.5	9.0	10.0	17.0	12.0	14.0	16.5	13.5	15.0	13.5	10.5	12.0
13	11.0	9.5	10.0	17.0	12.0	14.5	16.5	13.5	15.0	14.5	10.5	12.5
14	11.5	9.5	10.5	17.0	12.5	14.5	16.5	14.0	15.0	14.5	10.5	12.5
15	12.0	9.0	10.5	17.5	12.5	14.5	16.5	14.0	15.0	13.0	10.5	11.5
16	11.5	9.5	10.5	17.5	12.5	15.0	16.5	14.0	15.0	13.0	10.0	11.0
17	11.0	9.0	10.0	17.5	13.0	15.0	17.0	14.0	15.0	13.0	10.5	11.5
18	12.5	9.0	10.5	17.5	13.0	15.0	17.0	14.0	15.0	13.5	10.0	11.5
19	12.5	9.0	11.0	17.5	13.0	15.0	17.0	14.0	15.0	13.5	10.0	11.5
20	13.5	9.5	11.0	17.5	13.5	15.0	16.5	13.0	14.5	14.0	10.0	11.5
21	13.5	9.5	11.5	18.0	13.5	15.5	15.0	12.5	13.5	14.0	10.0	12.0
22	14.5	10.0	11.5	16.0	13.5	14.5	15.5	12.0	13.5	13.5	10.0	11.5
23	14.0	9.5	11.5	18.0	13.5	15.5	14.5	11.5	12.5	13.5	9.5	11.0
24	13.5	9.5	11.5	17.5	13.5	15.5	14.0	11.0	12.5	12.5	9.5	10.5
25	13.5	9.0	11.0	17.5	13.0	15.0	13.0	9.0	11.0	13.0	9.5	11.0
26	13.5	9.0	11.0	18.0	13.0	15.0	11.0	8.0	9.5	13.5	9.5	11.0
27	14.0	9.5	11.5	18.0	13.5	15.0	11.5	8.5	10.0	13.0	9.5	11.0
28	14.0	9.5	11.5	17.5	13.5	15.0	11.5	8.5	10.0	12.0	10.0	11.0
29	14.0	9.5	11.5	17.5	13.5	15.5	12.0	8.5	10.0	12.0	10.5	11.0
30	14.0	10.0	11.5	18.0	13.5	15.5	12.0	9.0	10.5	13.0	10.0	11.0
31	---	---	---	17.5	13.5	15.5	12.0	8.5	10.5	---	---	---
MONTH	14.5	8.0	10.5	18.0	10.0	14.5	18.0	8.0	13.5	14.5	9.0	11.5

ROGUE RIVER BASIN

413

14339000 ROGUE RIVER AT DODGE BRIDGE, NEAR EAGLE POINT, OR

LOCATION.--Lat 42°31'30", long 122°50'30", in SE 1/4 sec.17, T.35 S., R.1 W., Jackson County, Hydrologic Unit 17100307, on right bank 50 ft upstream from Dodge Bridge, 0.7 mi downstream from Reese Creek, 4.3 mi northwest of Eagle Point, and at mile 138.6.

DRAINAGE AREA.--1,215 mi<sup>2</sup>.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1938 to current year.

REVISED RECORDS.--WSP 1094: 1942(M), 1943, 1945(M), 1946. WSP 1738: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,271.99 ft above sea level. Prior to Dec. 21, 1938, nonrecording gage, Dec. 21, 1938, to Aug. 15, 1968, water-stage recorder, at datum 2.27 ft higher, Aug. 16, 1968, to Sept. 30, 1976, water-stage recorder, at datum 1.00 ft higher.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since February 1977 by Lost Creek Lake (station 14335040). Diversions for irrigation upstream from station; most of low flow of Big Butte Creek (station 14337500) is diverted near Butte Falls.

AVERAGE DISCHARGE.--39 years (water years 1939-77), 2,636 ft<sup>3</sup>/s, 1,910,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 87,600 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 12.78 ft, datum then in use, from rating curve extended above 23,000 ft<sup>3</sup>/s; minimum discharge, 567 ft<sup>3</sup>/s Feb. 18, 1977, result of closure of Lost Creek dam, minimum prior to that time, 611 ft<sup>3</sup>/s Aug. 6, 14, 29, Sept. 9, 1940.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,450 ft<sup>3</sup>/s June 11, gage height, 3.54 ft; minimum discharge, 809 ft<sup>3</sup>/s Mar. 28, 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1180	1110	1030	1140	1210	1800	1130	1170	2100	1320	1250	2040
2	1180	1070	1050	1180	1130	1480	1040	1150	2110	1200	1250	1990
3	1180	1060	1020	1200	1110	1340	997	1150	2340	1200	1260	1990
4	1180	1040	1040	1230	1100	1270	966	1170	2400	1200	1250	1980
5	1200	1030	1030	1410	1090	1180	944	1180	2660	1200	1250	1980
6	1200	1030	1020	1560	1090	1100	992	1570	3090	1200	1260	1970
7	1200	1020	1070	1400	1100	1040	1060	2090	3390	1200	1260	1960
8	1190	1020	2360	1390	1100	1000	1050	2560	3360	1200	1250	1970
9	1180	1010	2350	1830	1110	978	1120	3040	3340	1200	1260	1950
10	1190	1010	1970	1750	1190	962	1300	2830	3340	1190	1270	1950
11	1190	1010	1960	1570	1200	944	1240	2250	3410	1210	1550	1770
12	1200	996	2110	1480	1140	931	1160	2130	3400	1200	1900	1520
13	1190	976	1840	1560	1120	920	1100	2010	3200	1220	2110	1510
14	1190	984	1520	1510	1170	969	1050	1650	2840	1220	2120	1510
15	1220	990	1350	1480	1160	983	1010	1600	2830	1230	2110	1520
16	1230	992	1320	1440	1150	990	989	1540	2700	1230	2090	1530
17	1210	991	1210	1420	1150	989	974	1430	2430	1230	2080	1530
18	1190	992	1110	1390	1240	943	951	1430	2190	1220	2070	1520
19	1140	992	1110	1370	1240	965	936	1530	1990	1230	2070	1440
20	1140	994	1100	1370	1210	933	921	1800	1800	1230	2080	1300
21	1130	1000	1100	1360	1250	931	922	1860	1610	1230	2100	1130
22	1130	1010	1100	1360	1320	928	917	2050	1460	1240	2100	1020
23	1130	997	1100	1410	1330	907	914	2460	1360	1240	2080	1010
24	1130	994	1090	1570	1420	850	924	2290	1360	1240	2080	1010
25	1140	988	1110	1620	1600	857	925	1960	1370	1240	2070	1020
26	1150	989	1110	1500	2170	860	934	2130	1370	1250	2070	1020
27	1130	991	1110	1450	2270	862	941	2330	1370	1240	2070	1030
28	1110	992	1110	1410	2180	852	935	2680	1360	1250	2070	1040
29	1180	1010	1100	1380	---	850	961	3160	1360	1250	2080	1080
30	1130	1030	1110	1360	---	1090	1180	3090	1370	1250	2090	1070
31	1120	---	1120	1310	---	1340	---	2380	---	1250	2090	---
TOTAL	36260	30318	40730	44410	36550	32044	30483	61670	68910	38010	55640	45360
MEAN	1170	1011	1314	1433	1305	1034	1016	1989	2297	1226	1795	1512
MAX	1230	1110	2360	1830	2270	1800	1300	3160	3410	1320	2120	2040
MIN	1110	976	1020	1140	1090	850	914	1150	1360	1190	1250	1010
AC-FT	71920	60140	80790	88090	72500	63560	60460	122300	136700	75390	110400	89970

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 1994, BY WATER YEAR (WY)

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
MEAN	1311	1889	2834	2330	2464	2491	2656	2743	2390	2149	2185	1731					
MAX	1931	4925	7983	4749	6045	4645	4520	4330	3939	3152	3092	2200					
(WY)	1983	1985	1982	1980	1982	1989	1984	1984	1984	1984	1984	1983					
MIN	874	928	1274	1232	1080	920	969	1577	1656	1116	1795	1288					
(WY)	1993	1988	1990	1992	1988	1992	1992	1992	1992	1992	1994	1980					

SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1978 - 1994

ANNUAL TOTAL	914678	520385	
ANNUAL MEAN	2506	1426	2264
HIGHEST ANNUAL MEAN			3671
LOWEST ANNUAL MEAN			1381
HIGHEST DAILY MEAN	7360	Jan 20	3410
LOWEST DAILY MEAN	976	Nov 13	850
ANNUAL SEVEN-DAY MINIMUM	988	Nov 13	863
ANNUAL RUNOFF (AC-FT)	1814000		1032000
10 PERCENT EXCEEDS	4820		2110
50 PERCENT EXCEEDS	2180		1220
90 PERCENT EXCEEDS	1080		986
			1640000
			3680
			1960
			1140
			23000
			823
			842
			Feb 7 1981
			Dec 15 1977
			Feb 12 1981

## ROGUE RIVER BASIN

14339000 ROGUE RIVER AT DODGE BRIDGE, NEAR EAGLE POINT, OR--Continued

## WATER-QUALITY RECORDS

## PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: August 1973 to current year.

INSTRUMENTATION.--Temperature recorder since August 1973.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

## WATER TEMPERATURE:

Prior to construction of Lost Creek Dam and Lake: Maximum, 20.0°C July 27, 28, 1975; minimum, 0.0°C

Jan. 6-8, 10, 11, 1974, Jan. 6-9, 1977.

After full operation of Lost Creek Dam and Lake: Maximum, 21.0°C July 26-29, 1992; minimum, 0.5°C

Feb. 5, 6, 1989.

## EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 20.5°C July 23; minimum, 3.0°C Feb. 1-5.

## TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

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

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

Day	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
	February			March			April			May		
1	5.5	3.0	4.5	8.0	6.5	7.5	10.5	6.0	8.5	11.5	7.5	10.0
2	5.5	3.0	4.5	8.0	6.5	7.5	9.5	6.5	8.0	13.0	7.5	10.5
3	5.5	3.0	4.5	8.5	7.0	7.5	10.5	6.0	8.5	11.0	8.5	10.5
4	5.5	3.0	4.5	9.0	7.0	7.5	10.5	6.0	8.5	12.0	8.5	10.5
5	5.5	3.0	4.5	8.5	6.5	7.5	9.0	5.5	7.0	12.5	8.5	10.5
6	5.5	4.0	4.5	8.0	4.5	6.5	8.5	6.0	7.5	13.5	8.5	10.5
7	5.5	4.5	5.0	8.0	4.5	6.5	9.0	6.5	7.5	13.0	8.5	10.5
8	6.0	3.5	5.0	7.5	5.0	6.5	8.0	6.5	7.5	12.5	7.5	9.5
9	6.0	4.5	5.0	8.5	5.5	7.0	9.5	6.5	7.5	12.0	7.0	9.5
10	6.0	5.0	5.5	8.5	6.5	7.5	11.0	7.0	8.5	12.0	7.5	9.5
11	6.0	4.0	5.0	8.5	5.0	7.0	11.0	7.0	9.0	12.5	8.0	10.0
12	5.5	3.5	4.5	9.0	4.5	7.0	11.5	8.0	10.0	12.5	7.5	10.0
13	5.0	3.5	4.5	8.5	5.0	7.0	11.5	8.0	9.5	13.0	7.0	10.0
14	6.5	5.0	5.5	9.0	5.5	7.5	12.0	7.5	10.0	12.0	7.5	9.5
15	6.5	4.5	5.5	9.5	5.5	7.5	13.0	8.0	10.5	10.5	8.0	9.5
16	6.0	4.5	5.5	8.0	6.0	7.0	11.5	8.5	10.0	12.0	8.0	10.0
17	6.0	5.5	5.5	9.5	5.5	7.5	12.5	8.5	11.0	11.5	8.0	9.5
18	6.5	4.5	5.5	7.5	5.5	6.0	13.0	9.0	11.0	13.0	7.5	10.5
19	6.0	4.0	5.0	8.5	4.0	6.5	13.0	9.5	11.5	10.5	8.5	9.5
20	6.0	4.5	5.5	7.5	4.5	6.0	14.0	8.5	11.5	12.5	8.0	10.0
21	6.0	5.0	5.5	8.0	5.5	6.5	12.5	9.5	11.0	13.0	8.5	10.5
22	6.0	4.5	5.0	6.5	4.0	5.5	12.0	8.5	10.5	14.5	8.5	11.0
23	6.0	5.0	5.5	6.0	4.5	5.0	11.0	8.5	10.0	17.0	12.0	14.0
24	7.0	5.0	6.0	9.5	4.5	7.0	12.5	8.0	10.5	17.5	12.0	14.0
25	6.0	5.5	6.0	9.5	5.0	7.5	12.0	8.5	10.0	15.5	10.5	12.5
26	7.0	6.0	6.5	10.0	5.0	8.0	11.0	8.0	9.5	13.5	10.0	11.5
27	7.0	6.0	6.5	10.5	5.5	8.0	12.0	8.0	10.0	14.5	9.5	12.0
28	8.0	6.0	7.0	10.5	5.5	8.5	13.5	8.0	11.0	13.0	9.5	11.0
29	---	---	---	9.5	6.5	8.5	12.0	8.5	10.5	13.0	9.5	11.0
30	---	---	---	8.5	7.0	7.5	13.0	8.5	10.5	14.0	9.0	11.5
31	---	---	---	9.0	7.0	8.0	---	---	---	13.0	10.0	11.0
MONTH	8.0	3.0	5.5	10.5	4.0	7.0	14.0	5.5	9.5	17.5	7.0	10.5

Day	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
	June			July			August			September		
1	14.0	9.0	11.5	16.0	9.5	12.5	20.0	14.0	17.0	14.5	9.5	11.5
2	14.5	9.0	11.5	17.0	11.5	14.0	19.5	14.5	16.5	14.0	9.0	11.5
3	13.0	8.5	10.5	17.0	10.5	13.5	18.5	13.0	15.5	14.0	10.5	12.0
4	13.5	9.5	11.0	17.0	10.5	13.5	18.5	13.0	15.5	14.5	9.5	12.0
5	11.5	9.0	10.5	16.0	10.5	13.5	18.5	12.5	15.5	15.0	10.0	12.5
6	11.0	8.5	10.0	17.0	10.0	13.5	19.5	13.5	16.5	15.0	10.5	12.5
7	12.0	8.5	10.0	17.5	11.5	14.5	19.0	13.5	16.5	15.0	10.5	12.5
8	12.5	8.5	10.0	18.5	11.5	15.0	18.5	13.0	16.0	14.5	11.0	12.5
9	13.0	8.5	10.5	18.0	12.0	15.0	19.0	13.5	16.0	13.5	11.0	12.0
10	13.0	9.0	11.0	17.5	10.5	14.0	19.0	13.5	16.5	14.0	11.0	12.5
11	13.0	9.0	11.0	17.5	11.0	14.0	19.0	14.0	16.0	13.5	11.0	12.5
12	13.0	9.0	11.0	18.5	12.0	15.0	18.5	14.0	16.0	15.0	11.0	13.0
13	13.0	9.5	11.0	18.5	12.0	15.0	18.5	14.0	16.0	15.5	10.5	13.0
14	13.0	9.5	11.0	18.5	12.0	15.5	18.5	14.0	16.0	15.5	10.5	13.0
15	12.5	8.5	10.5	19.0	12.5	15.5	18.5	14.0	16.0	15.0	11.0	13.0
16	13.5	9.0	11.0	19.0	13.0	16.0	18.5	14.0	16.0	14.5	10.5	12.5
17	11.5	9.0	10.0	19.0	13.5	16.0	18.5	14.0	16.0	14.5	10.5	12.5
18	14.0	9.0	11.0	19.5	13.0	16.0	18.5	14.0	16.0	15.0	10.5	12.5
19	14.5	9.0	11.5	20.0	13.5	16.5	18.5	14.0	16.0	15.0	10.5	13.0
20	15.5	9.5	12.0	20.0	14.0	17.0	18.5	14.0	15.5	15.5	10.5	13.0
21	15.0	10.0	12.5	20.0	15.0	17.5	17.0	12.5	14.5	15.0	10.5	13.0
22	16.0	10.0	13.0	17.5	14.5	16.0	17.0	12.5	14.5	15.0	10.5	13.0
23	15.5	10.0	12.5	20.5	14.0	17.0	16.5	11.5	13.5	14.5	10.0	12.5
24	16.0	10.0	12.5	20.0	14.5	17.0	15.5	11.5	13.5	13.5	10.0	12.0
25	15.0	9.5	12.0	19.5	13.5	16.5	14.5	10.5	12.5	14.0	10.0	12.0
26	15.5	9.0	12.0	20.0	13.5	16.5	13.5	8.5	11.0	14.0	10.5	12.5
27	16.0	9.5	12.5	20.0	14.0	16.5	13.5	8.5	11.0	14.0	10.0	12.0
28	16.5	9.5	13.0	19.5	14.0	17.0	14.0	9.0	11.0	13.0	11.0	12.0
29	16.5	10.0	13.0	19.5	14.0	16.5	14.0	9.0	11.5	13.5	11.0	12.0
30	16.0	9.5	13.0	19.5	14.0	16.5	14.0	9.0	11.5	14.0	10.0	12.0
31	---	---	---	19.5	14.0	16.5	14.0	9.0	11.5	---	---	---
MONTH	16.5	8.5	11.5	20.5	9.5	15.5	20.0	8.5	14.5	15.5	9.0	12.5
YEAR	20.5	3.0	9.5									



## ROGUE RIVER BASIN

14354200 BEAR CREEK BELOW ASHLAND CREEK, AT ASHLAND, OR

LOCATION.--Lat 42°12'58", long 122°43'16", in SE 1/4 SE 1/4 sec.32, T.38 S., R.1 E, Jackson County, Hydrologic Unit 17100308, on left bank, 0.1 mi downstream from Ashland Creek, and at mile 21.0.

DRAINAGE AREA.--168 mi<sup>2</sup>.

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

GAGE.--Water-stage recorder. Datum of gage is 1,686.64 ft above sea level.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since 1924 by Emigrant Lake. Water is diverted into basin from the Klamath River basin. Many diversions for irrigation and municipal use upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,920 ft<sup>3</sup>/s May 16, 1991, gage height 3.92 ft; minimum discharge, 0.33 ft<sup>3</sup>/s Oct. 18, 1990.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 134 ft<sup>3</sup>/s Dec. 8, gage height, 1.53 ft; minimum discharge, 4.7 ft<sup>3</sup>/s Sept 17, 19.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26	12	15	16	15	39	25	14	29	61	37	29
2	22	12	14	16	15	40	21	15	27	57	39	24
3	21	12	12	17	14	39	20	17	24	60	39	23
4	20	12	16	20	15	37	17	18	25	60	38	22
5	23	11	14	23	14	35	14	23	27	59	37	20
6	25	12	12	22	14	32	17	37	30	66	37	19
7	21	12	16	19	15	30	19	19	25	56	39	18
8	21	12	70	19	15	29	12	19	26	55	41	17
9	19	11	42	19	14	26	13	21	23	60	41	17
10	21	11	31	18	24	27	17	22	21	60	42	12
11	21	11	45	17	18	26	16	19	22	55	44	11
12	22	11	34	17	16	22	12	23	22	39	44	11
13	22	12	27	17	15	21	14	23	22	42	40	9.1
14	24	11	24	17	15	21	19	20	22	44	37	7.3
15	26	11	22	17	16	20	15	21	25	47	34	7.1
16	26	13	19	16	16	23	13	23	28	51	32	7.6
17	23	14	15	15	24	21	12	24	37	40	32	6.0
18	22	15	15	15	22	24	15	24	38	39	34	6.5
19	22	14	15	15	20	22	15	28	35	40	35	6.3
20	21	15	15	15	17	20	12	36	27	43	31	7.6
21	21	17	14	15	19	20	11	41	24	39	31	9.8
22	19	19	14	16	18	21	10	22	36	39	31	9.7
23	18	20	14	20	18	20	17	17	34	39	33	9.4
24	16	12	13	28	18	19	22	14	44	40	33	9.3
25	14	9.1	14	29	25	21	20	19	60	39	33	9.3
26	13	9.4	15	26	40	20	14	24	63	38	30	10
27	12	9.8	15	22	42	18	13	26	62	39	31	8.7
28	13	9.8	14	18	41	16	11	29	60	41	31	10
29	13	15	15	17	---	21	10	27	61	43	30	11
30	12	19	15	17	---	37	14	28	64	40	28	7.1
31	13	---	16	16	---	33	---	29	---	37	28	---
TOTAL	612	384.1	632	574	555	800	460	722	1043	1468	1092	374.8
MEAN	19.7	12.8	20.4	18.5	19.8	25.8	15.3	23.3	34.8	47.4	35.2	12.5
MAX	26	20	70	29	42	40	25	41	64	66	44	29
MIN	12	9.1	12	15	14	16	10	14	21	37	28	6.0
AC-FT	1210	762	1250	1140	1100	1590	912	1430	2070	2910	2170	743

CAL YR 1993 TOTAL 18335.1 MEAN 50.2 MAX 492 MIN 9.1 AC-FT 36370  
WTR YR 1994 TOTAL 8716.9 MEAN 23.9 MAX 70 MIN 6.0 AC-FT 17290

ROGUE RIVER BASIN

417

14357500 BEAR CREEK AT MEDFORD, OR

LOCATION.--Lat 42°19'28", long 122°51'55", in NW 1/4 sec.30, T.37 S., R.1 W., Jackson County, Hydrologic Unit 17100308, on left bank 300 ft upstream from 10th street Bridge, in Medford, and at mile 10.1.

DRAINAGE AREA.--289 mi<sup>2</sup>.

PERIOD OF RECORD.--March 1915 to June 1920 (no low-flow records), October 1920 to September 1981, December 1983 to current year. Monthly discharge only for some periods, published in WSP 1318.

REVISED RECORDS.--WSP 1044: 1944. WSP 1448: 1916, 1917(M), 1918-20, 1922, 1924, 1927(M), 1928, 1930. WSP 1568: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,343.27 ft above sea level. Prior to Sept. 19, 1991, at site 0.2 mi downstream, at datum 1.29 ft lower, Dec. 31, 1947, to Sept. 23, 1985, at datum 2.00 ft higher. See WSP 1738 for history of changes prior to Dec. 31, 1947.

REMARKS.--No estimated daily discharges. Records good. Flow partly regulated since 1924 by Emigrant Lake. Water is diverted into basin from the Klamath River basin. Many diversions for irrigation and municipal use upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,500 ft<sup>3</sup>/s Dec. 2, 1962, gage height, 10.04 ft, present datum; maximum gage height, about 13.0 ft Feb. 20, 1927, from floodmarks, present datum, site then in use; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge 348 ft<sup>3</sup>/s Sept. 28, gage height, 4.40 ft; minimum discharge, 8.1 ft<sup>3</sup>/s Sept. 20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	30	21	29	29	24	50	52	33	45	34	31	21
2	25	22	27	28	24	50	37	34	44	33	29	21
3	22	22	25	28	24	50	26	31	37	35	28	22
4	21	22	31	32	23	47	23	30	37	35	26	24
5	21	22	26	36	23	44	18	38	35	34	26	24
6	25	23	24	36	23	42	32	70	53	36	27	20
7	21	22	30	33	25	39	35	49	59	31	29	19
8	18	22	125	39	25	36	23	33	38	26	33	17
9	18	21	72	36	24	34	20	34	33	27	32	20
10	18	21	53	33	43	35	22	23	27	31	34	25
11	24	22	95	31	38	36	24	26	28	28	33	23
12	29	23	70	30	28	30	23	28	32	27	34	19
13	28	22	47	29	27	29	23	33	38	32	32	18
14	20	22	43	29	26	22	33	31	29	30	27	16
15	50	22	41	29	26	26	33	35	30	34	26	14
16	49	22	37	28	26	46	23	34	31	40	22	13
17	38	23	32	27	32	38	18	35	34	35	20	13
18	36	25	30	26	35	39	24	35	31	34	21	12
19	36	24	29	27	31	40	29	42	29	32	24	11
20	34	24	29	26	28	42	26	55	29	31	23	10
21	33	25	27	26	31	38	24	66	28	29	22	11
22	30	29	27	27	29	22	24	54	25	31	22	12
23	29	30	26	30	28	24	28	49	25	32	23	11
24	28	23	26	44	28	16	48	39	28	28	25	11
25	24	19	26	44	36	11	42	27	33	29	29	11
26	23	19	27	40	51	15	38	35	34	28	28	12
27	22	19	26	35	58	13	36	37	33	30	29	11
28	23	19	27	30	54	12	34	36	30	29	32	43
29	23	35	26	27	---	15	29	37	28	32	32	29
30	22	43	27	27	---	92	39	36	30	35	24	17
31	22	---	28	26	---	69	---	37	---	31	23	---
TOTAL	842	708	1188	968	870	1102	886	1182	1013	979	846	530
MEAN	27.2	23.6	38.3	31.2	31.1	35.5	29.5	38.1	33.8	31.6	27.3	17.7
MAX	50	43	125	44	58	92	52	70	59	40	34	43
MIN	18	19	24	26	23	11	18	23	25	26	20	10
AC-FT	1670	1400	2360	1920	1730	2190	1760	2340	2010	1940	1680	1050

CAL YR 1993 TOTAL 29903 MEAN 81.9 MAX 986 MIN 18 AC-FT 59310  
WTR YR 1994 TOTAL 11114 MEAN 30.4 MAX 125 MIN 10 AC-FT 22040

## ROGUE RIVER BASIN

14359000 ROGUE RIVER AT RAYGOLD, NEAR CENTRAL POINT, OR

LOCATION.--Lat 42°26'15", long 122°59'10", in SW 1/4 sec.18, T.36 S., R.2 W., Jackson County, Hydrologic Unit 17100308, on right bank at Raygold, 0.1 mi downstream from Gold Ray Dam, 1.0 mi downstream from Bear Creek, 5.6 mi northwest of Central Point, and at mile 125.8.

DRAINAGE AREA.--2,053 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1905 to current year. Prior to October 1921, published as "near Tolo."

REVISED RECORDS.--WSP 1248: 1906, 1914(M), 1915. WSP 1398: 1910(M). WSP 1738: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,121.78 ft above sea level. Prior to Sept. 19, 1914, nonrecording gage and Sept. 19, 1914, to Sept. 30, 1956, water-stage recorder, at site 300 ft upstream at same datum.

REMARKS.--Water-discharge records excellent except for estimated daily discharges, which are good. Flow regulated since February 1977 by Lost Creek Lake (station 14335040). Slight regulation by Fish Lake and Emigrant Lake. Many diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--72 years (water years 1906-77), 2,976 ft<sup>3</sup>/s, 2,156,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 131,000 ft<sup>3</sup>/s Dec. 23, 1964, gage height, 23.43 ft, from rating curve extended above 63,000 ft<sup>3</sup>/s on basis of slope-area measurement of 113,000 ft<sup>3</sup>/s; minimum discharge recorded, 418 ft<sup>3</sup>/s Sept. 19, 1968, as result of regulation, but may have been lower during periods of no record during water years 1931-34.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,750 ft<sup>3</sup>/s Dec. 8, gage height, 3.09 ft; minimum discharge, 995 ft<sup>3</sup>/s Apr. 22, 23.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e1220	1270	1280	1320	1440	2360	1630	1320	2070	1390	1240	2010
2	1220	1220	1300	1350	1320	1990	1450	1300	2030	1270	1230	1950
3	1220	1210	1260	1360	1310	1810	1370	1250	2240	1260	1240	1970
4	1230	1190	1270	1400	1310	1730	1270	1290	2290	1270	1240	1960
5	1250	1190	1260	1560	1290	1610	1180	1300	2490	1270	1240	1960
6	1280	1180	1240	1790	1300	1520	1280	1640	2920	1260	1250	1940
7	1280	1180	1290	1610	1320	1450	1400	2090	3280	1250	1240	1920
8	1270	1180	2890	1570	1320	1400	1350	2450	3210	1230	1240	1930
9	1270	1180	2920	2000	1320	1350	1400	2980	3170	1230	1240	1930
10	1270	1180	2330	1990	1460	1310	1800	2850	3160	1210	1240	1930
11	1270	1180	2390	1780	1550	1310	1670	2240	3230	1240	1460	1880
12	1330	1180	2580	1680	1410	1290	1500	2100	3230	1230	1770	1590
13	1300	1150	2220	1740	1370	1260	1400	2060	3140	1230	2010	1600
14	1310	1160	1890	1700	1440	1250	1330	1690	2810	1230	2040	1580
15	1370	1160	1650	1660	1440	1190	1250	1620	2790	1250	2040	1570
16	1430	1170	1600	1640	1410	1230	1210	1610	2710	1240	2010	1570
17	1360	1180	1470	1610	1410	1240	1180	1470	2490	1230	2000	1560
18	1320	1180	1350	1580	1500	1180	1150	1470	2290	1230	2010	1550
19	1290	1180	1320	1560	1510	1210	1110	1510	2090	1220	2000	1490
20	1310	1180	1300	1560	1480	1160	1070	1870	1910	1230	2020	1350
21	1310	1190	1300	1560	1510	1150	1040	1920	1720	1230	2030	1200
22	1300	1220	1290	1560	1600	1130	1020	2050	1560	1230	2030	1090
23	1290	1210	1280	1600	1600	1110	1020	2410	1440	1230	2000	1050
24	1290	1190	1300	1790	1680	1120	1110	2300	1420	1250	2020	1050
25	1290	1180	1290	1940	1890	1130	1120	1900	1440	1240	2020	1070
26	1300	1180	1300	1760	2560	1130	1140	2040	1460	1230	2020	1070
27	1290	1190	1300	1690	2740	1140	1130	2210	1460	1230	2030	1070
28	1240	1190	1280	1630	2770	1120	1110	2460	1410	1230	2030	e1070
29	1290	1250	1280	1600	---	1090	1090	2990	1400	1220	2040	e1060
30	1270	1300	1270	1580	---	1510	1310	2990	1410	1240	2030	e1060
31	1270	---	1300	1550	---	2070	---	2360	---	1240	2040	---
TOTAL	39940	35800	49000	50720	44260	42550	38090	61740	68270	38540	54050	46030
MEAN	1288	1193	1581	1636	1581	1373	1270	1992	2276	1243	1744	1534
MAX	1430	1300	2920	2000	2770	2360	1800	2990	3280	1390	2040	2010
MIN	1220	1150	1240	1320	1290	1090	1020	1250	1400	1210	1230	1050
AC-FT	79220	71010	97190	100600	87790	84400	75550	122500	135400	76440	107200	91300

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 1994, BY WATER YEAR (WY)

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
MEAN	1454	2314	3745	2987	3304	3246	3342	3168	2572	2190	2220	1866					
MAX	2110	6184	10780	6006	8002	6151	5596	4968	4426	3161	3115	2508					
(WY)	1984	1985	1982	1980	1986	1989	1983	1983	1993	1984	1984	1983					
MIN	1012	1089	1512	1446	1407	1111	1125	1605	1649	1117	1744	1434					
(WY)	1993	1988	1990	1992	1992	1992	1992	1992	1992	1992	1994	1980					

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1978 - 1994

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
ANNUAL TOTAL	1079960																
ANNUAL MEAN	2959																
HIGHEST ANNUAL MEAN																	
LOWEST ANNUAL MEAN																	
HIGHEST DAILY MEAN	12600	Jan 22				3280	Jun 7		35600	Dec 19	1981						
LOWEST DAILY MEAN	1150	Nov 13				1020	Apr 22		935	Oct 17	1992						
ANNUAL SEVEN-DAY MINIMUM	1170	Nov 10				1060	Sep 23		949	Oct 14	1992						
ANNUAL RUNOFF (AC-FT)	2142000					1129000			1955000								
10 PERCENT EXCEEDS	5630					2210			4670								
50 PERCENT EXCEEDS	2510					1350			2150								
90 PERCENT EXCEEDS	1220					1180			1290								

e Estimated

ROGUE RIVER BASIN

419

14359000 ROGUE RIVER AT RAYGOLD, NEAR CENTRAL POINT, OR--Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: August 1973 to current year.

INSTRUMENTATION.--Temperature recorder since August 1973.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum, 22.0°C July 25, 26, 1976; minimum, 0.0°C Jan. 7, 1974. Maximum since full operation of Lost Creek Lake, 21.5°C June 22, 23, 1992, July 20-22, 1994; minimum, 1.0°C Dec. 30, 1978, Jan. 30, 1980, Feb. 5, 6, 1989, Dec. 21, 1990.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 21.5°C July 20-22; minimum, 4.0°C several days in December and February.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

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

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





ROGUE RIVER BASIN

421

14361500 ROGUE RIVER AT GRANTS PASS, OR

LOCATION.--Lat 42°25'50", long 123°19'00", in NW 1/4 sec.20, T.36 S., R.5 W., Josephine County, Hydrologic Unit 17100308, on right bank at city of Grants Pass filter plant, 0.6 mi upstream from bridge on State Highway 99 at Grants Pass, and at mile 101.8. Prior to Sept. 3, 1983, at site 300 ft upstream.

DRAINAGE AREA.--2,459 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1938 to current year. Prior to January 1939 monthly discharge only, published in WSP 1318.

REVISED RECORDS.--WSP 1738: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 884.28 ft above sea level. Prior to Aug. 8, 1957, at site 300 ft upstream at datum 4.00 ft higher and Aug. 8, 1957, to Sept. 2, 1983, at site 300 ft upstream at datum 1.00 ft higher.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since February 1977 by Lost Creek Lake (station 14355040), slight regulation by Fish Lake and Emigrant Lake. Large fluctuations at times caused by Savage Rapids Dam 5.5 mi upstream from station. Many diversions from Rogue River and tributaries upstream from station, the largest of which is at Savage Rapids Dam of Grants Pass Irrigation District, 5.5 mi upstream from station. Continuous water-quality records for the period August 1973 to September 1987 have been collected at this location.

AVERAGE DISCHARGE.--56 years (water years 1939-94), 3,364 ft<sup>3</sup>/s, 2,437,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 152,000 ft<sup>3</sup>/s Dec. 23, 1964, gage height, 35.15 ft, present datum, from rating curve extended above 93,000 ft<sup>3</sup>/s; minimum discharge, 195 ft<sup>3</sup>/s Jan. 30, 1961; minimum daily, 606 ft<sup>3</sup>/s Sept. 10, 1968.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in December 1861 reached a stage of about 43 ft, present datum (information furnished by Corps of Engineers). Flood in February 1890 reached a stage of about 36 ft, present datum, and that of Feb. 21, 1927, about 32 ft, present datum, according to local resident.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,950 ft<sup>3</sup>/s Dec. 8, gage height, 4.21 ft; minimum discharge, 596 ft<sup>3</sup>/s Apr. 29, result of regulation at Savage Rapids Dam.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1140	1330	1370	1260	1490	2850	1780	1290	2300	1290	1050	1950
2	1110	1270	1400	1310	1320	2340	1520	1260	2210	1220	1040	1860
3	1090	1260	1360	1320	1300	2090	1390	1200	2390	1160	1050	1880
4	1110	1240	1350	1370	1280	1970	1290	1210	2540	1160	1040	1870
5	1140	1230	1360	1550	1260	1810	1140	1170	2730	1160	1040	1870
6	1170	1230	1320	1940	1270	1650	1210	1380	3340	1140	1040	1830
7	1180	1220	1420	1770	1290	1550	1400	2030	3850	1140	1040	1810
8	1250	1220	3330	1670	1300	1460	1390	2410	3780	1120	1040	1800
9	1220	1230	3870	2310	1300	1400	1360	3180	3730	1090	1030	1830
10	1210	1220	2700	2350	1420	1340	1750	3170	3680	1070	1040	1830
11	1250	1230	2570	2030	1660	1330	1760	2350	3740	1090	1230	1850
12	1490	1220	3010	1870	1450	1300	1550	2030	3750	1090	1590	1410
13	1510	1200	2550	1860	1380	1250	1400	1970	3730	1080	1930	1400
14	1660	1200	2150	1820	1430	1240	1300	1560	3320	1080	2000	1410
15	1370	1210	1780	1770	1460	1160	1210	1420	3250	1090	2010	1390
16	1540	1220	1730	1730	1430	1190	1140	1440	3200	1100	1970	1380
17	1470	1230	1570	1690	1440	1220	1100	1250	2850	1090	1940	1370
18	1400	1230	1400	1640	1570	1170	1060	1230	2640	1080	1940	1360
19	1360	1220	1310	1620	1610	1190	1010	1250	2390	1060	1930	1350
20	1380	1220	1290	1600	1580	1140	1100	1710	2090	1070	1940	1100
21	1370	1230	1260	1600	1620	1110	933	1810	1810	1060	1960	1000
22	1360	1270	1250	1600	1740	1100	914	1930	1700	1050	1960	860
23	1350	1270	1230	1640	1730	1090	899	2470	1570	1060	1920	782
24	1350	1250	1240	1810	1800	1070	995	2400	1440	1070	1930	765
25	1360	1230	1240	2150	2060	1070	1040	1960	1420	1060	1930	777
26	1360	1220	1240	1980	2800	1080	984	2070	1450	1040	1930	789
27	1350	1240	1240	1860	3170	1090	933	2290	1440	1040	1930	786
28	1280	1240	1220	1730	3350	1060	859	2530	1400	1040	1940	835
29	1330	1300	1210	1670	---	1040	808	3320	1380	1030	1950	1000
30	1320	1400	1210	1640	---	1240	1110	3420	1340	1040	1940	984
31	1320	---	1230	1620	---	2280	---	2790	---	1040	1950	---
TOTAL	40800	37280	52410	53780	46510	43880	36335	61500	76460	33910	50230	41128
MEAN	1316	1243	1691	1735	1661	1415	1211	1984	2549	1094	1620	1371
MAX	1660	1400	3870	2350	3350	2850	1780	3420	3850	1290	2010	1950
MIN	1090	1200	1210	1260	1260	1040	808	1170	1340	1030	1030	765
AC-FT	80930	73940	104000	106700	92250	87040	72070	122000	151700	67260	99630	81580

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 1994, BY WATER YEAR (WY)

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
MEAN	1516	2640	4484	3672	4238	3892	3827	3338	2597	2117	2147	1814					
MAX	2282	7669	14030	7754	10960	8119	6843	5587	4572	3127	3080	2642					
(WY)	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995					
MIN	1020	1160	1557	1575	1641	1099	1211	1857	1549	1059	1620	1333					
(WY)	1993	1988	1990	1992	1992	1992	1994	1992	1992	1992	1994	1980					

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1978 - 1994
ANNUAL TOTAL	1184150	574223	
ANNUAL MEAN	3244	1573	3018
HIGHEST ANNUAL MEAN			5276
LOWEST ANNUAL MEAN			1538
HIGHEST DAILY MEAN	16100	3870	50400
LOWEST DAILY MEAN	1090	765	765
ANNUAL SEVEN-DAY MINIMUM	1120	799	799
ANNUAL RUNOFF (AC-FT)	2349000	1139000	2186000
10 PERCENT EXCEEDS	6030	2370	5560
50 PERCENT EXCEEDS	2660	1360	2190
90 PERCENT EXCEEDS	1230	1050	1290

## ROGUE RIVER BASIN

14361900 APPLEGATE LAKE NEAR COPPER, OR

LOCATION.--Lat 42°03'25", long 123°06'30", in SE 1/4 sec.25, T.40 S., R.4 W., Jackson County, Hydrologic Unit 17100309, in outlet structure of Applegate Dam on Applegate River, 2.5 mi northeast of former town of Copper, 13 mi south of Ruch, and at mile 46.3.

DRAINAGE AREA.--223 mi<sup>2</sup>.

PERIOD OF RECORD.--December 1980 to current year.

GAGE.--Water-stage recorder. Datum of gage is sea level (levels by Corps of Engineers).

REMARKS.--Reservoir is formed by earthfill dam completed in October 1980. Storage began Dec. 2, 1980. Total capacity, 82,200 acre-ft between elevations 1,763.0 ft and 1,987.0 ft, maximum pool elevation. Elevation of gated spillway crest, 1,943.7 ft. Usable contents, 75,200 acre-ft between elevations 1,854.0 ft and 1,987.0 ft. Water is used for flood control, recreation, pollution abatement, irrigation, and other purposes.

COOPERATION.--Capacity table furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 82,220 acre-ft May 9, 1989, May 10, 1993, elevation, 1,987.02 ft; minimum contents since first filling, 7,230 acre-ft Jan. 11, 1991, elevation, 1,855.1 ft, from graph of gage readings furnished by Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 54,710 acre-ft May 23, 24, elevation, 1,955.84 ft; minimum contents, 10,550 acre-ft Dec. 7, elevation, 1,868.78 ft.

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

1,840.0	4,400	1,900.0	21,380	1,960.0	58,060
1,860.0	8,330	1,920.0	30,960	1,980.0	75,470
1,880.0	13,890	1,940.0	43,090	1,990.0	85,190

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1935.53	1897.72	1870.85	1877.61	1899.22	1908.04	1931.02	1946.70	1955.07	1948.56	1940.78	1931.50
2	1934.37	1896.78	1870.67	1877.93	1899.43	1909.62	1931.55	1947.10	1954.95	1948.32	1940.50	1931.18
3	1933.20	1895.83	1870.21	1878.58	1899.62	1911.42	1932.10	1947.51	1954.79	1948.09	1940.24	1930.87
4	1932.04	1894.88	1869.98	1880.18	1899.74	1913.33	1932.63	1948.14	1954.68	1947.85	1939.97	1930.54
5	1930.87	1893.92	1869.54	1881.75	1899.85	1914.88	1933.09	1948.83	1954.55	1947.59	1939.69	1930.23
6	1929.73	1892.94	1868.98	1882.63	1899.96	1916.12	1933.55	1950.10	1954.46	1947.34	1939.42	1929.90
7	1928.52	1891.95	1869.82	1883.14	1900.07	1917.13	1933.96	1951.09	1954.36	1947.10	1939.13	1929.56
8	1927.26	1890.93	1875.54	1884.00	1900.13	1918.02	1934.35	1951.95	1954.21	1946.85	1938.83	1929.23
9	1926.00	1889.88	1876.74	1884.80	1900.16	1918.88	1934.76	1952.69	1954.04	1946.58	1938.55	1928.91
10	1924.75	1888.82	1877.40	1885.45	1900.32	1919.79	1935.09	1953.34	1953.86	1946.31	1938.25	1928.60
11	1923.50	1887.77	1878.70	1885.96	1900.37	1920.61	1935.42	1953.86	1953.67	1946.06	1937.97	1928.28
12	1922.28	1886.72	1879.29	1886.36	1900.39	1921.31	1935.77	1954.29	1953.46	1945.80	1937.66	1927.97
13	1921.03	1885.65	1879.62	1886.68	1900.41	1921.98	1936.14	1954.62	1953.26	1945.57	1937.38	1927.65
14	1919.72	1884.57	1879.82	1886.98	1900.46	1922.70	1936.50	1954.89	1953.05	1945.33	1937.07	1927.33
15	1918.41	1883.49	1879.87	1887.29	1900.53	1923.42	1936.93	1955.17	1952.84	1945.10	1936.79	1927.00
16	1917.23	1882.38	1879.92	1887.55	1900.64	1924.16	1937.54	1955.38	1952.62	1944.86	1936.50	1926.68
17	1916.16	1881.30	1879.94	1887.78	1901.40	1924.77	1938.31	1955.54	1952.41	1944.62	1936.20	1926.35
18	1915.03	1880.19	1879.89	1888.02	1902.03	1925.35	1939.19	1955.65	1952.18	1944.37	1935.90	1926.01
19	1913.87	1879.07	1879.80	1888.27	1902.49	1925.84	1940.16	1955.72	1951.95	1944.13	1935.61	1925.68
20	1912.67	1877.88	1879.67	1888.54	1902.86	1926.24	1941.02	1955.76	1951.68	1943.87	1935.30	1925.35
21	1911.45	1876.63	1879.50	1888.95	1903.30	1926.66	1941.77	1955.79	1951.43	1943.63	1935.00	1925.01
22	1910.25	1875.42	1879.31	1890.81	1903.60	1926.99	1942.37	1955.83	1951.17	1943.40	1934.69	1924.66
23	1909.03	1874.57	1879.09	1894.15	1903.89	1927.32	1942.94	1955.84	1950.89	1943.15	1934.37	1924.32
24	1907.80	1873.90	1878.87	1896.58	1904.21	1927.58	1943.45	1955.83	1950.60	1942.89	1934.05	1923.99
25	1906.56	1873.23	1878.66	1897.87	1904.66	1927.85	1943.99	1955.80	1950.32	1942.64	1933.74	1923.64
26	1905.29	1872.57	1878.44	1898.68	1905.28	1928.10	1944.43	1955.76	1950.02	1942.38	1933.42	1923.29
27	1904.02	1871.91	1878.20	1899.12	1906.06	1928.36	1944.86	1955.69	1949.73	1942.10	1933.11	1922.92
28	1902.75	1871.26	1877.95	1899.13	1906.87	1928.69	1945.31	1955.59	1949.43	1941.84	1932.77	1922.62
29	1901.47	1871.35	1877.66	1899.10	--	1929.14	1945.75	1955.46	1949.12	1941.59	1932.47	1922.36
30	1900.20	1871.19	1877.53	1899.07	--	1929.90	1946.25	1955.32	1948.82	1941.30	1932.14	1922.03
31	1898.83	--	1877.47	1899.05	--	1930.50	--	1955.19	--	1941.05	1931.82	--
MAX	1935.53	1897.72	1879.94	1899.13	1906.87	1930.50	1946.25	1955.84	1955.07	1948.56	1940.78	1931.50
MIN	1898.83	1871.19	1868.98	1877.61	1899.22	1908.04	1931.02	1946.70	1948.82	1941.05	1931.82	1922.03
(†)	20880	11220	13080	20970	24430	36960	47480	54200	49360	43810	37770	32060
(‡)	-20060	-9660	+1860	+7890	+3460	+12530	+10520	+6720	-4840	-5550	-6040	-5710

CAL YR 1993 MAX 1986.99 MIN 1868.98 AC-FT† -2580  
WTR YR 1994 MAX 1955.84 MIN 1868.98 AC-FT† -8880

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

ROGUE RIVER BASIN

423

14362000 APPLEGATE RIVER NEAR COPPER, OR

LOCATION.--Lat 42°03'50", long 123°06'37", in SW 1/4 NW 1/4 sec.30, T.40 S., R.3 W., Jackson County, Hydrologic Unit 17100309, U.S. Corps of Engineers land, on left bank 0.1 mi downstream from Brushy Gulch, 0.6 mi downstream from Applegate Dam, 3.1 mi northeast of former town of Copper, and at mile 45.7.

DRAINAGE AREA.--225 mi<sup>2</sup>.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1938 to current year. Prior to January 1939 monthly discharge only, published in WSP 1318.

REVISED RECORDS.--WDR OR-78-1: Drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 1,747.51 ft above sea level. Prior to Oct. 1, 1977, at site 0.6 mi upstream at datum 12.15 ft higher.

REMARKS.--No estimated daily discharges. Water-discharge records good. Flow regulated since December 1980 by Applegate Lake (station 14361900). Some storage during winter in Squaw Lakes Reservoir, capacity, 1,100 acre-ft on Squaw Creek upstream from station. Diversions upstream from station from Carberry Creek for irrigation in Thompson Creek basin. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--56 years, 425 ft<sup>3</sup>/s, 307,900 acre-ft/yr, adjusted for storage.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 29,800 ft<sup>3</sup>/s Jan. 15, 1974, gage height, 25.38 ft, site and datum then in use, from high-water mark in well, from rating curve extended above 12,000 ft<sup>3</sup>/s on basis of four slope-area measurements of peak flows made in 1950, 1955, 1964, and 1974; minimum discharge, 1.5 ft<sup>3</sup>/s Dec. 20, 1980, result of regulation at Applegate dam, 0.6 mi upstream.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 546 ft<sup>3</sup>/s Oct. 1, gage height, 3.37 ft; minimum discharge, 109 ft<sup>3</sup>/s several days in January, February and March.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	459	298	150	131	162	113	117	119	183	150	121	119
2	415	255	153	131	140	113	117	119	176	140	121	118
3	412	254	152	129	140	113	117	120	176	140	120	117
4	409	254	148	129	141	114	117	119	176	140	118	117
5	407	253	148	133	142	115	117	120	176	140	117	117
6	404	252	148	129	142	116	117	118	176	140	118	117
7	415	251	158	127	142	112	117	118	168	140	122	117
8	423	250	162	117	142	109	117	119	176	140	121	117
9	419	250	164	109	142	109	117	120	176	140	121	117
10	416	250	164	109	144	110	117	132	176	140	121	116
11	415	251	166	111	146	110	117	155	172	138	120	115
12	414	249	166	111	146	111	118	155	169	127	119	115
13	410	246	158	111	146	111	119	155	169	121	119	115
14	419	246	155	113	140	117	119	155	169	121	119	115
15	423	245	155	113	135	122	120	155	169	121	119	115
16	388	243	137	114	136	121	117	184	169	121	119	115
17	345	243	121	115	121	121	117	200	169	121	119	115
18	347	243	123	113	109	121	117	199	169	121	119	115
19	350	242	123	113	110	121	117	197	167	121	119	115
20	353	245	123	113	113	121	117	199	166	121	119	115
21	354	252	123	113	114	121	117	196	166	121	119	115
22	350	252	124	113	113	121	118	195	166	121	119	115
23	347	191	125	116	111	122	119	195	166	119	119	115
24	346	153	125	151	112	123	119	196	166	119	119	115
25	346	153	125	195	113	123	119	197	166	119	119	115
26	345	153	125	195	113	123	120	197	166	119	119	116
27	343	153	125	225	113	123	121	195	166	119	119	119
28	342	149	128	278	113	123	121	195	166	119	119	121
29	340	148	131	252	---	123	120	195	166	121	119	121
30	338	148	130	236	---	119	119	195	166	121	119	120
31	343	---	131	213	---	117	---	195	---	121	119	---
TOTAL	11837	6772	4366	4458	3641	3638	3541	5109	5107	3962	3700	3494
MEAN	382	226	141	144	130	117	118	165	170	128	119	116
MAX	459	298	166	278	162	123	121	200	183	150	122	121
MIN	338	148	121	109	109	109	117	118	166	119	117	115
AC-FT	23480	13430	8660	8840	7220	7220	7020	10130	10130	7860	7340	6930
MEAN†	55.6	63.4	171	272	192	321	295	274	88.9	37.6	21.1	20.5
AC-FT†	3420	3770	10520	16730	10680	19750	17540	16850	5290	2310	1300	1220

CAL YR 1993 TOTAL 168758 MEAN 462 MAX 3820 MIN 117 AC-FT 334700 MEAN† 459 AC-FT† 332120  
WTR YR 1994 TOTAL 59625 MEAN 163 MAX 459 MIN 109 AC-FT 118300 MEAN† 151 AC-FT† 109420

† Adjusted for change in contents of Applegate Lake.

## ROGUE RIVER BASIN

14362000 APPLEGATE RIVER NEAR COPPER, OR--Continued

## WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: September 1980 to September 1987.

pH: September 1980 to September 1987.

WATER TEMPERATURE: January 1977 to current year.

DISSOLVED OXYGEN: September 1980 to September 1987.

INSTRUMENTATION.--Water-quality monitor since September 1980.

REMARKS.--Temperatures are controlled by releases from Applegate Lake.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum, 188 microsiemens Sept. 13, 1980; minimum, 61 microsiemens Dec. 3, 1980,

Dec. 20, 1981, June 19, 20, 1983.

pH: Maximum, 9.0 units Sept. 4, 1980; minimum recorded, 7.1 units Oct. 8-10, 13, 16, 17, 1986.

WATER TEMPERATURE: Maximum, 26.5°C Aug. 7, 1978; minimum, 0.0°C on many days during winter periods prior to filling of Applegate Lake.

DISSOLVED OXYGEN: Maximum, 15.2 mg/L Feb. 17, 18, 1986; minimum, 4.9 mg/L Sept. 28-30, 1981.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 17.5°C Aug. 20; minimum, 4.0°C Dec. 29, 30, Jan. 3-7.

## TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

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

ROGUE RIVER BASIN

425

14362000 APPLEGATE RIVER NEAR COPPER, OR--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

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



## ROGUE RIVER BASIN

14362250 STAR GULCH NEAR RUCH, OR

LOCATION.--Lat 42°09'15", long 123°04'27", in NE 1/4 NE 1/4 sec.29, T.39 S., R.3 W., Jackson County, Hydrologic Unit 17100309, Bureau of Land Management land, on left bank 1.0 mi downstream from Benson Gulch, 6.0 mi southwest of Ruch, and at mile 1.1.

DRAINAGE AREA.--16.0 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1983 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,667.04 ft above sea level.

REMARKS.--No estimated daily discharges. Records good.

AVERAGE DISCHARGE.--11 years, 3.10 ft<sup>3</sup>/s, 2,250 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 153 ft<sup>3</sup>/s Dec. 14, 1983, Nov. 28, 1985, gage height, 3.11 ft; no flow at times most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 40 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 8	0200	*40	*2.25	No other peak greater than base discharge.			
No flow many days June to September.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.13	.67	.95	1.4	1.6	4.0	1.3	.89	.43	.00	.00	.00
2	.14	.74	.78	1.4	1.5	3.6	1.2	.87	.39	.00	.00	.00
3	.16	.77	.68	1.4	1.4	3.4	1.2	.84	.35	.00	.00	.00
4	.16	.80	1.2	1.5	1.3	3.0	1.1	1.0	.35	.00	.00	.00
5	.17	.84	.93	1.6	1.2	2.7	1.1	1.6	.37	.00	.00	.00
6	.18	.87	.73	1.6	1.3	2.5	1.2	2.4	.43	.00	.00	.00
7	.22	.90	2.1	1.5	1.4	2.3	1.1	2.2	.46	.00	.00	.00
8	.25	.91	2.1	2.0	1.4	2.2	1.1	1.7	.36	.00	.00	.00
9	.29	.91	8.0	2.6	1.3	2.0	1.1	1.4	.27	.00	.00	.00
10	.42	.87	3.9	2.4	1.7	1.9	1.0	1.2	.21	.00	.00	.00
11	.46	.90	4.4	2.2	2.0	1.9	.95	1.1	.16	.00	.00	.00
12	.54	1.0	5.1	2.0	1.9	1.7	.94	1.0	.12	.00	.00	.00
13	.51	1.1	3.9	1.8	1.8	1.6	.91	.89	.11	.00	.00	.00
14	.55	1.0	3.9	1.7	1.8	1.6	.87	.85	.14	.00	.00	.00
15	.80	1.0	3.2	1.6	2.0	1.5	.91	.84	.18	.00	.00	.00
16	.85	1.0	2.8	1.5	2.2	1.6	.88	.83	.19	.00	.00	.00
17	.63	1.0	2.4	1.4	4.1	1.5	.87	.86	.20	.00	.00	.00
18	.60	1.0	2.1	1.4	6.3	1.5	.81	.82	.20	.00	.00	.00
19	.59	1.0	1.9	1.3	5.3	1.5	.81	.74	.17	.00	.00	.00
20	.57	1.0	1.7	1.3	4.2	1.4	.80	.67	.11	.00	.00	.00
21	.55	1.0	1.6	1.3	4.1	1.4	.75	.65	.06	.00	.00	.00
22	.55	1.0	1.5	1.5	3.7	1.4	.75	.67	.04	.00	.00	.00
23	.55	1.0	1.4	1.9	3.5	1.3	.79	.59	.02	.00	.00	.00
24	.55	1.0	1.3	3.2	3.8	1.3	1.1	.50	.01	.00	.00	.00
25	.55	1.0	1.3	3.6	4.4	1.3	1.2	.43	.01	.00	.00	.00
26	.55	1.0	1.3	3.1	4.9	1.2	1.2	.44	.01	.00	.00	.00
27	.54	1.0	1.2	2.6	4.9	1.1	1.1	.45	.00	.00	.00	.00
28	.52	1.0	1.2	2.3	4.4	1.1	1.0	.41	.00	.00	.00	.00
29	.54	1.4	1.1	2.1	---	1.3	.95	.38	.00	.00	.00	.00
30	.56	1.4	1.2	1.9	---	1.6	.93	.37	.00	.00	.00	.00
31	.59	---	1.4	1.7	---	1.4	---	.38	---	.00	.00	---
TOTAL	14.27	29.08	86.17	58.8	79.4	57.8	29.92	27.97	5.35	0.00	0.00	0.00
MEAN	.46	.97	2.78	1.90	2.84	1.86	1.00	.90	.18	.000	.000	.000
MAX	.85	1.4	2.1	3.6	6.3	4.0	1.3	2.4	.46	.00	.00	.00
MIN	.13	.67	.68	1.3	1.2	1.1	.75	.37	.00	.00	.00	.00
AC-FT	28	58	171	117	157	115	59	55	11	.00	.00	.00

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 1994, BY WATER YEAR (WY)

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
MEAN	.70	3.29	5.85	5.12	6.87	7.07	4.37	2.15	1.10	.65	.38	.40
MAX	1.98	18.0	36.5	16.6	18.6	20.5	12.5	5.68	3.27	3.14	2.16	2.00
(WY)	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1983	1984
MIN	.021	.23	.87	1.13	1.58	.95	1.00	.22	.012	.000	.000	.000
(WY)	1993	1993	1990	1992	1992	1992	1994	1992	1992	1994	1988	1991

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1983 - 1994
ANNUAL TOTAL	1700.80	388.76	
ANNUAL MEAN	4.66	1.07	3.10
HIGHEST ANNUAL MEAN			9.81
LOWEST ANNUAL MEAN			.60
HIGHEST DAILY MEAN	102 Jan 20	21 Dec 8	139 Dec 14 1983
LOWEST DAILY MEAN	.06 Sep 11	.00 Jun 27	.00 Aug 10 1987
ANNUAL SEVEN-DAY MINIMUM	.08 Sep 7	.00 Jun 27	.00 Aug 21 1987
ANNUAL RUNOFF (AC-FT)	3370	771	2250
10 PERCENT EXCEEDS	10	2.3	7.1
50 PERCENT EXCEEDS	1.7	.84	1.1
90 PERCENT EXCEEDS	.25	.00	.01

ROGUE RIVER BASIN

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14366000 APPLEGATE RIVER NEAR APPLEGATE, OR

LOCATION.--Lat 42°14'30", long 123°08'20", in NE 1/4 sec.26, T.38 S., R.4 W., Jackson County, Hydrologic Unit 17100309, on left bank 0.9 mi downstream from Keeler Creek, 1.8 mi southeast of Applegate, and at mile 26.7.

DRAINAGE AREA.--483 mi<sup>2</sup>.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1938 to current year.

RECORDS.--WSP 1738: Drainage area. WSP 1935: 1953(M). WDR OR-76-1: 1956(M), 1965(M).

GAGE.--Water-stage recorder. Datum of gage is 1,285.33 ft above sea level. Prior to Dec. 23, 1938, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Water-discharge records good. Flow regulated since December 1980 by Applegate Lake (station 14361900). Many diversions for irrigation upstream from station. McDonald Creek Canal diverts from McDonald Creek upstream from station for irrigation in Bear Creek basin. Thompson Creek Irrigation Association ditch diverts upstream from station for irrigation in Thompson Creek basin. Fowler-Keeler and Berryman ditches divert upstream from station for irrigation downstream. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--42 years (water years 1939-80), 548 ft<sup>3</sup>/s, 397,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 37,200 ft<sup>3</sup>/s Jan. 15, 1974, gage height, 20.41 ft, from rating curve extended above 18,000 ft<sup>3</sup>/s on basis of slope-area measurements of flow at gage heights 18.00 ft and 19.57 ft; minimum discharge, 4.6 ft<sup>3</sup>/s Sept. 22-25, 1979. Minimum since first filling of Applegate Lake, 65 ft<sup>3</sup>/s Aug. 2, 1992.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Feb. 20, 1927, reached a stage of 18.7 ft, from floodmarks.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 478 ft<sup>3</sup>/s Oct. 1, gage height, 2.59 ft; minimum discharge, 78 ft<sup>3</sup>/s Aug. 3.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	445	323	168	151	189	161	148	146	176	117	84	87
2	399	260	169	151	153	168	147	142	163	102	82	89
3	394	258	164	152	153	170	147	138	158	100	82	90
4	392	257	171	152	152	171	146	141	157	102	82	93
5	391	257	166	160	152	166	145	147	159	99	83	92
6	393	257	162	158	155	161	145	202	164	98	82	92
7	396	256	181	149	153	156	146	196	155	97	84	90
8	407	254	328	153	154	149	142	190	154	96	85	90
9	407	255	242	145	151	147	141	183	152	96	86	93
10	407	255	209	143	158	148	140	176	150	97	87	93
11	406	257	226	143	158	150	140	195	146	101	86	97
12	405	259	224	141	154	147	135	188	143	95	88	94
13	403	256	206	139	156	146	134	175	142	89	88	94
14	414	254	195	138	155	147	136	173	142	88	89	93
15	428	252	192	137	149	154	136	172	145	87	86	95
16	410	251	183	136	149	158	135	182	142	86	86	95
17	351	251	157	134	164	155	135	210	143	89	87	95
18	349	250	155	133	156	154	131	206	144	89	85	94
19	358	248	154	131	147	153	138	206	143	86	89	94
20	358	247	153	130	144	150	143	207	139	86	88	90
21	359	254	151	130	150	151	140	203	138	86	90	92
22	353	255	148	134	146	149	139	203	137	87	90	93
23	350	226	146	156	143	149	134	197	135	86	90	94
24	350	161	148	167	143	148	135	187	134	87	90	93
25	350	158	148	216	147	148	141	182	131	88	93	94
26	350	160	148	216	155	148	139	188	126	87	91	93
27	345	163	147	223	157	148	140	184	126	93	91	95
28	339	160	145	259	156	148	140	179	128	87	90	108
29	338	173	147	273	---	153	141	179	125	87	90	114
30	336	178	149	243	---	158	147	179	124	85	85	108
31	338	---	152	232	---	155	---	179	---	84	84	---
TOTAL	11721	7045	5434	5125	4299	4766	4206	5635	4321	2857	2693	2834
MEAN	378	235	175	165	154	154	140	182	144	92.2	86.9	94.5
MAX	445	323	328	273	189	171	148	210	176	117	93	114
MIN	336	158	145	130	143	146	131	138	124	84	82	87
AC-FT	23250	13970	10780	10170	8530	9450	8340	11180	8570	5670	5340	5620

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1982 - 1994, BY WATER YEAR (WY)

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
MEAN	340	482	698	503	688	625	524	665	426	199	167	232	
MAX	507	1261	3077	1201	2552	1596	1304	1705	1237	370	263	425	
(WY)	1983	1985	1982	1982	1983	1983	1982	1983	1983	1983	1993	1983	
MIN	218	195	158	142	148	142	139	160	119	86.5	74.5	83.8	
(WY)	1982	1988	1991	1991	1992	1992	1992	1992	1992	1992	1992	1992	

SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1982 - 1994

ANNUAL TOTAL	209421	60936	461
ANNUAL MEAN	574	167	1072
HIGHEST ANNUAL MEAN			153
LOWEST ANNUAL MEAN			1983
HIGHEST DAILY MEAN	4980	Mar 20	7230
LOWEST DAILY MEAN	145	Dec 28	67
ANNUAL SEVEN-DAY MINIMUM	147	Dec 23	71
ANNUAL RUNOFF (AC-FT)	415400	120900	334100
10 PERCENT EXCEEDS	1290	259	992
50 PERCENT EXCEEDS	325	148	253
90 PERCENT EXCEEDS	208	89	134

## ROGUE RIVER BASIN

14366000 APPLEGATE RIVER NEAR APPLEGATE, OR--Continued

## WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: August 1973 to current year.

INSTRUMENTATION.--Temperature recorder since August 1973.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum, 28.0°C July 29, 30, Aug. 3, 4, 1974; minimum, 0.0°C on several days during winter periods most years. Maximum since full operation of Applegate Lake, 25.5°C July 5, 1984, July 16, 19, 27, 1992; minimum, 0.0°C on several days during winter periods most years.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 24.0°C July 19-21; minimum, 1.5°C Dec. 23.

## TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	16.0	13.0	14.0	10.0	7.5	9.0	8.0	6.5	7.0	6.5	4.5	5.5
2	14.0	10.5	12.0	10.0	7.0	8.5	7.5	6.0	6.5	6.5	5.5	6.0
3	14.0	10.0	12.0	10.0	7.0	8.5	6.5	5.0	6.0	6.5	5.0	5.5
4	13.0	11.0	12.0	10.5	8.0	9.5	8.0	6.0	7.0	6.5	5.5	6.0
5	14.0	12.0	12.5	9.5	7.0	8.5	6.5	5.5	6.0	6.0	5.0	5.5
6	13.5	11.0	12.5	9.5	6.5	8.0	6.5	5.5	6.0	5.5	4.0	5.0
7	14.0	11.0	12.5	9.0	6.5	8.0	7.5	6.0	7.0	4.5	3.0	4.0
8	13.5	9.5	11.5	9.0	6.5	8.0	7.0	6.5	7.0	6.0	4.5	5.0
9	13.5	10.0	12.0	9.0	7.5	8.5	7.5	6.0	6.5	6.0	5.0	5.5
10	14.0	12.0	13.0	10.0	7.5	9.0	8.5	6.5	7.5	5.0	4.0	4.5
11	14.0	11.5	13.0	9.5	7.5	8.5	8.5	6.5	7.5	6.5	5.0	5.5
12	14.5	13.0	13.5	9.5	8.5	9.0	6.5	5.5	6.0	6.0	5.0	5.5
13	14.5	12.5	13.5	10.0	8.5	9.0	7.0	5.0	6.0	5.5	4.5	5.0
14	14.5	12.5	13.5	8.5	6.5	7.5	7.0	5.5	6.0	5.0	3.0	4.0
15	13.0	12.0	12.5	8.0	6.0	7.0	7.5	6.5	7.0	5.5	4.0	4.5
16	12.5	11.0	12.0	9.0	6.5	7.5	6.5	5.0	6.0	6.0	4.5	5.0
17	12.0	9.5	11.0	8.5	7.0	8.0	5.5	4.0	4.5	4.5	3.0	3.5
18	11.5	8.5	10.0	9.5	7.5	8.5	4.0	2.5	3.5	4.5	2.5	3.5
19	11.5	8.5	10.0	7.5	6.0	7.0	4.0	2.0	3.0	4.0	2.0	3.0
20	11.5	8.5	10.0	7.0	5.0	6.0	4.0	2.0	3.0	4.0	2.0	3.0
21	12.5	10.0	11.0	7.0	5.0	6.0	4.0	2.0	3.0	6.5	3.5	5.0
22	11.5	9.0	10.5	8.0	7.0	7.5	3.5	2.0	2.5	8.0	6.0	7.0
23	11.0	8.0	9.5	7.5	5.5	6.5	3.5	1.5	2.5	8.0	6.5	7.0
24	11.0	8.5	10.0	6.0	3.5	4.5	3.5	2.0	2.5	7.0	6.0	6.5
25	10.5	8.0	9.5	5.0	3.0	4.0	3.5	2.0	3.0	6.0	4.5	5.0
26	10.5	8.0	9.5	5.5	3.0	4.0	5.0	3.0	4.0	6.0	4.5	5.0
27	10.0	8.0	9.0	6.5	5.0	6.0	4.5	3.0	3.5	5.5	4.5	5.0
28	10.5	8.0	9.5	7.5	6.0	7.0	5.0	3.0	4.0	5.5	3.5	4.5
29	11.0	8.5	9.5	7.5	7.0	7.0	5.0	3.5	4.0	5.5	3.0	4.0
30	10.5	8.0	9.5	7.5	6.5	7.0	5.0	4.0	4.5	5.5	3.0	4.0
31	11.0	8.5	10.0	---	---	---	5.0	4.0	4.5	5.0	2.5	4.0
MONTH	16.0	8.0	11.5	10.5	3.0	7.5	8.5	1.5	5.0	8.0	2.0	5.0

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



## ROGUE RIVER BASIN

14369500 APPLEGATE RIVER NEAR WILDERVILLE, OR

LOCATION.--Lat 42°21'15", long 123°24'20", in SE 1/4 NE 1/4 sec.16, T.37 S., R.6 W., Josephine County, Hydrologic Unit 17100309, on left bank 0.3 mi downstream from Jackson Creek, 3.6 mi southeast of Wilderville, and at mile 7.6.

DRAINAGE AREA.--698 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1938 to September 1955, September 1978 to current year.

REVISED RECORDS.--WSP 1318: 1943. WSP 1738: 1951, 1953, drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 947.18 ft above sea level (Corps of Engineers bench mark). Prior to Sept. 1, 1978, nonrecording gage at site 1,100 ft upstream at datum 2.36 ft higher.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since December 1980 by Applegate Lake (station 14361900). Many diversions for irrigation upstream from station. Wilderville ditch diverts up to 16 ft<sup>3</sup>/s 0.3 mi upstream and at the mouth of Jackson Creek. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--19 years (water years 1939-55, 1979, 1980), 717 ft<sup>3</sup>/s, 519,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 47,500 ft<sup>3</sup>/s Jan. 18, 1953, gage height, 18.3 ft, from floodmark, site and datum then in use, from rating curve extended above 12,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; minimum discharge, 0.78 ft<sup>3</sup>/s Aug. 22-24, 1979. Minimum since first filling of Applegate Lake, 34 ft<sup>3</sup>/s Aug. 4, 1992.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Dec. 22, 1955, reached a stage of 20.3 ft, from floodmark, former site and datum, discharge, 66,500 ft<sup>3</sup>/s, from rating curve extended above 12,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow.

Flood of February 1927 reached a stage of 22 ft at former site, from local resident. Floods of Dec. 22, 1964, and Jan. 15, 1974, are known to have exceeded the December 1955 flood.

No flow was observed at present site during the late summer of 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,340 ft<sup>3</sup>/s Dec. 8, gage height, 3.91 ft; minimum discharge, 34 ft<sup>3</sup>/s Jul. 20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	420	366	210	192	272	312	201	165	170	87	44	53
2	386	299	208	197	236	308	197	160	157	80	44	57
3	374	288	202	200	223	301	195	152	150	71	44	62
4	369	284	214	205	219	294	191	150	154	69	43	64
5	372	281	210	260	216	278	187	160	151	67	44	66
6	374	279	198	264	218	264	189	182	157	64	44	61
7	375	278	237	240	220	252	192	216	151	68	45	60
8	384	276	1010	253	219	239	189	203	141	61	47	62
9	384	277	587	323	214	232	187	194	139	57	46	67
10	386	275	363	291	232	226	189	177	137	55	46	68
11	394	272	363	271	252	224	184	181	139	56	45	73
12	405	277	387	257	244	217	174	185	136	60	45	75
13	401	274	325	245	240	212	167	173	132	55	45	72
14	408	272	303	237	244	210	166	163	125	50	44	71
15	432	269	288	230	245	212	162	173	125	49	50	64
16	431	276	274	222	245	219	165	183	122	47	48	66
17	370	270	244	215	310	217	164	209	122	49	48	67
18	358	271	221	211	361	212	157	212	128	49	51	69
19	368	265	215	207	310	216	155	208	128	37	51	66
20	363	263	211	204	280	208	163	213	121	35	54	61
21	366	267	207	201	302	212	160	208	112	37	54	59
22	370	273	202	203	306	214	159	208	113	40	53	60
23	364	270	196	217	284	212	156	198	110	47	51	65
24	366	207	193	260	281	209	159	187	108	51	51	69
25	364	188	192	293	287	206	163	181	109	48	52	68
26	368	186	190	295	294	204	167	180	106	46	52	68
27	365	188	190	289	303	201	163	182	98	46	54	64
28	359	190	186	303	316	200	166	175	95	47	55	75
29	359	203	183	335	---	204	165	173	93	43	55	112
30	359	228	186	304	---	214	163	169	87	44	54	112
31	359	---	191	298	---	210	---	162	---	44	52	---
TOTAL	11753	7812	8386	7722	7373	7139	5195	5682	3816	1659	1511	2056
MEAN	379	260	271	249	263	230	173	183	127	53.5	48.7	68.5
MAX	432	366	1010	335	361	312	201	216	170	87	55	112
MIN	358	186	183	192	214	200	155	150	87	35	43	53
AC-FT	23310	15500	16630	15320	14620	14160	10300	11270	7570	3290	3000	4080

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1982 - 1994, BY WATER YEAR (WY)

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
MEAN	373	681	1115	845	1193	1000	800	730	456	185	147	228	
MAX	569	2099	4719	1963	4241	2715	2177	1916	1333	390	239	482	
(WY)	1984	1985	1982	1983	1983	1982	1983	1983	1983	1984	1984	1983	
MIN	272	239	196	209	263	230	173	166	98.4	53.5	39.3	66.0	
(WY)	1993	1988	1991	1991	1994	1994	1994	1992	1992	1994	1992	1992	

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1982 - 1994

ANNUAL TOTAL	257832	70104	643	
ANNUAL MEAN	706	192	1546	1983
HIGHEST ANNUAL MEAN			192	1994
LOWEST ANNUAL MEAN			16200	Feb 18 1983
HIGHEST DAILY MEAN	5330	Mar 20	35	Jul 20 1994
LOWEST DAILY MEAN	183	Dec 29	37	Jul 31 1992
ANNUAL SEVEN-DAY MINIMUM	188	Dec 25	42	
ANNUAL RUNOFF (AC-FT)	511400		139100	465900
10 PERCENT EXCEEDS	1550		359	1460
50 PERCENT EXCEEDS	418		193	327
90 PERCENT EXCEEDS	211		51	125



ROGUE RIVER BASIN

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14369500 APPLEGATE RIVER NEAR WILDERVILLE, OR--Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: September 1978 to current year.

INSTRUMENTATION.--Temperature recorder since September 1978.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum, 29.0°C June 22, 1992; minimum, 0.0°C Feb. 6, 7, 1989.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 28.0°C July 19, 20; minimum, 1.5°C Dec. 24.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	17.5	15.0	16.5	10.5	8.5	9.5	8.0	7.5	7.5	6.5	5.0	6.0
2	16.5	13.5	15.0	10.0	7.5	9.0	8.0	7.0	7.5	7.0	6.5	6.5
3	16.0	13.0	14.5	10.0	7.5	9.0	7.5	6.5	7.0	8.0	6.5	7.0
4	15.5	13.5	14.5	10.0	8.0	9.5	7.5	6.5	7.0	8.0	7.5	7.5
5	16.0	13.5	15.0	10.0	8.0	9.0	7.0	6.0	6.5	7.5	6.5	7.0
6	15.5	13.5	14.5	9.0	7.0	8.0	7.0	6.0	6.5	7.0	6.0	6.5
7	15.0	13.0	14.0	8.5	6.5	8.0	7.5	6.5	7.0	6.0	5.0	5.5
8	14.0	11.5	13.0	8.5	6.5	7.5	7.5	7.0	7.5	6.5	5.5	6.0
9	13.5	11.0	12.5	8.5	7.0	7.5	7.5	7.0	7.0	7.0	6.0	6.5
10	15.5	13.0	14.0	9.0	7.0	8.5	9.5	7.5	9.0	6.5	5.5	6.0
11	14.5	13.5	14.0	9.0	7.5	8.0	9.5	7.5	8.5	7.0	6.0	6.5
12	15.5	14.0	14.5	9.0	7.5	8.5	7.5	6.5	7.0	7.5	6.5	7.0
13	15.5	14.0	14.5	8.5	7.0	8.0	6.5	5.5	6.0	7.0	6.0	6.5
14	15.0	13.5	14.5	8.0	6.5	7.0	7.0	6.0	6.5	6.0	5.5	5.5
15	14.5	13.5	14.0	7.0	5.0	6.5	8.0	7.0	7.5	6.0	5.0	5.5
16	13.5	12.5	13.0	7.5	5.5	7.0	7.0	6.0	6.5	6.5	5.5	6.0
17	13.5	11.5	12.5	8.0	6.5	7.0	6.0	4.5	5.5	6.0	5.0	5.5
18	12.5	10.5	11.5	8.5	7.5	8.0	4.5	3.5	4.0	5.0	4.5	4.5
19	12.0	9.5	11.0	7.5	6.5	6.5	4.0	2.5	3.5	5.0	4.5	4.5
20	12.0	10.0	11.0	6.5	5.5	6.0	3.5	2.5	3.0	5.0	4.5	4.5
21	13.5	11.0	12.5	5.5	5.0	5.5	3.5	2.5	3.0	6.0	4.5	5.0
22	13.0	11.0	12.0	7.0	5.5	6.5	3.5	3.0	3.0	8.0	6.0	6.5
23	12.5	10.5	11.5	7.0	6.0	6.5	3.5	3.0	3.0	8.5	7.5	8.0
24	12.5	10.0	11.5	6.0	4.0	4.5	3.0	1.5	2.5	8.5	7.0	7.5
25	12.0	10.0	11.0	4.0	2.5	3.5	3.0	2.0	2.5	7.0	6.0	6.5
26	11.5	9.5	11.0	4.5	2.5	3.5	4.0	3.0	3.5	6.5	5.5	6.0
27	11.0	9.5	10.5	6.0	4.5	5.5	4.0	3.5	4.0	6.0	5.0	5.5
28	11.0	9.0	10.0	7.5	6.0	6.5	4.5	3.5	4.0	6.0	4.5	5.0
29	11.5	9.5	10.5	8.0	7.5	8.0	4.5	3.5	4.5	5.0	3.5	4.5
30	11.5	9.5	10.5	8.0	7.0	7.5	5.5	4.0	4.5	5.0	3.0	4.5
31	11.5	10.0	10.5	---	---	---	5.5	5.0	5.5	5.0	3.0	4.0
MONTH	17.5	9.0	13.0	10.5	2.5	7.0	9.5	1.5	5.5	8.5	3.0	6.0

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



ROGUE RIVER BASIN

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14372300 ROGUE RIVER NEAR AGNESS, OR  
(National stream-quality accounting network station)

LOCATION.--Lat 42°34'50", long 124°03'30", in NE 1/4 NW 1/4 sec.6, T.35 S., R.11 W., Curry County, Hydrologic Unit 17100310, on left bank 0.8 mi upstream from Shasta Costa Creek, 1.5 mi north of Agness, 2.6 mi upstream from Illinois River, and at mile 29.7.

DRAINAGE AREA.--3,939 mi<sup>2</sup>.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 113.81 ft above sea level (levels by U.S. Bureau of Public Roads).

REMARKS.--No estimated daily discharges. Water-discharge records good. Flow regulated since February 1977 by Lost Creek Lake (station 14335040), since December 1980 by Applegate Lake (station 14361900), slight regulation by Fish Lake and Emigrant Lake. Many diversions for irrigation and mining.

AVERAGE DISCHARGE.--34 years, 5,012 ft<sup>3</sup>/s, 3,631,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 290,000 ft<sup>3</sup>/s Dec. 23, 1964, from slope-area measurement; maximum gage height, 68.03 ft Dec. 23, 1964, from floodmark (backwater from Illinois River); minimum discharge, 608 ft<sup>3</sup>/s July 9, 10, 1968.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 11,300 ft<sup>3</sup>/s Dec. 8, gage height, 7.10 ft; minimum discharge, 955 ft<sup>3</sup>/s Sept. 24, 25.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1840	1820	2290	1980	2670	5380	3010	1750	2910	1430	1160	2000
2	1850	1820	2160	2110	2470	4750	2500	1850	2580	1410	1160	2010
3	1760	1690	1920	2260	2260	4500	2260	1780	2490	1330	1150	1930
4	1740	1670	2160	2370	2180	4190	2110	1780	2720	1300	1130	1980
5	1740	1640	2010	3360	2110	3830	1970	1820	2820	1300	1140	1980
6	1770	1640	1900	4120	2070	3470	1950	1830	3180	1310	1150	1970
7	1810	1630	2990	3890	2050	3190	2130	2140	3720	1280	1160	1940
8	1820	1630	9000	3680	2050	2950	2410	2690	3950	1280	1160	1910
9	1890	1630	9300	5010	2020	2780	2950	3150	3840	1250	1170	1970
10	1880	1630	6300	5220	2110	2650	2910	3670	3780	1220	1150	2010
11	1910	1630	7550	4550	2330	2490	3120	3400	3730	1200	1150	2010
12	1980	1640	6660	3850	2420	2390	2850	2720	3770	1220	1360	1980
13	2110	1630	5340	3430	2270	2290	2520	2590	3760	1200	1750	1560
14	2180	1600	4570	3270	2360	2210	2330	2550	3640	1180	2020	1590
15	2200	1590	3910	3080	2410	2150	2180	2230	3320	1180	2070	1580
16	2060	1600	3360	2910	2430	2110	2020	2530	3290	1190	2070	1540
17	2140	1630	3060	2770	4620	2120	1930	2390	3160	1200	2030	1520
18	1990	1640	2690	2640	5480	2130	1850	2130	2890	1190	1990	1520
19	1930	1630	2390	2540	4700	2100	1770	2090	2710	1190	1990	1530
20	1910	1610	2230	2470	4150	2070	1700	2080	2450	1140	1980	1500
21	1920	1620	2120	2440	4590	2190	1760	2570	2120	1160	1980	1260
22	1920	1690	2030	2590	4870	2190	1600	2570	1870	1140	2020	1180
23	1900	1730	1960	3730	4620	2210	1550	2700	1790	1140	2010	1050
24	1890	1670	1910	4820	4710	2380	1590	3140	1650	1150	1950	982
25	1880	1570	1880	4870	4660	2350	1700	2880	1540	1170	1980	980
26	1870	1530	1860	4290	4850	2290	1730	2420	1540	1160	1980	997
27	1880	1540	1850	3700	5570	2240	1630	2630	1570	1130	1980	1010
28	1850	1570	1810	3350	5670	2180	1540	2780	1550	1130	1980	999
29	1790	1830	1770	3170	--	2060	1490	3110	1500	1120	1990	1130
30	1840	1930	1790	3000	--	2050	1420	3700	1480	1120	2000	1350
31	1830	--	1850	2840	--	2480	--	3610	--	1140	1990	--
TOTAL	59080	49680	102620	104310	94700	84370	62480	79280	81320	37560	51800	46968
MEAN	1906	1656	3310	3365	3382	2722	2083	2557	2711	1212	1671	1566
MAX	2200	1930	9300	5220	5670	5380	3120	3700	3950	1430	2070	2010
MIN	1740	1530	1770	1980	2020	2050	1420	1750	1480	1120	1130	980
AC-FT	117200	98540	203500	206900	187800	167300	123900	157300	161300	74500	102700	93160

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 1994, BY WATER YEAR (WY)

	1980	4717	8448	7474	9368	7505	6343	4688	3274	2325	2230	2066
MEAN	1980	4717	8448	7474	9368	7505	6343	4688	3274	2325	2230	2066
MAX	3497	16650	29250	16570	30280	17750	15090	8158	6292	3446	3370	3187
(WY)	1983	1985	1982	1980	1983	1983	1983	1983	1993	1984	1984	1983
MIN	1421	1386	2124	2839	3071	2048	2083	2124	1821	1212	1671	1346
(WY)	1989	1988	1990	1992	1988	1992	1994	1992	1992	1994	1994	1980

SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1978 - 1994

ANNUAL TOTAL	2018730	854168		
ANNUAL MEAN	5531	2340		
HIGHEST ANNUAL MEAN			5012	
LOWEST ANNUAL MEAN			9827	1983
HIGHEST DAILY MEAN	35900	Jan 21	9300	Dec 9
LOWEST DAILY MEAN	1530	Nov 26	980	Sep 25
ANNUAL SEVEN-DAY MINIMUM	1610	Nov 14	1020	Sep 23
ANNUAL RUNOFF (AC-FT)	4004000		1694000	
10 PERCENT EXCEEDS	10100		3800	
50 PERCENT EXCEEDS	3800		2010	
90 PERCENT EXCEEDS	1820		1200	

## ROGUE RIVER BASIN

14372300 ROGUE RIVER NEAR AGNESS, OR--Continued

## WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: October 1960 to September 1987.

INSTRUMENTATION.--Temperature recorder from October 1960 to September 1987.

REMARKS.--Some samples were analyzed by different methods and may have data with different levels of detection.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum, 26.5°C on several days in 1962, Aug. 3, 6, 9-11, 1977; minimum, 1.0°C Jan. 22-25, 1962, Dec. 9-16, 1972, Jan. 9, 10, 1977, Jan. 1-3, 1979.

## WATER-QUALITY DATA

		DIS- CHARGE, INST. 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)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	
DATE	TIME										
OCT 1993											
26...	1330	1880	E110	7.6	14.5	0.8	10.2	764	100	K4	
DEC											
14...	1330	4570	111	7.2	7.0	3.6	11.9	755	99	46	
FEB 1994											
10...	1330	2090	116	7.8	6.5	0.7	12.0	761	98	K5	
APR											
06...	1230	1930	120	7.9	11.5	1.0	9.8	762	90	K4	
JUN											
29...	1130	1480	97	8.0	21.0	1.7	9.4	763	105	K6	
AUG											
16...	1145	2070	85	8.1	23.0	2.9	9.0	764	104	K17	
DATE		STREP- TOCOCCHI FECAL, KF AGAR (COLS. PER 100 ML)	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 AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY, DIS IT FIELD (MG/L AS CACO3)	BICAR-E BONATE, DIS IT FIELD (MG/L AS HCO)	
OCT 1993											
26...	K5	42	10	4.0	5.7	22	0.4	1.1	46	57	
DEC											
14...	39	44	10	4.5	5.2	20	0.3	1.0	--	49	
FEB 1994											
10...	K1	43	10	4.4	5.4	21	0.4	1.1	49	59	
APR											
06...	K3	47	11	4.8	5.8	21	0.4	1.2	52	64	
JUN											
29...	K7	35	8.3	3.5	5.3	--	0.4	--	42	51	
AUG											
16...	K9	31	7.4	3.1	5.3	26	0.4	1.4	39	48	
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 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)
OCT 1993											
26...	0	3.0	3.5	<0.1	20	79	77	0.11	401	0.02	
DEC											
14...	0	4.2	--	<0.1	22	84	--	--	--	0.07	
FEB 1994											
10...	0	3.7	4.0	<0.1	19	79	78	0.11	446	0.01	
APR											
06...	0	3.9	3.7	<0.1	19	83	81	0.11	433	0.04	
JUN											
29...	0	2.3	--	<0.1	24	94	--	--	--	0.02	
AUG											
16...	0	1.8	2.4	<0.1	28	68	74	0.09	380	0.03	

E - Estimated.

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

## ROGUE RIVER BASIN

14372300 ROGUE RIVER NEAR AGNESS, OR--Continued

## WATER-QUALITY DATA

DATE	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, AM- MONIA + ORGANIC 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)	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 1993										
26...	0.01	<0.2	0.28	0.07	0.05	0.05	20	8	<3	24
DEC 14...	0.01	0.2	0.22	0.06	0.04	0.05	--	--	--	--
FEB 1994										
10...	0.01	<0.2	0.19	0.05	0.05	0.03	<10	8	<3	23
APR 06...	0.03	0.2	0.06	0.03	0.03	0.03	30	10	<3	31
JUN 29...	<0.01	0.2	0.10	0.05	0.08	0.08	--	--	--	--
AUG 16...	<0.01	0.2	0.05	0.07	0.06	0.05	20	8	<3	32
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- PENDEDED (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDEDED (T/DAY)
OCT 1993										
26...	<4	2	<10	<1	<1	<1	73	<6	<1	--
DEC 14...	--	--	--	--	--	--	--	--	7	86
FEB 1994										
10...	<4	2	<10	<1	<1	<1	75	<6	2	11
APR 06...	<4	3	10	1	<1	<1	83	<6	5	26
JUN 29...	--	--	--	--	--	--	--	--	4	16
AUG 16...	<4	2	<10	<1	<1	<1	68	8	13	73



## ROGUE RIVER BASIN

14377100 ILLINOIS RIVER NEAR KERBY, OR

LOCATION.--Lat 42°13'55", long 123°39'45", in SE 1/4 SE 1/4 sec.29, T.38 S., R.8 W., Josephine County, Hydrologic Unit 17100311, Siskiyou National Forest, on right bank 1.6 mi upstream from Josephine Creek, 2.5 mi northwest of Kerby, and at mile 50.3.

DRAINAGE AREA.--380 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1961 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,198.8 ft above sea level. Prior to Jan. 28, 1965, water-stage recorder, and Jan. 28 to Sept. 30, 1965, nonrecording gage 700 ft downstream at datum 2.99 ft lower.

REMARKS.--No estimated daily discharges. Records good. No regulation. Diversions for irrigation upstream from station. Several observations of water temperature were obtained during the year.

AVERAGE DISCHARGE.--33 years, 1,221 ft<sup>3</sup>/s, 43.64 in/yr, 844,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 92,200 ft<sup>3</sup>/s Dec. 22, 1964, gage height, 45.28 ft, from floodmark, site and datum then in use, from rating curve extended above 30,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; minimum discharge, 12 ft<sup>3</sup>/s Aug. 24, 1992.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 11,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 8	1630	*11,200	*16.76	No other peak greater than base discharge.			
Minimum discharge, 13 ft <sup>3</sup> /s Aug. 30, 31.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	56	90	219	777	625	1970	610	430	286	78	38	15
2	54	83	435	1120	586	1810	577	408	265	76	35	15
3	55	85	290	1130	560	1660	556	386	240	73	25	15
4	56	86	266	1320	527	1630	528	418	237	72	24	17
5	53	90	361	2240	502	1350	502	544	231	70	21	16
6	52	90	263	2020	488	1150	509	697	270	67	21	16
7	55	88	1250	1420	483	990	547	700	314	60	20	19
8	58	84	8990	1570	461	884	570	622	269	57	16	20
9	59	84	3740	2560	440	818	985	566	241	54	17	21
10	57	86	1760	1920	488	787	903	517	227	46	18	23
11	65	90	2820	1470	545	763	763	481	217	48	17	24
12	71	93	2440	1180	515	691	675	447	201	48	18	25
13	84	94	1550	987	498	648	619	406	186	43	20	24
14	79	92	2080	866	574	628	577	371	190	36	22	23
15	80	88	1610	787	598	611	542	449	178	34	25	23
16	92	89	1140	712	580	617	533	1150	172	33	26	24
17	96	90	891	654	1740	590	537	1010	167	34	19	24
18	88	93	784	610	2260	570	536	779	164	31	18	23
19	87	94	683	575	1810	587	525	654	153	28	18	23
20	86	93	610	546	1510	554	503	580	139	27	20	34
21	86	92	558	552	2080	693	483	531	133	28	21	25
22	84	94	516	601	1850	825	464	502	125	29	21	25
23	83	106	480	1290	1460	752	446	463	121	31	19	26
24	85	107	449	2330	1610	745	467	429	115	30	17	27
25	91	100	429	1860	1740	782	488	401	114	29	19	26
26	98	97	414	1360	1790	786	515	379	120	27	19	26
27	97	96	398	1100	2340	780	487	362	103	29	18	21
28	102	99	381	929	2230	773	468	335	89	32	18	25
29	93	129	365	826	---	735	451	318	86	34	17	33
30	94	306	373	736	---	712	446	305	81	36	15	29
31	93	---	560	683	---	663	---	291	---	36	14	---
TOTAL	2389	3008	37105	36731	30890	27554	16812	15931	5434	1356	636	687
MEAN	77.1	100	1197	1185	1103	889	560	514	181	43.7	20.5	22.9
MAX	102	306	8990	2560	2340	1970	985	1150	314	78	38	34
MIN	52	83	219	546	440	554	446	291	81	27	14	15
AC-FT	4740	5970	73600	72860	61270	54650	33350	31600	10780	2690	1260	1360
CFSM	.20	.26	3.15	3.12	2.90	2.34	1.47	1.35	.48	.12	.05	.06
IN.	.23	.29	3.63	3.60	3.02	2.70	1.65	1.56	.53	.13	.06	.07

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 1994, 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	1994	
MEAN	236	1502	2520	2723	2444	2290	1549	880	361	93.5	46.4	66.1																						
MAX	1771	6344	9242	7184	6686	4867	4518	2439	1214	280	116	358																						
(WY)	1963	1974	1965	1970	1986	1983	1982	1963	1993	1983	1976	1978																						
MIN	25.0	82.4	115	236	358	508	433	315	82.7	36.5	19.0	15.5																						
(WY)	1988	1988	1977	1977	1977	1988	1977	1992	1992	1987	1992	1992																						

SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1962 - 1994

ANNUAL TOTAL	502042	178533	1221
ANNUAL MEAN	1375	489	2372
HIGHEST ANNUAL MEAN			275
LOWEST ANNUAL MEAN			1977
HIGHEST DAILY MEAN	18300	Jan 20	8990
LOWEST DAILY MEAN	52	Sep 13	14
ANNUAL SEVEN-DAY MINIMUM	53	Sep 13	15
ANNUAL RUNOFF (AC-FT)	995800	354100	884300
ANNUAL RUNOFF (CFSM)	3.62	1.29	3.21
ANNUAL RUNOFF (INCHES)	49.15	17.48	43.64
10 PERCENT EXCEEDS	3120	1300	2990
50 PERCENT EXCEEDS	683	270	492
90 PERCENT EXCEEDS	63	23	37

## CHETCO RIVER BASIN

437

14400000 CHETCO RIVER NEAR BROOKINGS, OR

LOCATION.--Lat 42°07'25", long 124°11'10", in SE 1/4 sec.12, T.40 S., R.13 W., Curry County, Hydrologic Unit 17100312, on right bank 16 ft upstream from bridge, 0.5 mi upstream from Elk Creek, 6.8 mi northeast of Brookings, and at mile 10.7.

DRAINAGE AREA.--271 mi<sup>2</sup>.

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

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 50 ft above sea level, from topographic map.

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

AVERAGE DISCHARGE.--25 years, 2,168 ft<sup>3</sup>/s, 108.69 in/yr, 1,571,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 65,800 ft<sup>3</sup>/s Jan. 16, 1971, gage height, 27.45 ft; minimum discharge, 42 ft<sup>3</sup>/s Oct. 14, 1987.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Dec. 22, 1964, reached a stage of 32.25 ft, from high-water mark on bridge pier, discharge, 85,400 ft<sup>3</sup>/s, from rating curve extended above 45,000 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 20,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 8	1400	*20,000	*13.22	No other peak greater than base discharge.			
Minimum discharge, 71 ft <sup>3</sup> /s Nov. 7-9, Sept. 1, 2.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	76	77	1190	1570	1340	4010	958	769	600	283	111	74
2	76	76	1490	2160	1220	3380	894	725	559	275	111	73
3	76	76	525	2640	1120	3690	833	718	534	266	110	82
4	76	76	745	3730	1030	3940	783	1410	539	255	108	93
5	76	75	693	5190	962	3160	737	1460	535	245	107	88
6	77	76	489	4110	910	2590	815	1250	800	239	105	81
7	80	74	6760	3060	869	2190	925	1120	870	230	101	77
8	79	73	16900	3760	811	1870	2210	1010	714	221	99	77
9	76	72	7270	5480	775	1650	4580	924	629	212	96	287
10	77	74	6090	4250	882	1480	3220	853	577	200	95	371
11	136	74	12100	3420	872	1330	2440	796	540	192	95	191
12	235	76	7550	2730	795	1210	1970	748	513	188	94	135
13	176	78	4820	2280	838	1110	1680	706	514	179	93	109
14	121	77	5250	1950	1210	1030	1460	669	510	174	91	100
15	107	75	4230	1700	1170	957	1300	1130	482	168	91	95
16	132	73	3230	1490	1160	958	1170	3080	465	160	89	92
17	123	76	2560	1340	4450	892	1070	2310	448	158	87	89
18	105	89	2090	1210	4300	917	988	1750	439	151	85	87
19	98	88	1760	1110	3530	944	928	1450	419	146	84	86
20	91	80	1510	1020	3410	879	862	1280	404	144	84	84
21	88	77	1320	1120	4610	1380	827	1150	387	142	83	81
22	87	93	1170	1880	3930	1400	768	1050	380	139	82	78
23	85	122	1060	5570	3180	1370	739	962	374	140	81	77
24	85	106	969	7220	3440	1680	732	890	359	138	80	76
25	85	89	898	4890	3600	1590	1150	831	344	139	78	78
26	83	84	846	3530	3550	1510	1150	772	340	132	78	78
27	80	83	790	2790	5080	1440	1020	727	326	125	76	74
28	79	88	745	2300	4820	1350	960	684	311	123	75	74
29	79	423	708	1940	---	1220	888	660	302	121	76	89
30	78	513	783	1690	---	1140	834	633	289	120	75	93
31	78	---	1100	1500	---	1040	---	600	---	113	75	---
TOTAL	3000	3213	97641	88630	63864	53307	38891	33117	14503	5518	2795	3169
MEAN	96.8	107	3150	2859	2281	1720	1296	1068	483	178	90.2	106
MAX	235	513	16900	7220	5080	4010	4580	3080	870	283	111	371
MIN	76	72	489	1020	775	879	732	600	289	113	75	73
AC-FT	5950	6370	193700	175800	126700	105700	77140	65690	28770	10940	5540	6290
CFSM	.36	.40	11.6	10.5	8.42	6.35	4.78	3.94	1.78	.66	.33	.39
IN.	.41	.44	13.40	12.17	8.77	7.32	5.34	4.55	1.99	.76	.38	.44

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1970 - 1994, BY WATER YEAR (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	1994
MEAN	593	3235	4766	4684	4367	3890	2339	1121	615	195	119	213													
MAX	2540	10230	12770	13150	11490	7041	6956	2508	2121	442	310	1531													
(WY)	1982	1974	1982	1970	1986	1989	1982	1979	1993	1983	1983	1978													
MIN	48.3	107	121	479	619	859	673	430	221	121	69.1	54.9													
(WY)	1988	1994	1977	1977	1977	1988	1977	1973	1992	1973	1987	1987													

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1970 - 1994

	1993	1994	1970-1994
ANNUAL TOTAL	940233	407648	
ANNUAL MEAN	2576	1117	2168
HIGHEST ANNUAL MEAN			3911
LOWEST ANNUAL MEAN			549
HIGHEST DAILY MEAN	27800	16900	48500
LOWEST DAILY MEAN	72	72	44
ANNUAL SEVEN-DAY MINIMUM	74	74	46
ANNUAL RUNOFF (AC-FT)	1865000	808600	1571000
ANNUAL RUNOFF (CFSM)	9.51	4.12	8.00
ANNUAL RUNOFF (INCHES)	129.07	55.96	108.69
10 PERCENT EXCEEDS	6850	3290	5650
50 PERCENT EXCEEDS	1120	629	742
90 PERCENT EXCEEDS	80	77	81

## CHEMICAL QUALITY OF PRECIPITATION

## SILVER LAKE BASIN

430701121040001 SILVER LAKE RANGER STATION, OR

LOCATION.--Lat 43°07'01", Long 121°04'00", in NE 1/4 SW 1/4 sec.21, T.28 S., R.14 E., Lake County, Hydrologic Unit 17120005, at Silver Lake Ranger Station, 0.5 mi south of State Highway 31, and 1 mi southwest of town of Silver Lake.

PERIOD OF RECORD.--August 1983 to current year (weekly composite).

INSTRUMENTATION.--The wet-deposition sample collector is an Aerochem Metrics Model 301 wet/dry deposition collector. Collector efficiency equals total precipitation collected in wet deposition collector divided by total precipitation collected in recording weighing-bucket gage. Refer to WDR OR-92-1 for further description of instrumentation.

REMARKS.--Inches of precipitation obtained from an on-site recording weighing-bucket gage. Samples are collected by Silver Lake Ranger Station personnel and analyzed by the Illinois State Water Survey Central Analytical Laboratory.

## WATER-QUALITY DATA

DATE	TIME	TOTAL PRECIP- ITATION FOR DEFINED PERIOD (IN)	COL- LECTOR EFFI- CIENCY WET DEPOS. PERCENT	SPEC. CONDUCT- TANCE CK. SOL.* ATM DEP WET TOT (US/CM)	SPEC. CONDUCT- TANCE FIELD ATM DEP WET TOT (US/CM)	SPEC. CONDUCT- TANCE LAB ATM DEP WET TOT (US/CM)	PH CK. SOL.* ATM DEP WET TOT (UNITS)	PH FIELD ATM DEP WET TOT (UNITS)	PH LAB ATM DEP WET TOT (UNITS)
OCT 1993									
05-12	1715	0.34	101	21.8	12.5	8.8	4.32	4.67	5.05
OCT 12-19	1545	0.33	98	21.5	7.4	5.9	4.35	4.80	5.88
NOV 16-23	1520	0.10	33	--	--	3.4	--	--	6.29
NOV 23-30	1530	0.07	84	22.2	4.6	3.9	4.36	5.06	5.72
NOV 30-DEC 07	1705	0.08	69	22.7	4.5	5.9	4.34	4.99	6.50
DEC 07-14	1520	1.31	98	21.9	3.0	1.7	4.36	5.20	5.38
DEC 28 1993-JAN 04 1994	1630	0.13	80	21.3	4.2	2.7	4.33	5.03	5.76
JAN 04-11	1530	0.08	98	22.5	4.1	2.9	4.33	5.01	5.46
JAN 18-25	1505	0.04	97	--	--	5.3	--	--	5.20
FEB 01-08	1625	0.22	24	21.9	7.0	4.2	4.37	4.97	5.14
FEB 15-22	1600	0.16	50	22.5	3.9	3.5	4.36	5.20	5.21
FEB 22-MAR 01	1615	0.16	98	22.4	3.7	2.8	4.37	5.22	5.56
MAR 15-22	1545	0.20	93	21.9	6.3	5.3	4.35	4.96	5.18
MAR 29-APR 05	1445	0.10	94	21.9	16.8	12.5	4.35	4.57	4.78
APR 05-12	1445	0.02	87	--	--	5.0	--	--	5.32
APR 19-26	1425	0.52	96	22.7	7.2	4.6	4.31	4.80	5.19
APR 26-MAY 03	1445	0.05	109	21.6	14.2	10.4	4.34	4.56	4.77
MAY 03-10	1510	0.29	101	22.2	4.5	4.1	4.34	5.23	5.30
MAY 10-17	1530	0.07	100	22.6	10.8	8.6	4.35	4.72	4.97
MAY 17-24	1510	0.92	101	21.3	8.5	5.5	4.34	4.88	5.04
MAY 24-31	1545	0.09	101	21.7	14.7	16.6	4.35	4.66	4.62
MAY 31-JUN 07	1430	0.15	99	22.4	12.2	9.4	4.31	4.75	4.91
JUL 19-26	1345	0.10	109	23.0	37.2	31.4	4.35	5.69	6.10
JUL 26-AUG 02	1335	0.02	101	--	--	15.4	--	--	4.66
AUG 30-SEP 06	1320	0.04	112	22.4	14.5	16.0	4.31	4.90	4.74
SEP 06-13	1340	0.84	102	21.1	7.4	6.1	4.32	4.93	4.98
SEP 27-OCT 04	1645	0.35	102	22.4	12.3	11.6	4.36	4.68	4.70

\* Measurements of check solution (ck. sol.), with theoretical values of conductance 21.8 +/- 3uS/cm, pH 4.3 +/- 0.1, made prior to the corresponding sample measurement.

## CHEMICAL QUALITY OF PRECIPITATION

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## SILVER LAKE BASIN

430701121040001 SILVER LAKE RANGER STATION, OR--Continued

## WATER-QUALITY DATA

DATE	CALCIUM ATM DEP WET DIS (MG/L)	MAG- NESIUM ATM DEP WET DIS (MG/L)	SODIUM ATM DEP WET DIS (MG/L)	POTAS- SIUM ATM DEP WET DIS (MG/L)	SULFATE ATM DEP WET DIS AS SO4 (MG/L)	CHLO- RIDE ATM DEP WET DIS (MG/L)	NI- TROGEN AMMON. ATM DEP WET DIS AS NH4 (MG/L)	NI- TROGEN NITRATE ATM DEP WET DIS AS NO3 (MG/L)	PHOS- PHORUS ORTHO ATM DEP WET DIS AS PO4 (MG/L)
OCT 1993									
05-12	0.13	0.017	0.093	0.032	0.82	0.11	0.25	1.15	<0.02
OCT 12-19	<0.06	<0.018	0.314	0.037	<0.18	0.43	0.12	0.37	<0.12
NOV 16-23	0.02	0.008	0.081	0.010	0.09	0.09	0.03	0.19	0.050
NOV 23-30	0.06	0.029	0.102	0.021	0.24	0.14	0.10	0.64	0.006
NOV 30-DEC 07	0.18	0.098	0.131	0.039	0.33	0.19	0.04	0.36	<0.003
DEC 07-14	<0.01	<0.003	0.011	<0.003	0.04	<0.03	<0.02	0.15	0.013
DEC 28 1993-JAN 04 1994	0.03	0.012	0.068	0.018	0.22	0.11	0.08	0.26	<0.003
JAN 04-11	0.01	<0.003	0.025	0.006	0.05	<0.03	0.05	0.15	0.005
JAN 18-25	0.04	0.010	0.147	0.019	0.21	0.25	0.54	0.61	<0.003
FEB 01-08	0.02	<0.003	0.041	0.005	0.07	0.05	0.10	0.52	<0.003
FEB 15-22	<0.01	<0.003	0.035	0.004	0.04	0.03	0.09	0.36	<0.003
FEB 22-MAR 01	0.09	0.006	0.073	0.004	0.12	0.08	0.10	0.27	<0.003
MAR 15-22	0.05	0.010	0.057	0.009	0.16	0.10	0.06	0.41	<0.003
MAR 29-APR 05	0.13	0.031	0.072	0.069	1.03	0.11	0.39	1.58	0.004
APR 05-12	0.10	0.017	0.151	0.030	0.54	0.10	0.20	0.57	<0.010
APR 19-26	0.07	0.010	0.030	0.010	0.31	<0.03	0.14	0.50	<0.003
APR 26-MAY 03	0.12	0.026	0.071	0.033	0.84	0.06	0.14	0.85	<0.003
MAY 03-10	0.08	0.015	0.033	0.009	0.30	0.04	0.13	0.41	<0.003
MAY 10-17	0.18	0.041	0.154	0.047	0.75	0.17	0.15	0.81	<0.003
MAY 17-24	0.03	0.005	0.032	0.005	0.35	0.03	0.09	0.47	<0.003
MAY 24-31	0.30	0.065	0.118	0.136	0.98	0.16	0.08	1.57	<0.003
MAY 31-JUN 07	0.19	0.060	0.161	0.258	0.68	0.20	0.03	0.99	<0.003
JUL 19-26	1.43	0.189	2.80	0.303	2.79	1.03	0.70	6.03	0.008
JUL 26-AUG 02	0.41	0.067	0.202	0.112	0.74	0.32	0.19	1.76	<0.010
AUG 30-SEP 06	0.53	0.098	0.217	0.196	1.27	0.14	0.22	1.96	<0.003
SEP 06-13	0.05	0.011	0.075	0.014	0.30	0.11	0.06	0.47	<0.003
SEP 27-OCT 04	0.10	0.012	0.069	0.038	0.64	0.12	0.19	1.29	0.007

## CHEMICAL QUALITY OF PRECIPITATION

## SANDY RIVER BASIN

452650122091801 BULL RUN RESERVOIR NUMBER TWO, OR

LOCATION.--Lat 45°26'55", long 122°08'45", in SE 1/4 SE 1/2 sec.26, T.1 S., R.5 E., Clackamas County, Hydrologic Unit 17080001, in Mount Hood National Forest, on headworks dam on Bull Run River, 4.4 mi northeast of town of Bull Run, and approximately 20 mi east of Portland.

PERIOD OF RECORD.--June 1980 to September 1981 (event sampling), September 1981 to November 1981 (weekly composite), July 1982 to current year (weekly composite).

INSTRUMENTATION.--A bulk-type plastic double cylinder with receiving funnel directing deposition to inner cylinder was used for the period of record June 1980 to September 1981. The wet-deposition sample collector is an Aerochem Model 301 wet/dry deposition collector. Collector efficiency equals total precipitation collected in wet deposition collector divided by total precipitation collected in recording weighing-bucket gage. Refer to WDR OR-92-1 for further description of instrumentation.

REMARKS.--Inches of precipitation obtained from an on-site recording weighing-bucket gage. The sample collector is located in the restricted access area of the city of Portland's Bull Run River Watershed. Samples are collected by Bull Run Headworks Water Quality Laboratory personnel and analyzed by the Illinois Supply Central Analytical Laboratory.

## WATER-QUALITY DATA

DATE	TIME	TOTAL PRECIP- ITATION, FOR DEFINED PERIOD (IN)	COL- LECTOR EFFI- CIENCY, WET DEPOS. PERCENT	SPEC. CONDC- TANCE, CK. SOL.* ATM DEP WET TOT (US/CM)	SPEC. CONDC- TANCE, FIELD ATM DEP WET TOT (US/CM)	SPEC. CONDC- TANCE, LAB ATM DEP WET TOT (US/CM)	PH, CK. SOL.* WET TOT (UNITS)	PH, FIELD ATM DEP WET TOT (UNITS)	PH, LAB ATM DEP WET TOT (UNITS)
OCT 1993									
05-12	1525	0.69	105	21.5	6.8	6.7	4.33	5.10	5.29
OCT 12-19	1620	1.40	101	21.9	5.2	4.8	4.33	5.14	5.24
OCT 19-26	1530	0.39	97	21.5	4.2	3.8	4.30	5.29	5.56
OCT 26- NOV 02	1520	0.22	111	21.5	11.5	8.6	4.28	4.64	4.98
NOV 02-09	1605	0.94	104	22.2	4.5	4.0	4.33	5.20	5.48
NOV 23-30	1615	0.67	106	21.8	9.2	8.2	4.30	5.19	5.41
NOV 30- DEC 07	1740	4.30	98	21.6	7.5	6.5	4.33	5.34	5.42
DEC 07-14	1650	3.56	41	22.1	3.7	3.2	4.33	5.82	5.42
DEC 28 1993- JAN 04 1994	1700	5.27	97	22.3	3.8	2.9	4.27	5.11	5.33
JAN 18-25	1720	0.87	92	22.3	4.1	2.9	4.32	5.15	5.23
FEB 08-15	1640	1.88	98	22.2	9.4	9.1	4.34	5.38	5.33
FEB 15-22	1720	2.40	103	21.6	--	5.5	4.30	5.30	5.16
FEB 22- MAR 01	1635	6.19	102	21.8	3.9	2.5	4.33	5.40	5.55
MAR 01-08	1645	0.77	101	21.7	4.5	2.3	4.33	5.50	5.67
MAR 08-15	1730	0.46	104	22.1	6.6	5.0	4.32	5.17	5.14
MAR 15-22	1815	3.05	100	20.4	9.3	9.7	4.33	5.35	5.49
MAR 22-29	1725	0.16	109	21.6	10.8	10.2	4.33	5.07	5.07
MAR 29- APR 05	1605	2.41	--	21.9	9.8	9.2	4.29	4.77	4.88
APR 05-12	1715	3.48	95	21.4	4.3	3.5	4.30	5.21	5.36
APR 12-19	1640	0.35	109	22.1	8.7	7.5	4.29	5.38	5.69
APR 19-26	1550	1.31	103	22.1	9.8	8.9	4.28	4.77	4.93
APR 26- MAY 03	1520	0.45	101	22.5	10.5	11.8	4.31	4.92	5.08
MAY 03-10	1515	0.49	106	22.5	2.9	2.2	4.29	5.47	5.46
MAY 10-17	1715	0.39	167	22.6	7.6	7.3	4.27	5.15	5.49
MAY 17-24	1540	0.55	95	22.2	21.5	22.3	4.29	4.50	4.56
MAY 24-31	1550	0.68	104	22.3	8.1	8.1	4.26	5.13	5.25
MAY 31- JUN 07	1535	1.72	106	22.0	4.9	5.3	4.22	5.10	5.12
JUN 07-14	1850	1.28	100	21.8	10.8	9.0	4.37	5.36	5.48
JUN 14-21	1600	1.49	99	22.6	6.6	7.0	4.23	5.03	5.00
JUN 21-28	1650	0.41	103	22.3	12.7	12.2	4.23	4.69	4.77
JUN 28- JUL 05	1500	0.48	101	20.7	9.3	9.0	4.31	5.22	5.31
AUG 16-23	1650	0.19	105	22.3	13.1	10.1	4.38	5.02	5.82
AUG 30- SEP 06	1545	0.90	99	21.8	4.3	4.4	4.34	5.29	5.22
SEP 06-13	1430	0.65	103	22.3	5.8	6.4	4.33	5.07	5.09
SEP 27- OCT 04	1540	0.33	104	21.8	16.6	17.0	4.31	4.59	4.60

\* Measurements of check solution (ck. sol.) with theoretical values of conductance 21.8 +/- 3uS/cm, pH 4.3 +/- 0.1, made prior to the corresponding sample measurement.  
E Estimated.



## CHEMICAL QUALITY OF PRECIPITATION

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## SANDY RIVER BASIN

452650122091801 BULL RUN RESERVOIR NUMBER TWO, OR--Continued

## WATER-QUALITY DATA

DATE	CALCIUM, ATM DEP WET DIS (MG/L)	MAG- NESIUM, ATM DEP WET DIS (MG/L)	SODIUM, ATM DEP WET DIS (MG/L)	POTAS- SIUM, ATM DEP WET DIS (MG/L)	SULFATE, ATM DEP WET DIS AS SO <sub>4</sub> (MG/L)	CHLO- RIDE, ATM DEP WET DIS (MG/L)	NI- TROGEN AMMON., ATM DEP WET DIS AS NH <sub>4</sub> (MG/L)	NI- TROGEN NITRATE, ATM DEP WET DIS AS NO <sub>3</sub> (MG/L)	PHOS- PHORUS ORTHO, ATM DEP WET DIS AS PO <sub>4</sub> (MG/L)
OCT 1993									
05-12	0.03	0.024	0.194	0.120	0.67	0.38	0.24	0.58	<0.02
OCT 12-19	0.02	0.011	0.088	0.033	0.32	0.16	0.12	0.48	<0.02
OCT 19-26	0.04	0.014	0.109	0.017	0.24	0.18	0.13	0.23	<0.02
OCT 26- NOV 02	0.07	0.012	0.069	0.011	0.74	0.10	0.17	1.01	<0.02
NOV 02-09	0.03	0.028	0.276	0.017	0.28	0.44	0.04	0.18	<0.02
NOV 23-30	0.03	0.087	0.731	0.033	0.42	1.25	0.09	0.46	<0.003
NOV 30- DEC 07	0.04	0.078	0.658	0.027	0.27	1.29	0.03	0.10	0.004
DEC 07-14	0.02	0.022	0.222	0.007	0.11	0.36	<0.02	0.09	0.013
DEC 28 1993- JAN 04 1994	<0.01	0.008	0.117	0.003	0.14	0.19	0.03	0.16	<0.003
JAN 18-25	<0.01	<0.003	0.022	0.004	0.13	0.04	0.07	0.24	<0.003
FEB 08-15	0.04	0.093	0.773	0.034	0.47	1.35	0.14	0.33	0.006
FEB 15-22	0.02	0.041	0.385	0.017	0.23	0.63	0.05	0.26	<0.003
FEB 22- MAR 01	0.05	0.006	0.064	0.004	0.11	0.07	0.04	0.14	<0.003
MAR 01-08	0.09	0.012	0.091	0.006	0.15	0.11	0.06	0.13	<0.003
MAR 08-15	0.05	0.010	0.052	0.014	0.32	0.07	0.26	0.80	0.003
MAR 15-22	0.08	0.113	0.992	0.042	0.44	1.80	0.12	0.24	<0.003
MAR 22-29	0.06	0.088	0.737	0.044	0.55	1.26	0.15	0.59	<0.003
MAR 29- APR 05	0.05	0.021	0.145	0.017	0.71	0.25	0.22	0.89	<0.003
APR 05-12	0.02	0.011	0.130	0.006	0.21	0.20	0.12	0.28	0.005
APR 12-19	0.14	0.055	0.356	0.027	0.66	0.56	0.39	0.83	<0.003
APR 19-26	0.08	0.031	0.190	0.022	0.66	0.29	0.24	0.93	<0.003
APR 26- MAY 03	0.13	0.048	0.313	0.041	0.83	0.49	0.25	0.91	0.004
MAY 03-10	0.05	0.005	0.016	0.010	0.12	<0.03	0.04	0.13	<0.003
MAY 10-17	0.13	0.053	0.332	0.037	0.60	0.52	0.29	0.87	<0.003
MAY 17-24	0.12	0.056	0.459	0.040	2.00	0.59	0.70	2.38	<0.003
MAY 24-31	0.05	0.061	0.519	0.024	0.56	0.87	0.16	0.45	<0.003
MAY 31- JUN 07	0.02	0.023	0.206	0.011	0.27	0.35	0.06	0.32	<0.003
JUN 07-14	0.05	0.103	0.880	0.043	0.43	1.52	0.11	0.21	<0.003
JUN 14-21	0.04	0.027	0.217	0.017	0.45	0.37	0.11	0.53	<0.003
JUN 21-28	0.07	0.027	0.165	0.026	1.26	0.21	0.34	0.91	<0.003
JUN 28- JUL 05	0.08	0.044	0.299	0.076	0.93	0.52	0.39	0.70	<0.003
AUG 16-23	0.05	0.057	0.395	--	1.20	0.45	0.07	<0.03	0.008
AUG 30- SEP 06	0.02	0.017	0.159	0.015	0.31	0.26	0.05	0.16	<0.003
SEP 06-13	0.03	0.029	0.258	0.041	0.40	0.47	0.07	0.33	<0.003
SEP 27- OCT 04	0.09	0.041	0.315	0.055	1.19	0.47	0.29	1.53	<0.003

## 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 1994

Station name and number	Location and drainage area	Period of record	Date	Water year 1994 maximum		Period of record maximum		Date	Dis- charge (ft <sup>3</sup> /s)
				Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)		
NESTUCCA RIVER BASIN									
Walker Creek near Fairdale (14302850)	Lat 45°18'12", long 123°24'51", in SW 1/4 SW 1/4 sec.15, T.3 S., R.6 W., Yamhill County, Hydrologic Unit 17100203, at culvert, 0.5 mi upstream from confluence with Nestucca River, and 5.3 mi southwest of Fairdale. Drainage area is 2.72 mi <sup>2</sup> .	1992-94	1-31-92	3.74	*180	12- 9-93	4.00	199	
			12- 9-93	4.00	199				

\* - Revised.

## DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Measurements of streamflow at points other than gaging stations or partial-record stations are given in the following table.

Discharge measurements at miscellaneous sites during water year 1994

Stream	Tributary to	Location	Drainage area (mi <sup>2</sup> )	Measured previously (water years)	Measurements Date	Discharge (ft <sup>3</sup> /s)
WILLIAMSON RIVER BASIN						
11492100 Williamson River	Upper Klamath Lake	Lat 42°57'13", long 121°40'22", in SW 1/4 SE 1/4 sec.20, T.30 S., R.9 E., Klamath County, Hydrologic Unit 18010201, at Military Crossing, on Klamath Marsh, and 13 mi northeast of Fuego, on road 676.	---	1992-93	10-12-93 10-25-93 11-10-93 11-30-93 12-21-93 1- 4-94 1-21-94 1-31-94 2-15-94 3- 1-94 3-15-94 3-28-94 4-13-94 5- 4-94 5-31-94 6-15-94 6-29-94 7-14-94 8- 1-94 8-19-94	no flow no flow 28 no flow a5 44 9.5 10 5.0 89 57 33 8.8 a4.0 4.0 2.0 1.2 no flow no flow no flow
KLAMATH RIVER BASIN						
11504100 Wood River	Agency Lake	Lat 42°38'48", long 121°59'40", in NE 1/4 SE 1/4 sec.4, T.34 S., R.7 1/2 E., Klamath County, Hydrologic Unit 18010203, 1.1 mi downstream from North Canal, and 4.0 mi south of Fort Klamath, on Weed Road.	---	1992-93	10-29-93	306
MALHEUR RIVER BASIN						
13233300 Malheur River below Nevada Dam	SNAKE River	Lat 43°59'20", long 117°13'10", in NE 1/4 SW 1/4 sec.21, T.118 S., R.45 E., Malheur County, Hydrologic Unit 17050117, on right bank about 510 ft downstream from dam and headgate at Nevada Canal, and 1.5 mi northeast of Vale.	3,880	1926-34† 1936-42† 1944-50†	3-23-93	5,430
DESCHUTES RIVER BASIN						
Paulina Creek	Little Deschutes River	Lat 43°43'39", long 121°24'56", in SW 1/4 NW 1/4 sec.28, T.21 S., R.11 E., Deschutes County, Hydrologic Unit 17070302, 100 ft upstream from bridge, on Forest Service road 21, and 2.4 mi southeast of Highway 97.	---	1992-93	6-14-94	10
Central Oregon Canal	Crooked River	Lat 44°04'41", long 121°01'52", in SW 1/4 SE 1/4 SE 1/4 sec.22, T.17 S., R.14 E., Deschutes County, Hydrologic Unit 17070305, at Alfalfa Market Road bridge.	---	---	9-20-94	205
Pilot Butte Canal, J-Lateral	.....do.....	Lat 44°20'08", long 121°07'38", in SE 1/4 SE 1/4 SE 1/4 sec.23, T.14 S., R.13 E., Deschutes County, Hydrologic Unit 17070305, at 33rd Street bridge.	---	---	9-19-94	26
Pilot Butte Canal	Deschutes River	Lat 44°11'47", long 121°15'09", in NE 1/4 NE 1/4 NW 1/4 sec.14, T.16 S., R.12 E., Deschutes County, Hydrologic Unit 17070301, at Young Road bridge.	---	---	9-20-94	408
Mud Springs Creek	Trout Creek	Lat 44°46'32", long 121°04'51", in NE 1/4 SE 1/4 NW 1/4 sec.20, T.9 S., R.14 E., Jefferson County, Hydrologic Unit 17070307, at Gateway bridge.	---	---	9-19-94 3-13-95	2.8 4.4
COLUMBIA RIVER BASIN						
14128910 Columbia River at Warrendale	Pacific Ocean	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, 0.1 mi west of Warrendale, 5.1 mi downstream from Bonneville Dam, and at mile 141.0.	240,000	---	12-12-93 4-12-94 6- 7-94 8-10-94 10-12-94	152,000 150,000 217,000 83,400 120,000
SANDY RIVER BASIN						
14138600 Bull Run River at Lake Outlet, near Brightwood	Sandy River	Lat 45°27'42", long 121°50'44", in SE 1/4 SE 1/4 sec.20, T.1 S., R.8 E., Multnomah County, Hydrologic Unit 17080001, 300 ft downstream from Bull Run Lake, and 9.9 mi northeast of Brightwood.	---	1992-93	11-22-93 1-11-94 3-22-94 5-18-94	no flow no flow no flow no flow

† Operated as a continuous-record gaging station after 5-1-93

a Estimated.

## Discharge measurements at miscellaneous sites during water year 1994--Continued

Stream	Tributary to	Location	Drainage area (mi <sup>2</sup> )	Measured previously (water years)	Measurements Date	Discharge (ft <sup>3</sup> /s)
SANDY RIVER BASIN--Continued						
14138700 Bull Run River at Upper Flume, near Brightwood	Sandy River	Lat 45°27'54", long 121°51'16", in NE 1/4 SW 1/4 sec.20, T.1 S., R.8 E., Multnomah County, Hydrologic Unit 17080001, at flume, 0.6 mi downstream from outlet structure, at Bull Run Lake, and 9.7 mi northeast of Brightwood.	---	1992-93	7-16-93 9-21-93 11- 4-93 1-11-94 3-23-94 5-18-94 7- 7-94 9-13-94	4.6 1.5 0.2 6.5 5.6 5.6 4.8 1.1
Bull Run River 15 ft upstream from Lower Flume, near Brightwood	.....do.....	Lat 45°28'14", long 121°51'55", in SE 1/4 NE 1/4 sec. 19, T.1 S., R. 8 E., Multnomah County, Hydrologic Unit 17080001, 15 ft upstream from Lower Flume, 1.2 mi downstream from outlet structure, at Bull Run Lake, and 9.5 mi northeast of Brightwood.	---	---	11-10-93	16
Bull Run River 1,000 ft downstream from Lower Flume, near Brightwood	.....do.....	Lat 45°28'20", long 121°52'07", in NW 1/4 NE 1/4 sec. 19, T.1 S., R.8 E., Multnomah County, Hydrologic Unit 17080001, 1,000 ft downstream from Lower Flume, 1.4 mi downstream from outlet structure, at Bull Run Lake, and 9.5 mi northeast of Brightwood.	---	---	11-10-93	9.7
Bull Run River 1,200 ft downstream from Lower Flume, near Brightwood	.....do.....	Lat 45°28'21", long 121°52'09", in NW 1/4 NE 1/4 sec. 19, T.1 S., R.8 E., Multnomah County, Hydrologic Unit 17080001, 1,200 ft downstream from Lower Flume, 1.4 mi downstream from outlet structure, at Bull Run Lake, and 9.5 mi northeast of Brightwood.	---	---	11-10-93	9.5
Bull Run River 1,400 ft downstream from Lower Flume, near Brightwood	.....do.....	Lat 45°28'23", long 121°52'11", in NW 1/4 NE 1/4 sec. 19, T.1 S., R.8 E., Multnomah County, Hydrologic Unit 17080001, 1,400 ft downstream from Lower Flume, 1.4 mi downstream from outlet structure, at Bull Run Lake, and 9.5 mi northeast of Brightwood.	---	---	11-10-93	8.4
Bull Run River 1,700 ft downstream from Lower Flume, near Brightwood	.....do.....	Lat 45°28'24", long 121°52'14", in NW 1/4 NE 1/4 sec. 19, T.1 S., R.8 E., Multnomah County, Hydrologic Unit 17080001, 1,700 ft downstream from Lower Flume, 1.5 mi downstream from outlet structure, at Bull Run Lake, and 9.5 mi northeast of Brightwood.	---	---	11-10-93	5.6
Bull Run River 2,600 ft downstream from Lower Flume, near Brightwood	.....do.....	Lat 45°28'28", long 121°52'25", in NE 1/4 NW 1/4 sec. 19, T.1 S., R.8 E., Multnomah County, Hydrologic Unit 17080001, 2,600 ft downstream from Lower Flume, 1.7 mi downstream from outlet structure, at Bull Run Lake, and 9.4 mi northeast of Brightwood.	---	---	11-10-93	17
Bull Run River 4,100 ft downstream from Lower Flume, near Brightwood	.....do.....	Lat 45°28'34", long 121°52'43", in SW 1/4 SW 1/4 sec. 18, T.1 S., R.8 E., Multnomah County, Hydrologic Unit 17080001, 4,100 ft downstream from Lower Flume, 1.9 mi downstream from outlet structure, at Bull Run Lake, and 9.4 mi northeast of Brightwood.	---	---	11-10-93	23
WILLAMETTE RIVER BASIN						
Mosby Creek	Willamette River	Lat 43°45'58", long 122°59'30", Lane County Hydrologic Unit 17090002m at covered bridge, at mile 1.8.	---	---	7-24-93	7.1
Muddy Creek	.....do.....	Lat 44°31'38", long 123°12'09", Linn County Hydrologic Unit 17090003, at bridge, on Peoria Road, north of Peoria.	---	---	7-28-94	32
Mary's River	.....do.....	Lat 44°33'21", long 123°15'52", Benton County, Hydrologic Unit 17090003, at northbound bridge, north of Peoria, on Highway 99 W.	---	---	7-27-94	14
Calapooia River	.....do.....	Lat 44°38'06", long 121°59'40", Linn County Hydrologic Unit 17090003, at park, at mouth.	---	---	7-28-94	95
Willamette River	Columbia River	Lat 44°44'53", long 123°08'23", Marion County, Hydrologic Unit 17090003, upstream of confluence with Santiam River, and at mile 108.1.	---	1992-93	7- 7-94	4,820
Santiam River	Willamette River	Lat 44°44'12", long 123°03'24", Marion County, Hydrologic Unit 170900005, downstream from Interstate 5, and at mile 6.3.	---	1992	7- 6-94	1,480
Morgan Creek	Santiam River	Lat 44°44'56", long 123°03'40", Marion County, Hydrologic Unit 17090005, downstream from Interstate 5, and at mile 0.0.	---	1992	7- 6-94	2.1

## Discharge measurements at miscellaneous sites during water year 1994--Continued

Stream	Tributary to	Location	Drainage area (mi <sup>2</sup> )	Measured	Measurements	
				previously (water years)	Date	Discharge (ft <sup>3</sup> /s)
WILLAMETTE RIVER BASIN--Continued						
Santiam River	Willamette River	Lat 44°44'56", long 123°03'42", Marion County, Hydrologic Unit 17090005, downstream from interstate 5, and at mile 4.8.	---	---	7- 6-94	1,610
Santiam River	.....do.....	Lat 44°44'48", long 123°05'12", Marion County, Hydrologic Unit 17090005, downstream from interstate 5, and at mile 3.6.	---	---	7- 6-94	1,780
Santiam River	.....do.....	Lat 44°44'50", long 123°03'46", Marion County, Hydrologic Unit 17090005, downstream from Burlington Northern railroad bridge, and at mile 3.0.	---	---	7- 6-94	1,530
Santiam River	.....do.....	Lat 44°45'33", long 123°06'48", Marion County, Hydrologic Unit 17090005, 4.0 mi southeast of Buena Vista, and at mile 2.0.	---	---	7- 7-94	1,640
Santiam River	.....do.....	Lat 44°45'06", long 123°07'20", Marion County, Hydrologic Unit 17090005, 3.0 mi southeast of Buena Vista, and at mile 1.0.	---	---	7- 7-94	1,680
Santiam River	.....do.....	Lat 44°45'08", long 123°07'54", Maion County, Hydrologic Unit 17090005, 2.0 mi southeast of Buena Vista, and at mile 0.0.	---	1992-93	7- 7-94	1,460
Willamette River	Columbia River	Lat 44°45'31", long 123°08'48", Marion County, Hydrologic Unit 17090003, downstream from Santiam and Luckiamute rivers, and at mile 107.5.	---	---	7- 5-94	6,100
Willamette River	.....do.....	Lat 44°46'04", long 123°08'46", Marion County, Hydrologic Unit 17090003, upstream from Buena Vista Ferry, and at mile 106.5.	---	---	7- 5-94	5,970
Willamette River	.....do.....	Lat 44°47'24", long 123°07'42", Marion County, Hydrologic Unit 17090003, downstream from Santiam River and at mile 105.0.	---	---	7- 5-94	6,270
Willamette River	.....do.....	Lat 44°47'35", long 123°07'14", Marion County, Hydrologic Unit 170090007, upstream from Rock Creek, and at mile 104.0.	---	---	7- 7-94	6,210
Rocky Creek	Willamette River	Lat 44°47'40", long 123°06'52", Marion County, Hydrologic Unit 17090007, 0.7 mi north of Sidney, and at mile 0.0.	---	1992-93	7- 7-94	15
South Yamhill River	Yamhill River	Lat 45°12'37", long 123°10'20", Yamhill County, Hydrologic Unit 17090008, 1.0 mi east of McMinnville, and at mile 4.2.	---	---	8-23-94	26
South Yamhill River	.....do.....	Lat 45°12'21", long 123°09'37", Yamhill County, Hydrologic Unit 17090008, 1.6 mi east of McMinnville, and at mile 2.3.	---	---	8-23-94	25
14206255 Jackson Slough	Tualatin River	Lat 45°29'59", long 122°59'06", in NE 1/4 SE 1/4 sec.7, T.1 S., R.2 W., Washington County, Hydrologic Unit 17090010, at mouth.	---	---	5-11-94 5-25-94 6- 8-94 6-22-94 7- 6-94 7-20-94 8- 3-94 8-17-94 8-31-94 9-13-94 9-28-94 10-12-94 10-26-94	2.7 0.1 0.2 0.1 0.1 0.02 0.02 0.03 0.1 0.1 0.1 0.1 0.1 0.5
14206270 Unnamed Tributary (Miller Swale)	.....do.....	Lat 45°29'59", long 122°58'46", in NE 1/4 SE 1/4 sec.7, T.1 S., R.2 W., Washington County, Hydrologic Unit 17090010, at mouth.	---	---	5-11-94 5-25-94 6- 8-94 6-22-94 7- 6-94 7-20-94 8- 3-94 8-17-94 8-31-94 9-13-94 9-28-94 10-12-94 10-26-94	0.5 0.3 0.8 0.2 0.1 0.5 0.2 0.4 0.1 0.3 0.1 0.1 0.1



## Discharge measurements at miscellaneous sites during water year 1994--Continued

Stream	Tributary to	Location	Drainage area (mi <sup>2</sup> )	Measured	Measurements	
				previously (water years)	Date	Discharge (ft <sup>3</sup> /s)
WILLAMETTE RIVER BASIN--Continued						
Oak Grove Fork	Clackamas River	Lat 45°06'24", long 121°49'00", Clackamas County, Hydrologic Unit 17090011, downstream from Stone Creek, and at mile 14.8.	---	---	9- 7-94	93
NESTUCCA RIVER BASIN						
14302850 Walker Creek	Nestucca River	Lat 45°18'12", long 123°24'53", in SE 1/4 SW 1/4 sec.15, T.3 S., R.6 W., Tillamook County, Hydrologic Unit 17100203, 0.4 mi upstream from Nestucca River, near Fairdale gaging station.	2.72	1991-93	10- 7-93 12- 3-93 3-11-94 5-12-94 7-19-94 9- 1-94	0.31 11 9.3 4.4 0.95 0.21
UMPQUA RIVER BASIN						
14312260 South Umpqua River	Umpqua River	Lat 43°13'23", long 123°24'48", in SW 1/4 NE 1/4 sec.16, T.27 S., R.6 W., Douglas County, Hydrologic Unit 17100302, 3.7 mi west of Roseburg, and at mile 117.7.	1,798	---	4- 5-94 7- 6-94 9-13-94	1,670 769 601
14316800 North Umpqua River	.....do.....	Lat 43°19'18", long 122°48'30", Douglas County, Hydrologic Unit 17100301, 4.0 mi downstream from Steamboat Creek, 12 mi northeast of Glide, and at mile 48.1.	865	---	12- 8-93	5,650
14317500 North Umpqua River	.....do.....	Lat 43°19'51", long 123°00'07", near line between SE 1/4 SE 1/4 sec.1, T.26 S., R.3 W., Douglas County, Hydrologic Unit 17100301, 0.1 mi upstream from Rock Creek, 5.1 mi northeast of Glide, and at mile 35.8.	886	---	12- 9-93	3,660

## GROUND WATER LEVELS

## MULTNOMAH COUNTY

452938122254801. Local number, 01S/03E-10CCA

LOCATION.--Lat 45°29'38", long 122°25'48", Hydrologic Unit 17090012, 0.25 miles southeast of West Gresham School, City of Gresham.  
Owner: Forest Lawn Memorial Park.

AQUIFER.--Cemented gravel of the Troutdale Formation and volcanic rocks of the Columbia River Basalt Group, both formations of Tertiary age.

WELL CHARACTERISTICS.--Drilled irrigation well, 16 inch casing 0 to 476 ft, 12 inch casing 480 to 715 ft, well depth 715 ft, perforated 235 to 242 ft, 360 to 365 ft, 415 to 420 ft, and 628 to 697 ft.

INSTRUMENTATION.--Monthly measurements with chalked steel tape by USGS personnel since Nov. 2, 1990, periodic measurements using electric sounder tape and steel tape by Oregon Water Resources personnel from August 1963 to August 1990.

DATUM.--Elevation of land surface is 355 ft above sea level (from topographic map). Measuring point: Marked access hole 0.6 ft above land-surface datum in steel plate covering casing.

REMARKS.--Used to irrigate cemetery for approximately 3 months during the summer months some years, including 1994.

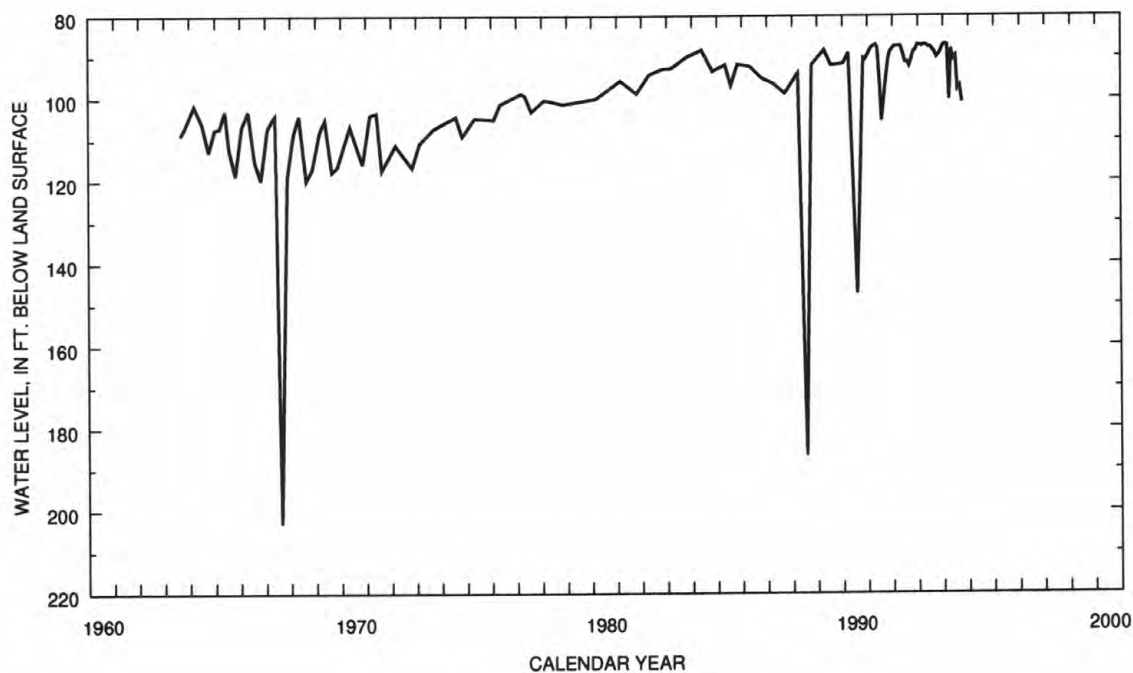
PERIOD OF RECORD.--August 1963 to current year. Records prior to October 1993 are unpublished and are available in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 86.9 ft below land-surface datum, January 25, 1994; lowest measurement, 203.0 ft below land-surface datum, August 16, 1967 well was being pumped.

## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1993 to SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	89.46	JAN 25	86.92	APR 26	88.06	JUL 29	97.84R
NOV 26	88.79	FEB 28	87.19	MAY 27	90.51	AUG 29	96.92R
DEC 29	87.25	MAR 29	100.41R	JUN 30	89.77	SEP 29	101.01R

R Indicates well was recovering from pumping previous night.



## GROUND WATER LEVELS

## UMATILLA COUNTY

453934118491701. Local number, 02N/32E-16BAB

LOCATION.--Lat 45°39'34", long 118°49'17", Hydrologic Unit 17070103, 0.5 miles northwest of Sherwood Heights School.

Owner: City of Pendleton.

AQUIFER.--Volcanic rocks of the Columbia River Basalt Group.

WELL CHARACTERISTICS.--24 inch casing 0 to 91 ft, 20 inch casing 0 to 390 ft, well depth 1500 ft.

INSTRUMENTATION.--Mostly monthly, some weekly, measurements with electric sounder tape by City of Pendleton, Oregon Water Resources Dept., and U.S. Geological Survey personnel, also a long term analog recorder record since August 23, 1977 and an electronic data logger hourly record since February 25, 1994.

DATUM.--Elevation of land surface is 1060 ft above sea level (from topographic map). Measuring point: access hole in steel plate covering casing 1.1 ft above land-surface datum.

REMARKS.--Unused but affected by nearby pumping wells in Columbia River Basalt Group.

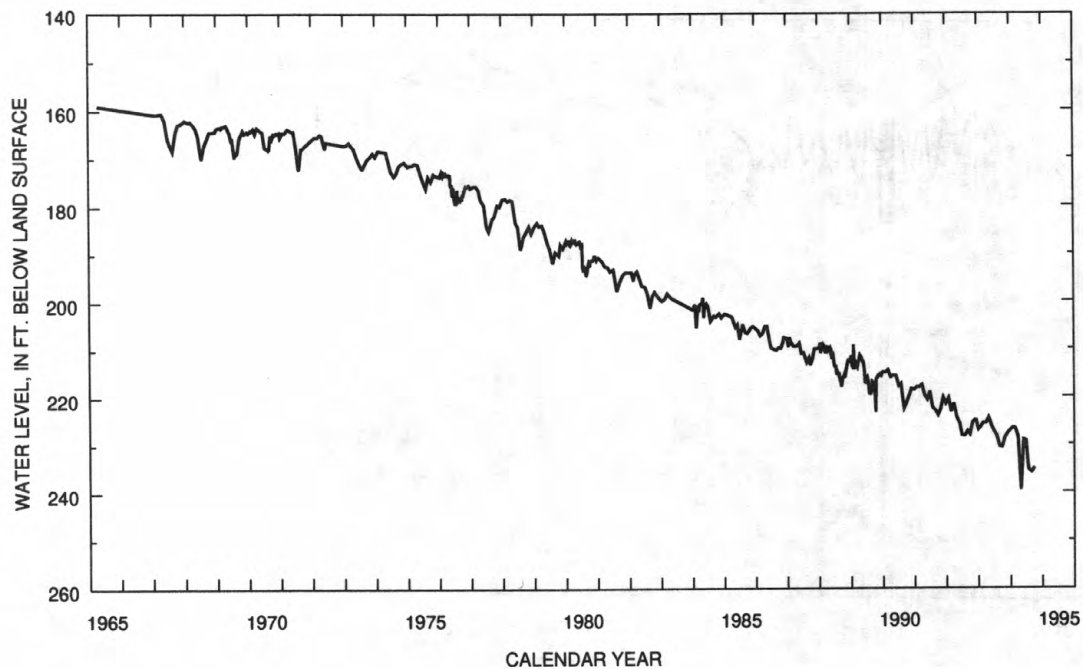
PERIOD OF RECORD.--April 1965 to current year. Records prior to October 1993 are unpublished and available in the files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 159.0 ft below land-surface datum, April 17, 1965; lowest measured, 239.69 ft. below land-surface datum, April 28, 1994.

## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 28	228.74	JAN 26	226.70	APR 28	239.69S	JUL 11	233.03
NOV 30	227.77	FEB 25	226.72	MAY 31	229.14	AUG 29	235.92
DEC 28	227.24	MAR 30	228.55	JUN 28	229.34	SEPS 30	234.95

S Indicates pumping nearby.



## BI-STATE WATER-QUALITY STUDY

Water samples were collected monthly at three sites on the Columbia River and one site on the Multnomah Channel during the period January to December 1994 for the Bi-State Water-Quality Study. In addition, miscellaneous sites on four tributary streams were sampled during the period April to September 1994. These data were used to determine spatial and temporal patterns of water-quality constituent concentrations and loads downstream from Bonneville Dam.

14128910 - COLUMBIA RIVER AT WARRENDALE, OR (LAT 45 36 45N LONG 122 01 35W) MULTNOMAH CO, HYDROLOGIC UNIT 17080001

## WATER-QUALITY DATA

DATE	TIME	DIS-CHARGE, IN CUBIC FEET PER SECOND (00060)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	BARO-METRIC PRES-SURE (MM HG) (00025)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	DIS-SOLVED GAS (PER-CENT SATUR-ATION) (99910)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML) (31625)	STREP-TOCOCCHI, KF AGAR (COLS./100 ML) (31673)	ENTERO-COCCI ME, MF WATER TOTAL (COL / 100 ML) (31649)	
FEB 1994	16...	0922	E135000	171	8.2	4.0	13.1	755	101	--	K1	<1	K1
MAR 16...	1100	E131000	178	8.4	6.5	13.6	762	110	--	<1	<1	<1	
APR 13...	0835	E161000	180	8.5	9.5	12.0	768	105	--	K3	--		K25
MAY 11...	0942	E222000	153	8.5	14.0	11.9	766	115	--	K2	--	<1	
JUN 15...	0948	E233000	126	7.9	16.0	10.7	765	107	107	K2	K2	K1	
JUL 27...	0828	E144000	133	7.7	21.5	9.4	762	106	108	K2	<1	<1	
AUG 10...	1022	E93800	149	7.9	21.5	9.5	760	108	--	<1	--	K1	
SEP 15...	0906	E72500	138	7.8	19.5	9.2	767	99	--	K5	<1	<1	
OCT 24...	0937	E105000	151	8.0	15.5	10.4	764	103	--	K3	--	K3	
NOV 08...	1057	E120000	167	7.9	12.0	10.4	757	97	--	K1	K5	K3	
DEC 20...	1045	E128000	157	7.9	6.5	--	758	--	--	K1	--	--	
DATE		CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY WAT DIS TOT IT FIELD (MG/L AS CACO3) (39086)	BICAR-BONATE WATER DIS IT FIELD (MG/L AS HCO3) (00453)	CAR-BONATE WATER DIS IT FIELD (MG/L AS CO3) (00452)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)
FEB 1994	16...	21	5.8	6.1	1.3	77	94	0	14	3.0	0.20	8.5	109
MAR 16...	21		6.0	6.5	1.2	69	83	0	14	3.2	0.10	9.4	107
APR 13...	20		5.9	6.8	1.2	71	81	3	14	4.0	0.20	8.5	100
MAY 11...	17		5.0	6.1	1.2	61	69	3	12	3.2	0.20	8.9	89
JUN 15...	16		4.2	3.7	0.90	53	65	0	9.1	2.1	0.10	8.0	77
JUL 27...	16		4.4	4.3	0.90	52	63	0	9.0	2.0	0.20	7.6	78
AUG 10...	16		4.6	5.8	1.1	58	71	0	11	2.7	0.10	8.7	88
SEP 15...	17		4.6	4.1	1.0	55	67	0	9.5	2.1	0.10	6.3	85
OCT 24...	16		4.7	5.4	1.1	64	78	0	11	2.6	0.10	5.0	86
NOV 08...	18		5.5	7.7	1.4	62	76	0	13	3.8	0.20	8.3	97
DEC 20...	18		5.3	7.0	1.3	67	82	0	12	3.8	0.10	9.7	99
DATE		NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C) (00689)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	ANTI-MONY, DIS-SOLVED (UG/L AS SB) (01095)
FEB 1994	16...	0.010	0.020	<0.20	<0.20	0.220	0.040	0.030	0.010	--	--	--	--
MAR 16...	0.030	<0.010	<0.20	<0.20	0.210	<0.010	0.020	0.001	--	--	--	--	--
APR 13...	0.020	<0.010	<0.20	0.20	0.170	0.020	<0.010	0.004	--	--	--	--	--
MAY 11...	<0.010	<0.010	<0.20	0.30	0.075	0.020	<0.010	0.001	1.9	1.1	20	<1	<1
JUN 15...	0.060	<0.010	<0.20	<0.20	<0.050	0.040	<0.010	0.002	1.9	0.7	5	<1	<1
JUL 27...	0.030	<0.010	<0.20	<0.20	0.065	0.020	0.020	0.013	--	--	--	--	--
AUG 10...	0.030	<0.010	<0.20	<0.20	0.420	0.040	0.050	0.013	1.4	0.3	8	<1	<1
SEP 15...	0.020	<0.010	<0.20	<0.20	<0.050	0.020	0.010	0.010	--	--	--	--	--
OCT 24...	0.020	<0.010	<0.20	<0.20	<0.050	0.020	<0.010	0.010	--	--	--	--	--
NOV 08...	0.020	<0.010	<0.20	<0.20	0.160	0.040	0.030	0.013	1.5	0.3	8	<1	<1
DEC 20...	<0.010	<0.010	<0.20	<0.20	0.240	0.010	<0.010	0.017	--	--	--	--	--

E - Estimated.

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

## CHEMICAL ANALYSES OF SURFACE WATER SAMPLES IN LOWER COLUMBIA RIVER BASIN

## BI-STATE WATER-QUALITY STUDY--Continued

14128910 - COLUMBIA RIVER AT WARRENDALE, OR (LAT 45 36 45N LONG 122 01 35W) MULTNOMAH CO, HYDROLOGIC UNIT 17080001

## WATER-QUALITY DATA

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)	CADMIUM, DIS- SOLVED (UG/L AS CD) (01025)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MERCURY, DIS- SOLVED (UG/L AS HG) (71890)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)
FEB 1994												
MAR 16...	--	--	--	--	--	--	--	8	--	<1	--	--
APR 13...	--	--	--	--	--	--	--	17	--	<1	--	--
MAY 11...	1	24	<1	<1.0	1	<1	1	18	<1	<1	<0.1	<1
JUN 15...	1	22	<1	<1.0	<1	<1	1	9	<1	<1	<0.1	<1
JUL 27...	--	--	--	--	--	--	--	7	--	<1	--	--
AUG 10...	1	24	<1	<1.0	1	<1	1	9	<1	<1	<0.1	<1
SEP 15...	--	--	--	--	--	--	--	7	--	<1	--	--
OCT 24...	--	--	--	--	--	--	--	<3	--	<1	--	--
NOV 08...	1	28	<1	<1.0	<1	<1	3	11	<1	<1	<0.1	1
DEC 20...	--	--	--	--	--	--	--	25	--	1	--	--
DATE	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	URANIUM NATURAL DIS- SOLVED (UG/L AS U) (22703)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	CHLORO- PHYLL A FLUORO- METRIC METHOD CORR. (UG/L AS CL) (32209)	HALIDE TOTAL ORGANIC WATER RECOV. (UG/L AS CL) (79747)	ACETO- CHLOR, WATER FLTRD REC (UG/L) (49260)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)	PRO- METON, WATER, DISS, REC (UG/L) (04037)
FEB 1994												
MAR 16...	--	--	--	--	--	2.1	2	--	--	--	--	--
APR 13...	--	--	--	--	--	10	<5	--	--	--	--	--
MAY 11...	<1	<1	<1.0	<1.0	<1	20	<5	--	<0.007	<0.002	<0.005	<0.003
JUN 15...	<1	<1	<1.0	<1.0	<1	9.0	7	--	<0.007	<0.002	<0.005	<0.003
JUL 27...	--	--	--	--	--	1.9	15	--	--	--	--	--
AUG 10...	<1	<1	<1.0	<1.0	1	2.5	6	--	<0.007	<0.002	0.001	<0.003
SEP 15...	--	--	--	--	--	--	<5	--	--	--	--	--
OCT 24...	--	--	--	--	--	3.1	<5	--	--	--	--	--
NOV 08...	<1	<1	<1.0	<1.0	8	3.4	9	<0.009	<0.007	<0.002	<0.005	<0.003
DEC 20...	--	--	--	--	--	2.6	6	--	--	--	--	--
DATE	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	FONOFOS WATER, DISS, REC (UG/L) (04095)	ALPHA BHC DIS- SOLVED (UG/L) (34253)	P, P' DDE DISSOLV (UG/L) (34653)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)	LINDANE DIS- SOLVED (UG/L) (39341)	DI- ELDRIN DIS- SOLVED (UG/L) (39381)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)	MALA- THION, DIS- SOLVED (UG/L) (39532)	PARA- THION, DIS- SOLVED (UG/L) (39542)	DI- AZINON, DIS- SOLVED (UG/L) (39572)
MAY 11...	<0.002	<0.004	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	<0.002	<0.005	<0.004	<0.002
JUN 15...	<0.002	<0.004	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	<0.002	<0.005	<0.004	<0.002
AUG 10...	<0.002	<0.004	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	<0.002	<0.005	<0.004	<0.002
NOV 08...	<0.002	<0.004	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	<0.004	<0.005	<0.004	<0.002
DATE	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)	ALA- CHLOR, WATER, DISS, REC (UG/L) (46342)	METRI- BUZIN WATER, DISSOLV (UG/L) (82630)	2,6-DI- ETHYL ANILINE WAT FLT GF, REC (UG/L) (82660)	TRI- FLUR- ALIN WAT FLT GF, REC (UG/L) (82661)	ETHAL- FLUR- ALIN WAT FLT GF, REC (UG/L) (82663)	PHORATE WATER FLTRD GF, REC (UG/L) (82664)	TER- BACIL WATER FLTRD GF, REC (UG/L) (82665)	LIN- URON WATER FLTRD GF, REC (UG/L) (82666)	METHYL PARA- THION WAT FLT GF, REC (UG/L) (82667)	EPTC WATER FLTRD GF, REC (UG/L) (82668)	PBB- ULATE WATER FLTRD GF, REC (UG/L) (82669)
MAY 11...	<0.001	<0.002	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	0.006	<0.004
JUN 15...	<0.001	<0.002	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	0.003	<0.004
AUG 10...	0.002	<0.002	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004
NOV 08...	E0.006	<0.002	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004

E - Estimated.



## CHEMICAL ANALYSES OF SURFACE WATER SAMPLES IN LOWER COLUMBIA RIVER BASIN

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## BI-STATE WATER-QUALITY STUDY--Continued

14128910 - COLUMBIA RIVER AT WARRENDALE, OR (LAT 45 36 45N LONG 122 01 35W) MULTNOMAH CO, HYDROLOGIC UNIT 17080001

## WATER-QUALITY DATA

DATE	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)
MAY 11...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003
JUN 15...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003
AUG 10...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003
NOV 08...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003

## \*\*\*\*\* QA SURROGATES\*\*\*\*\*

## \*\*\*\*\*ADDED TO SAMPLE\*\*\*\*\*

DATE	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	DIAZ- INON D10 SRG WAT FLT 0.7 U GF, REC (UG/L) (91063)	TERBUTH YLAZINE SURROCT WAT FLT 0.7 U GF, REC (UG/L) (91064)	HCH ALPHA D6 SRG WAT FLT 0.7 U GF, REC (UG/L) (91065)	AN- TIMONY SED. SUSP. (UG/G) (29816)
MAY 11...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	100	110	100	1.5
JUN 15...	<0.002	0.001	<0.004	<0.003	<0.013	<0.001	<0.005	100	110	100	1.4
AUG 10...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	100	130	100	1.9
NOV 08...	<0.002	E0.003	<0.004	<0.003	<0.013	<0.001	<0.005	100	110	100	1.7

DATE	ARSENIC SED. SUSP. (UG/G) (29818)	BARIUM SED. SUSP. (UG/G) (29820)	BERYL- LIUM SED. SUSP. (UG/G) (29822)	CADMIUM SED. SUSP. (UG/G) (29826)	CHRO- MIUM SED. SUSP. (UG/G) (29829)	COPPER SED. SUSP. (UG/G) (29832)	GOLD SEDI- MENT SUSP. (UG/G) (82170)	LEAD SED. SUSP. (UG/G) (29836)	MAN- GANESE SED. SUSP. (UG/G) (29839)	MERCURY SED. SUSP. (UG/G) (29841)	MOLYB- DENUM SED. SUSP. (UG/G) (29843)
MAY 11...	9.8	580	<2.0	2.3	56	38	<20	27	1200	0.1	0.9
JUN 15...	8.1	580	<2.0	<2.0	54	44	<20	27	1300	0.2	0.6
AUG 10...	11	590	<2.0	2.0	58	59	<20	37	1700	--	0.7
NOV 08...	8	560	<2.0	2.1	48	30	<20	49	2000	0.2	0.6

DATE	NICKEL SED. SUSP. (UG/G) (29845)	SELE- NIUM SED. SUSP. (UG/G) (29847)	SILVER SED. SUSP. (UG/G) (29850)	VANA- DIUM SED. SUSP. (UG/G) (29853)	ZINC SED. SUSP. (UG/G) (29855)	ALUM- INUM SED, SUS PERCENT (30221)	CALCIUM SED. SUSP. PERCENT (30240)	IRON SEDI- MENT SUSP. PERCENT (30269)	MAGNES- IUM SEDI- MENT SUSP. PERCENT (30277)	PHOS- PHORUS SEDI- MENT SUSP. PERCENT (30292)	POTAS- SIUM SEDI- MENT SUSP. PERCENT (30294)
MAY 11...	27	0.6	0.6	110	230	6.4	2.0	4.0	1.1	0.15	1.3
JUN 15...	26	0.6	0.3	110	230	6.4	2.0	4.0	1.0	0.14	1.3
AUG 10...	31	--	0.4	110	300	6.4	1.8	4.3	1.1	0.15	1.3
NOV 08...	28	--	0.2	110	220	6.9	2.2	4.2	1.0	0.17	1.2

DATE	SODIUM SEDI- MENT SUSP. PERCENT (30304)	TITA- NIUM SEDI- MENT SUSP. PERCENT (30317)	BISMUTH SEDI- MENT SUSP. (UG/G) (35030)	COBALT SEDI- MENT SUSP. (UG/G) (35031)	EURO- PIUM SEDI- MENT SUSP. (UG/G) (35032)	GALLIUM SEDI- MENT SUSP. (UG/G) (35033)	HOLMIUM SEDI- MENT SUSP. (UG/G) (35035)	LANTHA- NIUM SEDI- MENT SUSP. (UG/G) (35036)	NEODYM- IUM SEDI- MENT SUSP. (UG/G) (35037)	NIOBIUM SEDI- MENT SUSP. (UG/G) (35038)	SCAN- DIUM SEDI- MENT SUSP. (UG/G) (35039)
MAY 11...	1.4	0.44	<20	18	<4.0	18	<8.0	26	22	<8.0	14
JUN 15...	1.4	0.48	<20	17	<4.0	17	<8.0	26	25	14	14
AUG 10...	1.2	0.46	<20	19	<4.0	17	<8.0	28	26	15	15
NOV 08...	1.6	0.46	<20	20	<4.0	12	<8.0	28	23	<8.0	14

E - Estimated.

## CHEMICAL ANALYSES OF SURFACE WATER SAMPLES IN LOWER COLUMBIA RIVER BASIN

## BI-STATE WATER-QUALITY STUDY--Continued

14128910 - COLUMBIA RIVER AT WARRENDALE, OR (LAT 45 36 45N LONG 122 01 35W) MULTNOMAH CO, HYDROLOGIC UNIT 17080001

## WATER-QUALITY DATA

DATE	STRON- TIUM SEDI- MENT SUSP. (UG/G) (35040)	TANTA- LUM SEDI- MENT SUSP. (UG/G) (35042)	THORIUM SEDI- MENT SUSP. (UG/G) (35043)	TIN SEDI- MENT SUSP. (UG/G) (35044)	URANIUM SEDI- MENT SUSP. (UG/G) (35046)	YTTRIUM SEDI- MENT SUSP. (UG/G) (35047)	YTTER- BIUM SEDI- MENT SUSP. (UG/G) (35048)	LITHIUM SEDI- MENT SUSP. (UG/G) (35050)	CERIUM SEDI- MENT SUSP. (UG/G) (35051)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
FEB 1994											
16...	--	--	--	--	--	--	--	--	--	3	E92
MAR											
16...	--	--	--	--	--	--	--	--	--	5	E82
APR											
13...	--	--	--	--	--	--	--	--	--	7	E87
MAY											
11...	260	<80	7.9	<10	1.5	21	<2.0	23	47	12	89
JUN											
15...	260	<80	7.8	<10	2.7	23	<2.0	23	48	11	88
JUL											
27...	--	--	--	--	--	--	--	--	--	6	E98
AUG											
10...	230	<80	8.9	<10	3.3	25	2.0	27	48	4	E100
SEP											
15...	--	--	--	--	--	--	--	--	--	4	E97
OCT											
24...	--	--	--	--	--	--	--	--	--	5	E96
NOV											
08...	290	<80	6.3	<10	2.9	25	2.0	24	52	7	E85
DEC											
20...	--	--	--	--	--	--	--	--	--	4	E97

E - Estimated.

## BI-STATE WATER-QUALITY STUDY--Continued

14144710 - COLUMBIA RIVER, RM 102, DS OF HAYDEN ISLAND, OR (LAT 45 38 55N LONG 122 45 02W) MULTNOMAH CO,  
HYDROLOGIC UNIT 17090012

## WATER-QUALITY DATA

DATE	TIME	DIS-CHARGE, IN CUBIC FEET PER SECOND (00060)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	DIS-SOLVED GAS (PER-CENT SATUR-ATION) (99910)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	ENTERO-COCCI ME, MF WATER TOTAL (COL / 100 ML) (31649)	
JAN 1994	18...	1212	E138000	166	8.0	6.0	764	99	--	K13	--	K8	
FEB	14...	1344	E132000	178	8.0	4.5	765	102	--	K6	--	K1	
MAR	22...	0937	E161000	191	8.2	6.5	760	109	--	K3	--	K2	
APR	11...	1251	E139000	170	8.6	9.5	769	106	--	K3	--	K5	
MAY	10...	1202	E209000	166	8.7	14.5	766	120	--	<2	K2	K2	
25...	1357	E214000	155	8.4	16.0	10.5	766	106	114	K5	--	K3	
JUN	14...	1254	E211000	125	8.0	16.0	764	105	106	K60	--	K1	
JUL	25...	1322	E142000	135	7.9	22.5	764	107	108	K5	--	<1	
AUG	08...	1022	E97000	150	7.9	21.5	758	102	--	100	--	K6	
SEP	13...	0923	E74000	139	7.8	19.5	762	97	--	K18	--	K5	
OCT	25...	0923	E106000	151	8.0	15.0	759	97	--	K9	--	K6	
NOV	07...	1115	E102000	145	7.9	11.0	766	96	--	K14	--	K9	
DEC	05...	1209	E129000	149	7.9	6.5	750	100	--	K7	--	<1	
DATE		CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY WAT DIS TOT IT FIELD (MG/L AS CAC03) (39086)	BICAR-BONATE WATER DIS IT FIELD (MG/L AS HCO3) (00453)	CAR-BONATE WATER DIS IT FIELD (MG/L AS CO3) (00452)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)
JAN 1994	18...	20	5.5	6.9	1.3	66	81	0	13	4.2	0.10	10	100
FEB	14...	21	5.9	8.0	1.4	71	87	0	14	4.0	0.10	9.0	112
MAR	22...	20	6.0	7.8	1.3	71	87	0	15	5.0	0.20	10	115
APR	11...	17	4.9	6.2	1.1	66	77	2	11	4.3	0.10	9.9	88
MAY	10...	17	5.3	7.3	1.4	63	68	4	12	4.1	0.20	8.7	101
25...	17	4.9	6.3	6.3	1.3	59	66	3	12	3.7	0.20	8.8	95
JUN	14...	15	4.0	4.1	1.0	53	65	0	8.8	1.9	0.10	7.5	72
JUL	25...	16	4.4	4.6	0.90	63	77	0	9.2	2.3	0.10	7.4	79
AUG	08...	16	4.5	5.9	1.1	57	70	0	11	3.0	0.10	8.6	86
SEP	13...	16	4.5	4.7	1.1	55	67	0	9.9	2.7	0.10	7.0	93
OCT	25...	17	4.8	5.8	1.2	59	72	0	11	2.7	0.20	5.4	87
NOV	07...	17	4.9	6.6	1.2	56	68	0	11	3.4	0.10	8.0	91
DEC	05...	16	4.8	7.2	1.3	54	66	0	12	4.9	0.10	9.2	89
DATE		NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C) (00689)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	ANTI-MONY, DIS-SOLVED (UG/L AS SB) (01095)
JAN 1994	18...	0.030	<0.010	<0.20	<0.20	0.330	0.030	0.020	0.030	--	--	--	--
FEB	14...	0.020	0.040	<0.20	<0.20	0.280	0.040	0.030	0.014	--	--	--	--
MAR	22...	0.030	<0.010	<0.20	0.20	0.340	0.040	<0.010	0.007	1.6	0.6	20	<1
APR	11...	0.090	0.020	0.20	0.30	0.730	0.040	0.030	0.042	--	--	--	--
MAY	10...	0.020	<0.010	<0.20	0.30	0.067	0.030	<0.010	0.002	--	--	--	--
25...	0.050	0.030	<0.20	<0.20	0.20	0.078	0.050	<0.010	0.002	1.8	0.7	6	<1
JUN	14...	0.070	<0.010	<0.20	0.20	<0.050	0.030	<0.010	0.003	--	--	--	--
JUL	25...	0.040	<0.010	<0.20	<0.20	0.050	0.030	0.010	0.009	1.8	0.4	7	<1
AUG	08...	0.030	<0.010	<0.20	<0.20	0.063	0.030	0.040	0.013	--	--	--	--
SEP	13...	0.020	<0.010	<0.20	<0.20	0.052	0.030	0.020	0.010	--	--	--	--
OCT	25...	0.010	<0.010	<0.20	<0.20	0.066	0.040	0.020	0.013	--	--	--	--
NOV	07...	0.030	<0.010	<0.20	<0.20	0.140	0.030	0.020	0.015	--	--	--	--
DEC	05...	0.020	<0.010	<0.20	<0.20	0.230	0.020	0.020	0.007	1.4	--	10	<1

E - Estimated.

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

## CHEMICAL ANALYSES OF SURFACE WATER SAMPLES IN LOWER COLUMBIA RIVER BASIN

## BI-STATE WATER-QUALITY STUDY--Continued

14144710 - COLUMBIA RIVER, RM 102, DS OF HAYDEN ISLAND, OR (LAT 45 38 55N LONG 122 45 02W) MULTNOMAH CO,  
HYDROLOGIC UNIT 17090012

## WATER-QUALITY DATA

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MERCURY DIS- SOLVED (UG/L AS HG) (71890)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)
JAN 1994												
18...	--	--	--	--	--	--	--	8	--	2	--	--
FEB												
14...	--	--	--	--	--	--	--	8	--	2	--	--
MAR												
22...	1	30	<1	<1.0	2	<1	1	19	<1	2	<0.1	1
APR												
11...	--	--	--	--	--	--	--	39	--	2	--	--
MAY												
10...	--	--	--	--	--	--	--	16	--	1	--	--
25...	1	24	<1	<1.0	1	<1	2	5	<1	<1	<0.1	<1
JUN												
14...	--	--	--	--	--	--	--	11	--	1	--	--
JUL												
25...	1	22	<1	<1.0	1	<1	<1	10	<1	3	<0.1	<1
AUG												
08...	--	--	--	--	--	--	--	13	--	1	--	--
SEP												
13...	--	--	--	--	--	--	--	10	--	1	--	--
OCT												
25...	--	--	--	--	--	--	--	6	--	1	--	--
NOV												
07...	--	--	--	--	--	--	--	16	--	<1	--	--
DEC												
05...	1	21	<1	<1.0	<1	<1	<1	17	<1	1	<0.1	<1
DATE	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	URANIUM NATURAL DIS- SOLVED (UG/L AS U) (22703)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	CHLORO- PHYLL A FLUORO- METRIC METHOD CORR. (UG/L) (32209)	HALIDE TOTAL ORGANIC WATER RECOV. (UG/L AS CL) (79747)	ACETO- CHLOR, WATER, FLTRD REC (UG/L) (49260)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)	PRO- METON, WATER, DISS, REC (UG/L) (04037)
JAN 1994												
18...	--	--	--	--	--	--	17	--	--	--	--	--
FEB												
14...	--	--	--	--	--	4.6	12	--	--	--	--	--
MAR												
22...	<1	<1	<1.0	1.0	1	6.5	19	--	<0.007	<0.002	<0.005	<0.003
APR												
11...	--	--	--	--	--	22	16	--	--	--	--	--
MAY												
10...	--	--	--	--	--	24	6	--	--	--	--	--
25...	<1	<1	<1.0	<1.0	4	25	24	--	<0.007	<0.002	<0.005	<0.003
JUN												
14...	--	--	--	--	--	12	19	--	--	--	--	--
JUL												
25...	<1	<1	<1.0	<1.0	2	4.3	27	--	<0.007	<0.002	<0.005	<0.003
AUG												
08...	--	--	--	--	--	5.0	22	--	--	--	--	--
SEP												
13...	--	--	--	--	--	2.8	9	--	--	--	--	--
OCT												
25...	--	--	--	--	--	3.5	14	--	--	--	--	--
NOV												
07...	--	--	--	--	--	2.6	13	--	--	--	--	--
DEC												
05...	<1	<1	<1.0	<1.0	<1	4.4	25	<0.009	<0.007	<0.002	<0.005	<0.003
DATE	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	FONOFOS WATER DISS REC (UG/L) (04095)	ALPHA BHC DIS- SOLVED (UG/L) (34253)	P, P' DDE DISSOLV (UG/L) (34653)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)	LINDANE DIS- SOLVED (UG/L) (39341)	DI- ELDRIN DIS- SOLVED (UG/L) (39381)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)	MALA- THION, DIS- SOLVED (UG/L) (39532)	PARA- THION, DIS- SOLVED (UG/L) (39542)	DI- AZINON, DIS- SOLVED (UG/L) (39572)
MAR												
22...	<0.002	<0.004	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	<0.002	<0.005	<0.004	<0.002
MAY												
25...	<0.002	<0.004	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	<0.002	<0.005	<0.004	<0.002
JUL												
25...	<0.002	<0.004	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	<0.002	<0.005	<0.004	<0.002
DEC												
05...	<0.002	<0.004	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	E0.002	<0.005	<0.004	<0.002
DATE	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)	ALA- CHLOR, WATER, DISS, REC (UG/L) (46342)	METRI- BUZIN WATER DISSOLV (UG/L) (82630)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	TRI- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)	ETHAL- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	PHORATE WATER FLTRD FLTRD (UG/L) (82664)	TER- BACIL WATER FLTRD FLTRD (UG/L) (82665)	LIN- URON WATER FLTRD FLTRD (UG/L) (82666)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	EPTC WATER FLTRD FLTRD (UG/L) (82668)	PEB- ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)
MAR												
22...	0.003	<0.002	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	0.002	<0.004
MAY												
25...	<0.001	<0.002	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	0.004	<0.004
JUL												
25...	0.003	<0.002	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004
DEC												
05...	E0.003	<0.002	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004

E - Estimated.

## BI-STATE WATER-QUALITY STUDY--Continued

14144710 - COLUMBIA RIVER, RM 102, DS OF HAYDEN ISLAND, OR (LAT 45 38 55N LONG 122 45 02W) MULTNOMAH CO,  
HYDROLOGIC UNIT 17090012

## WATER-QUALITY DATA

DATE	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)
MAR 22...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003
MAY 25...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003
JUL 25...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003
DEC 05...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003

\*\*\*\*\*QA SURROGATES\*\*\*\*\*

\*\*\*\*\*ADDED TO SAMPLE\*\*\*\*\*

DATE	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	DIAZ- INON D10 SRG WAT FLT 0.7 U GF, REC (UG/L) (91063)	TERBUTH YLAZINE SURROGT WAT FLT 0.7 U GF, REC (UG/L) (91064)	HCH ALPHA D6 SRG WAT FLT 0.7 U GF, REC (UG/L) (91065)	AN- TIMONY SED. SUSP. (UG/G) (29816)
MAR 22...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	100	98	80	1.1
MAY 25...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	100	110	90	1.6
JUL 25...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	100	130	100	1.1
DEC 05...	<0.002	E0.001	<0.004	E0.007	<0.013	<0.001	<0.005	90	100	90	1.2

DATE	ARSENIC SED. SUSP. (UG/G) (29818)	BARIUM SED. SUSP. (UG/G) (29820)	BERYL- LIUM SED. SUSP. (UG/G) (29822)	CADMIUM SED. SUSP. (UG/G) (29826)	CHRO- MIUM SED. SUSP. (UG/G) (29829)	COPPER SED. SUSP. (UG/G) (29832)	GOLD SEDI- MENT SUSP. (UG/G) (82170)	LEAD SED. SUSP. (UG/G) (29836)	MAN- GANESE SED. SUSP. (UG/G) (29839)	MERCURY SED. SUSP. (UG/G) (29841)	MOLYB- DENUM SED. SUSP. (UG/G) (29843)
MAR 22...	6.0	440	<4.0	5.1	79	76	<30	26	2100	--	0.8
MAY 25...	8.4	590	<2.0	2.0	55	37	<20	24	1200	0.1	0.8
JUL 25...	8.2	570	<2.0	<2.0	60	50	<20	28	1400	0.2	0.6
DEC 05...	6.0	610	2.0	1.3	53	86	<20	41	1500	3.2	0.5

DATE	NICKEL SED. SUSP. (UG/G) (29845)	SELE- NIUM SED. SUSP. (UG/G) (29847)	SILVER SED. SUSP. (UG/G) (29850)	VANA- DIUM SED. SUSP. (UG/G) (29853)	ZINC SED. SUSP. (UG/G) (29855)	ALUM- INIUM SED, SUS PERCENT (30221)	CALCIUM SED. SUSP. PERCENT (30240)	IRON SEDI- MENT SUSP. PERCENT (30269)	MAGNES- IUM SEDI- MENT SUSP. PERCENT (30277)	PHOS- PHORUS SEDI- MENT SUSP. PERCENT (30292)	POTAS- SIUM SEDI- MENT SUSP. PERCENT (30294)
MAR 22...	36	--	0.4	170	190	8.6	1.4	6.1	1.0	0.22	0.86
MAY 25...	28	0.5	0.6	110	230	6.5	2.0	4.1	1.1	0.15	1.3
JUL 25...	31	0.6	0.5	120	220	6.8	2.0	4.5	1.1	0.17	1.3
DEC 05...	28	--	0.2	130	190	7.7	2.4	4.9	1.1	0.17	1.2

DATE	SODIUM SEDI- MENT SUSP. PERCENT (30304)	TITA- NIUM SEDI- MENT SUSP. PERCENT (30317)	BISMUTH SEDI- MENT SUSP. (UG/G) (35030)	COBALT SEDI- MENT SUSP. (UG/G) (35031)	EURO- PIUM SEDI- MENT SUSP. (UG/G) (35032)	GALLIUM SEDI- MENT SUSP. (UG/G) (35033)	HOLMIUM SEDI- MENT SUSP. (UG/G) (35035)	LANTHA- NIUM SEDI- MENT SUSP. (UG/G) (35036)	NEODYM- IUM SEDI- MENT SUSP. (UG/G) (35037)	NIOBIUM SEDI- MENT SUSP. (UG/G) (35038)	SCAN- DIUM SEDI- MENT SUSP. (UG/G) (35039)
MAR 22...	0.8	0.74	<40	26	<8.0	19	<20	28	30	20	24
MAY 25...	1.5	0.46	<20	17	<4.0	16	<8.0	28	25	<8.0	14
JUL 25...	1.3	0.52	<20	20	<4.0	16	<8.0	28	28	16	16
DEC 05...	1.7	0.56	<20	21	<4.0	16	<8.0	28	25	8.0	16

E - Estimated.



## CHEMICAL ANALYSES OF SURFACE WATER SAMPLES IN LOWER COLUMBIA RIVER BASIN

## BI-STATE WATER-QUALITY STUDY--Continued

14144710 - COLUMBIA RIVER, RM 102, DS OF HAYDEN ISLAND, OR (LAT 45 38 55N LONG 122 45 02W) MULTNOMAH CO,  
HYDROLOGIC UNIT 17090012

## WATER-QUALITY DATA

DATE	STRON- TIUM SEDI- MENT SUSP. (UG/G) (35040)	TANTA- LUM SEDI- MENT SUSP. (UG/G) (35042)	THORIUM SEDI- MENT SUSP. (UG/G) (35043)	TIN SEDI- MENT SUSP. (UG/G) (35044)	URANIUM SEDI- MENT SUSP. (UG/G) (35046)	YTTRIUM SEDI- MENT SUSP. (UG/G) (35047)	YTTER- BIUM SEDI- MENT SUSP. (UG/G) (35048)	LITHIUM SEDI- MENT SUSP. (UG/G) (35050)	CERIUM SEDI- MENT SUSP. (UG/G) (35051)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
JAN 1994											
18...	--	--	--	--	--	--	--	--	--	5	E93
FEB											
14...	--	--	--	--	--	--	--	--	--	1	E7
MAR											
22...	190	<200	6.7	<20	3	27	<4	28	62	7	E82
APR											
11...	--	--	--	--	--	--	--	--	--	8	E87
MAY											
10...	--	--	--	--	--	--	--	--	--	14	88
25...	270	<80	7.4	<10	2	22	3	23	48	15	81
JUN											
14...	--	--	--	--	--	--	--	--	--	12	92
JUL											
25...	250	<80	8.4	<10	3	22	2	26	47	7	E100
AUG											
08...	--	--	--	--	--	--	--	--	--	5	E100
SEP											
13...	--	--	--	--	--	--	--	--	--	6	E94
OCT											
25...	--	--	--	--	--	--	--	--	--	5	E100
NOV											
07...	--	--	--	--	--	--	--	--	--	7	E94
DEC											
05...	320	<80	5.6	<10	3	28	3	26	52	8	E96

E - Estimated

## BI-STATE WATER-QUALITY STUDY--Continued

14222850 - MULTNOMAH CHANNEL NEAR MOUTH, AT ST HELENS, OR (LAT 45 51 12N LONG 122 47 39W) COLUMBIA CO,  
HYDROLOGIC UNIT 17090012

## WATER-QUALITY DATA

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STANDARD UNITS) (00400)	TEMPERATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	BAROMETRIC PRESSURE (MM HG) (00025)	OXYGEN, DIS-SOLVED (PERCENT SATURATION) (00301)	DIS-SOLVED GAS (PERCENT SATURATION) (99910)	COLIFORM, FECA, 0.7 UM-MF (COLS./100 ML) (31625)	ENTEROCOCCI ME, MF WATER TOTAL (COL /100 ML) (31649)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNESIUM, DIS-SOLVED (MG/L AS MG) (00925)
FEB 1994												
15...	1202	107	7.3	5.0	12.6	761	98	--	K16	K14	9.0	3.0
MAR 15...	1114	84	7.0	9.5	10.3	761	90	--	24	K14	6.8	2.3
APR 12...	1002	73	7.3	10.5	10.7	769	95	--	K62	K10	6.3	2.1
MAY 09...	0918	132	8.0	15.5	11.1	768	110	--	K14	K1	11	3.7
JUN 10...	1339	118	7.3	18.0	9.0	767	94	103	49	K7	9.3	3.3
13...	1004	121	7.3	17.5	8.8	758	92	104	K9	K6	9.7	3.1
JUL 26...	0952	147	7.5	23.0	8.6	765	99	102	K16	K2	15	4.4
AUG 09...	1037	138	7.3	22.5	7.4	761	85	--	21	K9	10	3.3
SEP 14...	1302	130	7.4	20.0	8.2	765	89	--	K50	K15	13	3.8
OCT 26...	1353	125	7.3	13.5	9.3	754	91	--	130	34	7.5	2.7
NOV 09...	1009	141	7.6	10.5	10.9	751	99	--	57	42	14	4.1
DEC 07...	1239	61	7.0	5.5	13.1	772	103	--	160	K11	5.4	1.8

DATE	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	POTASSIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKALINITY WAT DIS TOT IT (MG/L AS CACO3) (39086)	BICARBONATE WATER DIS IT (MG/L AS HCO3) (00453)	CARBONATE WATER DIS IT (MG/L AS CO3) (00452)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLORIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUORIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C (70300)	NITROGEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITROGEN, NITRATE DIS-SOLVED (MG/L AS N) (00613)
FEB 1994												
15...	7.9	1.0	31	38	0	6.2	8.0	<0.10	17	78	0.130	0.060
MAR 15...	5.6	0.80	24	29	0	4.2	5.8	<0.10	16	60	0.080	0.020
APR 12...	5.1	0.70	23	28	0	4.2	4.9	<0.10	14	58	0.030	<0.010
MAY 09...	8.5	1.1	44	54	0	8.3	7.7	0.10	12	88	0.020	0.010
JUN 10...	8.4	1.1	38	46	0	6.8	8.7	<0.10	14	66	0.050	0.010
13...	10	1.1	36	44	0	6.8	9.5	<0.10	13	73	0.030	<0.010
JUL 26...	7.1	1.1	49	60	0	9.6	6.4	0.20	8.2	81	0.020	<0.010
AUG 09...	9.7	1.2	40	48	0	7.4	9.1	0.10	13	82	0.050	<0.010
SEP 14...	7.1	1.2	46	57	0	8.5	6.1	<0.10	10	82	0.030	<0.010
OCT 26...	12	1.2	33	40	0	5.4	14	<0.10	15	78	0.070	<0.010
NOV 09...	6.8	1.2	47	57	0	10	4.6	0.10	9.9	86	0.030	<0.010
DEC 07...	3.9	0.80	31	37	0	3.1	4.3	<0.10	15	56	<0.010	<0.010

DATE	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	PHOSPHORUS TOTAL (MG/L AS P) (00665)	PHOSPHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOSPHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUSPENDED TOTAL (MG/L AS C) (00689)	ALUMINUM, DIS-SOLVED (UG/L AS AL) (01106)	ANTIMONY, DIS-SOLVED (UG/L AS SB) (01095)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)
FEB 1994												
15...	<0.20	0.30	1.10	0.090	0.070	0.049	--	--	--	--	--	--
MAR 15...	<0.20	0.20	0.910	0.060	0.040	0.029	--	--	--	--	--	--
APR 12...	<0.20	0.20	0.240	0.020	<0.010	0.007	--	--	--	--	--	--
MAY 09...	<0.20	0.30	0.370	0.060	0.020	0.017	--	--	--	--	--	--
JUN 10...	<0.20	<0.20	0.340	0.030	0.020	0.034	1.8	0.8	9	<1	<1	10
13...	<0.20	0.30	0.310	0.060	0.020	0.030	--	--	--	--	--	--
JUL 26...	<0.20	<0.20	0.100	0.030	<0.010	0.011	--	--	--	--	--	--
AUG 09...	<0.20	0.30	0.220	0.090	0.050	0.041	1.7	0.8	10	<1	1	11
SEP 14...	<0.20	<0.20	0.130	0.040	0.030	0.030	--	--	--	--	--	--
OCT 26...	0.20	0.20	0.210	0.080	0.060	0.044	1.7	0.4	10	<1	<1	6
NOV 09...	<0.20	0.20	0.420	0.050	0.020	0.015	--	--	--	--	--	--
DEC 07...	<0.20	<0.20	<0.050	0.020	<0.010	0.003	2.5	0.8	170	<1	<1	7

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

## CHEMICAL ANALYSES OF SURFACE WATER SAMPLES IN LOWER COLUMBIA RIVER BASIN

## BI-STATE WATER-QUALITY STUDY--Continued

14222850 - MULTNOMAH CHANNEL NEAR MOUTH, AT ST HELENS, OR (LAT 45 51 12N LONG 122 47 39W) COLUMBIA CO,  
HYDROLOGIC UNIT 17090012

## WATER-QUALITY DATA

DATE	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MERCURY DIS- SOLVED (UG/L AS HG) (71890)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)
FEB 1994												
15...	--	--	--	--	--	120	--	20	--	--	--	--
MAR 15...	--	--	--	--	--	120	--	19	--	--	--	--
APR 12...	--	--	--	--	--	130	--	11	--	--	--	--
MAY 09...	--	--	--	--	--	37	--	2	--	--	--	--
JUN 10...	<1	<1.0	<1	<1	1	40	<1	5	<0.1	<1	<1	<1
13...	--	--	--	--	--	39	--	3	--	--	--	--
JUL 26...	--	--	--	--	--	14	--	2	--	--	--	--
AUG 09...	<1	<1.0	1	<1	3	27	<1	2	0.1	<1	<1	<1
SEP 14...	--	--	--	--	--	16	--	<1	--	--	--	--
OCT 26...	<1	<1.0	<1	<1	2	71	<1	7	<0.1	<1	<1	<1
NOV 09...	--	--	--	--	--	43	--	4	--	--	--	--
DEC 07...	<1	<1.0	<1	<1	1	160	<1	11	<0.1	<1	<1	<1
DATE	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	URANIUM NATURAL DIS- SOLVED (UG/L AS U) (22703)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	CHLORO- PHYLL A FLUORO- METRIC METHOD (UG/L CORR.) (32209)	HALIDE TOTAL ORGANIC WATER RECOV. (UG/L AS CL) (79747)	ACETO- CHLOR, WATER, FLTRD REC (UG/L) (49260)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)	PRO- METON, WATER, DISS, REC (UG/L) (04037)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)
FEB 1994												
15...	--	--	--	1.2	10	--	--	--	--	--	--	--
MAR 15...	--	--	--	1.9	10	--	--	--	--	--	--	--
APR 12...	--	--	--	2.5	16	--	--	--	--	--	--	--
MAY 09...	--	--	--	15.1	18	--	--	--	--	--	--	--
JUN 10...	<1.0	<1.0	2	5.6	23	--	<0.007	<0.002	0.019	<0.003	E0.006	<0.004
13...	--	--	--	11.4	28	--	--	--	--	--	--	--
JUL 26...	--	--	--	6.0	39	--	--	--	--	--	--	--
AUG 09...	<1.0	<1.0	5	6.1	29	--	<0.007	<0.002	0.004	<0.003	<0.002	<0.004
SEP 14...	--	--	--	3.8	12	--	--	--	--	--	--	--
OCT 26...	<1.0	<1.0	3	1.8	23	<0.009	<0.007	<0.002	<0.005	<0.003	<0.002	<0.004
NOV 09...	--	--	--	2.0	25	--	--	--	--	--	--	--
DEC 07...	<1.0	<1.0	1	1.0	13	<0.009	<0.007	<0.002	0.035	<0.003	E0.009	<0.004
DATE	FONOFOS WATER DISS REC (UG/L) (04095)	ALPHA BHC DIS- SOLVED (UG/L) (34253)	P,P' DDE DISSOLV (UG/L) (34653)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)	LINDANE DIS- SOLVED (UG/L) (39341)	DI- ELDRIN DIS- SOLVED (UG/L) (39381)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)	MALA- THION, DIS- SOLVED (UG/L) (39532)	PARA- THION, DIS- SOLVED (UG/L) (39542)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)	
JUN 10...	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	0.004	<0.005	<0.004	0.006	0.011	
AUG 09...	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	<0.002	<0.005	<0.004	0.005	0.008	
OCT 26...	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	E0.009	<0.005	<0.004	<0.002	<0.001	
DEC 07...	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	0.044	<0.005	<0.004	<0.002	0.160	
DATE	ALA- CHLOR, WATER, DISS, REC (UG/L) (46342)	METRI- BUZIN WATER DISSOLV (UG/L) (82630)	2,6-DI- ETHYL ANILINE WAT FLT GF, REC (UG/L) (82660)	TRI- FLUR- ALIN WAT FLT GF, REC (UG/L) (82661)	ETHAL- FLUR- ALIN WAT FLT GF, REC (UG/L) (82663)	PHORATE WATER FLTRD GF, REC (UG/L) (82664)	TER- BACIL WATER FLTRD GF, REC (UG/L) (82665)	LIN- URON WATER FLTRD GF, REC (UG/L) (82666)	METHYL PARA- THION WAT FLT GF, REC (UG/L) (82667)	EPTC WATER FLTRD GF, REC (UG/L) (82668)	PBB- ULATE WATER FLTRD GF, REC (UG/L) (82669)	
JUN 10...	<0.002	<0.004	<0.003	<0.002	<0.004	<0.002	E0.012	<0.002	<0.006	0.006	<0.004	
AUG 09...	<0.002	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	
OCT 26...	<0.002	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	
DEC 07...	<0.002	0.021	<0.003	<0.002	<0.004	<0.002	E0.008	<0.002	<0.006	<0.002	<0.004	

E - Estimated.

## CHEMICAL ANALYSES OF SURFACE WATER SAMPLES IN LOWER COLUMBIA RIVER BASIN

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## BI-STATE WATER-QUALITY STUDY--Continued

14222850 - MULTNOMAH CHANNEL NEAR MOUTH, AT ST HELENS, OR (LAT 45 51 12N LONG 122 47 39W) COLUMBIA CO,  
HYDROLOGIC UNIT 17090012

## WATER-QUALITY DATA

DATE	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)
JUN 10...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003
AUG 09...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003
OCT 26...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003
DEC 07...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003

\*\*\*\*\*QA SURROGATE\*\*\*\*\*  
\*\*\*\*ADDED TO SAMPLE\*\*\*\*\*

DATE	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	DIAZ- INON D10 SRG WAT FLT 0.7 U GF, REC (UG/L) (91063)	TERBUTH YLAZINE SURROGT WAT FLT 0.7 U GF, REC (UG/L) (91064)	HCH ALPHA D6 SRG WAT FLT 0.7 U GF, REC (UG/L) (91065)	AN- TIMONY SED. SUSP. (UG/G) (29816)
JUN 10...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	100	110	100	0.8
AUG 09...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	100	130	100	0.7
OCT 26...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	90	100	80	1.2
DEC 07...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	100	120	100	1.6

DATE	ARSENIC SED. SUSP. (UG/G) (29818)	BARIUM SED. SUSP. (UG/G) (29820)	BERYL- LIUM SED. SUSP. (UG/G) (29822)	CADMIUM SED. SUSP. (UG/G) (29826)	CHRO- MIUM SED. SUSP. (UG/G) (29829)	COPPER SED. SUSP. (UG/G) (29832)	GOLD SEDI- MENT SUSP. (UG/G) (82170)	LEAD SED. SUSP. (UG/G) (29836)	MAN- GANESE SED. SUSP. (UG/G) (29839)	MERCURY SED. SUSP. (UG/G) (29841)	MOLYB- DENUM SED. SUSP. (UG/G) (29843)
JUN 10...	7.0	530	<2	<2	78	49	<20	28	2200	0.1	0.7
AUG 09...	6.8	570	<2	<2	75	48	<20	24	1900	0.1	0.6
OCT 26...	10	580	3	0.9	77	62	<20	49	2600	0.1	0.7
DEC 07...	6	540	3	0.3	76	70	<20	34	2100	0.7	0.5

DATE	NICKEL SED. SUSP. (UG/G) (29845)	SELE- NIUM SED. SUSP. (UG/G) (29847)	SILVER SED. SUSP. (UG/G) (29850)	VANA- DIUM SED. SUSP. (UG/G) (29853)	ZINC SED. SUSP. (UG/G) (29855)	ALUM- INUM SED.SUS (30221)	CALCIUM SED. SUSP. (30240)	IRON SEDI- MENT SUSP. (30269)	MAGNES- IUM SEDI- MENT SUSP. (30277)	PHOS- PHORUS SEDI- MENT SUSP. (30292)	POTAS- SIUM SEDI- MENT SUSP. (30294)
JUN 10...	33	0.4	0.5	150	170	7.7	1.9	5.1	1.1	0.19	1.0
AUG 09...	33	0.4	0.4	150	180	7.7	2.0	5.0	1.1	0.16	1.1
OCT 26...	35	--	0.6	160	180	8.3	2.0	5.6	1.1	0.17	1.1
DEC 07...	41	0.4	0.3	180	140	9.3	1.9	6.4	1.2	0.17	1.0

DATE	SODIUM SEDI- MENT SUSP. PERCENT (30304)	TITA- NIUM SEDI- MENT SUSP. PERCENT (30317)	BISMUTH SEDI- MENT SUSP. (UG/G) (35030)	COBALT SEDI- MENT SUSP. (UG/G) (35031)	EURO- PIUM SEDI- MENT SUSP. (UG/G) (35032)	GALLIUM SEDI- MENT SUSP. (UG/G) (35033)	HOLMIUM SEDI- MENT SUSP. (UG/G) (35035)	LANTHA- NIUM SEDI- MENT SUSP. (UG/G) (35036)	NEODYM- IUM SEDI- MENT SUSP. (UG/G) (35037)	NIOBIUM SEDI- MENT SUSP. (UG/G) (35038)	SCAN- DIUM SEDI- MENT SUSP. (UG/G) (35039)
JUN 10...	1.3	0.66	<20	25	<4	21	<8	25	27	15	19
AUG 09...	1.3	0.64	<20	23	<4	19	<8	26	23	14	19
OCT 26...	1.4	0.70	<20	29	<4	15	<8	28	24	10	20
DEC 07...	1.3	0.79	<20	30	<4	18	<8	29	27	10	24

## CHEMICAL ANALYSES OF SURFACE WATER SAMPLES IN LOWER COLUMBIA RIVER BASIN

## BI-STATE WATER-QUALITY STUDY--Continued

14222850 - MULTNOMAH CHANNEL NEAR MOUTH, AT ST HELENS, OR (LAT 45 51 12N LONG 122 47 39W) COLUMBIA CO,  
HYDROLOGIC UNIT 17090012

## WATER-QUALITY DATA

DATE	STRON- TIUM SEDI- MENT SUSP. (UG/G) (35040)	TANTA- LUM SEDI- MENT SUSP. (UG/G) (35042)	THORIUM SEDI- MENT SUSP. (UG/G) (35043)	TIN SEDI- MENT SUSP. (UG/G) (35044)	URANIUM SEDI- MENT SUSP. (UG/G) (35046)	YTTRIUM SEDI- MENT SUSP. (UG/G) (35047)	YTTER- BIUM SEDI- MENT SUSP. (UG/G) (35048)	LITHIUM SEDI- MENT SUSP. (UG/G) (35050)	CERIUM SEDI- MENT SUSP. (UG/G) (35051)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SED SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
FEB 1994											
15...	--	--	--	--	--	--	--	--	--	7	E99
MAR											
15...	--	--	--	--	--	--	--	--	--	17	90
APR											
12...	--	--	--	--	--	--	--	--	--	10	93
MAY											
09...	--	--	--	--	--	--	--	--	--	14	92
JUN											
10...	270	<80	6.6	<10	3.2	23	<2	24	49	18	89
13...	--	--	--	--	--	--	--	--	--	15	91
JUL											
26...	--	--	--	--	--	--	--	--	--	8	E100
AUG											
09...	280	<80	7.1	<10	3.6	23	2	26	47	23	99
SEP											
14...	--	--	--	--	--	--	--	--	--	9	E99
OCT											
26...	290	<80	5.7	<10	3.7	27	3	27	52	10	94
NOV											
09...	--	--	--	--	--	--	--	--	--	11	93
DEC											
07...	260	<80	6.0	<10	2.1	31	3	32	56	25	97

E - Estimated.



## BI-STATE WATER-QUALITY STUDY--Continued

14222890 - COLUMBIA RIVER NR COLUMBIA CITY, OR (LAT 45 54 55N LONG 122 48 54W) COLUMBIA CO, HYDROLOGIC UNIT 17080003

## WATER-QUALITY DATA

DATE	TIME	DIS-CHARGE, IN CUBIC FEET PER SECOND (00060)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	DIS-SOLVED GAS (PER-CENT SATUR-ATION) (99910)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML) (31625)	ENTERO-COCCI ME, MF WATER TOTAL (COL / 100 ML) (31649)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	
JAN 1994													
19...	1033	E221000	152	7.9	6.5	12.3	760	100	--	K20	K6	18	
FEB													
15...	1000	E178000	175	8.0	4.5	13.5	761	104	--	K21	K2	20	
MAR													
15...	0958	E166000	147	8.2	7.0	13.5	761	112	--	K7	K1	16	
APR													
12...	0913	E230000	--	8.5	9.5	10.8	768	--	--	24	K4	21	
MAY													
09...	1134	E229000	160	8.5	15.0	12.3	767	121	--	K2	K1	17	
JUN													
13...	0858	E207000	126	8.1	16.5	10.7	758	110	110	K3	K7	14	
JUL													
26...	1106	E160000	142	7.7	22.5	9.4	764	108	105	K6	K3	16	
AUG													
09...	0848	E106000	149	7.7	21.5	8.7	761	99	--	21	K5	15	
SEP													
14...	1026	E97000	137	7.6	19.5	8.8	764	96	--	K14	K10	15	
OCT													
26...	1021	E123000	146	7.9	15.0	9.8	755	98	--	25	K10	15	
NOV													
09...	1224	E228000	133	7.7	10.5	10.7	751	97	--	--	--	14	
DEC													
07...	1021	E373000	128	7.5	5.5	12.6	770	99	--	K26	K3	14	
DATE		MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY WAT DIS TOT IT FIELD (MG/L AS CACO3) (39086)	BICAR-BONATE WATER DIS IT FIELD (MG/L AS HCO3) (00453)	CAR-BONATE WATER DIS IT FIELD (MG/L AS CO3) (00452)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)
JAN 1994													
19...	5.1	6.9	1.2	60	73	0	12	4.2	0.10	11		93	0.040
FEB													
15...	5.6	7.0	1.3	67	82	0	13	4.5	0.10	9.8		117	0.070
MAR													
15...	4.6	6.2	1.0	55	67	0	11	4.3	<0.10	11		88	0.030
APR													
12...	6.1	6.6	0.70	62	76	0	14	3.8	0.20	8.7		108	0.050
MAY													
09...	5.2	7.8	1.3	65	75	2	12	4.5	0.20	10		105	0.010
JUN													
13...	3.7	4.0	0.90	49	60	0	9.0	2.8	0.10	7.2		70	0.020
JUL													
26...	4.5	5.9	1.0	52	63	0	9.5	4.4	0.20	7.5		78	0.030
AUG													
09...	4.3	6.6	1.1	53	64	0	10	4.6	0.10	9.0		88	0.020
SEP													
14...	4.2	4.9	1.1	54	66	0	9.5	3.2	0.10	7.4		82	0.020
OCT													
26...	4.2	6.2	1.0	55	67	0	10	4.3	0.10	6.3		82	0.020
NOV													
09...	4.2	6.7	1.3	48	58	0	10	4.1	0.10	10		81	0.030
DEC													
07...	4.2	6.2	1.1	51	62	0	11	4.1	0.10	10		81	0.030
DATE		NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C) (00689)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	ANTI-MONY, DIS-SOLVED (UG/L AS SB) (01095)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)
JAN 1994													
19...	0.010	<0.20	<0.20	0.400	0.020	0.010	0.030	--	--	20	--	--	--
FEB													
15...	0.040	<0.20	<0.20	0.560	0.050	0.030	0.016	--	--	--	--	--	--
MAR													
15...	<0.010	<0.20	<0.20	0.270	0.030	<0.010	0.003	--	--	--	--	--	--
APR													
12...	<0.010	0.30	0.50	0.220	0.020	<0.010	0.003	--	--	--	--	--	--
MAY													
09...	<0.010	<0.20	0.30	0.130	0.040	<0.010	0.003	2.0	1.5	20	<1	1	1
JUN													
13...	<0.010	<0.20	0.20	<0.050	0.030	<0.010	0.001	--	--	--	--	--	--
JUL													
26...	<0.010	<0.20	<0.20	0.150	0.040	<0.010	0.009	1.9	0.4	6	<1	1	1
AUG													
09...	<0.010	<0.20	0.20	0.078	0.050	0.050	0.012	--	--	--	--	--	--
SEP													
14...	<0.010	<0.20	<0.20	0.066	0.030	0.020	0.020	1.6	0.5	7	<1	1	1
OCT													
26...	<0.010	<0.20	<0.20	0.066	0.030	0.010	0.016	--	--	--	--	--	--
NOV													
09...	<0.010	<0.20	<0.20	0.310	0.040	0.020	0.014	1.8	0.5	30	<1	1	1
DEC													
07...	<0.010	<0.20	<0.20	0.390	0.040	0.020	0.019	--	--	--	--	--	--

E - Estimated.

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

## CHEMICAL ANALYSES OF SURFACE WATER SAMPLES IN LOWER COLUMBIA RIVER BASIN

## BI-STATE WATER-QUALITY STUDY--Continued

14222890 - COLUMBIA RIVER NR COLUMBIA CITY, OR (LAT 45 54 55N LONG 122 48 54W) COLUMBIA CO. HYDROLOGIC UNIT 17080003

## WATER-QUALITY DATA

DATE	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)	CADMIUM, DIS- SOLVED (UG/L AS CD) (01025)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MERCURY, DIS- SOLVED (UG/L AS HG) (71890)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)
JAN 1994												
19...	--	--	--	--	--	--	15	--	2	--	--	--
FEB												
15...	--	--	--	--	--	--	16	--	3	--	--	--
MAR												
15...	--	--	--	--	--	--	32	--	3	--	--	--
APR												
12...	--	--	--	--	--	--	20	--	<1	--	--	--
MAY												
09...	21	<1	<1.0	1	<1	2	22	<1	<1	<0.1	<1	<1
JUN												
13...	--	--	--	--	--	--	26	--	2	--	--	--
JUL												
26...	23	<1	<1.0	<1	<1	1	12	<1	<1	<0.1	<1	<1
AUG												
09...	--	--	--	--	--	--	16	--	2	--	--	--
SEP												
14...	21	<1	<1.0	1	<1	2	10	<1	<1	<0.1	<1	<1
OCT												
26...	--	--	--	--	--	--	14	--	1	--	--	--
NOV												
09...	20	<1	<1.0	<1	<1	1	36	<1	3	<0.1	1	<1
DEC												
07...	--	--	--	--	--	--	49	--	4	--	--	--

DATE	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	URANIUM, DIS- SOLVED (UG/L AS U) (22703)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	CHLORO- PHYLL A FLUORO- METRIC METHOD (UG/L) (32209)	HALIDE TOTAL ORGANIC WATER RECOV. (UG/L AS CL) (79747)	ACETO- CHLOR, WATER, FLTRD REC (UG/L) (49260)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)	PRO- METON, WATER, DISS, REC (UG/L) (04037)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)
JAN 1994												
19...	--	--	--	--	--	35	--	--	--	--	--	--
FEB												
15...	--	--	--	--	1.3	4	--	--	--	--	--	--
MAR												
15...	--	--	--	--	8.0	26	--	--	--	--	--	--
APR												
12...	--	--	--	--	4.7	18	--	--	--	--	--	--
MAY												
09...	<1	<1.0	<1.0	<1	23	10	--	<0.007	<0.002	<0.005	<0.003	<0.002
JUN												
13...	--	--	--	--	12	18	--	--	--	--	--	--
JUL												
26...	<1	<1.0	<1.0	2	5.1	--	--	<0.007	<0.002	<0.005	<0.003	<0.002
AUG												
09...	--	--	--	--	5.7	26	--	--	--	--	--	--
SEP												
14...	<1	<1.0	<1.0	<1	4.1	8	<0.009	<0.007	<0.002	<0.005	<0.003	<0.002
OCT												
26...	--	--	--	--	3.6	17	--	--	--	--	--	--
NOV												
09...	<1	<1.0	<1.0	2	3.1	18	<0.009	<0.007	<0.002	0.005	<0.003	<0.002
DEC												
07...	--	--	--	--	4.1	24	--	--	--	--	--	--

DATE	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	FONOFOS WATER, DISS, REC (UG/L) (04095)	ALPHA BHC DIS- SOLVED (UG/L) (34253)	P,P'- DDE DISSOLV (UG/L) (34653)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)	LINDANE DIS- SOLVED (UG/L) (39341)	DI- ELDRIN DIS- SOLVED (UG/L) (39381)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)	MALA- THION, DIS- SOLVED (UG/L) (39532)	PARA- THION, DIS- SOLVED (UG/L) (39542)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)
MAY												
09...	<0.004	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	<0.002	<0.005	<0.004	<0.002	<0.001
JUL												
26...	<0.004	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	<0.002	<0.005	<0.004	<0.002	0.004
SEP												
14...	<0.004	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	<0.002	<0.005	<0.004	<0.002	<0.001
NOV												
09...	<0.004	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	0.017	<0.005	<0.004	<0.002	0.020

DATE	ALA- CHLOR, WATER, DISS, REC (UG/L) (46342)	METRI- BUZIN WATER DISSOLV (UG/L) (82630)	2,6-DI- ETHYL ANILINE WAT FLT GF, REC (UG/L) (82660)	TRI- FLUR- ALIN WAT FLT GF, REC (UG/L) (82661)	ETHAL- FLUR- ALIN WAT FLT GF, REC (UG/L) (82663)	PHORATE WATER FLTRD GF, REC (UG/L) (82664)	TER- BACIL WATER FLTRD GF, REC (UG/L) (82665)	LIN- URON WATER FLTRD GF, REC (UG/L) (82666)	METHYL PARA- THION WAT FLT GF, REC (UG/L) (82667)	EPTC WATER FLTRD GF, REC (UG/L) (82668)	PEB- ULATE WATER FILTRED GF, REC (UG/L) (82669)
MAY											
09...	<0.009	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	0.005	<0.004
JUL											
26...	<0.009	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004
SEP											
14...	<0.009	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004
NOV											
09...	<0.009	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004

## CHEMICAL ANALYSES OF SURFACE WATER SAMPLES IN LOWER COLUMBIA RIVER BASIN

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## BI-STATE WATER-QUALITY STUDY--Continued

14222890 - COLUMBIA RIVER NR COLUMBIA CITY, OR (LAT 45 54 55N LONG 122 48 54W) COLUMBIA CO, HYDROLOGIC UNIT 17080003

## WATER-QUALITY DATA

DATE	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)
MAY 09...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003
JUL 26...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003
SEP 14...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003
NOV 09...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003

\*\*\*\*\*QA SURROGATES\*\*\*\*\*

\*\*\*\*\*ADDED TO SAMPLE\*\*\*\*\*

DATE	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PRO- FARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	DIAZ- INON D10 SRG WAT FLT 0.7 U GF, REC (UG/L) (91063)	TERBUTH YLAZINE SURROGT WAT FLT 0.7 U GF, REC (UG/L) (91064)	HCH ALPHA D6 SRG WAT FLT 0.7 U GF, REC (UG/L) (91065)	AN- TIMONY SED. SUSP. (UG/G) (29816)
MAY 09...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	100	120	100	2.0
JUL 26...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	100	130	100	1.4
SEP 14...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	100	120	100	1.2
NOV 09...	<0.002	E0.003	<0.004	<0.003	<0.013	<0.001	<0.005	100	120	100	0.9

DATE	ARSENIC SED. SUSP. (UG/G) (29818)	BARIUM SED. SUSP. (UG/G) (29820)	BERYL- LIUM SED. SUSP. (UG/G) (29822)	CADMIUM SED. SUSP. (UG/G) (29826)	CHRO- MIUM SED. SUSP. (UG/G) (29829)	COPPER SED. SUSP. (UG/G) (29832)	GOLD SEDI- MENT SUSP. (UG/G) (82170)	LEAD SED. SUSP. (UG/G) (29836)	MAN- GANESE SED. SUSP. (UG/G) (29839)	MERCURY SED. SUSP. (UG/G) (29841)	MOLYB- DENUM SED. SUSP. (UG/G) (29843)
MAY 09...	8.8	580	<2	2.3	72	40	<20	26	1200	0.1	1.2
JUL 26...	8.9	560	<2	<2.0	56	59	<20	30	1300	0.2	0.6
SEP 14...	8.0	600	<2	7.8	63	79	<20	30	1800	0.2	0.8
NOV 09...	6.0	560	2	0.8	61	83	<20	36	1600	0.1	0.4

DATE	NICKEL SED. SUSP. (UG/G) (29845)	SELE- NIUM SED. SUSP. (UG/G) (29847)	SILVER SED. SUSP. (UG/G) (29850)	VANA- DIUM SED. SUSP. (UG/G) (29853)	ZINC SED. SUSP. (UG/G) (29855)	ALUM- INIUM SED. SUSP. (UG/G) (30221)	CALCIUM SED. SUSP. (UG/G) (30240)	IRON SEDI- MENT SUSP. (UG/G) (30269)	MAGNES- IUM SEDI- MENT SUSP. (UG/G) (30277)	PHOS- PHORUS SEDI- MENT SUSP. (UG/G) (30292)	POTAS- SIUM SEDI- MENT SUSP. (UG/G) (30294)
MAY 09...	29	0.6	0.6	110	230	6.5	2.0	4.1	1.1	0.16	1.3
JUL 26...	29	0.6	0.3	110	250	6.4	1.9	4.2	1.1	0.15	1.3
SEP 14...	34	--	1.1	120	260	6.8	2.1	4.4	1.1	0.17	1.2
NOV 09...	32	0.5	0.2	140	170	8.3	2.3	5.2	1.1	0.15	1.1

DATE	SODIUM SEDI- MENT SUSP. PERCENT (30304)	TITA- NIUM SEDI- MENT SUSP. PERCENT (30317)	BISMUTH SEDI- MENT SUSP. (UG/G) (35030)	COBALT SEDI- MENT SUSP. (UG/G) (35031)	EURO- PIUM SEDI- MENT SUSP. (UG/G) (35032)	GALLIUM SEDI- MENT SUSP. (UG/G) (35033)	HOLMIUM SEDI- MENT SUSP. (UG/G) (35035)	LANTHA- NIUM SEDI- MENT SUSP. (UG/G) (35036)	NEODYM- IUM SEDI- MENT SUSP. (UG/G) (35037)	NIOBIUM SEDI- MENT SUSP. (UG/G) (35038)	SCAN- DIUM SEDI- MENT SUSP. (UG/G) (35039)
MAY 09...	1.4	0.45	<20	17	<4	16	<8	27	18	8	14
JUL 26...	1.3	0.48	<20	19	<4	17	<8	29	28	13	15
SEP 14...	1.4	0.52	<20	21	<4	15	<8	30	24	20	15
NOV 09...	1.6	0.63	<20	26	<4	15	<7	28	24	8	18

E - Estimated.

## CHEMICAL ANALYSES OF SURFACE WATER SAMPLES IN LOWER COLUMBIA RIVER BASIN

## BI-STATE WATER-QUALITY STUDY--Continued

14222890 - COLUMBIA RIVER NR COLUMBIA CITY, OR (LAT 45 54 55N LONG 122 48 54W) COLUMBIA CO, HYDROLOGIC UNIT 17080003

## WATER-QUALITY DATA

DATE	STRON- TIUM SEDI- MENT SUSP. (UG/G) (35040)	TANTA- LUM SEDI- MENT SUSP. (UG/G) (35042)	THORIUM SEDI- MENT SUSP. (UG/G) (35043)	TIN SEDI- MENT SUSP. (UG/G) (35044)	URANIUM SEDI- MENT SUSP. (UG/G) (35046)	YTTRIUM SEDI- MENT SUSP. (UG/G) (35047)	YTTER- BIUM SEDI- MENT SUSP. (UG/G) (35048)	LITHIUM SEDI- MENT SUSP. (UG/G) (35050)	CERIUM SEDI- MENT SUSP. (UG/G) (35051)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
JAN 1994											
19...	--	--	--	--	--	--	--	--	--	5	E99
FEB											
15...	--	--	--	--	--	--	--	--	--	5	E93
MAR											
15...	--	--	--	--	--	--	--	--	--	15	58
APR											
12...	--	--	--	--	--	--	--	--	--	9	E96
MAY											
09...	260	<80	6.5	<10	1.4	21	<2	23	47	18	72
JUN											
13...	--	--	--	--	--	--	--	--	--	11	92
JUL											
26...	240	<80	8.8	<10	2.8	22	2	26	47	9	E95
AUG											
09...	--	--	--	--	--	--	--	--	--	7	E100
SEP											
14...	270	<80	13	<10	3.5	22	<2	26	52	5	E100
OCT											
26...	--	--	--	--	--	--	--	--	--	6	E92
NOV											
09...	310	<70	5.0	<9	2.9	27	3	26	50	15	89
DEC											
07...	--	--	--	--	--	--	--	--	--	16	96

E - Estimated.

## BI-STATE WATER-QUALITY STUDY--Continued

WATER-QUALITY DATA  
MISCELLANEOUS STATION ANALYSES

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	ENTERO- COCCI ME, MF WATER TOTAL (COL / 100 ML) (31649)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	
14223600 - KALAMA RIVER ABOVE SPENCER CREEK, NR KALAMA, WA (LAT 46 02 50N LONG 122 50 11W)COWLITZ CO, HYDROLOGIC UNIT 17080003													
MAY 1994													
16...	1038	608	48	8.0	11.0	11.9	758	108	29	K1	4.6	1.2	
JUL 13...	1037	--	55	7.9	17.0	10.5	762	109	K13	K5	5.4	1.4	
AUG 17...	1041	--	68	7.8	16.0	10.1	762	103	K12	K8	6.0	1.5	
SEP 06...	1105	189	67	7.9	16.0	10.8	757	110	30	40	6.2	1.5	
14244200 - COWLITZ RIVER AT KELSO, WA (LAT 46 08 44N LONG 122 54 49W)COWLITZ CO, HYDROLOGIC UNIT 17080005													
APR 1994													
18...	1049	--	86	7.4	10.5	11.0	761	99	K10	<1	7.7	1.7	
JUN 22...	1050	--	107	7.4	15.5	10.1	765	101	K7	<1	9.0	2.0	
JUL 14...	1057	--	102	7.5	15.0	10.1	764	100	K9	K6	8.7	1.9	
AUG 31...	1042	--	114	7.5	16.0	10.1	759	102	K16	57	9.3	1.9	
453056122213701 SANDY RIVER NEAR TROUTDALE, OR (LAT 45 30 56N LONG 122 21 37W) MULTNOMAH CO, HYDROLOGIC UNIT 17080001													
MAY 1994													
03...	1030	1270	41	7.7	9.5	12.3	762	107	K5	K7	3.7	1.4	
JUL 07...	1005	E725	51	7.7	16.0	10.8	760	109	K16	E6	4.1	1.5	
AUG 15...	1105	E570	70	7.9	20.0	9.7	762	107	K4	K4	5.2	2.0	
SEP 19...	1015	299	72	7.6	17.5	10.2	763	106	K15	33	6.0	2.3	
455417122441000 LEWIS RIVER AT WOODLAND, WA (LAT 45 54 17N LONG 122 44 10W) COWLITZ CO, HYDROLOGIC UNIT 17080002													
APR 1994													
20...	1016	--	39	7.3	8.0	12.3	763	103	K8	K1	4.0	0.99	
JUN 29...	1028	--	44	7.1	11.5	11.9	768	108	K6	K2	4.2	1.1	
JUL 19...	1059	--	46	7.1	14.5	10.1	759	99	K6	<1	4.3	1.1	
SEP 07...	1055	--	48	7.2	14.5	10.1	758	100	K4	K5	4.3	1.1	
DATE		SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	ALKA- LINITY WAT DIS TOT IT FIELD (MG/L AS CACO3 (39086)	BICAR- BONATE WATER DIS IT FIELD (MG/L AS HCO3 (00453)	CAR- BONATE WATER DIS IT FIELD (MG/L AS CO3 (00452)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SiO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)
14223600 - KALAMA RIVER ABOVE SPENCER CREEK, NR KALAMA, WA (LAT 46 02 50N LONG 122 50 11W)													
MAY 1994													
16...	3.1	0.30	2	25	0	1.1	2.5	<0.10	16	22	0.030	<0.010	
JUL 13...	4.0	0.40	2	29	0	1.4	3.3	<0.10	19	45	0.020	<0.010	
AUG 17...	4.9	0.50	2	29	0	1.5	4.2	<0.10	21	59	0.010	<0.010	
SEP 06...	4.7	0.50	2	28	0	1.5	4.9	<0.10	19	55	0.010	<0.010	
14244200 - COWLITZ RIVER AT KELSO, WA (LAT 46 08 44N LONG 122 54 49W)													
APR 1994													
18...	6.6	0.70	2	33	0	12	4.1	<0.10	13	60	--	--	
JUN 22...	8.5	0.80	2	32	0	15	5.4	<0.10	14	60	0.010	<0.010	
JUL 14...	7.9	0.80	2	31	0	15	5.5	<0.10	14	66	<0.010	<0.010	
AUG 31...	8.8	0.70	2	32	0	15	5.9	<0.10	14	78	<0.010	<0.010	
453056122213701 SANDY RIVER NEAR TROUTDALE, OR (LAT 45 30 56N LONG 122 21 37W)													
MAY 1994													
03...	2.9	0.50	1	21	0	2.6	1.6	<0.10	17	33	0.010	<0.010	
JUL 07...	3.2	0.40	2	24	0	4.0	1.7	<0.10	17	56	0.010	<0.010	
AUG 15...	4.5	0.40	2	26	0	6.1	2.4	<0.10	19	56	<0.010	<0.010	
SEP 19...	5.2	0.90	2	30	0	6.4	2.5	<0.10	21	67	0.020	<0.010	
455417122441000 LEWIS RIVER AT WOODLAND, WA (LAT 45 54 17N LONG 122 44 10W)													
APR 1994													
20...	3.0	0.40	1	20	0	1.9	1.6	<0.10	14	37	0.010	0.010	
JUN 29...	3.1	0.40	1	21	0	2.1	1.8	0.10	14	36	0.010	<0.010	
JUL 19...	3.1	0.40	1	21	0	2.1	1.8	<0.10	14	28	0.020	<0.010	
SEP 07...	3.1	0.40	2	25	0	2.1	1.9	<0.10	14	25	0.010	<0.010	

E - Estimated.

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



## CHEMICAL ANALYSES OF SURFACE WATER SAMPLES IN LOWER COLUMBIA RIVER BASIN

## BI-STATE WATER-QUALITY STUDY--Continued

WATER-QUALITY DATA  
MISCELLANEOUS STATION ANALYSES

DATE	NITRO- GEN, AM- MONIA + ORGANIC DIS- (MG/L AS N) (00623)	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS- PENDED TOTAL (MG/L AS C) (00689)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	ANTI- MONY, DIS- SOLVED (UG/L AS SB) (01095)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)
14223600 - KALAMA RIVER ABOVE SPENCER CREEK, NR KALAMA, WA (LAT 46 02 50N LONG 122 50 11W)												
MAY 1994												
16...	<0.20	<0.20	0.12	<0.010	<0.010	0.006	1.1	0.5	10	<1	<1	1
JUL 13...	<0.20	<0.20	0.05	0.030	0.010	0.008	1.0	0.4	7	<1	<1	1
AUG 17...	<0.20	<0.20	0.05	0.020	<0.010	0.007	0.8	0.2	6	<1	<1	1
SEP 06...	<0.20	<0.20	0.07	0.010	<0.010	0.008	0.8	0.3	8	<1	<1	2
14244200 - COWLITZ RIVER AT KELSO, WA (LAT 46 08 44N LONG 122 54 49W)												
APR 1994												
18...	--	--	--	--	--	--	1.3	0.5	40	<1	<1	2
JUN 22...	<0.20	<0.20	0.06	0.020	<0.010	0.001	1.2	0.3	30	<1	<1	3
JUL 14...	<0.20	<0.20	0.08	0.010	<0.010	0.001	1.4	0.3	7	<1	<1	2
AUG 31...	<0.20	<0.20	0.15	<0.010	0.010	0.002	1.0	0.4	10	<1	<1	2
453056122213701 SANDY RIVER NEAR TROUTDALE, OR (LAT 45 30 56N LONG 122 21 37W)												
MAY 1994												
03...	<0.20	<0.20	0.05	0.010	<0.010	0.002	1.0	0.6	10	<1	<1	1
JUL 07...	<0.20	<0.20	<0.05	<0.010	<0.010	0.003	0.9	0.3	10	<1	<1	2
AUG 15...	<0.20	<0.20	0.07	0.020	0.020	0.007	0.6	0.3	30	<1	<1	2
SEP 19...	<0.20	<0.20	<0.05	<0.010	0.030	0.004	0.8	0.3	20	<1	<1	2
455417122441000 LEWIS RIVER AT WOODLAND, WA (LAT 45 54 17N LONG 122 44 10W)												
APR 1994												
20...	<0.20	<0.20	0.31	<0.010	<0.010	0.001	0.8	0.3	9	<1	<1	1
JUN 29...	<0.20	<0.20	<0.05	<0.010	<0.010	0.001	0.9	0.3	2	<1	<1	1
JUL 19...	<0.20	<0.20	<0.05	0.020	<0.010	<0.001	0.8	0.3	3	<1	<1	1
SEP 07...	<0.20	<0.20	<0.05	<0.010	<0.010	0.002	0.9	0.2	4	<1	<1	1
DATE	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MERCURY DIS- SOLVED (UG/L AS HG) (71890)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)
14223600 - KALAMA RIVER ABOVE SPENCER CREEK, NR KALAMA, WA (LAT 46 02 50N LONG 122 50 11W)												
MAY 1994												
16...	<1	<1.0	<1	<1	<1	18	<1	<1	<0.1	<1	<1	<1
JUL 13...	<1	<1.0	<1	<1	2	20	<1	2	<0.1	<1	<1	<1
AUG 17...	<1	<1.0	<1	<1	2	17	<1	2	<0.1	<1	<1	<1
SEP 06...	<1	<1.0	1	<1	<1	20	<1	4	<0.1	<1	<1	<1
14244200 - COWLITZ RIVER AT KELSO, WA (LAT 46 08 44N LONG 122 54 49W)												
APR 1994												
18...	<1	<1.0	<1	<1	1	72	<1	7	<0.1	<1	<1	<1
JUN 22...	<1	<1.0	<1	<1	1	73	<1	6	<0.1	<1	<1	<1
JUL 14...	<1	<1.0	<1	<1	2	44	<1	5	<0.1	<1	<1	<1
AUG 31...	<1	<1.0	<1	<1	<1	50	<1	6	<0.1	<1	<1	<1
453056122213701 SANDY RIVER NEAR TROUTDALE, OR (LAT 45 30 56N LONG 122 21 37W)												
MAY 1994												
03...	<1	<1.0	<1	<1	<1	38	<1	4	<0.1	<1	<1	<1
JUL 07...	<1	<1.0	<1	<1	<1	44	<1	3	<0.1	<1	<1	<1
AUG 15...	<1	<1.0	<1	<1	<1	66	<1	4	<0.1	<1	<1	<1
SEP 19...	<1	<1.0	<1	<1	1	62	<1	4	<0.1	<1	<1	<1
455417122441000 LEWIS RIVER AT WOODLAND, WA (LAT 45 54 17N LONG 122 44 10W)												
APR 1994												
20...	<1	<1.0	<1	<1	<1	25	<1	3	<0.1	<1	<1	<1
JUN 29...	<1	<1.0	<1	<1	<1	43	<1	12	<0.1	<1	<1	<1
JUL 19...	<1	<1.0	<1	<1	<1	48	<1	12	<0.1	<1	<1	<1
SEP 07...	<1	<1.0	<1	<1	<1	34	<1	11	<0.1	<1	<1	<1

## BI-STATE WATER-QUALITY STUDY--Continued

WATER-QUALITY DATA  
MISCELLANEOUS STATION ANALYSES

DATE	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	URANIUM NATURAL DIS- SOLVED (UG/L AS U) (22703)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	CHLORO- PHYL A FLUORO- METRIC METHOD (UG/L) (32209)	HALIDE TOTAL ORGANIC WATER RECOV. (UG/L AS CL) (79747)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)	PRO- METON, WATER, DISS, REC (UG/L) (04037)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)
14223600 - KALAMA RIVER ABOVE SPENCER CREEK, NR KALAMA, WA (LAT 46 02 50N LONG 122 50 11W)											
MAY 1994											
16...	<1.0	<1.0	<1	2.0	<5	<0.007	<0.002	<0.005	<0.003	<0.002	<0.004
JUL											
13...	<1.0	<1.0	2	0.8	<5	<0.007	<0.002	<0.005	<0.003	<0.002	<0.004
AUG											
17...	<1.0	<1.0	1	0.4	<5	<0.007	<0.002	<0.005	<0.003	<0.002	<0.004
SEP											
06...	<1.0	<1.0	2	0.7	<5	<0.007	<0.002	<0.005	<0.003	<0.002	<0.004
14244200 - COWLITZ RIVER AT KELSO, WA (LAT 46 08 44N LONG 122 54 49W)											
APR 1994											
18...	<1.0	<1.0	1	1.0	<5	<0.007	<0.002	<0.005	<0.003	<0.002	<0.004
JUN											
22...	<1.0	<1.0	<1	0.9	9	<0.007	<0.002	<0.005	<0.003	<0.002	<0.004
JUL											
14...	<1.0	<1.0	<1	0.7	13	<0.007	<0.002	<0.005	<0.003	<0.002	<0.004
AUG											
31...	<1.0	<1.0	1	2.2	<5	<0.007	<0.002	<0.005	<0.003	<0.002	<0.004
453056122213701 SANDY RIVER NEAR TROUTDALE, OR (LAT 45 30 56N LONG 122 21 37W)											
MAY 1994											
03...	<1.0	<1.0	2	2.2	6	<0.007	<0.002	<0.005	<0.003	<0.002	<0.004
JUL											
07...	<1.0	<1.0	2	0.9	<5	<0.007	<0.002	<0.005	<0.003	<0.002	<0.004
AUG											
15...	<1.0	<1.0	2	1.0	<5	<0.007	<0.002	<0.005	<0.003	<0.002	<0.004
SEP											
19...	<1.0	<1.0	1	0.9	6	<0.007	<0.002	<0.005	<0.003	<0.002	<0.004
455417122441000 LEWIS RIVER AT WOODLAND, WA (LAT 45 54 17N LONG 122 44 10W)											
APR 1994											
20...	<1.0	<1.0	<1	1.0	<5	<0.007	<0.002	<0.005	<0.003	<0.002	<0.004
JUN											
29...	<1.0	<1.0	<1	1.0	7	<0.007	<0.002	<0.005	<0.003	<0.002	<0.004
JUL											
19...	<1.0	<1.0	<1	0.6	14	<0.007	<0.002	<0.005	<0.003	<0.002	<0.004
SEP											
07...	<1.0	<1.0	3	0.5	<5	<0.007	<0.002	<0.005	<0.003	<0.002	<0.004
DATE	FONOFOS WATER DISS REC (UG/L) (04095)	ALPHA BHC DIS- SOLVED (UG/L) (34253)	P,P' DDE DISSOLV (UG/L) (34653)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)	LINDANE DIS- SOLVED (UG/L) (39341)	DI- ELDRIN DIS- SOLVED (UG/L) (39381)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)	MALA- THION, DIS- SOLVED (UG/L) (39532)	PARA- THION, DIS- SOLVED (UG/L) (39542)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)
14223600 - KALAMA RIVER ABOVE SPENCER CREEK, NR KALAMA, WA (LAT 46 02 50N LONG 122 50 11W)											
MAY 1994											
16...	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	<0.002	<0.005	<0.004	<0.002	<0.001
JUL											
13...	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	<0.002	<0.005	<0.004	<0.002	<0.001
AUG											
17...	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	<0.002	<0.005	<0.004	<0.002	<0.001
SEP											
06...	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	<0.002	<0.005	<0.004	<0.002	<0.001
14244200 - COWLITZ RIVER AT KELSO, WA (LAT 46 08 44N LONG 122 54 49W)											
APR 1994											
18...	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	<0.002	<0.005	<0.004	<0.002	<0.001
JUN											
22...	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	<0.002	<0.005	<0.004	<0.002	<0.001
JUL											
14...	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	<0.002	<0.005	<0.004	<0.002	<0.001
AUG											
31...	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	<0.002	<0.005	<0.004	<0.002	<0.001
453056122213701 SANDY RIVER NEAR TROUTDALE, OR (LAT 45 30 56N LONG 122 21 37W)											
MAY 1994											
03...	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	<0.002	<0.005	<0.004	<0.002	<0.001
JUL											
07...	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	<0.002	<0.005	<0.004	<0.002	<0.001
AUG											
15...	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	<0.002	<0.005	<0.004	<0.002	<0.001
SEP											
19...	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	<0.002	<0.005	<0.004	<0.002	<0.001
455417122441000 LEWIS RIVER AT WOODLAND, WA (LAT 45 54 17N LONG 122 44 10W)											
APR 1994											
20...	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	<0.002	<0.005	<0.004	<0.002	<0.001
JUN											
29...	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	<0.002	<0.005	<0.004	<0.002	0.003
JUL											
19...	<0.003	<0.002	<0.006	0.010	<0.004	<0.001	<0.002	<0.005	<0.004	<0.002	<0.001
SEP											
07...	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	<0.002	<0.005	<0.004	<0.002	<0.001

## CHEMICAL ANALYSES OF SURFACE WATER SAMPLES IN LOWER COLUMBIA RIVER BASIN

## BI-STATE WATER-QUALITY STUDY--Continued

WATER-QUALITY DATA  
MISCELLANEOUS STATION ANALYSES

DATE	ALA- CHLOR, WATER, DISS, REC, (UG/L) (46342)	METRI- BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	TRI- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)	ETHAL- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)	TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	LIN- URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	PEB- ULATE WATER FLTRD 0.7 U GF, REC (UG/L) (82669)
14223600 - KALAMA RIVER ABOVE SPENCER CREEK, NR KALAMA, WA (LAT 46 02 50N LONG 122 50 11W)											
MAY 1994											
16...	<0.002	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004
JUL 13...	<0.002	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004
AUG 17...	<0.002	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004
SEP 06...	<0.002	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004
14244200 - COWLITZ RIVER AT KELSO, WA (LAT 46 08 44N LONG 122 54 49W)											
APR 1994											
18...	<0.002	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004
JUN 22...	<0.002	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004
JUL 14...	<0.002	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004
AUG 31...	<0.002	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004
453056122213701 SANDY RIVER NEAR TROUTDALE, OR (LAT 45 30 56N LONG 122 21 37W)											
MAY 1994											
03...	<0.002	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004
JUL 07...	<0.002	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004
AUG 15...	<0.002	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004
SEP 19...	<0.002	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004
455417122441000 LEWIS RIVER AT WOODLAND, WA (LAT 45 54 17N LONG 122 44 10W)											
APR 1994											
20...	<0.002	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004
JUN 29...	<0.002	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004
JUL 19...	<0.002	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004
SEP 07...	<0.002	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004
DATE	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	BEN- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82673)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)
14223600 - KALAMA RIVER ABOVE SPENCER CREEK, NR KALAMA, WA (LAT 46 02 50N LONG 122 50 11W)											
MAY 1994											
16...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003
JUL 13...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003
AUG 17...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003
SEP 06...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003
14244200 - COWLITZ RIVER AT KELSO, WA (LAT 46 08 44N LONG 122 54 49W)											
APR 1994											
18...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003
JUN 22...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003
JUL 14...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003
AUG 31...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003
453056122213701 SANDY RIVER NEAR TROUTDALE, OR (LAT 45 30 56N LONG 122 21 37W)											
MAY 1994											
03...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003
JUL 07...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003
AUG 15...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003
SEP 19...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003
455417122441000 LEWIS RIVER AT WOODLAND, WA (LAT 45 54 17N LONG 122 44 10W)											
APR 1994											
20...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003
JUN 29...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003
JUL 19...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003
SEP 07...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.007	<0.018	<0.017	<0.001	<0.004	<0.003

## BI-STATE WATER-QUALITY STUDY--Continued

WATER-QUALITY DATA  
MISCELLANEOUS STATION ANALYSES

DATE	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	*****QA SURROGATES***** *****ADDED TO SAMPLES***** DIAZ- INON D-10 PERCENT (91063)	TERBUTH YLAZINE PERCENT (91064)	HCH ALPHA D-6 PERCENT (91065)	AN- TIMONY SED. SUSP. (UG/G) (29816)
14223600 - KALAMA RIVER ABOVE SPENCER CREEK, NR KALAMA, WA (LAT 46 02 50N LONG 122 50 11W)											
MAY 1994											
16...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	90	100	90	0.5
JUL											
13...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	90	130	100	0.4
AUG											
17...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	80	100	100	7.2
SEP											
06...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	60	95	80	0.6
14244200 - COWLITZ RIVER AT KELSO, WA (LAT 46 08 44N LONG 122 54 49W)											
APR 1994											
18...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	70	93	100	0.8
JUN											
22...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	80	98	200	0.2
JUL											
14...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	90	140	100	0.3
AUG											
31...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	100	110	100	2.3
453056122213701 SANDY RIVER NEAR TROUTDALE, OR (LAT 45 30 56N LONG 122 21 37W)											
MAY 1994											
03...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	80	95	100	0.5
JUL											
07...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	80	100	200	0.6
AUG											
15...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	80	110	100	4.1
SEP											
19...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	100	110	100	0.4
455417122441000 LEWIS RIVER AT WOODLAND, WA (LAT 45 54 17N LONG 122 44 10W)											
APR 1994											
20...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	80	100	100	2.0
JUN											
29...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	100	120	100	0.3
JUL											
19...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	70	110	100	1.5
SEP											
07...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	90	100	80	1.8
DATE	ARSENIC SED. SUSP. (UG/G) (29818)	BARIUM SED. SUSP. (UG/G) (29820)	BERYL- LIUM SED. SUSP. (UG/G) (29822)	CADMIUM SED. SUSP. (UG/G) (29826)	CHRO- MIUM SED. SUSP. (UG/G) (29829)	COPPER SED. SUSP. (UG/G) (29832)	GOLD SEDI- MENT SUSP. (UG/G) (82170)	LEAD SED. SUSP. (UG/G) (29836)	MAN- GANESE SED. SUSP. (UG/G) (29839)	MERCURY SED. SUSP. (UG/G) (29841)	MOLYB- DENUM SED. SUSP. (UG/G) (29843)
14223600 - KALAMA RIVER ABOVE SPENCER CREEK, NR KALAMA, WA (LAT 46 02 50N LONG 122 50 11W)											
MAY 1994											
16...	4.7	190	<2	0.5	62	84	<20	17	1100	0.1	0.8
JUL											
13...	3.5	170	<2	<2	54	71	<20	15	1300	0.3	0.5
AUG											
17...	4.7	160	<2	<2	50	100	<20	26	1800	--	0.7
SEP											
06...	5.0	160	<2	0.8	49	76	<20	17	1500	--	0.9
14244200 - COWLITZ RIVER AT KELSO, WA (LAT 46 08 44N LONG 122 54 49W)											
APR 1994											
18...	4.2	350	<2	0.2	25	56	<20	8.3	1200	0.3	1.1
JUN											
22...	2.2	330	<10	<2	31	66	<80	2.2	2300	0.1	0.2
JUL											
14...	4.2	350	<2	<2	20	61	<20	12	1900	0.1	1.0
AUG											
31...	1.7	330	<2	<2	25	41	<20	15	1100	<0.02	0.6
453056122213701 SANDY RIVER NEAR TROUTDALE, OR (LAT 45 30 56N LONG 122 21 37W)											
MAY 1994											
03...	2.2	380	<4	1.2	48	41	<30	37	900	--	1.5
JUL											
07...	3.2	330	<2	<2	32	64	<20	14	1700	0.1	0.8
AUG											
15...	12	330	<2	<2	34	110	<20	24	1400	0.1	1.2
SEP											
19...	4.0	320	<3	0.4	20	84	<20	12	1600	--	1.2
455417122441000 LEWIS RIVER AT WOODLAND, WA (LAT 45 54 17N LONG 122 44 10W)											
APR 1994											
20...	7.6	330	<5	0.6	35	91	<40	21	2100	--	1.0
JUN											
29...	9.4	240	<2	<2	23	45	<20	12	3100	--	0.5
JUL											
19...	12	240	<2	<2	26	60	<20	22	5700	--	0.7
SEP											
07...	15	220	<2	0.5	23	50	<20	21	5000	--	1.1

## CHEMICAL ANALYSES OF SURFACE WATER SAMPLES IN LOWER COLUMBIA RIVER BASIN

## BI-STATE WATER-QUALITY STUDY--Continued

WATER-QUALITY DATA  
MISCELLANEOUS STATION ANALYSES

DATE	NICKEL SED. SUSP. (UG/G) (29845)	SELE- NIUM SED. SUSP. (UG/G) (29847)	SILVER SED. SUSP. (UG/G) (29850)	VANA- DIUM SED. SUSP. (UG/G) (29853)	ZINC SED. SUSP. (UG/G) (29855)	ALUM- INUM SED,SUS PERCENT (30221)	CALCIUM SED. SUSP. PERCENT (30240)	IRON SEDI- MENT SUSP. PERCENT (30269)	MAGNES- IUM SEDI- MENT SUSP. PERCENT (30277)	PHOS- PHORUS SEDI- MENT SUSP. PERCENT (30292)	POTAS- SIUM SEDI- MENT SUSP. PERCENT (30294)
14223600 - KALAMA RIVER ABOVE SPENCER CREEK, NR KALAMA, WA (LAT 46 02 50N LONG 122 50 11W)											
MAY 1994											
16...	33	--	0.2	140	92	6.5	1.8	4.4	1.0	0.19	0.43
JUL											
13...	29	--	0.4	120	83	5.4	1.8	3.7	0.90	0.18	0.37
AUG											
17...	96	--	0.2	120	320	4.9	1.6	3.3	0.81	0.23	0.36
SEP											
06...	32	--	0.4	110	120	5.0	1.5	3.3	0.75	0.22	0.35
14244200 - COWLITZ RIVER AT KELSO, WA (LAT 46 08 44N LONG 122 54 49W)											
APR 1994											
18...	18	0.4	0.3	91	67	8.4	2.9	3.8	1.1	0.11	1.1
JUN											
22...	<20	0.4	<0.1	100	76	8.0	2.7	4.3	0.98	0.13	0.91
JUL											
14...	18	0.4	0.2	88	82	8.0	2.9	3.7	0.99	0.11	1.2
AUG											
31...	47	<0.1	<0.1	100	86	8.7	3.6	4.0	1.5	0.08	1.1
453056122213701 SANDY RIVER NEAR TROUTDALE, OR (LAT 45 30 56N LONG 122 21 37W)											
MAY 1994											
03...	25	--	0.3	97	130	6.9	2.5	4.0	1.0	0.14	0.94
JUL											
07...	26	--	0.1	90	81	6.4	2.3	3.9	0.91	0.17	0.87
AUG											
15...	27	0.3	0.2	110	220	7.1	2.7	4.8	1.5	0.15	0.96
SEP											
19...	76	--	0.3	62	86	5.9	2.1	3.0	0.84	0.16	0.88
455417122441000 LEWIS RIVER AT WOODLAND, WA (LAT 45 54 17N LONG 122 44 10W)											
APR 1994											
20...	120	--	1.0	120	95	7.4	2.4	4.2	0.96	0.14	0.94
JUN											
29...	23	--	0.1	110	69	4.7	1.4	3.9	0.58	0.16	0.59
JUL											
19...	14	--	0.1	140	76	4.7	1.7	4.7	0.66	0.20	0.58
SEP											
07...	19	--	0.3	110	81	4.3	1.4	3.8	0.56	0.20	0.54
DATE	SODIUM SEDI- MENT SUSP. PERCENT (30304)	TITA- NIUM SEDI- MENT SUSP. PERCENT (30317)	BISMUTH SEDI- MENT SUSP. PERCENT (35030)	COBALT SEDI- MENT SUSP. PERCENT (35031)	EURO- PIUM SEDI- MENT SUSP. PERCENT (35032)	GALLIUM SEDI- MENT SUSP. PERCENT (35033)	HOLMIUM SEDI- MENT SUSP. PERCENT (35035)	LANTHA- NIUM SEDI- MENT SUSP. PERCENT (35036)	NEODYM- IUM SEDI- MENT SUSP. PERCENT (35037)	NIOBIUM SEDI- MENT SUSP. PERCENT (35038)	SCAN- DIUM SEDI- MENT SUSP. PERCENT (35039)
14223600 - KALAMA RIVER ABOVE SPENCER CREEK, NR KALAMA, WA (LAT 46 02 50N LONG 122 50 11W)											
MAY 1994											
16...	0.79	0.50	<20	22	<4	16	<8	19	21	8	16
JUL											
13...	0.72	0.46	<20	21	<4	13	<8	18	19	11	14
AUG											
17...	0.68	0.40	<20	21	<4	14	<8	15	18	11	13
SEP											
06...	0.59	0.40	<20	20	<4	9	<8	16	15	14	13
14244200 - COWLITZ RIVER AT KELSO, WA (LAT 46 08 44N LONG 122 54 49W)											
APR 1994											
18...	2.8	0.44	<20	18	<4	19	<8	21	21	11	12
JUN											
22...	2.4	0.42	<100	18	<20	<40	<40	<20	<40	<40	<20
JUL											
14...	2.9	0.39	<20	16	<4	18	<8	18	14	13	10
AUG											
31...	3.2	0.50	<20	18	<4	20	<8	14	15	11	12
453056122213701 SANDY RIVER NEAR TROUTDALE, OR (LAT 45 30 56N LONG 122 21 37W)											
MAY 1994											
03...	1.9	0.41	<40	19	<8	<20	<20	21	<20	<20	11
JUL											
07...	1.8	0.34	<20	22	<4	15	<8	22	21	11	10
AUG											
15...	2.2	0.43	<20	22	<4	17	<8	19	19	14	12
SEP											
19...	1.9	0.23	<30	17	<6	10	<10	18	14	11	8
455417122441000 LEWIS RIVER AT WOODLAND, WA (LAT 45 54 17N LONG 122 44 10W)											
APR 1994											
20...	2.0	0.47	<50	17	<10	<20	<20	21	25	<20	12
JUN											
29...	1.1	0.30	<20	15	<4	14	<9	13	14	9	9
JUL											
19...	1.2	0.30	<20	19	<4	17	<8	14	16	9	9
SEP											
07...	1.0	0.27	<20	15	<4	11	<8	14	14	10	8



CHEMICAL ANALYSES OF SURFACE WATER SAMPLES IN LOWER COLUMBIA RIVER BASIN

471

BI-STATE WATER-QUALITY STUDY--Continued

WATER-QUALITY DATA  
MISCELLANEOUS STATION ANALYSES

DATE	STRON- TIUM SEDI- MENT SUSP. (UG/G) (35040)	TANTA- LUM SEDI- MENT SUSP. (UG/G) (35042)	THORIUM SEDI- MENT SUSP. (UG/G) (35043)	TIN SEDI- MENT SUSP. (UG/G) (35044)	URANIUM SEDI- MENT SUSP. (UG/G) (35046)	YTTRIUM SEDI- MENT SUSP. (UG/G) (35047)	YTTER- BIUM SEDI- MENT SUSP. (UG/G) (35048)	LITHIUM SEDI- MENT SUSP. (UG/G) (35050)	CERIUM SEDI- MENT SUSP. (UG/G) (35051)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
14223600 - KALAMA RIVER ABOVE SPENCER CREEK, NR KALAMA, WA (LAT 46 02 50N LONG 122 50 11W)											
MAY 1994											
16...	160	<80	2.6	<10	0.6	19	<2	15	35	8	E94
JUL											
13...	150	<80	2.5	<10	0.9	17	<2	14	28	5	E65
AUG											
17...	140	<80	2.2	<10	0.9	16	<2	13	28	3	E85
SEP											
06...	130	<80	3.2	<10	0.9	17	<2	13	29	2	E100
14244200 - COWLITZ RIVER AT KELSO, WA (LAT 46 08 44N LONG 122 54 49W)											
APR 1994											
18...	390	<80	4.3	<10	1.0	18	2	23	42	36	27
JUN											
22...	350	<400	0.8	<50	0.2	<20	<10	23	49	7	E77
JUL											
14...	370	<80	3.7	<10	1.1	14	<2	22	31	11	73
AUG											
31...	480	<80	2.8	<10	0.9	13	<2	20	29	31	11
453056122213701 SANDY RIVER NEAR TROUTDALE, OR (LAT 45 30 56N LONG 122 21 37W)											
MAY 1994											
03...	370	<200	5.6	<20	1.0	16	<4	14	37	2	E76
JUL											
07...	350	<80	4.0	<10	1.3	16	<2	15	35	3	E75
AUG											
15...	430	<80	3.7	<10	1.1	15	<2	16	37	8	E53
SEP											
19...	340	<100	5.0	<20	1.0	12	<3	13	34	3	E100
455417122441000 LEWIS RIVER AT WOODLAND, WA (LAT 45 54 17N LONG 122 44 10W)											
APR 1994											
20...	310	<200	4.3	<30	0.9	18	<5	22	42	1	E82
JUN											
29...	180	<90	2.5	<10	0.8	14	<2	14	26	2	E85
JUL											
19...	200	<80	2.8	<10	1.0	13	<2	14	26	3	E62
SEP											
07...	170	<80	4.0	<10	0.9	14	<2	14	24	1	E100

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## CONVERSION FACTORS AND VERTICAL DATUM

Multiply	By	To obtain
<i>Length</i>		
inch (in.)	$2.54 \times 10^1$	millimeter
	$2.54 \times 10^{-2}$	meter
foot (ft)	$3.048 \times 10^{-1}$	meter
mile (mi)	$1.609 \times 10^0$	kilometer
<i>Area</i>		
acre	$4.047 \times 10^3$	square meter
	$4.047 \times 10^{-1}$	square hectometer
	$4.047 \times 10^{-3}$	square kilometer
square mile (mi <sup>2</sup> )	$2.590 \times 10^0$	square kilometer
<i>Volume</i>		
gallon (gal)	$3.785 \times 10^0$	liter
	$3.785 \times 10^0$	cubic decimeter
	$3.785 \times 10^{-3}$	cubic meter
million gallons (Mgal)	$3.785 \times 10^3$	cubic meter
	$3.785 \times 10^{-3}$	cubic hectometer
cubic foot (ft <sup>3</sup> )	$2.832 \times 10^1$	cubic decimeter
	$2.832 \times 10^{-2}$	cubic meter
cubic-foot-per-second day [(ft <sup>3</sup> /s) d]	$2.447 \times 10^3$	cubic meter
	$2.447 \times 10^{-3}$	cubic hectometer
acre-foot (acre-ft)	$1.233 \times 10^3$	cubic meter
	$1.233 \times 10^{-3}$	cubic hectometer
	$1.233 \times 10^{-6}$	cubic kilometer
<i>Flow</i>		
cubic foot per second (ft <sup>3</sup> /s)	$2.832 \times 10^1$	liter per second
	$2.832 \times 10^1$	cubic decimeter per second
	$2.832 \times 10^{-2}$	cubic meter per second
gallon per minute (gal/min)	$6.309 \times 10^{-2}$	liter per second
	$6.309 \times 10^{-2}$	cubic decimeter per second
	$6.309 \times 10^{-5}$	cubic meter per second
million gallons per day (Mgal/d)	$4.381 \times 10^1$	cubic decimeter per second
	$4.381 \times 10^{-2}$	cubic meter per second
<i>Mass</i>		
ton (short)	$9.072 \times 10^{-1}$	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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