



**Figure 38.** Location of surface-water stations in the Lewis River Basin and on the Columbia River from Bonneville Dam to the Pacific Ocean.

## 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 NGVD of 1929. 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, 35.11 ft, Feb. 9, 1996; minimum, 6.06 ft, Sept. 21, 2003.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 23.08 ft, May 29; minimum, 6.54 ft, Oct. 6.

GAGE HEIGHT, FEET  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	9.38	7.40	8.21	12.56	10.41	11.35	11.69	11.36	11.52	15.23	12.93	13.83
2	11.46	9.05	10.84	13.81	8.01	10.35	11.79	11.29	11.56	14.09	12.02	12.57
3	11.72	7.89	9.60	14.66	11.12	12.01	11.78	11.29	11.51	16.11	12.03	12.97
4	9.96	6.77	8.04	12.01	10.98	11.48	12.09	11.33	11.55	15.53	14.08	14.53
5	7.93	6.73	7.35	13.24	11.09	11.79	14.60	11.46	11.97	17.49	11.95	15.03
6	8.65	6.54	7.40	13.20	11.29	11.98	14.95	11.36	13.01	16.46	12.05	14.61
7	11.08	6.65	9.36	13.71	11.11	12.10	15.09	11.43	13.09	16.51	15.03	16.03
8	11.45	7.96	10.02	13.29	11.11	11.54	16.77	11.31	13.62	15.06	12.85	14.20
9	12.51	8.38	10.57	11.86	11.11	11.38	18.98	11.39	14.32	15.40	13.35	14.24
10	12.47	9.54	10.42	12.02	11.10	11.46	18.43	11.56	14.07	13.68	11.97	12.38
11	11.77	8.56	10.11	11.93	11.21	11.44	18.81	11.52	14.40	12.50	11.84	12.15
12	11.62	7.41	8.80	11.58	11.15	11.33	18.40	11.49	14.44	14.43	11.83	12.53
13	10.60	7.16	8.83	11.69	11.17	11.41	18.18	11.66	14.67	14.55	12.02	13.38
14	10.86	8.07	9.45	11.69	11.16	11.43	18.27	11.69	14.67	13.81	12.03	12.46
15	10.74	9.23	10.21	11.74	11.25	11.44	19.45	11.67	14.94	14.26	12.10	12.76
16	12.66	9.51	10.60	11.76	11.22	11.43	20.08	11.73	15.40	14.65	12.37	13.69
17	11.66	9.73	10.58	11.64	11.24	11.44	20.94	11.96	15.53	14.07	11.74	12.20
18	10.84	7.64	8.52	11.78	11.36	11.53	18.91	11.88	15.47	14.11	11.87	12.84
19	8.22	7.16	7.72	11.77	11.35	11.50	18.98	11.69	14.93	14.04	11.87	12.74
20	10.50	7.26	8.77	11.71	11.34	11.49	18.71	12.02	14.55	14.07	11.94	13.11
21	11.70	8.45	9.63	15.12	11.36	12.14	18.23	11.90	13.90	14.91	12.21	13.23
22	12.19	8.51	10.02	16.77	11.42	13.43	14.63	11.74	12.50	12.98	12.10	12.43
23	11.91	8.26	10.19	17.14	11.42	13.45	16.38	11.72	13.44	14.93	12.07	12.90
24	12.57	11.34	12.05	14.62	11.28	11.93	16.65	11.82	13.70	14.96	13.79	14.30
25	12.59	11.92	12.24	13.15	11.30	11.74	15.95	11.73	13.16	14.33	12.16	12.91
26	12.67	11.34	12.04	12.18	11.27	11.56	14.21	11.73	12.64	15.94	11.92	13.87
27	12.67	11.02	11.90	11.54	11.25	11.39	14.48	11.70	12.18	16.24	12.47	14.88
28	12.64	10.55	11.47	11.80	11.17	11.44	15.27	11.75	13.13	16.99	12.71	15.00
29	14.28	10.37	11.46	11.85	11.34	11.48	17.33	11.78	13.74	17.96	16.06	17.11
30	13.42	10.75	11.98	11.65	11.32	11.46	17.24	11.71	14.08	18.78	16.45	17.65
31	12.92	10.82	11.43	---	---	---	17.72	11.81	15.39	18.92	16.57	18.09
MONTH	14.28	6.54	9.99	17.14	8.01	11.66	20.94	11.29	13.65	18.92	11.74	13.89



## COLUMBIA RIVER MAIN STEM

14144700 COLUMBIA RIVER AT VANCOUVER, WA

LOCATION.--Lat 45°37'15", long 122°40'20", in NE<sup>1</sup>/<sub>4</sub>NW<sup>1</sup>/<sub>4</sub>, sec.34, T.2 N., R.1 E., Clark County, Hydrologic Unit 17080001, near right bank in control house of Interstate Highway 5 bridge at south edge of Vancouver, 5.0 mi upstream from Willamette River, and at mile 106.5.

DRAINAGE AREA.--241,000 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--October 1963 to June 1970 (discharge), February 1998 to current year (gage heights only).

GAGE.--Water-stage recorder. Datum of the gage is Columbia River Datum, add 1.82 ft to correct to NGVD of 1929. Prior to February 1998, datum of gage was NGVD of 1929.

REMARKS.--Considerable regulation by many large reservoirs. Diurnal fluctuations caused by powerplant operations at Bonneville Dam and tides. Gage maintained by National Weather Service.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 27.60 ft, Dec. 25, 1964, present datum, (backwater from Willamette River).

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 7, 1894, reached a stage of 34.4 ft, present datum, from information provided by U.S. Army Corps of Engineers. Flood of June 13, 14, 1948, reached a stage of 31.0 ft, present datum, from National Weather Service records.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 10.23 ft, Jan. 30; minimum recorded, -0.31 ft, Oct. 5.

GAGE HEIGHT, FEET  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	3.93	0.69	2.04	3.22	1.10	2.16	4.52	2.48	3.47	6.64	4.91	5.87
2	4.27	0.58	2.02	3.19	0.34	1.84	4.55	2.33	3.35	5.73	3.97	4.90
3	4.12	1.06	2.10	3.87	1.46	2.55	4.81	2.46	3.48	5.72	3.95	4.64
4	3.65	0.28	1.65	3.83	1.06	2.36	4.73	2.48	3.42	6.13	4.35	5.31
5	3.14	-0.31	1.36	4.17	1.38	2.61	5.81	2.82	4.17	5.71	4.20	4.95
6	3.15	-0.20	1.49	4.09	1.43	2.62	6.25	3.70	5.18	5.76	4.23	5.01
7	3.89	0.31	2.09	4.50	1.59	2.85	6.35	4.69	5.42	7.02	4.71	5.84
8	4.65	0.94	2.73	4.90	1.77	3.10	5.91	4.60	5.25	6.80	5.43	5.97
9	4.72	1.53	3.06	5.02	1.78	3.16	5.97	4.74	5.34	7.08	4.94	5.91
10	4.50	1.55	2.99	5.01	1.75	3.11	5.91	4.55	5.34	6.51	5.09	5.80
11	4.58	1.15	2.67	4.88	1.86	3.17	5.94	4.50	5.30	6.22	4.68	5.45
12	4.52	1.56	2.90	4.48	1.64	2.78	6.15	4.79	5.51	5.77	4.57	5.25
13	4.10	0.81	2.19	4.34	1.39	2.61	6.75	5.23	5.90	5.83	4.36	5.24
14	3.99	0.94	2.13	4.28	1.39	2.71	7.22	6.07	6.77	5.71	4.12	4.85
15	4.41	0.89	2.30	3.91	1.47	2.72	7.26	5.97	6.81	5.86	3.91	4.81
16	4.22	1.11	2.51	4.54	1.35	2.90	7.55	6.15	7.06	6.31	4.23	5.23
17	3.92	1.65	2.70	4.10	2.07	3.03	7.80	6.13	7.10	6.18	4.19	5.16
18	3.53	1.06	2.15	4.60	1.86	3.15	7.22	6.14	6.59	6.33	4.10	4.97
19	3.10	0.22	1.66	5.18	2.46	3.59	7.10	5.83	6.46	6.70	4.25	5.18
20	3.42	-0.08	1.87	5.25	2.14	3.47	6.79	5.38	6.09	6.78	4.31	5.24
21	3.86	0.78	2.46	5.51	2.27	3.61	7.06	5.29	6.14	6.81	4.58	5.34
22	4.32	1.15	2.81	5.55	2.73	3.91	6.98	4.73	5.69	6.35	3.97	4.91
23	4.41	1.14	2.79	5.99	2.87	4.18	7.44	4.59	5.68	6.91	3.91	5.19
24	5.05	1.62	3.21	6.23	2.95	4.22	7.81	4.95	6.15	7.64	5.12	6.37
25	---	2.08	---	6.58	2.50	4.26	7.40	5.03	6.14	6.93	5.54	6.28
26	5.59	1.98	3.39	5.94	---	---	6.39	4.42	5.41	6.65	5.00	5.78
27	5.78	2.11	3.54	5.05	2.37	3.42	5.81	4.02	4.84	6.69	5.54	6.25
28	5.83	2.22	3.64	5.59	1.94	3.58	5.50	3.99	4.68	7.04	5.57	6.31
29	5.36	2.15	3.41	4.82	2.63	3.89	5.89	4.31	5.06	9.30	7.04	8.23
30	4.60	2.21	3.26	4.56	2.62	3.62	6.10	4.73	5.47	10.23	9.30	9.83
31	3.63	1.54	2.49	---	---	---	6.16	5.17	5.70	10.07	9.46	9.78
MONTH	5.83	-0.31	2.52	6.58	0.34	3.14	7.81	2.33	5.45	10.23	3.91	5.80



14216500 MUDDY RIVER BELOW CLEAR CREEK, NEAR COUGAR, WA

LOCATION.-- Lat 46°04'33", long 121°59'51", in NE¼SE¼, sec.24, T.7 N., R.6 E., Skamania County, Hydrologic Unit 17080002, Gifford Pinchot National Forest, on left bank 3.9 mi downstream from Clear Creek, approximately 14 mi northeast of Cougar, and 0.5 mi upstream from mouth.

DRAINAGE AREA.--135 mi<sup>2</sup>.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1927 to September 1934, October 1954 to December 1973 (destroyed by flood of January 1974), October 1983 to current year. Monthly discharge only for October, December 1933 and January 1934 published in WSP 1318. Published as "near Cougar" 1927-34. Records for August to October 1909, published in WSP 272 and 492, have been found to be unreliable and should not be used.

REVISED RECORDS.--WDR WA-99-1: 1991 (m), 1996-97 (M).

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 1,032.90 ft above NGVD of 1929. August 1927 to September 1934, at same site at different datum; October 1954 to December 1973 at site 3.7 mi upstream at different datum.

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

AVERAGE DISCHARGE.--47 years (water years 1928-34, 1955-73, 1984-2004), 870 ft<sup>3</sup>/s, 87.52 in/yr, 630,300 acre-ft/yr, includes monthly data published in WSP 1318.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 25,000 ft<sup>3</sup>/s, Feb. 8, 1996, gage height, 33.26 ft from high-water marks, from rating curve extended above 8,000 ft<sup>3</sup>/s; minimum, 94 ft<sup>3</sup>/s, Dec. 5-7, 1929.

EXTREMES OUTSIDE PERIOD OF RECORD.--A flood occurred about 0900 hours on May 18, 1980, from a mudflow caused by the eruption of Mount St. Helens.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,500 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 30	0600	*5,460	*22.30	No other peak greater than base discharge.			

Minimum discharge, 107 ft<sup>3</sup>/s, Oct. 3, 4, 5, 6, gage height, 15.00 ft.

DISCHARGE, CUBIC FEET PER SECOND  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	111	191	900	675	2,520	1,000	1,240	1,160	791	308	177	234
2	110	188	1,090	640	2,040	938	1,150	1,230	725	301	175	234
3	110	183	1,720	603	1,660	895	1,110	1,270	688	295	174	225
4	109	178	1,560	558	1,430	915	1,130	1,250	674	286	173	215
5	109	172	2,170	476	1,230	929	1,130	1,170	677	279	172	207
6	109	168	2,810	477	1,170	876	1,120	1,050	841	274	207	202
7	119	167	2,380	496	1,080	967	1,120	982	807	270	234	197
8	132	166	1,890	595	966	1,030	1,120	969	750	263	188	193
9	152	163	1,550	732	881	1,200	1,120	920	715	258	177	190
10	136	173	1,360	800	823	1,230	1,150	866	667	254	172	187
11	140	311	1,180	747	778	1,210	1,210	814	628	249	168	327
12	273	248	1,160	714	734	1,180	1,300	757	589	242	165	233
13	215	225	1,410	771	693	1,130	1,330	726	628	241	162	284
14	165	214	1,300	921	735	1,080	1,430	708	569	235	160	313
15	172	232	1,180	1,280	811	1,050	1,300	713	535	230	160	342
16	352	439	1,140	1,350	878	1,010	1,190	702	508	225	160	312
17	285	581	1,080	1,300	943	1,010	1,080	678	488	221	159	427
18	218	1,120	994	1,270	1,360	e1,100	988	669	471	219	156	766
19	225	1,980	939	1,240	1,350	e1,100	961	679	458	220	153	817
20	359	1,370	956	1,160	1,270	998	1,110	674	438	214	150	676
21	459	1,010	1,010	1,080	1,160	978	1,120	684	422	208	154	582
22	319	810	929	1,020	1,060	1,030	1,040	716	411	205	285	518
23	311	705	903	1,240	974	1,120	1,030	763	404	201	209	468
24	261	655	1,020	1,250	986	1,300	1,000	704	392	196	325	431
25	236	631	1,010	1,170	940	1,440	988	630	378	192	665	404
26	218	584	917	1,140	963	1,610	1,030	721	363	190	478	382
27	206	515	894	1,090	1,130	1,660	1,170	914	348	188	380	363
28	222	585	847	1,430	1,060	1,500	1,250	1,150	335	185	315	346
29	245	1,170	800	3,040	1,030	1,430	1,200	1,020	325	183	285	330
30	220	885	723	4,410	---	1,420	1,140	946	317	181	264	320
31	201	---	704	3,260	---	1,350	---	873	---	180	248	---
TOTAL	6,499	16,019	38,526	36,935	32,655	35,686	34,257	27,108	16,342	7,193	7,050	10,725
MEAN	210	534	1,243	1,191	1,126	1,151	1,142	874	545	232	227	358
MAX	459	1,980	2,810	4,410	2,520	1,660	1,430	1,270	841	308	665	817
MIN	109	163	704	476	693	876	961	630	317	180	150	187
AC-FT	12,890	31,770	76,420	73,260	64,770	70,780	67,950	53,770	32,410	14,270	13,980	21,270
CFSM	1.55	3.96	9.21	8.83	8.34	8.53	8.46	6.48	4.04	1.72	1.68	2.65
IN.	1.79	4.41	10.62	10.18	9.00	9.83	9.44	7.47	4.50	1.98	1.94	2.96

## 14216500 MUDDY RIVER BELOW CLEAR CREEK, NEAR COUGAR, WA—Continued

DISCHARGE, CUBIC FEET PER SECOND—CONTINUED  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1928 - 2004, BY WATER YEAR (WY)												
MEAN	336	1,072	1,234	1,232	1,219	1,198	1,288	1,259	825	364	203	187
MAX	1,567	2,609	2,828	2,308	3,222	2,841	2,318	2,467	2,341	1,163	438	385
(WY)	(1998)	(1984)	(1974)	(1997)	(1996)	(1972)	(1997)	(1956)	(1933)	(1971)	(1933)	(1968)
MIN	107	102	313	365	254	386	620	425	194	143	116	122
(WY)	(1988)	(1930)	(1931)	(1985)	(1929)	(1955)	(1973)	(1934)	(1992)	(1992)	(1992)	(2003)

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1928 - 2004	
ANNUAL TOTAL	295,012		268,995			
ANNUAL MEAN	808		735		866	
HIGHEST ANNUAL MEAN					1,297	
LOWEST ANNUAL MEAN					465	
HIGHEST DAILY MEAN	7,260	Jan 31	4,410	Jan 30	21,000	Feb 8, 1996
LOWEST DAILY MEAN	109	Oct 4	109	Oct 4	94	Dec 5, 1929
ANNUAL SEVEN-DAY MINIMUM	110	Sep 30	111	Oct 1	95	Dec 1, 1929
ANNUAL RUNOFF (AC-FT)	585,200		533,600		627,600	
ANNUAL RUNOFF (CFSM)	5.99		5.44		6.42	
ANNUAL RUNOFF (INCHES)	81.29		74.12		87.18	
10 PERCENT EXCEEDS	1,820		1,290		1,830	
50 PERCENT EXCEEDS	627		703		632	
90 PERCENT EXCEEDS	128		177		155	

e Estimated

## 14216500 MUDDY RIVER BELOW CLEAR CREEK, NEAR COUGAR, WA—Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1983 to current year.

PERIOD OF DAILY RECORD.--

SUSPENDED SEDIMENT DISCHARGE: October 1983 to March 1995, October 1998 to current year. Water years 1995 and 1996, daily sediment discharge values for period October to March, monthly sediment discharge values only for the period April to September. Water years 1997 and 1998, annual sediment discharge estimates only (on file at the Cascades Volcano Observatory in Vancouver, WA). Records prior to October 1985 are published in U.S. Geological Survey Open-File Report 85-632; records for 1984-87 are published in U.S. Geological Survey Open-File Report 91-219.

INSTRUMENTATION.--Water-quality monitor May 1990 to September 1991. Automatic pumping sediment sampler August 1983 to September 1996, October 1998 to current year.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SEDIMENT CONCENTRATION: Maximum daily, 37,800 mg/L, Oct. 26, 1986; minimum, 1 mg/L, on several days in water years 2001-03.

SEDIMENT DISCHARGE: Maximum daily, 1,400,000 tons (estimated), Feb. 8, 1996; minimum, 0.34 tons, Oct. 11, 30, 2003.

EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATION: Maximum daily, 1,290 mg/L, Jan. 30; minimum daily, 2 mg/L, Aug. 18-20.

SEDIMENT DISCHARGE: Maximum daily, 15,900 tons, Jan. 30; minimum daily, 0.82 tons, Oct. 3.

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY)  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Day	Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)	OCTOBER			NOVEMBER			DECEMBER		
				Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)	Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)	Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)
1	111	9	1.4	191	11	5.5	900	26	62			
2	110	5	1.4	188	10	5.3	1,090	148	538			
3	110	3	0.82	183	10	5.1	1,720	369	1,800			
4	109	6	1.6	178	10	4.9	1,560	128	541			
5	109	6	1.7	172	10	4.6	2,170	531	3,300			
6	109	4	1.1	168	10	4.4	2,810	809	6,260			
7	119	4	1.3	167	10	4.3	2,380	238	1,550			
8	132	6	2.3	166	9	4.2	1,890	101	524			
9	152	5	2.2	163	9	4.1	1,550	50	213			
10	136	5	1.7	173	10	4.9	1,360	32	118			
11	140	6	2.4	311	e48	e42	1,180	20	65			
12	273	53	42	248	12	7.9	1,160	16	51			
13	215	10	6.1	225	8	5.1	1,410	85	365			
14	165	5	2.4	214	6	3.7	1,300	26	93			
15	172	10	5.4	232	9	5.7	1,180	14	46			
16	352	64	68	439	60	99	1,140	11	34			
17	285	12	9.3	581	30	49	1,080	9	26			
18	218	14	8.1	1,120	399	1,490	994	8	22			
19	225	14	8.5	1,980	1,150	6,830	939	6	15			
20	359	59	67	1,370	119	455	956	6	16			
21	459	66	87	1,010	34	95	1,010	7	19			
22	319	29	25	810	39	83	929	4	10			
23	311	23	19	705	46	89	903	5	11			
24	261	9	6.5	655	31	56	1,020	10	28			
25	236	10	6.4	631	22	38	1,010	8	21			
26	218	12	7.1	584	18	29	917	6	14			
27	206	10	5.3	515	15	20	894	4	9.4			
28	222	15	9.1	585	32	73	847	6	14			
29	245	11	7.1	1,170	e266	e869	800	4	9.4			
30	220	11	6.3	885	52	128	723	4	7.6			
31	201	11	5.9	---	---	---	704	4	7.1			
TOTAL	6,499	---	419.42	16,019	---	10,514.7	38,526	---	15,789.5			



## 14216500 MUDDY RIVER BELOW CLEAR CREEK, NEAR COUGAR, WA—Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY)—CONTINUED  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Day	Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)	Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)	Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)
	JANUARY			FEBRUARY			MARCH		
1	675	4	6.6	2,520	209	1,440	1,000	e17	e46
2	640	3	6.0	2,040	131	725	938	e16	e41
3	603	3	5.4	1,660	69	311	895	e15	e36
4	558	3	4.8	1,430	36	141	915	e16	e38
5	476	3	4.0	1,230	29	97	929	e18	e46
6	477	7	9.0	1,170	22	68	876	e13	e31
7	496	17	23	1,080	15	44	967	e18	e48
8	595	e43	e69	966	12	30	1,030	e19	e53
9	732	e75	e149	881	10	23	1,200	e46	e151
10	800	e60	e128	823	10	22	1,230	e47	e155
11	747	e43	e87	778	16	33	1,210	e30	e100
12	714	e28	e54	734	19	38	1,180	e22	e69
13	771	e26	e55	693	13	24	1,130	e15	e46
14	921	e56	e143	735	15	30	1,080	e10	e30
15	1,280	e146	e507	811	20	43	1,050	e9	e24
16	1,350	e168	e617	878	e33	e84	1,010	e7	e20
17	1,300	e115	e407	943	e31	e81	1,010	7	18
18	1,270	e82	e280	1,360	e87	e320	e1,100	14	e42
19	1,240	e57	e192	1,350	e49	e178	e1,100	16	e48
20	1,160	e39	e124	1,270	e33	e113	998	18	48
21	1,080	e22	e66	1,160	e27	e84	978	15	40
22	1,020	e19	e51	1,060	e23	e67	1,030	16	45
23	1,240	e86	e293	974	e20	e53	1,120	28	86
24	1,250	e51	e174	986	e22	e58	1,300	52	184
25	1,170	e25	e80	940	e19	e48	1,440	76	312
26	1,140	e15	e47	963	e19	e50	1,610	96	418
27	1,090	e11	e33	1,130	e43	e131	1,660	82	368
28	1,430	e148	e651	1,060	e27	e78	1,500	66	266
29	3,040	940	8,750	1,030	e20	e56	1,430	123	476
30	4,410	1,290	15,900	---	---	---	1,420	162	620
31	3,260	584	5,240	---	---	---	1,350	138	503
TOTAL	36,935	---	34,155.8	32,655	---	4,470	35,686	---	4,408
	APRIL			MAY			JUNE		
1	1,240	41	138	1,160	e29	e91	791	5	10
2	1,150	24	75	1,230	e31	e104	725	8	17
3	1,110	41	126	1,270	e36	e124	688	12	22
4	1,130	91	279	1,250	e25	e86	674	12	22
5	1,130	45	138	1,170	14	43	677	7	13
6	1,120	34	103	1,050	10	27	841	22	52
7	1,120	26	80	982	10	25	807	19	42
8	1,120	22	65	969	9	25	750	13	26
9	1,120	20	59	920	7	18	715	10	19
10	1,150	22	69	866	7	16	667	5	9.0
11	1,210	24	78	814	8	18	628	5	8.4
12	1,300	44	153	757	10	21	589	4	6.9
13	1,330	30	109	726	7	14	628	10	17
14	1,430	70	274	708	4	7.7	569	8	13
15	1,300	30	107	713	7	13	535	7	10
16	1,190	18	57	702	7	13	508	6	8.7
17	1,080	16	47	678	4	6.8	488	7	8.7
18	988	17	44	669	4	6.4	471	8	10
19	961	19	51	679	7	13	458	10	12
20	1,110	38	116	674	5	10	438	12	14
21	1,120	30	91	684	8	15	422	15	17
22	1,040	17	48	716	21	42	411	19	21
23	1,030	17	46	763	21	43	404	32	35
24	1,000	14	39	704	8	15	392	42	45
25	988	14	37	630	6	11	378	36	37
26	1,030	17	47	721	18	38	363	30	29
27	1,170	e35	e111	914	48	134	348	24	22
28	1,250	e50	e170	1,150	79	248	335	17	16
29	1,200	e38	e124	1,020	11	31	325	9	8.0
30	1,140	e32	e98	946	6	16	317	10	8.2
31	---	---	---	873	5	13	---	---	---
TOTAL	34,257	---	2,979	27,108	---	1,287.9	16,342	---	578.9

## 14216500 MUDDY RIVER BELOW CLEAR CREEK, NEAR COUGAR, WA—Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY)—CONTINUED  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Day	Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)	Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)	Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)
1	308	17	14	177	7	3.2	234	14	8.6
2	301	25	20	175	6	3.0	234	9	5.9
3	295	32	26	174	6	2.8	225	6	3.7
4	286	38	30	173	6	2.6	215	5	3.1
5	279	35	26	172	5	2.4	207	6	3.3
6	274	29	21	207	e31	e22	202	7	3.7
7	270	23	17	234	e35	e24	197	6	3.3
8	263	18	12	188	11	5.5	193	6	2.9
9	258	12	8.3	177	8	3.8	190	5	2.5
10	254	7	4.8	172	7	3.1	187	7	3.5
11	249	7	4.7	168	6	2.7	327	338	338
12	242	8	5.2	165	5	2.3	233	64	41
13	241	9	5.8	162	5	2.0	284	131	106
14	235	10	6.3	160	4	1.8	313	74	62
15	230	11	6.8	160	4	1.6	342	62	57
16	225	12	7.1	160	3	1.4	312	27	23
17	221	11	6.6	159	3	1.2	427	88	108
18	219	10	5.9	156	2	1.0	766	314	677
19	220	9	5.4	153	2	0.87	817	105	242
20	214	8	4.7	150	2	0.98	676	36	66
21	208	7	4.0	154	4	1.9	582	21	34
22	205	6	3.4	285	e81	e65	518	15	21
23	201	7	3.7	209	e20	e12	468	12	15
24	196	8	4.0	325	68	69	431	10	12
25	192	8	4.4	665	476	1,090	404	9	9.5
26	190	9	4.8	478	59	78	382	8	8.3
27	188	10	5.1	380	30	31	363	8	7.9
28	185	11	5.4	315	27	23	346	8	7.4
29	183	10	4.8	285	23	18	330	7	6.3
30	181	8	4.1	264	20	14	320	6	3.1
31	180	7	3.5	248	17	11	---	---	---
TOTAL	7,193	---	284.8	7,050	---	1,501.15	10,725	---	1,885.0
YEAR	268,995	78,274.17							

e Estimated

## 14217600 SWIFT RESERVOIR AT COUGAR, WA

LOCATION.-- Lat 46°03'38", long 122°11'44", in NE $\frac{1}{4}$ SW $\frac{1}{4}$ , sec.28, T.7 N., R.5 E., Skamania County, Hydrologic Unit 17080002, at the intake structure near left bank on Swift Dam on Lewis River, 5.0 mi east of Cougar, and at mile 47.9.

DRAINAGE AREA.--481 mi<sup>2</sup>.

PERIOD OF RECORD.--September 1958 to current year.

GAGE.--Water-stage recorder and long distance indicator in powerhouse. Datum of gage is NGVD of 1929 (levels by PacifiCorp).

REMARKS.--Hourly elevations for the year were furnished by PacifiCorp. Reservoir is formed by rock and earthfill dam; storage began Sept. 29, 1958; dam completed in December 1958. Usable capacity, 446,600 acre-ft between elevations 878 ft, lower limit for economic operation, and 1,000.5 ft, maximum operating limit. Dead storage unknown. Figures given herein represent total contents. Water is used by PacifiCorp for power generation. Capacity table furnished by PacifiCorp.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 759,100 acre-ft, Nov. 15, 1973, elevation, 1,000.77 ft; minimum contents since reservoir was first filled, 325,100 acre-ft, May 1, 1967, elevation 883.60 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 755,100 acre-ft, June 1, elevation, 999.89 ft; minimum contents, 539,200 acre-ft, Mar. 4, elevation 948.18 ft.

MONTH-END ELEVATION AND CONTENTS AT 2400  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
September 30	977.74	657,400	--
October 31	974.41	643,500	-13,900
November 30	959.72	583,700	-59,800
December 31	953.40	559,100	-24,600
Calender Year 2003	--	--	-102,500
January 31	977.82	657,800	+98,700
February 29	951.40	551,400	-106,400
March 31	970.94	628,900	+77,500
April 30	989.12	706,600	+77,700
May 31	999.31	752,400	+45,800
June 30	997.85	745,800	-6,600
July 31	995.29	734,200	-11,600
August 31	996.51	739,700	+5,500
September 30	983.64	682,600	-57,100
Water Year 2004	--	--	+25,200

## 14218500 YALE RESERVOIR NEAR YALE, WA

LOCATION.-- Lat 45°57'50", long 122°19'53", in SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec.32, T.6 N., R.4 E., Clark County, Hydrologic Unit 17080002, at left bank on Yale Dam on Lewis River just upstream from intake, 500 ft upstream from powerhouse, 1.0 mi upstream from Canyon Creek, 3.2 mi southeast of Yale, and at mile 34.2.

DRAINAGE AREA.--596 mi<sup>2</sup>.

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

GAGE.--Water-stage recorder and long distance indicator in powerhouse. Datum of gage is NGVD of 1929 (levels by PacifiCorp). Prior to Feb. 1, 1954, nonrecording indicator gage at same site and datum.

REMARKS.--Hourly elevations for the year were furnished by PacifiCorp. Reservoir is formed by rock and earthfill dam; storage began July 31, 1952; dam completed in 1952. Usable capacity, 189,500 acre-ft between elevations 430 ft, lower limit for economic operation, and 490 ft, top of spillway gates. Dead storage below elevation 417 ft, 178,000 acre-ft. Figures given herein represent total contents. Water is used by PacifiCorp for power generation. Capacity table furnished by PacifiCorp.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 402,500 acre-ft, May 13, 1961, elevation, 490.15 ft; minimum contents observed since reservoir was first filled, 227,600 acre-ft, Feb. 22, 1957, elevation, 435.65 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 400,500 acre-ft, June 8, elevation, 489.67 ft; minimum contents 286,900 acre-ft, Apr. 17, elevation, 456.07.

MONTH-END ELEVATION AND CONTENTS AT 2400  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
September 30	483.26	376,800	--
October 31	470.39	332,100	-44,700
November 30	478.80	360,800	+28,700
December 31	483.71	378,400	+17,600
Calender Year 2003	--	--	-1,500
January 31	480.27	366,000	-12,400
February 29	484.88	382,700	+16,700
March 31	469.09	327,800	-54,900
April 30	481.97	372,100	+44,300
May 31	489.21	398,800	+26,700
June 30	489.49	399,900	+1,100
July 31	487.11	390,900	-9,000
August 31	487.58	392,700	+1,800
September 30	482.26	373,200	-19,500
Water Year 2004	--	--	-3,600

## 14219800 SPEELYAI CREEK NEAR COUGAR, WA

LOCATION.--Lat 46°00'17", long 122°20'35", in SW¼NW¼, sec.17, T.6 N., R.4 E., Cowlitz County, Hydrologic Unit 17080002, on right bank 3.8 mi southwest of Cougar, and at mile 0.5.

DRAINAGE AREA.--12.6 mi<sup>2</sup>.

PERIOD OF RECORD.--May 1959 to May 1978, October 1978 to current year.

REVISED RECORDS.--WSP 1718: 1959. WDR WA-81-1: 1978-80(P). WDR WA-84-1: 1983.

GAGE.--Water-stage recorder. Elevation of gage is 500 ft above NGVD of 1929, from topographic map. Prior to Nov. 21, 1959, at site 900 ft upstream at different datum; Nov. 22, 1959, to Sept. 30, 1996, at site 1,150 ft upstream at different datum.

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

AVERAGE DISCHARGE.--44 years (water years 1960-77, 1979-2004), 102 ft<sup>3</sup>/s, 110.19 in/yr, 74,030 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,600 ft<sup>3</sup>/s, probably Nov. 20, 1962 (by slope-area measurement, gage height not determined); maximum gage height, 8.12 ft, Feb. 8, 1996, datum then in use; minimum discharge, no flow part of each day Sept. 6-7, 2003.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 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 29	1115	*1,960	*8.53	No other peak greater than base discharge.			

Minimum discharge, 0.29 ft<sup>3</sup>/s, Oct. 2, 4, 5, gage height, 3.59 ft.

DISCHARGE, CUBIC FEET PER SECOND  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.39	17	195	68	240	135	77	37	125	19	3.2	37
2	0.31	16	216	63	180	114	67	34	98	18	3.0	33
3	0.32	15	314	57	143	104	62	31	81	17	2.9	29
4	0.31	14	207	50	125	120	60	31	68	16	2.9	25
5	0.32	13	337	44	107	162	55	29	65	15	3.3	22
6	0.37	12	387	e40	117	177	50	26	101	14	8.4	20
7	2.7	12	267	e50	149	160	46	24	128	13	6.9	19
8	7.0	11	198	72	135	152	42	25	122	12	3.8	17
9	9.8	10	159	94	117	153	40	23	140	12	3.0	16
10	8.2	18	139	118	103	136	39	22	125	11	2.6	15
11	11	68	122	124	93	117	40	22	109	10	2.4	48
12	106	49	183	124	85	105	39	20	94	9.4	2.3	28
13	60	41	294	127	79	94	36	18	97	8.9	2.2	54
14	32	35	294	179	89	84	56	17	86	8.3	2.1	63
15	30	39	217	339	103	78	68	16	77	7.8	2.1	98
16	84	151	180	289	126	73	80	15	69	7.3	2.0	90
17	64	282	165	210	150	70	72	14	62	7.0	1.9	e130
18	42	475	146	183	240	70	62	13	56	6.6	1.7	e200
19	51	511	130	200	228	67	59	13	50	6.5	1.7	e180
20	53	270	132	192	177	60	78	12	45	6.3	1.6	e140
21	45	164	148	155	141	57	148	11	41	5.8	2.5	e110
22	39	119	134	128	117	58	121	30	38	5.3	14	92
23	42	99	118	256	101	61	99	26	35	4.8	7.3	76
24	34	95	124	320	98	69	82	20	33	4.4	80	65
25	28	116	138	226	95	74	71	18	30	4.2	334	55
26	24	127	120	189	108	112	63	37	28	4.2	249	47
27	21	114	111	161	234	190	e60	84	25	4.0	157	41
28	22	121	99	425	206	140	e50	190	24	3.7	102	36
29	24	299	89	1,620	163	114	45	156	22	3.5	75	33
30	21	241	79	953	---	105	40	161	21	3.5	57	30
31	19	---	74	403	---	89	---	159	---	3.4	45	---
TOTAL	881.72	3,554	5,516	7,459	4,049	3,300	1,907	1,334	2,095	271.9	1,182.8	1,849
MEAN	28.4	118	178	241	140	106	63.6	43.0	69.8	8.77	38.2	61.6
MAX	106	511	387	1,620	240	190	148	190	140	19	334	200
MIN	0.31	10	74	40	79	57	36	11	21	3.4	1.6	15
AC-FT	1,750	7,050	10,940	14,790	8,030	6,550	3,780	2,650	4,160	539	2,350	3,670
CFSM	2.26	9.40	14.1	19.1	11.1	8.45	5.04	3.42	5.54	0.70	3.03	4.89
IN.	2.60	10.49	16.29	22.02	11.95	9.74	5.63	3.94	6.19	0.80	3.49	5.46

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 2004, BY WATER YEAR (WY)

MEAN	49.4	170	204	198	181	151	124	76.9	40.3	15.3	9.28	14.6
MAX	174	371	393	350	374	357	238	151	106	71.2	49.0	61.6
(WY)	(1998)	(1996)	(1976)	(1974)	(1972)	(1972)	(1993)	(1960)	(1981)	(1983)	(1968)	(2004)
MIN	1.34	6.79	39.9	37.1	57.2	25.9	50.0	20.0	6.93	3.25	0.71	1.49
(WY)	(1988)	(1994)	(1977)	(1977)	(1973)	(1992)	(1998)	(1994)	(1992)	(2003)	(2003)	(2003)

## LEWIS RIVER BASIN

14219800 SPEELYAI CREEK NEAR COUGAR, WA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1960 - 2004	
ANNUAL TOTAL	34,259.53		33,399.42		102	
ANNUAL MEAN	93.9		91.3		155	
HIGHEST ANNUAL MEAN					1974	
LOWEST ANNUAL MEAN					2001	
HIGHEST DAILY MEAN	1,600	Jan 31	1,620	Jan 29	2,410	Feb 8, 1996
LOWEST DAILY MEAN	0.01	Sep 6	0.31	Oct 2	0.01	Sep 6, 2003
ANNUAL SEVEN-DAY MINIMUM	0.09	Aug 31	0.67	Oct 1	0.09	Aug 31, 2003
ANNUAL RUNOFF (AC-FT)	67,950		66,250		74,030	
ANNUAL RUNOFF (CFSM)	7.45		7.24		8.11	
ANNUAL RUNOFF (INCHES)	101.15		98.61		110.19	
10 PERCENT EXCEEDS	227		193		240	
50 PERCENT EXCEEDS	46		62		56	
90 PERCENT EXCEEDS	0.67		5.7		4.6	

e Estimated

## 14220000 LAKE MERWIN NEAR ARIEL, WA

LOCATION.-- Lat 45°57'23", long 122°33'13", in SW<sup>1</sup>/<sub>4</sub>SW<sup>1</sup>/<sub>4</sub>, sec.34, T.6 N., R.2 E., Clark County, Hydrologic Unit 17080002, on left bank on Merwin Dam on Lewis River at Ariel, and at mile 19.6.

DRAINAGE AREA.--730 mi<sup>2</sup>.

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

GAGE.--Water-stage recorder and long distance indicator in powerhouse. Datum of gage is NGVD of 1929 (levels by PacifiCorp).

REMARKS.--Hourly elevations for the year were furnished by PacifiCorp. Reservoir is formed by combination gravity-concrete-arch dam; some storage began March 1931; completed May 13, 1931. Usable capacity, 245,600 acre-ft between elevations 165 ft, lower limit of regulation set by Federal Energy Regulatory Commission, and 235 ft, top of spillway gates. Additional storage of 18,200 acre-ft is provided by flashboards to elevation 239.6 ft. Unused storage below elevation 165 ft, 159,000 acre-ft. Figures given herein represent total contents. Water is used by PacifiCorp for power generation. Capacity table furnished by PacifiCorp.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents during the period 1931-52 not determined; maximum since 1953, 424,000 acre-ft, Jan. 24, 1959, elevation, 239.86 ft; minimum contents observed since reservoir was first filled, 164,200 acre-ft, Dec. 5, 1936, elevation, 166.7 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 422,100 acre-ft, July 26, elevation, 239.43 ft; minimum contents, 384,300 acre-ft, Jan. 9, elevation, 229.75 ft.

MONTH-END ELEVATION AND CONTENTS AT 2400  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
September 30	236.93	412,200	--
October 31	236.91	412,100	-100
November 30	235.25	405,600	-6,500
December 31	238.04	416,600	+11,000
Calender Year 2003	--	--	+5,800
January 31	236.53	410,600	-6,000
February 29	234.66	403,300	-7,300
March 31	236.41	410,100	+6,800
April 30	238.09	416,800	+6,700
May 31	238.91	420,100	+3,300
June 30	238.00	416,400	-3,700
July 31	237.86	415,900	-500
August 31	236.83	411,800	-4,100
September 30	236.00	408,500	-3,300
Water Year 2004	--	--	-3,700

## 14220500 LEWIS RIVER AT ARIEL, WA

LOCATION.--Lat 45°57'07", long 122°33'46", in NW<sup>1</sup>/<sub>4</sub>NE<sup>1</sup>/<sub>4</sub>, sec.4, T.5 N., R.2 E., Cowlitz County, Hydrologic Unit 17080002, on right bank 0.4 mi southeast of Ariel, 0.5 mi downstream from Merwin Dam and powerplant, 3.3 mi upstream from Cedar Creek, and at mile 19.0.

DRAINAGE AREA.--731 mi<sup>2</sup>.

PERIOD OF RECORD.--July to October 1909, November 1909 (gage heights only), July to October 1922, July 1923 to current year. Published as "near Ariel" water years 1922-29. Prior to October 1952, discharge measurements made at site 0.5 mi downstream; low discharges not equivalent due to local inflow.

REVISED RECORDS.--WSP 884: 1938. WSP 984: 1936-37, 1940-42. WSP 1318: 1924-30(M).

GAGE.--Water-stage recorder. Datum of gage is 44.0 ft above NGVD of 1929 (levels by Pacificorp). July to November 1909, nonrecording gage at site 4 mi upstream at different datum. July 27 to Oct. 29, 1922, and July 31, 1923, to Apr. 20, 1930, nonrecording gages at site 0.5 mi downstream at datums 3.90 ft and 0.90 ft higher respectively, than present datum.

REMARKS.--No estimated daily discharges. Records good. No diversion upstream from station. Flow regulated by Swift and Yale Reservoirs, and Lake Merwin (stations 14217600, 14218500, 14220000). Chemical analyses July 1959 to June 1960, April 1979 to September 1986. Additional data from April to August 1980 are published in U.S. Geological Survey Open-File Report 81-1007. Water temperatures October 1950 to September 1963.

AVERAGE DISCHARGE.--81 years (water years 1924-2004), 4,800 ft<sup>3</sup>/s, 89.17 in/yr, 3,478,000 acre-ft/yr, adjusted for storage in Lake Merwin Reservoir since March 1931, Yale Reservoir since August 1952, and Swift Reservoir since October 1958.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 129,000 ft<sup>3</sup>/s, Dec. 22, 1933, gage height, 35.0 ft, from floodmarks, from rating curve extended above 56,000 ft<sup>3</sup>/s on basis of computation of peak flow over dam; no flow at times June 30, July 1-3, 6-9, 1931 (caused by regulation during construction of Merwin Dam); minimum daily discharge, 1 ft<sup>3</sup>/s, July 6, 1931.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 11,700 ft<sup>3</sup>/s, Jan. 29, gage height, 7.44 ft; minimum discharge, 775 ft<sup>3</sup>/s, Aug. 20.

DISCHARGE, CUBIC FEET PER SECOND  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2,250	3,760	6,600	3,060	10,100	7,020	6,070	2,180	4,550	2,220	1,530	2,750
2	2,230	3,790	7,710	4,280	10,100	5,900	5,120	2,190	4,550	2,060	1,530	2,750
3	2,240	3,640	5,380	5,640	10,100	6,030	4,620	2,010	4,540	2,050	1,520	2,740
4	2,260	3,500	3,550	5,780	10,100	6,050	2,730	1,860	4,060	2,050	1,530	2,750
5	2,270	3,430	6,790	9,670	8,920	6,070	2,360	1,860	4,060	2,050	1,530	2,760
6	2,280	1,790	6,810	10,600	8,400	6,070	1,860	1,870	5,440	1,830	1,530	2,750
7	2,290	3,260	9,070	9,540	6,950	6,050	1,860	1,880	5,850	1,570	1,530	2,910
8	2,250	3,270	9,950	8,700	5,940	6,060	1,860	1,880	5,280	1,520	1,530	3,060
9	2,250	3,290	9,530	5,790	8,240	5,200	1,860	1,870	6,360	1,520	1,530	3,040
10	2,260	3,280	7,320	4,380	7,150	5,030	1,860	1,860	5,130	1,520	1,530	3,060
11	2,260	3,290	4,320	4,310	5,580	5,050	1,860	1,870	4,730	1,520	1,520	3,060
12	2,300	3,230	10,900	4,290	6,360	5,060	1,870	1,860	5,830	1,520	1,520	3,050
13	2,130	2,190	11,000	4,300	7,220	5,070	1,860	1,860	5,560	1,490	1,520	3,220
14	2,410	4,100	11,000	4,310	9,090	5,060	1,860	1,680	3,470	1,440	1,520	4,200
15	2,680	4,140	11,000	4,310	9,060	5,040	1,860	1,680	2,750	1,380	1,520	4,570
16	2,340	5,170	11,000	4,290	9,050	5,040	1,860	1,680	2,790	1,500	1,520	4,800
17	2,800	5,390	7,510	4,700	7,350	5,040	1,860	1,680	2,820	1,520	1,520	5,500
18	2,800	6,740	4,070	5,550	7,070	5,040	1,860	1,680	2,830	1,520	1,520	6,280
19	2,790	8,220	7,010	5,580	7,060	4,000	1,860	1,680	2,830	1,520	1,520	6,990
20	2,810	4,660	8,540	5,540	7,000	3,040	1,860	1,680	2,820	1,520	1,110	7,370
21	2,780	5,490	8,610	4,570	6,050	3,050	1,880	1,690	2,840	1,520	1,530	7,390
22	2,800	6,800	7,190	4,550	6,050	3,440	1,850	1,780	2,820	1,530	1,560	7,240
23	2,320	7,850	3,780	5,510	6,490	4,040	1,860	2,050	2,820	1,530	2,070	4,650
24	2,790	7,830	6,440	5,690	5,880	4,030	1,850	2,370	2,770	1,530	2,070	4,380
25	2,790	5,880	4,900	8,160	7,060	4,040	1,860	2,700	2,760	1,530	2,070	3,660
26	2,800	3,040	3,030	9,080	7,060	4,050	1,870	3,290	2,760	1,530	2,050	2,880
27	2,790	5,250	3,040	10,400	7,080	4,030	1,870	5,660	2,770	1,530	2,040	2,380
28	2,780	5,250	3,150	11,600	7,090	4,030	1,860	9,230	2,760	1,530	2,040	2,090
29	2,790	5,260	4,760	11,700	7,060	4,490	2,030	8,780	2,760	1,530	2,060	2,090
30	2,330	5,260	5,640	10,700	---	6,000	2,180	5,010	2,770	1,530	2,710	2,070
31	3,060	---	3,680	10,000	---	6,540	---	4,210	---	1,530	2,730	---
TOTAL	77,930	138,050	213,280	206,580	220,660	154,660	67,920	83,580	114,080	50,140	53,010	116,440
MEAN	2,514	4,602	6,880	6,664	7,609	4,989	2,264	2,696	3,803	1,617	1,710	3,881
MAX	3,060	8,220	11,000	11,700	10,100	7,020	6,070	9,230	6,360	2,220	2,730	7,390
MIN	2,130	1,790	3,030	3,060	5,580	3,040	1,850	1,680	2,750	1,380	1,110	2,070
AC-FT	154,600	273,800	423,000	409,800	437,700	306,800	134,700	165,800	226,300	99,450	105,100	231,000
MEAN†	1,560	3,969	6,944	7,971	5,923	5,468	4,427	3,929	3,648	1,274	1,761	2,539
CFSM†	2.13	5.43	9.50	10.90	8.10	7.48	6.06	5.37	4.99	1.74	2.41	3.47
IN.†	2.46	6.06	10.95	12.57	8.74	8.63	6.76	6.19	5.57	2.01	2.78	3.88
AC-FT†	95,900	236,200	427,000	490,100	340,700	336,200	263,400	241,600	217,100	78,350	108,300	151,100

CAL YR 2003 TOTAL 1,724,180 MEAN 4,724 MAX 42,800 MIN 1,210 AC-FT 3,420,000 MEAN† 4,589 CFSM† 6.28 IN.† 85.24 AC-FT† 3,322,000

WTR YR 2004 TOTAL 1,496,330 MEAN 4,088 MAX 11,700 MIN 1,110 AC-FT 2,968,000 MEAN† 4,113 CFSM† 5.63 IN.† 76.61 AC-FT† 2,986,000

† Adjusted for change in contents in Lake Merwin, Swift Reservoir and Yale Reservoir.



## 14222500 EAST FORK LEWIS RIVER NEAR HEISSON, WA

LOCATION.--Lat 45°50'13", long 122°27'54", in NE<sup>1</sup>/<sub>4</sub>NW<sup>1</sup>/<sub>4</sub>, sec.17, T.4 N., R.3 E., Clark County, Hydrologic Unit 17080002, on right bank 60 ft downstream from Basket Creek, 1.5 mi northeast of Heisson, 3.4 mi southwest of Yacolt, and at mile 20.2.

DRAINAGE AREA.--125 mi<sup>2</sup>.

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

GAGE.--Water-stage recorder. Datum of gage is 356.8 ft above NGVD of 1929 (from river-profile survey). Prior to Oct. 1, 1987, at datum 10.00 ft higher.

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

AVERAGE DISCHARGE.--75 years (water years 1930-2004), 738 ft<sup>3</sup>/s, 80.20 in/yr, 534,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 28,600 ft<sup>3</sup>/s, Feb. 8, 1996, from indirect measurement, gage height, 25.26 ft; minimum discharge, 29 ft<sup>3</sup>/s, Nov. 3, 1935, Sept. 27, 28, 1967.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,100 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 29	1145	*9,420	*19.46	No other peak greater than base discharge.			

Minimum discharge, 37 ft<sup>3</sup>/s, Oct. 4, gage height, 10.06 ft.

DISCHARGE, CUBIC FEET PER SECOND  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	38	106	1,330	668	2,440	1,020	606	329	817	178	66	187
2	38	95	1,150	629	1,930	865	531	324	665	171	63	196
3	39	86	1,700	577	1,520	826	503	311	561	167	62	185
4	38	79	1,200	514	1,330	1,260	500	303	480	158	64	159
5	39	73	1,850	448	1,110	1,460	472	297	441	150	68	146
6	40	68	2,330	429	1,050	1,450	439	265	671	145	85	131
7	56	66	1,740	470	1,110	1,350	415	252	998	155	100	122
8	59	64	1,410	550	1,010	1,300	400	301	899	142	69	115
9	77	63	1,150	692	886	1,310	388	312	1,030	134	59	110
10	72	70	1,000	794	790	1,150	395	268	1,280	128	55	107
11	68	466	849	853	720	952	415	317	1,230	123	54	232
12	231	289	1,160	864	661	836	414	297	980	116	53	163
13	206	204	2,290	882	609	744	384	270	832	111	52	288
14	102	163	2,510	1,200	630	671	500	251	701	107	51	396
15	89	171	1,790	2,110	697	619	578	243	602	103	52	359
16	185	472	1,470	2,130	873	588	512	248	527	100	50	381
17	134	979	1,380	1,590	1,130	570	453	236	464	96	49	720
18	92	1,410	1,180	1,400	1,680	593	410	235	413	95	47	1,090
19	107	2,020	1,010	1,480	1,670	591	396	237	380	96	47	1,040
20	113	1,220	910	1,390	1,310	513	485	217	348	94	45	721
21	98	768	958	1,160	1,040	465	744	208	318	90	49	539
22	87	542	863	972	868	458	652	294	301	86	252	440
23	140	440	778	1,990	758	490	564	504	292	79	184	374
24	102	607	840	3,330	757	611	495	434	276	75	419	326
25	85	844	1,280	2,360	765	719	443	366	258	73	1,250	292
26	74	926	1,080	2,010	878	981	423	533	238	74	969	266
27	69	735	1,050	1,730	1,520	1,370	427	1,340	222	73	725	244
28	78	665	1,130	3,140	1,530	1,050	402	1,980	209	70	442	221
29	220	2,400	975	8,440	1,210	839	362	1,480	197	68	323	207
30	182	1,790	816	5,910	---	812	337	1,210	187	67	259	195
31	128	---	743	3,390	---	714	---	1,020	---	69	214	---
TOTAL	3,086	17,881	39,922	54,102	32,482	27,177	14,045	14,882	16,817	3,393	6,277	9,952
MEAN	99.5	596	1,288	1,745	1,120	877	468	480	561	109	202	332
MAX	231	2,400	2,510	8,440	2,440	1,460	744	1,980	1,280	178	1,250	1,090
MIN	38	63	743	429	609	458	337	208	187	67	45	107
AC-FT	6,120	35,470	79,190	107,300	64,430	53,910	27,860	29,520	33,360	6,730	12,450	19,740
CFSM	0.80	4.77	10.3	14.0	8.96	7.01	3.75	3.84	4.48	0.88	1.62	2.65
IN.	0.92	5.32	11.88	16.10	9.67	8.09	4.18	4.43	5.00	1.01	1.87	2.96

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1930 - 2004, BY WATER YEAR (WY)

MEAN	341	1,071	1,477	1,411	1,285	1,111	912	589	346	144	83.6	114
MAX	1,318	2,502	3,957	3,460	2,636	2,432	1,818	1,254	914	561	278	555
(WY)	(1952)	(1996)	(1934)	(1953)	(1961)	(1932)	(1937)	(1933)	(1933)	(1983)	(1968)	(1941)
MIN	36.7	53.7	288	303	394	352	312	198	88.2	59.4	42.7	42.3
(WY)	(1988)	(1937)	(1977)	(1979)	(1977)	(1992)	(1941)	(1931)	(1992)	(1992)	(1992)	(1967)

## LEWIS RIVER BASIN

14222500 EAST FORK LEWIS RIVER NEAR HEISSON, WA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1930 - 2004	
ANNUAL TOTAL	249,784		240,016			
ANNUAL MEAN	684		656		738	
HIGHEST ANNUAL MEAN					1,117	1974
LOWEST ANNUAL MEAN					411	2001
HIGHEST DAILY MEAN	9,890	Jan 31	8,440	Jan 29	21,000	Feb 8, 1996
LOWEST DAILY MEAN	34	Sep 4	38	Oct 1	30	Sep 27, 1967
ANNUAL SEVEN-DAY MINIMUM	35	Aug 31	41	Oct 1	32	Sep 23, 1967
ANNUAL RUNOFF (AC-FT)	495,400		476,100		534,500	
ANNUAL RUNOFF (CFSM)	5.47		5.25		5.90	
ANNUAL RUNOFF (INCHES)	74.34		71.43		80.20	
10 PERCENT EXCEEDS	1,740		1,410		1,750	
50 PERCENT EXCEEDS	423		442		446	
90 PERCENT EXCEEDS	43		70		63	