



Figure 17. Location of surface-water stations in the Chambers Creek Basin.

## 12090400 NORTH FORK CLOVER CREEK NEAR PARKLAND, WA

LOCATION.--Lat 47°08'05", long 122°24'50", in SE $\frac{1}{4}$ NW $\frac{1}{4}$  sec.15, T.19 N., R.3 E., Pierce County, Hydrologic Unit 17110019, at Golden Given Avenue crossing, 1.5 mi southeast of Parkland.

DRAINAGE AREA.--6.25 mi<sup>2</sup>.

PERIOD OF RECORD.--Water years 1960-75 (annual maximum), November 1990 to September 1992, October 1994 to September 1997, October 1997 to April 1999 (seasonal records), October 1999 to current year.

REVISED RECORDS.--WDR WA-01-1: 1999(M).

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 315 ft above NGVD of 1929, from topographic map.

REMARKS.--Records fair, except for estimated daily discharges and those below 3 ft<sup>3</sup>/s, which are poor. Two flood control ponds (completed in 1999 and 2000, 228 acre-ft, total) upstream from station.

AVERAGE DISCHARGE.--9 years (water years 1992, 1995-97, 2000-04), 7.04 ft<sup>3</sup>/s, 15.31 in/yr, 5,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, not determined, Feb. 8, 1996, gage height, 12.81 ft from outside high-water mark, affected by backwater; minimum discharge, no flow for many days most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 103 ft<sup>3</sup>/s, Jan. 29, gage height, 6.93 ft; minimum discharge, no flow, on many days.

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	0.00	0.02	14	5.9	24	4.3	0.15	0.00	0.00	0.00	0.00	0.00
2	0.00	4.0	12	5.6	18	3.0	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	2.3	15	5.5	13	4.8	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.74	10	e4.7	12	5.0	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.15	20	e4.6	8.6	5.3	0.00	0.00	0.48	0.00	0.00	0.00
6	0.05	0.00	27	e5.4	8.2	4.6	0.00	0.00	0.19	0.00	0.04	0.00
7	0.00	0.00	20	e26	7.4	3.5	0.00	0.00	0.00	0.00	0.00	0.00
8	0.20	0.00	e15	47	5.3	2.7	0.00	0.09	0.00	0.00	0.00	0.00
9	0.01	0.00	e11	44	4.3	2.0	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	e16	40	3.5	1.4	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	e16	23	2.9	1.1	0.00	0.00	0.00	0.00	0.00	3.2
12	0.31	0.00	21	14	2.3	0.78	0.00	0.00	0.00	0.00	0.00	0.00
13	0.05	0.00	36	12	1.8	0.55	0.00	0.00	0.00	0.00	0.00	0.81
14	0.00	0.00	32	13	6.8	0.25	0.00	0.00	0.00	0.00	0.00	0.00
15	1.7	0.55	17	18	5.3	0.02	0.00	0.00	0.00	0.00	0.00	0.00
16	8.7	5.5	12	13	11	0.00	0.00	0.00	0.00	0.00	0.00	0.71
17	2.3	6.3	9.5	9.1	14	0.00	0.00	0.00	0.00	0.00	0.00	2.3
18	0.00	13	7.5	12	16	0.44	0.00	0.00	0.00	0.00	0.00	2.6
19	0.00	24	6.4	12	11	1.1	0.00	0.00	0.00	0.00	0.00	0.04
20	23	26	11	9.5	7.0	0.70	0.00	0.00	0.00	0.00	0.00	0.00
21	67	22	8.3	7.2	5.1	0.17	0.00	0.00	0.00	0.00	0.00	0.00
22	16	11	6.8	5.8	4.0	0.08	0.00	0.00	0.00	0.00	0.00	0.00
23	11	7.6	5.9	21	3.1	0.02	0.00	0.00	0.00	0.00	0.00	0.00
24	3.4	8.4	7.0	28	2.7	2.8	0.00	0.00	0.00	0.00	0.06	0.00
25	1.7	9.6	8.7	14	2.5	2.9	0.00	0.00	0.00	0.00	6.6	0.00
26	0.27	6.9	6.6	10	3.9	4.3	0.00	0.98	0.00	0.00	2.7	0.00
27	0.00	3.9	6.7	8.1	12	5.1	0.00	0.84	0.00	0.00	0.00	0.00
28	0.00	17	6.8	20	8.4	3.0	0.00	0.23	0.00	0.00	0.00	0.00
29	0.03	46	5.5	73	5.7	1.9	0.00	0.00	0.00	0.00	0.00	0.00
30	0.24	22	4.7	77	---	1.1	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	---	5.1	39	---	0.65	---	0.00	---	0.00	0.00	---
TOTAL	135.96	236.96	400.5	627.4	229.8	63.56	0.15	2.14	0.67	0.00	9.40	9.66
MEAN	4.39	7.90	12.9	20.2	7.92	2.05	0.01	0.07	0.02	0.00	0.30	0.32
MAX	67	46	36	77	24	5.3	0.15	0.98	0.48	0.00	6.6	3.2
MIN	0.00	0.00	4.7	4.6	1.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AC-FT	270	470	794	1,240	456	126	0.3	4.2	1.3	0.00	19	19
CFSM	0.70	1.26	2.07	3.24	1.27	0.33	0.00	0.01	0.00	0.00	0.05	0.05
IN.	0.81	1.41	2.38	3.73	1.37	0.38	0.00	0.01	0.00	0.00	0.06	0.06

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1991 - 2004, BY WATER YEAR (WY)

MEAN	1.34	9.99	18.4	20.3	17.7	12.2	8.69	2.00	0.69	0.08	0.09	0.13
MAX	4.39	20.6	40.3	42.2	41.9	23.2	27.8	5.41	3.01	0.23	0.42	0.40
(WY)	(2004)	(1996)	(1999)	(1997)	(1996)	(1997)	(1991)	(1996)	(2001)	(1995)	(2001)	(1997)
MIN	0.00	0.02	2.36	7.21	7.29	2.05	0.01	0.07	0.02	0.00	0.00	0.00
(WY)	(1995)	(2003)	(2003)	(2001)	(2001)	(2004)	(2004)	(2004)	(2004)	(1991)	(1996)	(2000)

## 12090400 NORTH FORK CLOVER CREEK NEAR PARKLAND, WA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1991 - 2004	
ANNUAL TOTAL	2,224.03		1,716.20		7.04	
ANNUAL MEAN	6.09		4.69		11.8	
HIGHEST ANNUAL MEAN					1997	
LOWEST ANNUAL MEAN					2003	
HIGHEST DAILY MEAN	95	Jan 31	77	Jan 30	400	Feb 8, 1996
LOWEST DAILY MEAN	0.00	Jan 20	0.00	Oct 1	0.00	May 23, 1991
ANNUAL SEVEN-DAY MINIMUM	0.00	May 18	0.00	Nov 6	0.00	Jun 2, 1991
ANNUAL RUNOFF (AC-FT)	4,410		3,400		5,100	
ANNUAL RUNOFF (CFSM)	0.975		0.750		1.13	
ANNUAL RUNOFF (INCHES)	13.24		10.21		15.31	
10 PERCENT EXCEEDS	18		14		19	
50 PERCENT EXCEEDS	0.46		0.00		0.75	
90 PERCENT EXCEEDS	0.00		0.00		0.00	

e Estimated

## CHAMBERS CREEK BASIN

12090500 CLOVER CREEK NEAR TILlicUM, WA

LOCATION.--Lat 47°08'46", long 122°30'33", in NW¼SE¼, sec.11, T.19 N., R.2 E., Pierce County, Hydrologic Unit 17110019, at Pacific Highway SW, in Lakewood, 2.5 mi northeast of Tillicum.

DRAINAGE AREA.--73.8 mi<sup>2</sup>.

PERIOD OF RECORD.--June 1949 to September 1954, October 1959 to September 1970 (annual maximums only), October 1990 to September 1992, October 1994 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 250 ft above NGVD of 1929, from topographic map. Prior to Oct. 22, 1999, at Bridgeport Way, 0.25 mi upstream, at various datums.

REMARKS.--Records fair, except for flows below 2 ft<sup>3</sup>/s and estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--17 years (water years 1950-54, 1991-92, 1995-2004), 41.7 ft<sup>3</sup>/s, 7.68 in/yr, 30,210 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 568 ft<sup>3</sup>/s, Feb. 12, 1991, gage height, 5.71 ft (datum then in use); no flow for many days in 1949, 1952-53, 2001-04.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 111 ft<sup>3</sup>/s, Jan. 31, gage height, 15.93 ft; minimum discharge, no flow on many days in October, August and September.

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	0.00	3.8	21	27	94	49	31	15	11	2.7	e0.40	e0.00
2	0.00	4.6	20	27	90	47	31	15	10	2.6	e0.30	e0.00
3	0.00	3.1	19	26	85	48	30	15	10	2.6	e0.19	e0.00
4	0.00	3.1	19	25	81	47	29	14	9.7	2.5	e0.10	e0.00
5	0.00	3.0	21	24	76	48	28	14	10	2.5	e0.00	e0.00
6	0.00	2.9	25	24	73	46	28	14	11	2.5	e3.5	e0.00
7	0.00	2.8	26	32	71	45	27	15	10	2.5	e1.1	e0.00
8	0.00	2.5	23	39	68	43	26	15	9.9	2.5	e0.01	e0.00
9	0.00	2.3	22	54	65	42	26	13	9.7	2.4	e0.00	e0.00
10	0.00	2.2	23	56	62	41	25	14	9.3	2.4	e0.00	e0.01
11	0.00	2.0	24	54	59	40	24	13	9.2	2.4	e0.00	e3.2
12	0.05	1.9	26	50	57	39	24	12	9.0	2.4	e0.00	e0.66
13	0.05	1.8	32	45	55	39	23	12	11	2.1	e0.00	e1.8
14	0.00	1.4	34	46	59	38	25	12	9.1	2.1	e0.00	e0.65
15	0.54	1.7	32	47	56	36	23	11	8.8	1.9	e0.00	e0.65
16	4.6	e5.3	30	45	60	35	24	11	7.9	1.8	e0.00	e1.6
17	0.00	e3.8	30	43	63	35	22	11	7.0	1.6	e0.00	e3.2
18	0.00	5.6	29	45	65	35	22	11	6.0	1.4	e0.00	e1.1
19	0.00	13	29	45	63	35	23	10	5.4	1.3	e0.00	e0.01
20	28	15	30	43	59	35	23	10	5.2	1.3	e0.00	e0.00
21	13	14	29	41	56	34	22	10	5.0	1.1	e0.04	e0.00
22	6.7	14	28	40	54	34	22	13	4.6	1.1	e1.3	e0.00
23	5.1	13	27	50	52	33	21	10	4.4	2.3	e0.00	e0.00
24	5.2	11	28	55	51	36	21	9.6	4.3	1.1	e0.00	e0.00
25	4.9	12	28	53	50	35	19	10	4.4	0.94	4.2	e0.00
26	4.8	10	28	49	51	35	19	13	4.3	0.79	1.5	e0.00
27	4.7	9.7	29	46	56	36	18	14	3.8	0.72	e0.01	e0.00
28	4.5	18	28	54	54	35	17	12	3.3	0.72	e0.00	e0.00
29	4.4	20	27	75	51	33	16	11	3.0	e0.70	e0.00	e0.00
30	4.2	22	26	97	---	33	15	12	2.9	e0.65	e0.00	e0.00
31	4.1	---	27	100	---	32	---	11	---	e0.61	e0.00	---
TOTAL	94.84	225.5	820	1,457	1,836	1,199	704	382.6	219.2	54.23	12.65	12.88
MEAN	3.06	7.52	26.5	47.0	63.3	38.7	23.5	12.3	7.31	1.75	0.41	0.43
MAX	28	22	34	100	94	49	31	15	11	2.7	4.2	3.2
MIN	0.00	1.4	19	24	50	32	15	9.6	2.9	0.61	0.00	0.00
AC-FT	188	447	1,630	2,890	3,640	2,380	1,400	759	435	108	25	26
CFSM	0.04	0.10	0.36	0.64	0.86	0.52	0.32	0.17	0.10	0.02	0.01	0.01
IN.	0.05	0.11	0.41	0.73	0.93	0.60	0.35	0.19	0.11	0.03	0.01	0.01

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1949 - 2004, BY WATER YEAR (WY)

MEAN	4.17	13.6	51.4	83.8	107	93.4	66.6	40.2	23.1	12.3	5.21	3.21
MAX	13.8	37.0	119	232	279	196	133	78.5	42.1	26.9	12.5	11.5
(WY)	(1998)	(1991)	(1951)	(1997)	(1951)	(1997)	(1991)	(1996)	(1996)	(1996)	(1996)	(1997)
MIN	0.00	0.00	0.00	13.4	14.8	15.3	22.8	12.3	7.31	1.75	0.41	0.00
(WY)	(1953)	(1953)	(1953)	(2001)	(2001)	(2001)	(2001)	(2004)	(2004)	(2004)	(2004)	(2003)

CHAMBERS CREEK BASIN

12090500 CLOVER CREEK NEAR TILlicUM, WA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1949 - 2004	
ANNUAL TOTAL	7,446.09		7,017.90			
ANNUAL MEAN	20.4		19.2		41.7	
HIGHEST ANNUAL MEAN					81.9	1997
LOWEST ANNUAL MEAN					9.72	2001
HIGHEST DAILY MEAN	72	Feb 1	100	Jan 31	532	Feb 12, 1951
LOWEST DAILY MEAN	0.00	Aug 22	0.00	Oct 1	0.00	Oct 20, 1949
ANNUAL SEVEN-DAY MINIMUM	0.00	Aug 22	0.00	Oct 1	0.00	Oct 20, 1949
ANNUAL RUNOFF (AC-FT)	14,770		13,920		30,210	
ANNUAL RUNOFF (CFSM)	0.276		0.260		0.565	
ANNUAL RUNOFF (INCHES)	3.75		3.54		7.68	
10 PERCENT EXCEEDS	46		51		110	
50 PERCENT EXCEEDS	17		11		21	
90 PERCENT EXCEEDS	0.00		0.00		1.3	

e Estimated

## 12091100 FLETT CREEK AT TACOMA, WA

LOCATION.--Lat 47°11'23", long 122°31'08", in NE $\frac{1}{4}$ SW $\frac{1}{4}$ , sec.26, T.20 N., R.2 E., Pierce County, Hydrologic Unit 17110019, on right bank upstream of 75th Street bridge, 0.6 mi upstream from mouth and 0.7 mi west of city limits of Tacoma.

DRAINAGE AREA.--7.33 mi<sup>2</sup>, excludes 0.68 mi<sup>2</sup> storm drainage diverted to Leach Creek basin but does not include some urban storm drainage diverted into the basin.

PERIOD OF RECORD.--June 1959 to September 1985, October 1985 to September 1996 (seasonal records). October 1996 to current year.

REVISED RECORDS.--WSP 1932: Drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 189.32 ft above NGVD of 1929 (levels by USGS National Mapping Division). Prior to Oct. 11, 2000, at same site and at datum 5.74 ft higher.

REMARKS.--Records fair, except for estimated daily discharges and discharges below 5.0 ft<sup>3</sup>/s, which are poor. Storm sewer drainage upstream from station. Several diversions for irrigation and industrial use. At times during winter months 1,000 gpm are pumped into creek for short intervals from Mountain View Memorial Park. Since October 1979, Flett Creek flood control retention ponds store and release flood water upstream from station. Chemical analyses October 1964 to September 1965.

AVERAGE DISCHARGE.--34 years (water years 1960-85, 1997-2004), 10.9 ft<sup>3</sup>/s, 7,890 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 203 ft<sup>3</sup>/s, Feb. 8, 1996, gage height, 3.08 ft, site and datum then in use, from rating curve extended above 115 ft<sup>3</sup>/s; minimum discharge, 0.09 ft<sup>3</sup>/s, Oct. 23-25, Nov. 11, 12, 1987, Sept. 5, 6, 9-15, 18, 2002.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 66 ft<sup>3</sup>/s, Jan. 30, gage height, 10.94 ft; minimum discharge, 0.16 ft<sup>3</sup>/s, July 19, 20, Aug. 28 to Sept. 10, but may have been less during period of missing record.

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	0.28	2.2	31	11	41	15	10	5.1	7.6	0.53	e0.17	0.19
2	0.28	4.2	22	11	39	14	9.3	4.7	7.8	0.46	e0.17	0.16
3	0.28	4.3	20	11	41	15	9.3	4.2	9.7	0.41	e0.18	0.16
4	0.28	2.2	18	9.5	33	17	9.0	3.9	6.8	0.39	e0.18	0.16
5	0.28	1.6	18	8.5	31	17	8.6	3.7	6.0	0.38	e0.20	0.16
6	0.50	1.5	22	8.7	23	17	8.6	3.3	5.8	0.34	e0.50	0.16
7	0.30	1.4	22	19	21	16	8.2	4.0	5.9	0.34	e0.80	0.17
8	0.46	1.2	21	40	17	15	8.2	6.4	5.7	0.30	e0.60	0.17
9	0.34	1.0	18	40	15	14	8.0	9.4	3.2	0.28	e0.40	0.17
10	0.34	1.2	15	26	14	13	7.4	7.7	3.7	0.27	e0.30	0.18
11	0.37	1.1	17	34	13	12	7.8	9.1	3.8	0.24	e0.28	1.6
12	0.68	0.84	18	20	13	12	7.7	7.7	3.9	0.24	e0.25	6.4
13	0.40	0.96	24	19	12	12	8.0	6.6	6.3	0.24	e0.25	8.6
14	0.39	0.67	37	21	18	12	8.2	5.7	6.7	0.24	e0.24	8.1
15	1.3	0.80	23	31	17	11	11	5.5	5.2	0.21	e0.24	5.4
16	3.0	1.5	22	20	19	11	8.7	5.3	4.0	0.20	e0.24	4.1
17	1.2	1.3	19	19	23	11	9.4	5.0	3.8	0.20	e0.25	8.9
18	0.40	2.9	14	19	23	12	8.2	5.2	3.4	0.20	0.24	14
19	0.62	38	12	20	22	14	8.8	4.5	2.7	0.17	0.24	15
20	10	38	14	17	21	11	11	4.2	1.9	e0.17	0.24	7.1
21	39	36	13	15	16	10	8.8	4.2	1.6	e0.18	0.67	3.1
22	57	25	12	13	14	11	7.9	4.5	1.4	e0.18	0.95	2.9
23	59	18	11	19	13	9.9	7.5	5.5	1.1	e0.17	0.25	2.9
24	48	18	12	23	13	13	6.7	4.7	0.94	e0.18	0.61	1.5
25	25	15	14	22	12	17	6.9	4.7	0.81	e0.19	1.9	1.6
26	18	12	12	22	14	18	6.6	8.2	0.68	e0.19	0.74	1.5
27	26	8.9	12	20	21	17	6.1	15	0.60	e0.18	0.21	0.87
28	12	12	13	19	21	16	5.8	19	0.56	e0.17	0.17	0.88
29	6.0	41	11	32	17	13	6.1	14	0.52	e0.17	0.16	0.59
30	4.2	28	9.7	58	---	13	5.7	11	0.46	e0.17	0.16	0.63
31	3.0	---	9.7	43	---	11	---	9.1	---	e0.17	0.16	---
TOTAL	318.90	320.77	536.4	690.7	597	419.9	243.5	211.1	112.57	7.76	11.95	97.35
MEAN	10.3	10.7	17.3	22.3	20.6	13.5	8.12	6.81	3.75	0.25	0.39	3.25
MAX	59	41	37	58	41	18	11	19	9.7	0.53	1.9	15
MIN	0.28	0.67	9.7	8.5	12	9.9	5.7	3.3	0.46	0.17	0.16	0.16
AC-FT	633	636	1,060	1,370	1,180	833	483	419	223	15	24	193

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 2004, BY WATER YEAR (WY)

MEAN	4.30	10.6	19.5	23.8	23.3	20.2	14.4	8.58	5.35	2.93	1.68	2.38
MAX	18.7	32.4	40.2	54.9	53.9	52.1	32.4	29.9	15.6	10.9	5.24	9.81
(WY)	(1998)	(1991)	(1999)	(1997)	(1999)	(1972)	(1991)	(1996)	(1997)	(1983)	(1983)	(1997)
MIN	0.13	1.39	3.14	1.93	1.69	5.81	2.96	2.39	0.45	0.25	0.18	0.14
(WY)	(1988)	(2003)	(1977)	(1977)	(1977)	(1962)	(1977)	(1977)	(2003)	(2003)	(2002)	(2002)

12091100 FLETT CREEK AT TACOMA, WA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1959 - 2004	
ANNUAL TOTAL	3,666.39		3,567.90			
ANNUAL MEAN	10.0		9.75		10.9	
HIGHEST ANNUAL MEAN					21.7	1997
LOWEST ANNUAL MEAN					2.87	1977
HIGHEST DAILY MEAN	59	Oct 23	59	Oct 23	138	Nov 15, 2001
LOWEST DAILY MEAN	0.15	Jul 12	0.16	Aug 29	0.09	Oct 24, 1987
ANNUAL SEVEN-DAY MINIMUM	0.17	Jul 6	0.16	Sep 2	0.10	Aug 29, 2002
ANNUAL RUNOFF (AC-FT)	7,270		7,080		7,890	
10 PERCENT EXCEEDS	26		22		26	
50 PERCENT EXCEEDS	6.3		7.4		6.5	
90 PERCENT EXCEEDS	0.24		0.21		0.95	

e Estimated

## CHAMBERS CREEK BASIN

12091200 LEACH CREEK NEAR FIRCREST, WA

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

DRAINAGE AREA.--4.73 mi<sup>2</sup> includes 0.68 mi<sup>2</sup> storm drainage from Flett Creek basin.

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

REVISED RECORDS.--WSP 1932: Drainage area.

GAGE.--Water-stage recorder, metal weir control, and crest-stage gage. Prior to Oct. 19, 1979, at site 20 ft downstream at same datum. Datum of gage is 222.98 ft above NGVD of 1929 (levels by U.S. Geological Survey National Mapping Division).

REMARKS.--No estimated daily discharges. Records fair except for flows below 3 ft<sup>3</sup>/s, which are poor. Since Oct. 1, 1961, flow may be regulated at dam upstream from station. Storage is not retained. Since early 1992 excess stormwater runoff pumped into Nalley Valley. Since June 30, 1993, low flows supplemented from well in basin. Drainage in basin influenced by urbanization. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--44 years (water years 1958-85, 1989-2004), 4.82 ft<sup>3</sup>/s, 13.84 in/yr, 3,490 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 417 ft<sup>3</sup>/s, Oct. 20, 2003, by computation of peak flow through culvert; maximum gage height, 7.52 ft, Oct. 20, from floodmark; minimum discharge, 0.1 ft<sup>3</sup>/s, Sept. 22, 1965.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 417 ft<sup>3</sup>/s, Oct. 20, by computation of peak flow through culvert; maximum gage height, 7.52 ft, Oct. 20, from floodmark; minimum discharge, 1.2 ft<sup>3</sup>/s, Nov. 12.

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	3.2	4.3	6.3	5.0	5.8	3.7	3.3	3.1	3.2	2.9	2.6	4.6
2	3.2	9.0	9.2	7.2	10	3.6	3.4	3.0	3.2	3.0	2.5	2.8
3	3.1	3.4	6.1	4.5	5.9	7.6	3.3	3.0	3.1	2.9	3.2	2.8
4	2.9	3.2	7.8	3.6	6.1	3.9	3.3	3.0	3.1	2.9	4.5	2.7
5	2.8	3.1	14	3.5	4.3	8.6	3.3	3.1	4.9	2.9	3.9	2.7
6	9.9	3.1	12	4.1	8.4	3.7	3.3	3.2	5.1	3.0	20	2.7
7	4.5	2.9	12	32	4.5	5.9	3.4	9.0	3.4	2.9	7.9	2.7
8	6.8	2.6	5.3	25	3.9	3.7	3.4	6.1	3.2	2.9	3.7	3.5
9	4.3	2.6	4.4	12	3.8	3.6	3.3	3.6	3.8	3.0	3.6	3.2
10	3.2	2.7	11	9.1	3.8	3.5	3.3	6.1	3.4	2.9	3.6	3.1
11	5.1	2.0	7.7	5.1	3.6	3.5	3.3	5.4	2.5	2.9	3.6	20
12	12	2.5	20	7.3	3.6	3.5	3.3	3.5	3.4	2.9	3.5	10
13	3.3	3.3	20	5.3	4.0	3.5	3.5	3.3	7.4	3.0	3.0	12
14	3.0	3.3	10	16	15	3.4	5.5	3.3	2.9	3.2	2.6	3.5
15	19	6.1	4.8	7.1	6.8	3.4	3.4	3.3	3.2	2.9	2.6	9.7
16	31	14	6.1	4.6	15	3.4	4.1	3.1	3.2	2.9	2.6	4.2
17	17	13	4.1	4.2	6.9	3.4	3.3	3.1	3.1	2.8	2.6	13
18	3.7	35	3.9	11	6.6	5.4	3.5	3.1	3.1	2.9	2.6	7.0
19	6.5	28	4.9	4.7	4.1	3.9	5.4	3.2	3.1	2.9	2.6	3.5
20	112	21	7.1	3.9	3.8	3.4	4.6	3.1	3.1	2.8	2.5	3.0
21	52	5.2	4.3	3.7	3.8	3.4	3.7	3.2	3.1	2.9	7.6	2.7
22	12	4.2	4.0	4.3	3.7	3.4	3.3	4.5	3.1	2.8	9.7	4.2
23	4.9	9.6	3.8	20	4.0	3.4	3.3	3.3	3.0	2.8	2.7	3.0
24	3.7	4.8	14	6.8	3.6	11	3.2	3.3	3.0	3.1	15	2.9
25	3.4	9.7	4.9	5.4	5.3	11	3.2	5.4	3.0	3.2	20	2.9
26	3.3	4.2	3.8	4.7	10	6.1	3.2	12	3.0	3.1	8.7	2.9
27	3.2	3.8	7.5	4.1	12	5.5	3.2	22	3.0	2.8	3.1	2.9
28	3.0	32	4.2	18	4.2	3.6	3.3	5.6	2.9	2.8	2.8	2.9
29	3.5	19	3.7	35	3.8	3.5	3.1	3.5	3.0	2.8	2.7	2.9
30	3.0	5.3	3.6	21	---	3.9	3.1	5.5	2.9	2.8	2.8	2.9
31	3.1	---	7.7	14	---	3.4	---	3.3	---	2.6	2.8	---
TOTAL	351.6	262.9	238.2	312.2	176.3	142.8	105.8	149.2	101.4	90.2	161.6	146.9
MEAN	11.3	8.76	7.68	10.1	6.08	4.61	3.53	4.81	3.38	2.91	5.21	4.90
MAX	112	35	20	35	15	11	5.5	22	7.4	3.2	20	20
MIN	2.8	2.0	3.6	3.5	3.6	3.4	3.1	3.0	2.5	2.6	2.5	2.7
AC-FT	697	521	472	619	350	283	210	296	201	179	321	291
CFSM	2.40	1.85	1.62	2.13	1.29	0.97	0.75	1.02	0.71	0.62	1.10	1.04
IN.	2.77	2.07	1.87	2.46	1.39	1.12	0.83	1.17	0.80	0.71	1.27	1.16

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1957 - 2004, BY WATER YEAR (WY)

MEAN	4.33	7.31	7.79	8.01	6.72	5.60	4.33	3.18	2.99	2.39	2.58	2.97
MAX	11.3	16.8	15.5	16.3	15.1	12.4	10.3	5.73	5.30	4.58	5.21	6.92
(WY)	(2004)	(1991)	(1997)	(1990)	(1999)	(1972)	(1991)	(1997)	(1997)	(1983)	(2004)	(1978)
MIN	1.57	2.53	3.54	2.80	1.72	2.22	2.09	1.72	1.40	1.33	1.12	1.24
(WY)	(1973)	(1977)	(1977)	(1962)	(1993)	(1992)	(1977)	(1965)	(1969)	(1969)	(1969)	(1989)



12091200 LEACH CREEK NEAR FIRCREST, WA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1957 - 2004	
ANNUAL TOTAL	2,455.1		2,239.1			
ANNUAL MEAN	6.73		6.12		4.82	
HIGHEST ANNUAL MEAN					8.15 1997	
LOWEST ANNUAL MEAN					2.61 1962	
HIGHEST DAILY MEAN	112	Oct 20	112	Oct 20	166	Jan 9, 1990
LOWEST DAILY MEAN	1.8	Jan 19	2.0	Nov 11	0.50	Sep 1, 1972
ANNUAL SEVEN-DAY MINIMUM	2.6	Nov 6	2.6	Aug 14	0.71	Aug 30, 1972
ANNUAL RUNOFF (AC-FT)	4,870		4,440		3,490	
ANNUAL RUNOFF (CFSM)	1.42		1.29		1.02	
ANNUAL RUNOFF (INCHES)	19.31		17.61		13.84	
10 PERCENT EXCEEDS	14		12		10	
50 PERCENT EXCEEDS	3.9		3.5		2.7	
90 PERCENT EXCEEDS	3.1		2.8		1.5	

## CHAMBERS CREEK BASIN

12091300 LEACH CREEK NEAR STEILACOOM, WA

LOCATION.--Lat 47°11'54", long 122°31'17", in NW<sup>1</sup>/<sub>4</sub>NW<sup>1</sup>/<sub>4</sub>, sec.26, T.20 N., R.2 E., Pierce County, Hydrologic Unit 17110019, on right bank 0.3 mi upstream from mouth, and 4.1 mi northeast of Steilacoom.

DRAINAGE AREA.--6.56 mi<sup>2</sup>, includes 0.68 mi<sup>2</sup> storm drainage from Flett Creek basin. Drainage area used prior to July 1967, 5.88 mi<sup>2</sup>.

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

REVISED RECORDS.--WSP 1932: Drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 140 ft above NGVD of 1929. Prior to June 27, 1973, water-stage recorder at site 150 ft upstream at different datum. Supplementary water-stage recorder at site 50 ft downstream at different datum used Feb. 4, 1963, to Feb. 27, 1964. June 27, 1973, to Mar. 14, 1975, nonrecording gage at site 350 ft upstream at different datum.

REMARKS.--Records fair, except for estimated daily discharges, which are poor. Some pumping for community use upstream from gage. Since Oct. 1, 1961, flow may be regulated at flood control dam upstream from gage. Since early 1992 excess stormwater runoff pumped into Nalley Valley. Since June 30, 1993, low flows supplemented from well in basin. Drainage in basin influenced by urbanization. Chemical analyses October 1962 to September 1965, October 1975 to September 1976. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--40 years (water years 1958-85, 1993-2004), 10.9 ft<sup>3</sup>/s, 7,920 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum recorded discharge, 378 ft<sup>3</sup>/s, Jan. 18, 1986, by culvert computation of peak flow through culvert, gage height, 5.21 ft, from outside high-water mark; minimum discharge, 2.0 ft<sup>3</sup>/s, July 3, 1961.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 292 ft<sup>3</sup>/s, Oct. 21, gage height, 4.73 ft; minimum discharge, 6.5 ft<sup>3</sup>/s, June 11.

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	7.1	12	e13	e14	21	9.6	9.1	7.9	8.1	7.3	7.1	8.6
2	7.1	24	e13	e14	22	9.3	8.8	7.8	8.1	7.3	7.1	7.4
3	7.2	13	e23	e11	13	15	9.0	7.8	7.9	7.3	7.2	7.1
4	7.3	12	e12	e9.3	15	10	8.8	7.7	7.8	7.3	8.1	7.1
5	7.2	12	e36	e9.5	11	16	8.7	7.6	8.9	7.3	8.0	7.0
6	9.1	12	e34	e9.3	15	9.8	8.6	7.7	8.7	7.3	20	6.9
7	13	12	e22	52	13	12	8.6	11	9.2	7.3	19	6.9
8	10	12	e21	55	10	9.8	8.5	13	7.6	7.3	8.5	7.0
9	8.3	12	e15	32	10	9.5	8.5	9.3	8.1	7.3	8.0	7.6
10	7.2	13	e25	24	9.9	9.2	8.4	8.3	7.7	7.3	7.9	6.9
11	8.0	13	e20	e15	9.9	9.0	8.4	13	7.1	7.3	7.8	32
12	16	11	e47	e14	9.5	8.9	8.4	8.5	7.3	7.3	7.7	17
13	7.4	13	e45	e18	9.4	8.8	8.5	8.2	12	7.4	7.5	20
14	6.8	13	e30	e24	25	8.8	11	8.1	7.5	7.3	7.0	8.7
15	22	15	e16	e25	14	8.8	9.1	7.9	7.3	7.5	6.9	14
16	46	30	e15	e13	28	8.8	9.6	7.8	7.3	7.4	6.9	8.7
17	26	22	e13	e12	15	8.8	8.6	7.7	7.3	7.3	6.9	14
18	9.6	e74	e11	20	15	12	8.3	7.7	7.2	7.3	6.9	16
19	12	e68	e10	e14	10	e10	9.2	7.7	7.1	7.4	7.0	9.2
20	88	e46	e17	e12	9.7	e9.8	12	7.6	7.1	7.3	7.0	8.1
21	e108	e19	e11	e9.9	9.5	e9.6	8.9	7.7	7.2	7.5	8.4	7.8
22	e33	e13	e11	e9.5	9.4	e9.7	8.4	9.0	7.1	7.4	19	8.3
23	e26	e14	e9.9	e33	9.6	e9.7	8.4	8.0	7.1	7.3	7.4	8.1
24	e15	e21	e18	e23	9.1	e18	8.3	7.8	7.1	7.3	19	7.5
25	e14	e21	e20	e12	11	17	8.2	8.2	7.2	7.4	36	7.3
26	e15	e13	e12	e11	17	17	8.1	21	7.1	7.4	15	7.3
27	e13	e11	e17	e11	25	14	8.1	31	7.1	7.3	8.7	7.3
28	13	e48	e15	34	11	9.3	8.1	17	7.2	7.1	8.0	7.3
29	12	e54	e11	71	9.9	9.2	8.0	8.3	7.3	7.1	7.8	7.1
30	12	e16	e11	58	---	9.6	7.9	9.8	7.3	7.1	7.7	7.1
31	11	---	e14	22	---	9.0	---	8.5	---	7.1	7.6	---
TOTAL	597.3	669	587.9	691.5	396.9	336.0	262.5	308.6	231.0	226.5	317.1	295.3
MEAN	19.3	22.3	19.0	22.3	13.7	10.8	8.75	9.95	7.70	7.31	10.2	9.84
MAX	108	74	47	71	28	18	12	31	12	7.5	36	32
MIN	6.8	11	9.9	9.3	9.1	8.8	7.9	7.6	7.1	7.1	6.9	6.9
AC-FT	1,180	1,330	1,170	1,370	787	666	521	612	458	449	629	586

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1957 - 2004, BY WATER YEAR (WY)

MEAN	9.98	14.4	15.2	16.5	14.8	12.6	10.9	9.03	8.14	7.11	7.23	7.94
MAX	19.3	28.9	28.7	34.4	28.1	25.2	23.0	18.3	14.5	10.6	10.2	13.7
(WY)	(2004)	(1991)	(1997)	(1990)	(1974)	(1972)	(1991)	(1984)	(1984)	(1983)	(2004)	(1997)
MIN	5.96	7.30	8.64	6.87	6.66	5.12	6.36	5.78	5.23	5.04	4.40	5.19
(WY)	(1988)	(1970)	(1977)	(1985)	(1973)	(1973)	(1973)	(1971)	(1969)	(1973)	(1969)	(1974)

## 12091300 LEACH CREEK NEAR STEILACOOM, WA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1957 - 2004	
ANNUAL TOTAL	4,872.6		4,919.6			
ANNUAL MEAN	13.3		13.4		10.9	
HIGHEST ANNUAL MEAN					15.2 1997	
LOWEST ANNUAL MEAN					7.50 1962	
HIGHEST DAILY MEAN	108	Oct 21	108	Oct 21	250	Nov 24, 1990
LOWEST DAILY MEAN	6.8	Sep 25	6.8	Oct 14	3.6	Aug 25, 1971
ANNUAL SEVEN-DAY MINIMUM	7.0	Sep 21	6.9	Aug 14	3.8	Aug 24, 1971
ANNUAL RUNOFF (AC-FT)	9,660		9,760		7,920	
10 PERCENT EXCEEDS	25		23		19	
50 PERCENT EXCEEDS	8.8		9.3		8.2	
90 PERCENT EXCEEDS	7.2		7.2		5.8	

e Estimated

## 12091500 CHAMBERS CREEK BELOW LEACH CREEK, NEAR STEILACOOM, WA

LOCATION.--Lat 47°11'52", long 122°31'39", in NE $\frac{1}{4}$ NE $\frac{1}{4}$ , sec.27, T.20 N., R.2 E., Pierce County, Hydrologic Unit 17110019, on right bank 200 ft downstream from Leach Creek, 1.5 mi downstream from outlet of Steilacoom Lake, and 4 mi northeast of Steilacoom.

DRAINAGE AREA.--104 mi<sup>2</sup>.

PERIOD OF RECORD.--December 1937 to September 1940, July 1943 to September 1965, October 1997 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 100 ft above NGVD of 1929, from topographic map. Prior to October 1997, at several sites within 0.10 mi downstream from present site at various datums.

REMARKS.--Records fair, except estimated daily discharges and May 25 to July 22, which are poor. Some diversions from tributaries for domestic use. Flow partially regulated at Steilacoom Lake and in Leach Creek Basin, see remarks for station 12091300.

AVERAGE DISCHARGE.--31 years (water years 1939-40, 1944-65, 1998-2004), 110 ft<sup>3</sup>/s, 79,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 792 ft<sup>3</sup>/s, Jan. 5, 1956, gage height, 3.58 ft, site and datum then in use; minimum discharge, 14 ft<sup>3</sup>/s, Aug. 15-17, 1965.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 445 ft<sup>3</sup>/s, Oct. 21, gage height, 3.70 ft; minimum daily discharge, 30 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	e32	84	118	125	221	e122	e80	50	54	37	32	34
2	e36	100	114	128	218	e118	e79	54	54	37	32	32
3	e35	87	116	124	211	e125	e76	59	55	36	32	32
4	e36	83	110	120	204	e120	e74	59	52	37	34	32
5	e36	81	128	117	194	e127	e70	e58	53	36	33	32
6	e37	80	131	119	188	e119	e69	e59	53	37	46	31
7	e41	79	127	170	181	e119	e68	65	52	36	42	31
8	e37	78	124	190	174	e114	e65	70	51	36	33	32
9	e37	77	117	182	170	e111	e63	68	51	36	32	32
10	e37	78	123	174	166	e110	e62	67	51	36	32	32
11	e36	79	121	181	162	e108	e61	73	49	36	32	54
12	e46	76	144	168	157	e106	e61	65	48	35	32	43
13	e36	78	154	164	154	e107	e64	63	54	37	31	48
14	e35	77	157	174	173	e105	e65	61	50	37	31	38
15	e51	82	137	188	163	e103	e65	60	48	37	31	43
16	e81	104	138	170	172	e102	e65	60	45	36	31	36
17	e57	91	132	167	169	e102	e61	59	44	36	31	47
18	e38	141	125	176	169	e106	e59	59	44	35	31	49
19	e41	186	122	170	164	e106	e63	58	41	36	31	44
20	e163	175	131	161	159	e103	e67	57	40	35	30	37
21	e200	122	126	157	153	e102	e61	57	40	e34	34	33
22	e152	108	123	154	147	e102	e58	59	40	e33	42	35
23	e143	103	121	183	145	e100	e57	58	39	33	31	34
24	e125	89	134	181	142	e112	e56	58	37	33	42	33
25	102	86	133	170	142	e115	e54	56	37	34	60	33
26	93	77	123	170	148	e117	e52	e81	37	35	42	33
27	100	72	129	165	e170	e115	e50	e97	37	34	34	33
28	93	124	127	182	e134	e108	50	69	36	33	33	32
29	89	155	122	225	e126	e90	50	60	36	32	32	32
30	88	116	120	255	---	e84	50	58	37	32	32	32
31	85	---	126	226	---	e85	---	55	---	32	32	---
TOTAL	2,218	2,968	3,953	5,236	4,876	3,363	1,875	1,932	1,365	1,089	1,073	1,089
MEAN	71.5	98.9	128	169	168	108	62.5	62.3	45.5	35.1	34.6	36.3
MAX	200	186	157	255	221	127	80	97	55	37	60	54
MIN	32	72	110	117	126	84	50	50	36	32	30	31
AC-FT	4,400	5,890	7,840	10,390	9,670	6,670	3,720	3,830	2,710	2,160	2,130	2,160
CFSM	0.69	0.95	1.23	1.62	1.62	1.04	0.60	0.60	0.44	0.34	0.33	0.35
IN.	0.79	1.06	1.41	1.87	1.74	1.20	0.67	0.69	0.49	0.39	0.38	0.39

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1938 - 2004, BY WATER YEAR (WY)

	54.8	71.5	127	182	209	195	149	114	82.6	59.6	48.0	46.1
MEAN	54.8	71.5	127	182	209	195	149	114	82.6	59.6	48.0	46.1
MAX	96.9	111	357	496	499	448	270	201	126	101	94.6	79.7
(WY)	(1998)	(1998)	(1956)	(1956)	(1951)	(1950)	(1950)	(1948)	(1948)	(1948)	(1948)	(1948)
MIN	36.0	37.4	40.5	43.7	72.1	73.2	62.5	60.4	45.5	35.1	30.9	31.9
(WY)	(1953)	(2003)	(1945)	(1945)	(2001)	(2001)	(2004)	(1944)	(2004)	(2004)	(2003)	(2003)

## 12091500 CHAMBERS CREEK BELOW LEACH CREEK, NEAR STEILACOOM, WA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1938 - 2004	
ANNUAL TOTAL	29,690		31,037		110	
ANNUAL MEAN	81.3		84.8		184	
HIGHEST ANNUAL MEAN					1951	
LOWEST ANNUAL MEAN					1944	
HIGHEST DAILY MEAN	200	Oct 21	255	Jan 30	650	Feb 13, 1951
LOWEST DAILY MEAN	29	Sep 6	30	Aug 20	14	Aug 16, 1965
ANNUAL SEVEN-DAY MINIMUM	30	Aug 31	31	Aug 14	26	Aug 13, 1965
ANNUAL RUNOFF (AC-FT)	58,890		61,560		79,600	
ANNUAL RUNOFF (CFSM)	0.782		0.815		1.06	
ANNUAL RUNOFF (INCHES)	10.62		11.10		14.35	
10 PERCENT EXCEEDS	130		167		216	
50 PERCENT EXCEEDS	85		65		83	
90 PERCENT EXCEEDS	31		33		40	

e Estimated