

FRENCH CREEK

**HOPKINS DITCH DIVERSION
PENROSE DITCH DIVERSION & PENROSE-JOHNSON DITCH DIVERSION**

FRENCH CREEK DRAINAGE INTRODUCTION

BACKGROUND

French Creek flows out of the east slope of the Bighorn Mountains between the tributaries of Rock and Clear creeks before becoming a tributary of Clear Creek. Clear Creek eventually joins the Powder River, which runs north to cross the Montana state line north of Spotted Horse, Wyoming. French Creek is fed in part by the Four Lakes & French Creek Ditch, which routes water from the North Fork of Clear Creek into upper French Creek. In turn, the Penrose Ditch diverts a supplementary supply from French Creek into Rock Creek to be used there.

CHARACTERISTICS

Compared to most of the other tributaries of Clear Creek and other east-slope drainages, French Creek has relatively small diversions. Because it goes through such steep descents in its passage, even the broken geology it crosses doesn't cause it to have the magnitude of losses found in streams meandering in the Powder River Basin. Water commissioners estimate French Creek's instream losses to be approximately 10 percent at the maximum.

French Creek does not play a significant part in returning flow to Clear Creek. Water commissioners and irrigators are careful to divert the entirety of the stream upstream of its confluence with Clear Creek.

USAGE

French Creek's diversions are entirely devoted to agricultural irrigation.

Regulation

Water commissioners estimate that regulation is imposed on French Creek drainage diversions with the following timing:

Wet Year	Average Year	Dry Year
None or last of August	2nd week of July	2nd week of June

Agriculture

Growers in the French Creek drainage tend to devote approximately 60 percent of their lands to alfalfa and 40 percent to grass hay. To deliver water from their diversions, they have the following irrigation practices:

Percentage of land served by irrigation practices		
Flood	Gated Pipe	Sprinklers
45	40	15

The typical irrigation season runs from April 15-May 1 (depending on whether the spring runoff is delayed by colder weather) to mid/early October (depending on when the first snows fall and the ground freezes). Approximately 10 percent of the irrigators using French Creek water (the biggest users) practice post-season irrigation, though they usually do not use their entire right to do so.

Shrinkage

Irrigators on Johnson Creek who receive water from the Four Lakes ditch via French Creek and Penrose Ditch are charged "shrinkage" (instream loss) on the reservoir water they use based on the following:

Type of water year	Shrinkage (% of flow or volume)
Wet	10
Average	30
Dry	50

Double Appropriation

Irrigation water rights with priority dates of March 1, 1945 or earlier are entitled to an additional 1cfs per 70 acres under Wyoming's surplus water statutes. Whenever the supply in a stream exceeds the amount required to satisfy all existing appropriations established prior to March 1, 1985, the stream is said to be in an excess flow condition and water right holders with priorities between March 2, 1945 and March 1, 1985 may use an additional 1 cfs for each 70 acres irrigated.

In French Creek, this practice is limited primarily by the condition of ditches that follow the diversions from the creek. Many of the ditches are not capable of carrying all of the water an irrigator could use.

% of appropriation	% of ditches in drainage capable of flow
200	20
150	60
100-150	90
0-100	90

Permitted Uses

Permits granted for water appropriation are granted for specific uses. The following pages contain tables of permits and their associated uses. The following table provides a key to those uses:

Code	Use
Chem	Chemical
Com	Commercial
Cul	Culinary
D	Domestic
Drl	Drilling
Eng	Steam Engines
Fire	Fire Protection
Fish	Fish Propagation
F.C.	Flood Control
I	Irrigation
Ind	Industrial
I.F.	Instream Flow
Mech	Mechanical
Mfg	Manufacturing
Mil	Milling

Code	Use
Min	Mining
Misc	Miscellaneous
Mun	Municipal
Oil	Oil Refining or Production
P.C.	Pollution Control
Power	Power Development
R.R.	Railroad
Rec	Recreational
Ref	Refining
Res. Supply	Supply Facility for a Reservoir
S	Stock
T	Transportation

WATER RIGHTS

Two water rights summary tables are provided for each diversion serving irrigation referenced here. The first, included in the body of the diversion synopsis, refers to the rights on record with the State Engineer's Office and is derived from that office's *Tabulation of Adjudicated Surface Water Rights of the State of Wyoming, Water Division Number Two* (Oct. 1999).

Because this rights summary is pulled directly from the SEO *Tab*, the rights cited follow the SEO's priority order:

Hierarchy	Format of right	Example
1	Day, Month, Year	05-15-1884
2	Month and Year	05-00-1884
3	Specified Season and Year	Spring 1884
4	Year Only	1884
5	Before Year	Before 1884

Board orders or court orders may also establish a specific priority.

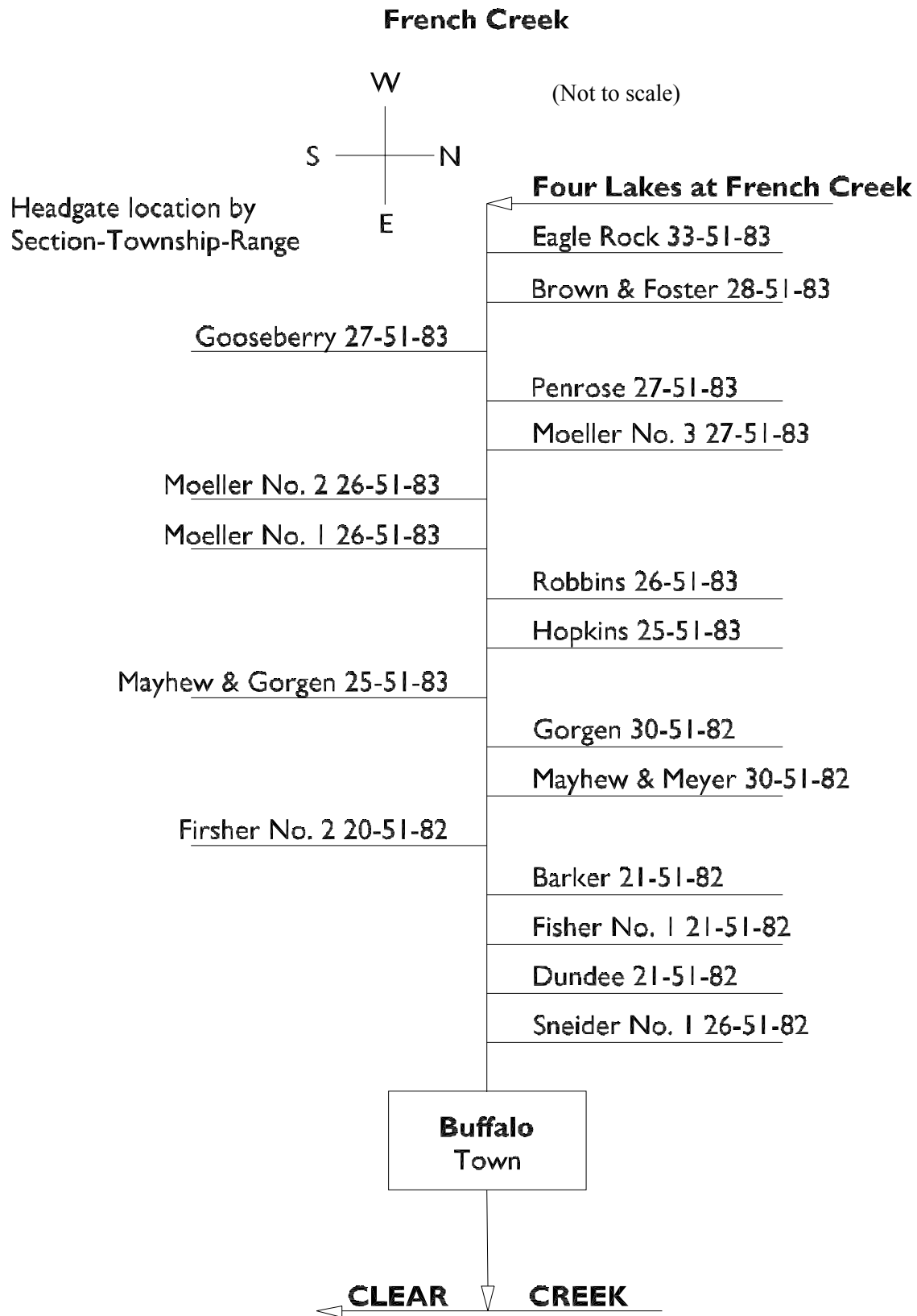
Irrigated Lands Water Rights Database

The second table, which follows the diversion synopsis, is taken from the irrigated lands water rights database developed for the basin plan. It can be used as a reference with the following caveats: It only lists water rights associated with the irrigated lands polygons mapped by HKM. The table does not include nonirrigation rights devoted to reservoir supply, municipal, fish propagation, etc. The rights on this table are associated only with those irrigated lands identified through the course of this study, both actively irrigated and currently idle.

Column Heading Key

PerNo	Permit Number	“Terr” denotes a territorial right.
PerSfx	Permit Suffix	D = direct flow E = enlargement R = reservoir
Facility Name		Parentheses denote the former means of conveyance for the water right.
Unit	Flow or volume	CFS = cubic feet per second AF = acre-feet GPM = gallons per minute
SupTyp	Supply Type	OS = original supply SS = supplement supply, for lands having an original supply from another source Sec = secondary supply, for water stored in a reservoir
Status	Status of adjudication	Adj = adjudicated Una = unadjudicated
Source	Source water	Parentheses denote the permit number of the related storage right.

Schematic of French Creek stream and diversions:



KEY DIVERSIONS

Diversion: **HOPKINS DITCH DIVERSION**
AKA: Hopkins (on French Creek)

Date: 18 Oct. 2000

Diversion Description: The Hopkins Ditch headgate consists of a single, 5 x 3.5-foot rectangular steel gate in steel slider, raised/lowered by a Waterman-type screw mounted in a concrete headwall penetrated with 12 feet of five-foot-wide oval corrugated metal pipe.



Hopkins Ditch headgate

Diversion Location: The Hopkins Ditch diversion on French Creek is located on the main stem of French Creek.

Headgate:

Lat. Long.
N 44° 21' 59" W 106° 47' 14"

Flume:

Lat. Long.
N 44° 21' 59" W 107° 47' 12"



Hopkins Ditch flume

Conveyance Description: Open channel canal, approximately 2.5 mi. long.

Direct Flow Water Rights: A summary of the direct-flow rights is shown below:

Permit	Priority Date	Permitted Use	Acres	Flow (cfs)	Cumulative (cfs)
Terr.	06-01-1884	I	1101.2	15.73	15.73
5283E	01-05-1931	I	19.1	0.27	16.0

Note:

- “Terr.” permits date from before Wyoming became a state and before a numerical system for the permits had been established.
- The Territorial permit cited here is diverted from the North Fork of Clear Creek through the Four Lakes-French Creek Ditch. Original right is for a total of 15.73 cfs, but subsequent subdivision has reduced the diversion the State Engineer’s Office allows to 10.43 cfs.

Associated Storage Rights: None

Irrigation Practices: See introduction to French Creek drainage

Agricultural Practices: See introduction to French Creek drainage

Return Flows: Estimated percentage of total diversion developing into return flows:

Destination	Wet Yr.	Avg. Yr.	Dry Yr.
French Creek	2.5	2.5	0

Losses: Typical (10 percent) by the end of the ditch

References: Dave Pelloux, water commissioner, State Engineer's Office, interview, 18 Oct. 2000

Irrigated Lands Water Rights Database

PerNo	PerSfx	Facility Name	Priority	Acres	Amount	Unit	SupTyp	Status	Source
5306	E	Enl. Hopkins	Jan. 2, 1931	3	0.04	CFS	OS	Una	French Creek
5283	E	Enl. Hopkins	Jan. 5, 1931	19.1	0.27	CFS	OS	Adj	French Creek
5283	E	Enl. Hopkins	Jan. 5, 1931	622.1	0		SS	Adj	French Creek
5284	E	Enl. Hopkins	April 24, 1935	104.67	0		SS	Adj	French Creek

Name Hopkins Ditch Diversion													
Source French Creek													
District 3													
Data Total monthly flow in AF													
Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
1970													
1971													
1972													
1973													
1974								161.41	721.11	465.04	0.00	0.00	1347.56
1975													
1976													
1977													
1978													
1979													
1980													
1981								369.95	686.70	451.63	315.72	37.27	1861.27
1982								185.70	741.75	783.87	567.64	64.50	2343.46
1983								80.93	743.90	751.95	562.58	256.04	2395.40
1984								0.00	774.68	845.79	557.81	88.40	2266.68
1985													
1986								0.00	909.70	683.51	232.88	0.00	1826.09
1987								0.00	839.94	819.74	468.71	104.43	2232.82
1988								68.17	735.79	257.78	0.00	0.00	1061.74
1989								220.43	363.72	0.00	0.00	0.00	584.15
1990								207.73	710.68	809.48	524.93	102.23	2355.05
1991								266.31	994.56	602.05	157.42	0.00	2020.34
1992								0.00	0.00	58.81	421.23	323.05	803.09
1993								164.78	659.51	665.43	409.48	229.55	2128.75
1994								291.50	628.38	503.38	286.58	0.00	1709.84
1995								57.67	642.07	360.38	286.77	0.00	1346.89
1996								25.31	1033.24	541.06	130.63	139.03	1869.27
1997								180.15	951.11	613.89	68.59	0.00	1813.74
1998								0.00	793.89	763.97	634.48	324.41	2516.75
1999								0.00	805.39	676.23	305.29	42.64	1829.55
Mean								120.00	722.95	560.74	312.14	90.08	1805.92
Max								369.95	1033.24	845.79	634.48	324.41	2516.75
Min								0.00	0.00	0.00	0.00	0.00	584.15

- Notes: 1. Monthly data is derived from spot measurements in the Hydrographers' Annual Reports for years 1980 and later, and from WRDS for years prior to 1980
2. Zero flow is assumed prior to the first and after the last measurement

Water Year	First Date of Measurement	Last Date of Measurement	Maximum Days Missing
1970			
1971			
1972			
1973			
1974	10-May	28-Jul	0
1975			
1976			
1977			
1978			
1979			
1980			
1981	15-May	6-Sep	34
1982	14-May	6-Sep	13
1983	28-May	23-Sep	26
1984	4-Jun	7-Sep	11
1985			
1986	3-Jun	27-Aug	9
1987	4-Jun	13-Sep	6
1988	28-May	19-Jul	4
1989	15-May	16-Jun	9
1990	23-May	10-Sep	14
1991	21-May	19-Aug	8
1992	29-Jul	29-Sep	13
1993	25-May	29-Sep	16
1994	19-May	30-Aug	49
1995	23-May	23-Aug	17
1996	31-May	18-Sep	31
1997	23-May	19-Aug	22
1998	2-Jun	24-Sep	15
1999	8-Jun	10-Sep	11
Avg.	28-May	30-Aug	16
Earliest	10-May	16-Jun	0
Latest	29-Jul	29-Sep	49

Notes: 1. Data is from Hydrographers' Annual Reports for years 1980 and later, and from WRDS for years prior to 1980.

KEY DIVERSIONS

Diversion: **PENROSE DITCH DIVERSION and
PENROSE-JOHNSON DITCH DIVERSION**
AKA: Penrose (on Johnson Creek)

Date: 18 Oct. 2000

Note: Two headgates divert for this ditch. The first diverts from French Creek to bring water to Johnson Creek, where the majority of the water is used. The second diverts water out of Johnson Creek.

Diversion Description: The French Creek headgate consists of a single, 3.4 x 1.8-foot round steel gate in steel slider raised/lowered by a Waterman-type screw mounted in a concrete headwall, all in good condition.



Penrose Ditch at French Creek headgate

The Johnson Creek headgate consists of a single, 3.5-foot round steel gate in steel slider raised/lowered by a Waterman-type screw mounted in a concrete wall, all in good condition.

Diversion Location: The Penrose Ditch diversion on French Creek is located on the main stem of French Creek and diverts Four Lakes Ditch water to Johnson Creek (a tributary of Rock Creek), where it is diverted by the second headgate.



Penrose Ditch at Johnson Creek headgate

French Creek Headgate:

Lat. Long.
N 44° 21' 27.9" W 106° 50' 6.4"

Flume:

Lat. Long.
N 44° 21' 30.5" W 106° 50' 2.4"



Penrose Ditch at French Creek flume

Johnson Creek Headgate:

Lat. Long.
N 44° 22' 38.4" W 106° 49' 26.4"

Flume:

Lat. Long.
N 44° 22' 38.4" W 106° 49' 26.6"



Penrose Ditch at Johnson Creek flume

Conveyance Description: Open channel canal, approximately 4.7 mi. long.

Direct Flow Water Rights: Because the Penrose is a means of conveyance for North Fork of Clear Creek water to get to irrigators on Johnson Creek for original and supplemental supplies, the direct-flow rights in Penrose are officially 0

cfs. But because Johnson Creek’s direct flow is notoriously poor, this supplemental supply is put to use for most of the season. As a result, the flow for Penrose can reasonably be calculated using the Wyoming State Engineer’s Office baseline allocation:

$$1 \text{ cfs}/70 \text{ acres} * 633.93 \text{ acres} = 9.06 \text{ cfs}$$

Note that this figure is subject to the shrinkage factors cited in the *Storage* section of the French Creek summary above. As a result, an average-year flow would be reduced by 30 percent to 6.34 cfs.

The direct-flow rights summary follows:

Permit	Priority Date	Permitted Use	Acres	Flow (cfs)	Cumulative (cfs)
17927	01-31-1931	I	134	0 (SS)	0
17927	01-31-1931	I	165.47	0 (SS)	0
17927	01-31-1931	I	334.46	0 (SS)	0

Note: Permit No. 17927 is designated supplemental supply only.

Associated Storage Rights:

None

Irrigation Practices:

See introduction to French Creek drainage

Agricultural Practices:

See introduction to French Creek drainage

Return Flows:

Estimated percentage of total diversion developing into return flows:

Destination	Wet Yr.	Avg. Yr.	Dry Yr.
French Creek	5	2.5	2.5

Losses:

Typical (10 percent) by the end of the ditch

References:

Dave Pelloux, water commissioner, State Engineer’s Office, interview, 18 Oct. 2000

Irrigated Lands Water Rights Database

PerNo	PerSfx	Facility Name	Priority	Acres	Amount	Unit	SupTyp	Status	Source
17927	D	Penrose	Jan. 31, 1931	633.93	0		SS	Adj	French Creek

Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
1970													
1971													
1972													
1973													
1974								379.06	780.99	507.83	0.00	0.00	1667.88
1975													
1976													
1977													
1978													
1979													
1980													
1981								410.48	725.95	675.17	496.89	57.39	2365.88
1982								139.14	1048.52	1211.31	884.48	290.08	3573.53
1983								0.00	1032.99	1097.85	935.95	482.12	3548.91
1984								0.00	1020.72	1224.29	997.35	128.75	3371.11
1985													
1986								600.99	1201.98	976.79	485.36	113.06	3378.18
1987								0.00	863.07	819.06	630.01	156.00	2468.14
1988								104.07	845.09	238.52	0.00	0.00	1187.68
1989								283.11	439.74	0.00	0.00	0.00	722.85
1990								171.24	955.86	1049.42	596.50	106.60	2879.62
1991								0.00	440.53	536.95	245.04	0.00	1222.52
1992								0.00	0.00	53.83	598.44	255.63	907.90
1993								0.00	509.77	252.19	482.65	189.90	1434.51
1994								326.87	897.61	784.47	370.66	0.00	2379.61
1995								38.08	707.57	901.54	314.77	189.57	2151.53
1996								80.61	148.45	535.32	124.52	0.00	888.90
1997								274.69	476.19	363.77	202.78	0.00	1317.43
1998								0.00	721.56	920.86	633.13	278.07	2553.62
1999								0.00	444.89	617.12	536.07	186.45	1784.53
Mean								147.81	697.97	671.91	449.19	128.09	2094.96
Max								600.99	1201.98	1224.29	997.35	482.12	3573.53
Min								0.00	0.00	0.00	0.00	0.00	722.85

- Notes: 1. Monthly data is derived from spot measurements in the Hydrographers' Annual Reports for years 1980 and later, and from WRDS for years prior to 1980
2. Zero flow is assumed prior to the first and after the last measurement

Name	Penrose Ditch Diversion		
Source	French Creek		
District	3		
Data	First & Last Dates, Max. Days		
Water Year	First Date of Measurement	Last Date of Measurement	Maximum Days Missing
1970			
1971			
1972			
1973			
1974	6-May	28-Jul	0
1975			
1976			
1977			
1978			
1979			
1980			
1981	15-May	6-Sep	34
1982	27-May	13-Sep	7
1983	3-Jun	23-Sep	26
1984	4-Jun	7-Sep	11
1985			
1986	17-May	16-Sep	11
1987	4-Jun	13-Sep	6
1988	24-May	19-Jul	5
1989	15-May	16-Jun	9
1990	14-May	10-Sep	14
1991	5-Jun	19-Aug	8
1992	30-Jul	29-Sep	13
1993	10-Jun	29-Sep	13
1994	19-May	30-Aug	49
1995	23-May	20-Sep	30
1996	24-May	13-Aug	24
1997	23-May	18-Aug	19
1998	2-Jun	24-Sep	15
1999	8-Jun	10-Sep	11
Avg.	29-May	31-Aug	16
Earliest	6-May	16-Jun	0
Latest	30-Jul	29-Sep	49

Notes: 1. Data is from Hydrographers' Annual Reports for years 1980 and later, and from WRDS for years prior to 1980.

Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
1970													
1971													
1972													
1973													
1974													
1975													
1976													
1977													
1978													
1979													
1980													
1981								341.92	606.94	549.16	403.26	58.35	1959.63
1982								126.94	810.39	886.83	659.40	244.96	2728.52
1983								0.00	888.59	983.80	746.97	390.37	3009.73
1984								0.00	704.23	808.56	749.67	95.40	2357.86
1985													
1986								512.63	1025.26	810.91	328.94	96.00	2773.74
1987								0.00	662.99	603.28	472.75	119.54	1858.56
1988								0.00	790.19	290.30	0.00	0.00	1080.49
1989								225.29	296.20	0.00	0.00	0.00	521.49
1990								201.96	651.79	701.50	707.55	133.15	2395.95
1991								0.00	427.72	458.55	210.80	0.00	1097.07
1992								0.00	0.00	0.00	475.81	159.33	635.14
1993								0.00	506.68	246.59	515.09	239.70	1508.06
1994								314.30				0.00	
1995								36.51	672.08	686.16	371.17	193.69	1959.61
1996								149.70	343.34	404.91	159.91	0.00	1057.86
1997								269.33	480.85	437.96	236.46	0.00	1424.60
1998								0.00	880.88	764.03	648.02	230.48	2523.41
1999								0.00	355.83	443.34	497.91	109.09	1406.17
Mean								121.03	594.35	533.88	422.57	115.00	1782.23
Max								512.63	1025.26	983.80	749.67	390.37	3009.73
Min								0.00	0.00	0.00	0.00	0.00	521.49

- Notes: 1. Monthly data is derived from spot measurements in the Hydrographers' Annual Reports for years 1980 and later, and from WRDS for years prior to 1980
2. Zero flow is assumed prior to the first and after the last measurement

Water Year	First Date of Measurement	Last Date of Measurement	Maximum Days Missing
1970			
1971			
1972			
1973			
1974			
1975			
1976			
1977			
1978			
1979			
1980			
1981	15-May	7-Sep	34
1982	27-May	13-Sep	7
1983	3-Jun	23-Sep	26
1984	4-Jun	7-Sep	11
1985			
1986	17-May	16-Sep	11
1987	4-Jun	13-Sep	6
1988	1-Jun	19-Jul	4
1989	15-May	16-Jun	9
1990	14-May	10-Sep	21
1991	5-Jun	19-Aug	8
1992	4-Aug	11-Sep	16
1993	10-Jun	29-Sep	13
1994	19-May	30-Aug	63
1995	23-May	20-Sep	30
1996	24-May	21-Aug	31
1997	23-May	15-Aug	19
1998	2-Jun	24-Sep	15
1999	8-Jun	10-Sep	11
Avg.	31-May	1-Sep	19
Earliest	14-May	16-Jun	4
Latest	4-Aug	29-Sep	63

Notes: 1. Data is from Hydrographers' Annual Reports for years 1980 and later, and from WRDS for years prior to 1980.