



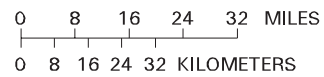
EXPLANATION

— Hydrologic boundary

— Streams

05449600  Transmitting gaging station and station number

05448600  Crest-stage gaging station and station number



Base from U.S. Geological Survey hydrologic unit map State of Iowa, 1974

## Gaging Stations

05485500	Des Moines River blw Raccoon River at Des Moines, IA . . . . .	316
05485605	Fourmile Creek near Ankeny, IA . . . . .	318
05485640	Fourmile Creek at Des Moines, IA . . . . .	322
05486000	North River near Norwalk, IA . . . . .	324
05486490	Middle River near Indianola, IA . . . . .	326
05487470	South River near Ackworth, IA . . . . .	328
05487500	Des Moines River near Runnells, IA . . . . .	330
05487540	Walnut Creek near Prairie City, IA . . . . .	332
05487550	Walnut Creek near Vandalia, IA . . . . .	341
05487980	White Breast Creek near Dallas, IA . . . . .	350
05488100	Lake Red Rock near Pella, IA . . . . .	352
05488110	Des Moines River near Pella, IA . . . . .	354
05488200	English Creek near Knoxville, IA . . . . .	356
05488500	Des Moines River near Tracy, IA . . . . .	358
05489000	Cedar Creek near Bussey, IA . . . . .	360
05489500	Des Moines River at Ottumwa, IA . . . . .	362
05490500	Des Moines River at Keosauqua, IA . . . . .	364
05494300	Fox River at Bloomfield, IA . . . . .	369

## Crest Stage Gaging Stations

05485940	Cedar Creek Tributary No. 2 near Winterset, IA . . . . .	491
05486230	Bush Branch Creek near Stanzel, IA . . . . .	491
05487825	Little White Breast Creek Tributary near Chariton, IA . . . . .	491
05489350	South Avery Creek near Blakesburg, IA . . . . .	491
05489490	Bear Creek at Ottumwa, IA . . . . .	492

## 05485500 DES MOINES RIVER BELOW RACCOON RIVER AT DES MOINES, IA

LOCATION.--Lat 41°34'40", long 93°36'19", in SW ¼ NE ¼ sec.10, T.78 N., R.24 W., Polk County, Hydrologic Unit 07100008, on left bank 40 ft downstream from bridge on Southeast 6th Street at Des Moines, 0.5 mi downstream from Raccoon River and Scott Street Dam, and at mile 201.0.

DRAINAGE AREA.--9,879 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1940 to current year.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1943 (P).

GAGE.--Water-stage recorder. Datum of gage is 762.52 ft above NGVD of 1929. Prior to Oct. 1, 1951, and Oct. 1, 1953 to Sept. 30, 1959, water-stage recorder upstream of Scott Street Dam, 0.8 mi upstream at datum 11.16 ft higher. Oct. 1, 1951 to Sept. 30, 1953, Oct. 1, 1959 to April 24, 1997 water-stage recorder .3 mi downstream at current datum, and Oct. 1, 1959 to Sept. 30, 1961, nonrecording gage at present site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Des Moines municipal water supply is taken from infiltration galleries on Raccoon River, 3.5 mi upstream from station. At times, water is pumped from Raccoon River into recharge basins or into Waterworks Reservoir, capacity 4,800 acre-ft. Effluent from sewage treatment plant enters the river 2.3 mi downstream from station. Net effect of diversions not known. Flow regulated by Saylorville Lake (station 05481630) 12.7 mi upstream, since Apr. 12, 1977. U.S. Army Corps of Engineers rain gage and data collection platform with satellite telemetry at station., U.S. National Weather Service Limited Automatic Remote Collector (LARC), and U.S. Geological Survey data logger at station. Precipitation records are available online at the U.S. Army Corps of Engineers website: [www2.mvr.usace.army.mil/WaterControl/datamining2.cfm](http://www2.mvr.usace.army.mil/WaterControl/datamining2.cfm).

COOPERATION.--Average monthly pumpage from galleries provided by Des Moines Water Works.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 116,000 ft<sup>3</sup>/s July 11, 1993, gage height, 34.29; minimum daily discharge, 26 ft<sup>3</sup>/s Jan. 16-29, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1893, that of June 26, 1947, site and datum then in use. Flood of May 31, 1903, reached a stage of 20.9 ft, from flood profile, at Scott Street site and datum, by office of Des Moines City Engineer.

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	320	315	411	543	e350	9,780	9,410	6,420	25,500	12,700	3,950	1,150
2	314	480	440	599	e325	11,800	7,580	5,540	23,500	11,800	3,650	1,060
3	310	1,580	473	592	e345	11,300	6,650	4,940	21,300	12,200	3,980	984
4	304	2,760	458	397	e315	10,300	6,020	4,400	19,000	12,100	6,990	953
5	300	1,190	476	e386	e305	10,100	5,260	4,140	17,800	12,400	6,870	1,150
6	301	823	484	e386	e295	11,500	4,590	3,890	17,200	11,600	6,430	2,130
7	301	641	670	e405	e300	13,200	4,410	3,700	16,800	11,300	5,440	1,980
8	300	565	e679	e372	e300	13,100	4,220	3,610	16,200	11,100	4,270	1,500
9	310	509	e724	e357	e310	11,300	3,960	5,580	15,600	11,800	3,670	973
10	310	486	e766	350	e311	8,790	3,640	7,670	15,600	12,900	3,380	882
11	342	474	e626	331	e317	7,080	3,500	5,760	15,400	13,300	3,210	758
12	347	442	641	308	e322	5,790	3,270	4,710	15,600	12,900	2,900	733
13	358	431	605	302	e344	4,730	2,990	4,470	16,100	11,200	2,550	719
14	514	429	421	293	e338	4,150	2,900	5,330	17,600	11,000	2,430	716
15	376	427	409	310	e333	3,980	2,850	5,580	18,500	10,800	2,240	731
16	355	410	415	341	e333	4,280	2,800	5,130	17,400	10,200	1,990	695
17	365	444	469	e398	e338	4,700	2,870	5,110	16,400	9,710	2,060	665
18	355	495	391	e356	e384	4,450	2,840	8,170	17,400	9,320	1,560	1,350
19	348	459	379	e338	e452	4,310	2,810	7,760	19,700	8,980	2,350	4,080
20	340	523	373	e347	e527	4,690	3,150	6,110	21,300	8,690	2,360	6,120
21	336	552	367	e347	e665	4,880	3,590	5,320	23,900	8,510	2,040	7,440
22	882	521	373	e319	e994	4,600	3,960	5,610	25,200	8,360	1,800	7,880
23	294	550	362	e329	e2,220	4,370	3,860	16,000	22,500	8,090	1,730	7,920
24	146	463	354	e315	e2,690	4,280	3,940	31,900	19,300	7,910	2,040	7,680
25	296	443	412	e342	e2,410	3,960	4,450	36,800	17,400	7,750	1,840	7,060
26	295	429	464	e315	e2,380	3,700	4,960	30,000	16,200	7,570	1,760	6,910
27	311	419	468	e296	2,800	3,660	5,650	24,200	15,600	7,410	1,820	6,590
28	343	413	500	e320	3,700	5,920	7,070	24,200	15,400	6,980	2,380	6,100
29	341	340	524	e315	6,240	9,300	8,110	24,800	14,800	6,360	2,630	5,480
30	328	397	467	e320	---	11,800	7,480	23,200	14,000	5,550	1,930	4,830
31	313	---	548	e324	---	12,000	---	24,700	---	4,510	1,600	---
TOTAL	10,655	18,410	15,149	11,253	30,943	227,800	138,790	354,750	548,200	305,000	93,850	97,219
MEAN	344	614	489	363	1,067	7,348	4,626	11,440	18,270	9,839	3,027	3,241
MAX	882	2,760	766	599	6,240	13,200	9,410	36,800	25,500	13,300	6,990	7,920
MIN	146	315	354	293	295	3,660	2,800	3,610	14,000	4,510	1,560	665
AC-FT	21,130	36,520	30,050	22,320	61,380	451,800	275,300	703,600	1,087,000	605,000	186,200	192,800
CFSM	0.03	0.06	0.05	0.04	0.11	0.74	0.47	1.16	1.85	1.00	0.31	0.33
IN.	0.04	0.07	0.06	0.04	0.12	0.86	0.52	1.34	2.06	1.15	0.35	0.37

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 2004, BY WATER YEAR (WY)

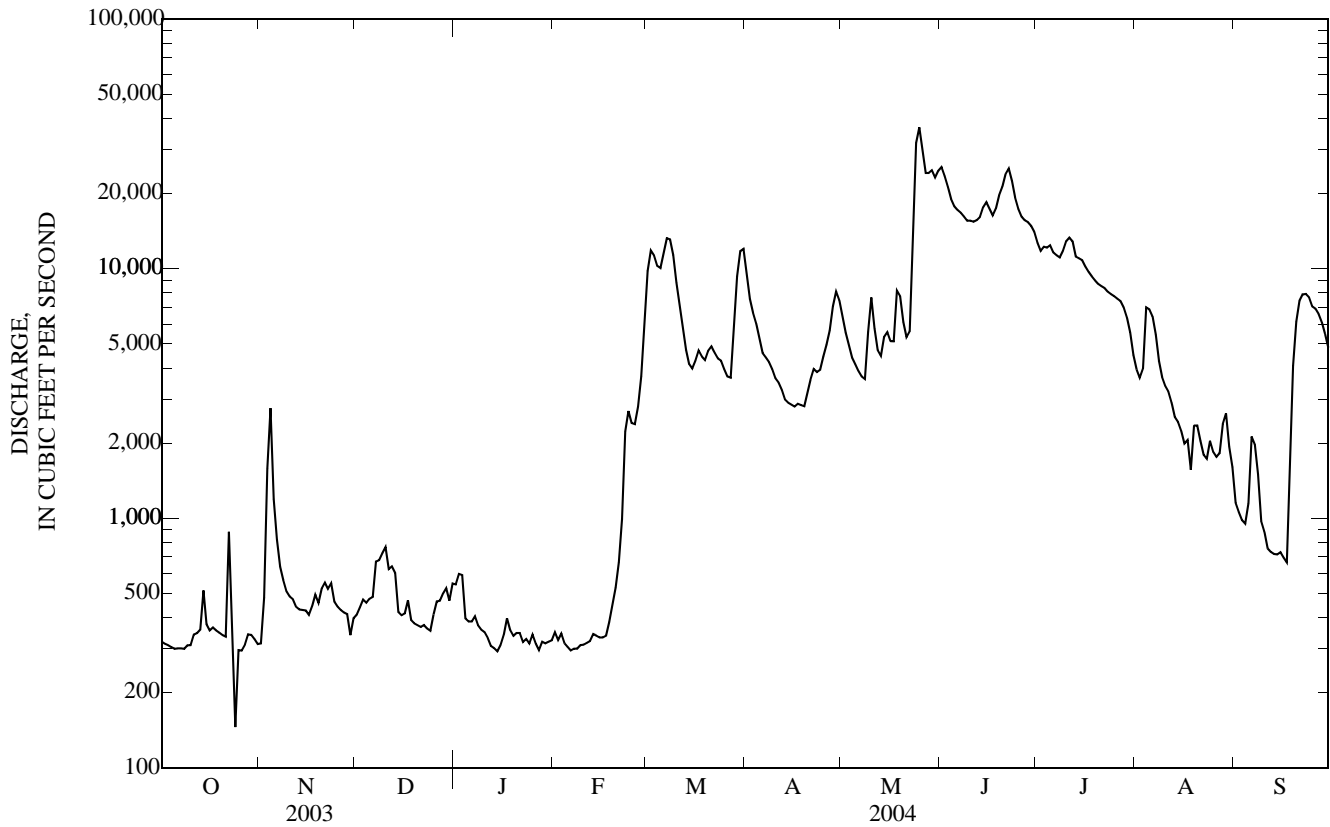
MEAN	2,866	3,179	2,738	1,666	2,920	7,730	11,210	11,980	12,950	10,830	4,894	3,236
MAX	15,060	10,610	9,045	6,439	12,400	23,530	27,620	28,190	35,250	55,960	26,050	21,430
(WY)	(1987)	(1993)	(1983)	(1983)	(1984)	(1983)	(1993)	(1993)	(1984)	(1993)	(1993)	(1993)
MIN	293	363	342	310	343	560	627	1,159	1,716	739	441	388
(WY)	(2001)	(1990)	(1990)	(1981)	(1978)	(1981)	(2000)	(2000)	(1988)	(1988)	(1988)	(2003)

05485500 DES MOINES RIVER BELOW RACCOON RIVER AT DES MOINES, IA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1978 - 2004 a	
ANNUAL TOTAL	1,606,671		1,852,019			
ANNUAL MEAN	4,402		5,060		6,362	
HIGHEST ANNUAL MEAN					19,180	1993
LOWEST ANNUAL MEAN					1,036	1989
HIGHEST DAILY MEAN	28,400	May 9	36,800	May 25	113,000	Jul 11, 1993
LOWEST DAILY MEAN	146	Oct 24	146	Oct 24	146	Oct 24, 2003
ANNUAL SEVEN-DAY MINIMUM	289	Oct 23	289	Oct 23	236	Mar 7, 1978
MAXIMUM PEAK FLOW			39,400	May 25	116,000	Jul 11, 1993
MAXIMUM PEAK STAGE			27.71	May 25	34.29	Jul 11, 1993
ANNUAL RUNOFF (AC-FT)	3,187,000		3,673,000		4,609,000	
ANNUAL RUNOFF (CFSM)	0.446		0.512		0.644	
ANNUAL RUNOFF (INCHES)	6.05		6.97		8.75	
10 PERCENT EXCEEDS	15,000		15,400		17,900	
50 PERCENT EXCEEDS	807		2,590		3,140	
90 PERCENT EXCEEDS	356		321		520	

a Post regulation.

e Estimated.



DES MOINES RIVER BASIN

05485605 FOURMILE CREEK NEAR ANKENY, IA

LOCATION.--Lat 41°43'03", long 93°34'12", in NW¼NW¼ NE¼ sec.30, T.80 N., R.23 W., Polk County, Hydrologic Unit 07100008, on right bank at bridge on N.E. 86th Ave., 1.4 mi downstream from Deer Creek, 6.0 mi upstream from Muchakinock Creek, and 1.0 mi SE of Ankeny.

DRAINAGE AREA.--62.0 mi<sup>2</sup>.

PERIOD OF RECORD.--June 3, 2003 to current year.

GAGE.--Water-stage recorder. Datum of gage is 882.0 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey data collection platform with satellite telemetry at station.

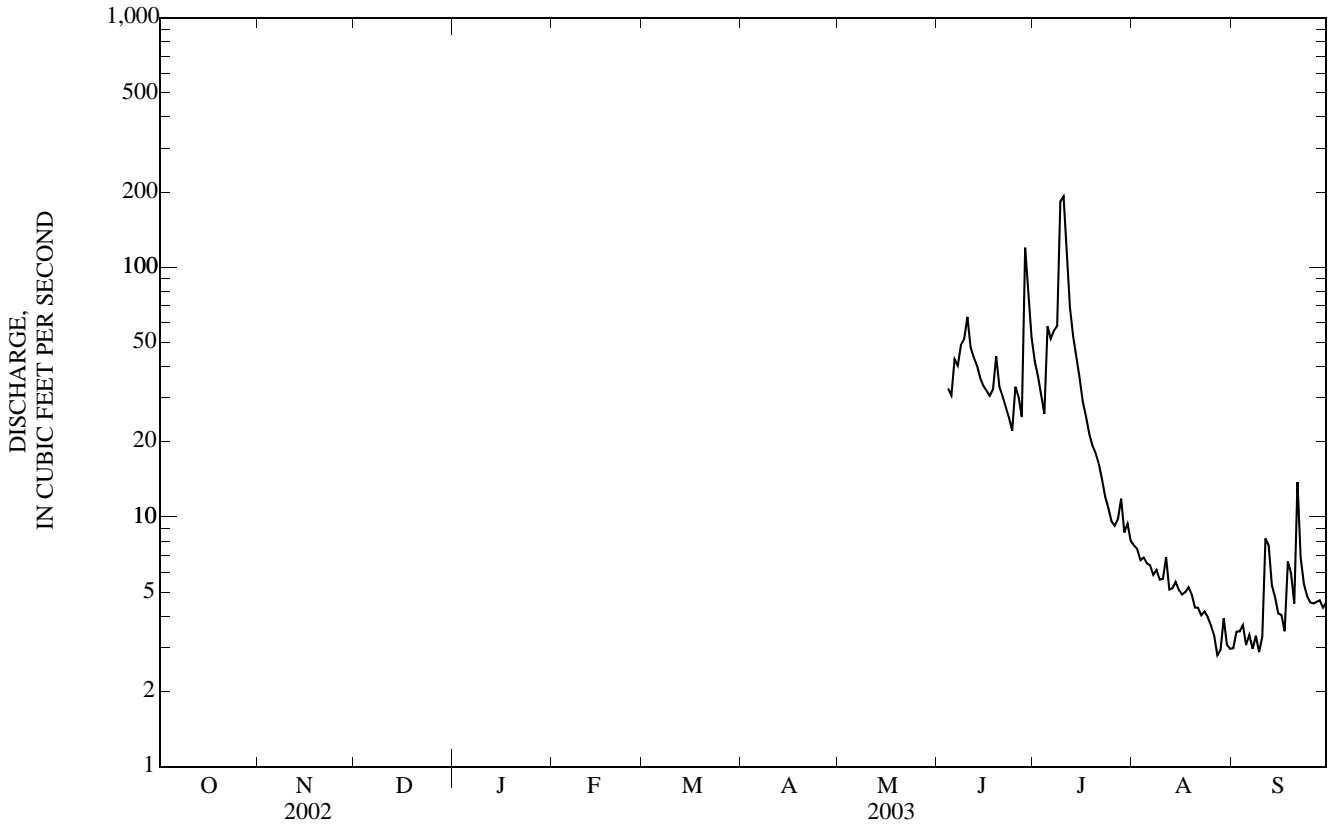
DISCHARGE, CUBIC FEET PER SECOND  
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	---	42	7.7	3.0
2	---	---	---	---	---	---	---	---	---	37	7.5	3.5
3	---	---	---	---	---	---	---	---	---	31	6.7	3.5
4	---	---	---	---	---	---	---	---	33	26	6.9	3.7
5	---	---	---	---	---	---	---	---	31	58	6.5	3.1
6	---	---	---	---	---	---	---	---	43	52	6.4	3.4
7	---	---	---	---	---	---	---	---	40	56	5.9	3.0
8	---	---	---	---	---	---	---	---	49	58	6.1	3.3
9	---	---	---	---	---	---	---	---	52	184	5.6	2.9
10	---	---	---	---	---	---	---	---	63	192	5.6	3.3
11	---	---	---	---	---	---	---	---	48	108	6.9	8.2
12	---	---	---	---	---	---	---	---	44	69	5.1	7.7
13	---	---	---	---	---	---	---	---	40	53	5.2	5.3
14	---	---	---	---	---	---	---	---	36	43	5.5	4.8
15	---	---	---	---	---	---	---	---	34	36	5.1	4.1
16	---	---	---	---	---	---	---	---	32	29	4.9	4.0
17	---	---	---	---	---	---	---	---	31	25	5.0	3.5
18	---	---	---	---	---	---	---	---	32	22	5.2	6.6
19	---	---	---	---	---	---	---	---	44	19	4.9	5.9
20	---	---	---	---	---	---	---	---	33	18	4.3	4.5
21	---	---	---	---	---	---	---	---	30	16	4.3	14
22	---	---	---	---	---	---	---	---	28	14	4.0	6.9
23	---	---	---	---	---	---	---	---	25	12	4.2	5.4
24	---	---	---	---	---	---	---	---	22	11	4.0	4.8
25	---	---	---	---	---	---	---	---	33	9.6	3.7	4.5
26	---	---	---	---	---	---	---	---	30	9.2	3.4	4.5
27	---	---	---	---	---	---	---	---	25	9.8	2.8	4.6
28	---	---	---	---	---	---	---	---	120	12	2.9	4.6
29	---	---	---	---	---	---	---	---	82	8.7	3.9	4.3
30	---	---	---	---	---	---	---	---	52	9.4	3.1	4.6
31	---	---	---	---	---	---	---	---	---	8.0	3.0	---
TOTAL	---	---	---	---	---	---	---	---	---	1,277.7	156.3	145.5
MEAN	---	---	---	---	---	---	---	---	---	41.2	5.04	4.85
MAX	---	---	---	---	---	---	---	---	192	7.7	14	---
MIN	---	---	---	---	---	---	---	---	8.0	2.8	2.9	---
AC-FT	---	---	---	---	---	---	---	---	---	2,530	310	289
CFSM	---	---	---	---	---	---	---	---	---	0.66	0.08	0.08
IN.	---	---	---	---	---	---	---	---	---	0.77	0.09	0.09

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2003 - 2003, BY WATER YEAR (WY)

MEAN	---	---	---	---	---	---	---	---	---	41.2	5.04	4.85
MAX	---	---	---	---	---	---	---	---	---	41.2	5.04	4.85
(WY)	---	---	---	---	---	---	---	---	---	(2003)	(2003)	(2003)
MIN	---	---	---	---	---	---	---	---	---	41.2	5.04	4.85
(WY)	---	---	---	---	---	---	---	---	---	(2003)	(2003)	(2003)

05485605 FOURMILE CREEK NEAR ANKENY, IA—Continued



## 05485605 FOURMILE CREEK NEAR ANKENY, IA—Continued

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	4.3	5.5	8.1	10	6.7	89	66	40	219	46	38	14
2	4.0	20	7.7	10	6.6	81	59	37	184	49	38	12
3	3.8	165	9.0	8.8	6.4	65	55	34	162	93	160	11
4	4.5	185	8.5	7.8	6.4	89	51	32	148	67	159	9.1
5	4.6	48	9.2	8.9	6.5	258	49	28	134	85	78	36
6	4.3	26	8.7	6.9	6.7	164	47	26	121	127	58	149
7	3.4	19	8.4	6.6	6.8	107	44	22	e106	89	44	96
8	4.2	15	9.9	7.2	6.8	81	43	22	e91	69	40	62
9	4.6	13	15	7.7	6.6	68	38	31	e88	290	35	46
10	4.8	12	11	7.9	6.5	60	37	21	e103	170	29	35
11	7.1	11	10	6.6	6.8	53	35	19	e95	e605	25	27
12	5.7	11	8.7	11	6.4	46	34	20	e84	e539	23	21
13	6.9	9.9	8.5	9.0	6.5	46	32	38	e99	253	19	19
14	14	9.4	8.8	8.3	6.7	44	31	27	90	157	16	16
15	5.4	9.5	9.1	7.9	6.4	45	30	24	76	116	15	16
16	6.7	9.9	8.9	14	6.2	48	29	23	88	93	13	14
17	5.4	14	8.0	17	6.2	53	45	143	99	77	12	12
18	4.5	12	8.8	10	6.9	73	29	193	81	66	31	12
19	4.5	9.3	8.3	7.7	11	128	26	110	73	61	27	12
20	4.6	8.7	8.3	7.8	41	100	74	84	70	55	20	9.5
21	3.4	8.0	9.1	8.0	53	71	315	67	86	52	16	9.1
22	4.1	7.7	10	7.7	155	64	139	163	101	50	14	8.6
23	4.3	11	9.8	7.4	201	59	95	e1,440	81	46	12	8.5
24	3.8	8.4	9.6	7.9	97	54	88	e817	72	42	17	9.2
25	4.8	8.5	8.8	7.8	62	50	98	e1,100	65	39	19	9.0
26	4.8	8.4	9.4	7.2	57	48	81	e512	62	35	15	8.7
27	6.2	7.8	11	7.0	68	59	66	e397	59	32	47	7.7
28	7.6	7.4	20	6.6	80	151	61	328	62	27	45	8.2
29	5.0	7.6	15	6.6	78	117	50	285	54	25	32	7.2
30	4.3	8.0	13	6.4	---	88	44	271	49	25	22	7.4
31	4.6	---	11	6.7	---	74	---	269	---	21	16	---
TOTAL	160.2	696.0	309.6	260.4	1,021.1	2,533	1,891	6,623	2,902	3,501	1,135	712.2
MEAN	5.17	23.2	9.99	8.40	35.2	81.7	63.0	214	96.7	113	36.6	23.7
MAX	14	185	20	17	201	258	315	1,440	219	605	160	149
MIN	3.4	5.5	7.7	6.4	6.2	44	26	19	49	21	12	7.2
AC-FT	318	1,380	614	517	2,030	5,020	3,750	13,140	5,760	6,940	2,250	1,410
CFSM	0.08	0.37	0.16	0.14	0.57	1.32	1.02	3.45	1.56	1.82	0.59	0.38
IN.	0.10	0.42	0.19	0.16	0.61	1.52	1.13	3.97	1.74	2.10	0.68	0.43

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2003 - 2004, BY WATER YEAR (WY)

MEAN	5.17	23.2	9.99	8.40	35.2	81.7	63.0	214	96.7	77.1	20.8	14.3
MAX	5.17	23.2	9.99	8.40	35.2	81.7	63.0	214	96.7	113	36.6	23.7
(WY)	(2004)	(2004)	(2004)	(2004)	(2004)	(2004)	(2004)	(2004)	(2004)	(2004)	(2004)	(2004)
MIN	5.17	23.2	9.99	8.40	35.2	81.7	63.0	214	96.7	41.2	5.04	4.85
(WY)	(2004)	(2004)	(2004)	(2004)	(2004)	(2004)	(2004)	(2004)	(2004)	(2003)	(2003)	(2003)

05485605 FOURMILE CREEK NEAR ANKENY, IA—Continued

SUMMARY STATISTICS

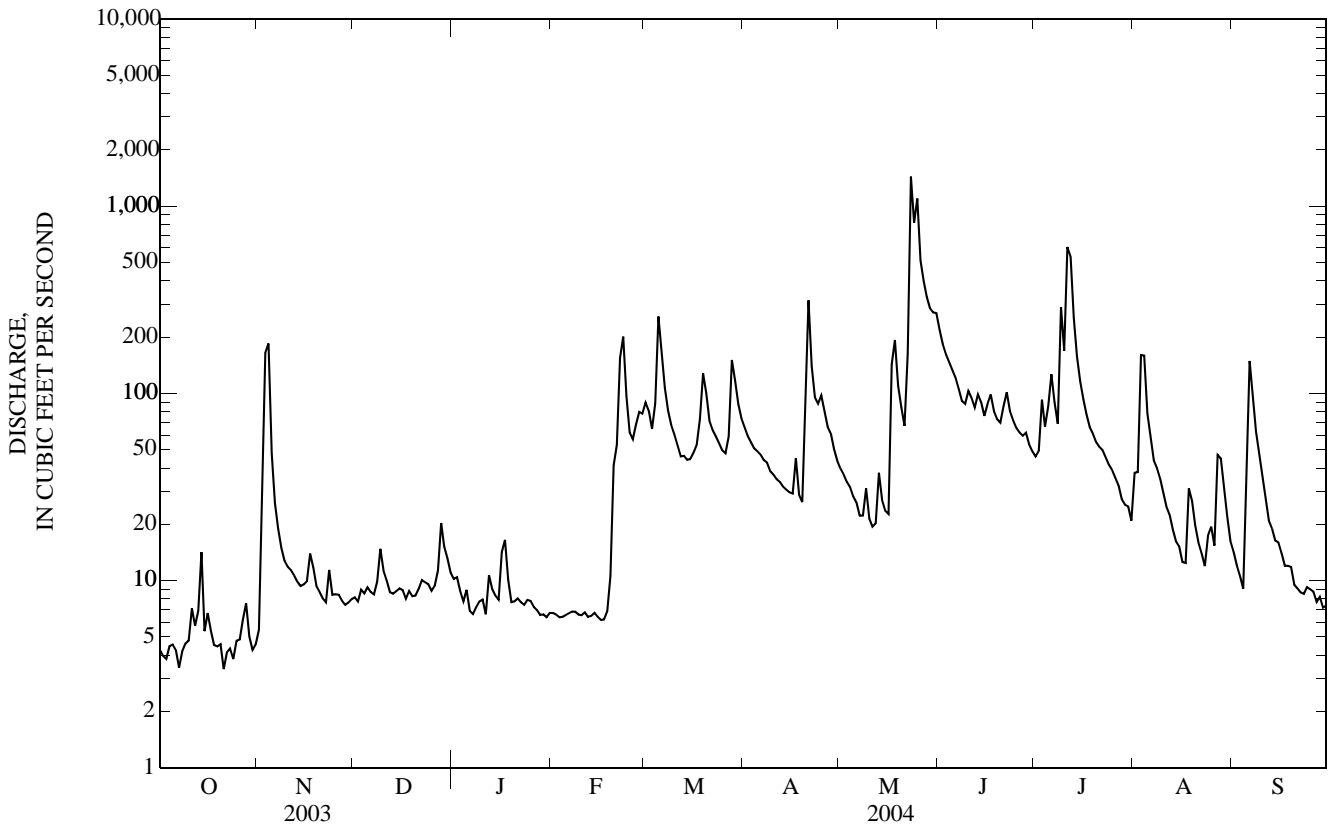
FOR 2004 WATER YEAR

WATER YEARS 2003 - 2004

ANNUAL TOTAL	21,744.5			
ANNUAL MEAN	59.4		59.4	
HIGHEST ANNUAL MEAN			59.4	2004
LOWEST ANNUAL MEAN			59.4	2004
HIGHEST DAILY MEAN	1,440	May 23	1,440	May 23, 2004
LOWEST DAILY MEAN	3.4	Oct 7 a	2.8	Aug 27, 2003
ANNUAL SEVEN-DAY MINIMUM	4.1	Oct 2	3.2	Aug 26, 2003
MAXIMUM PEAK FLOW	1,720	May 23	1,720	May 23, 2004
MAXIMUM PEAK STAGE	10.60	May 23	10.60	May 23, 2004
ANNUAL RUNOFF (AC-FT)	43,130		43,040	
ANNUAL RUNOFF (CFSM)	0.958		0.958	
ANNUAL RUNOFF (INCHES)	13.05		13.02	
10 PERCENT EXCEEDS	127		127	
50 PERCENT EXCEEDS	24		24	
90 PERCENT EXCEEDS	6.5		6.5	

a Also Oct. 21.

e Estimated.





## 05485640 FOURMILE CREEK AT DES MOINES, IA

LOCATION.--Lat 41°36'50", long 93°32'43", in NE $\frac{1}{4}$  NE $\frac{1}{4}$  sec.32, T.79 N., R.23 W., Polk County, Hydrologic Unit 07100008, on right bank 20 ft downstream from bridge on Easton Blvd., 4.4 mi downstream from Muchikinoek Creek, and 5.0 mi upstream from Des Moines River.

DRAINAGE AREA.--92.7 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1971 to current year.

REVISED RECORDS.--WDR IA-75-1: 1974 (P).

GAGE.--Water-stage recorder. Datum of gage is 795.87 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey data collection platform with satellite telemetry and U.S. National Weather Service Limited Automatic Remote Collector (LARC) at station.

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	3.3	e8.5	e6.3	e9.6	138	55	56	259	52	47	27
2	3.3	21	e9.0	e6.8	e9.3	131	46	53	207	55	58	21
3	3.1	240	10	e5.8	e9.0	101	40	50	176	205	476	16
4	3.0	512	11	e5.1	e9.1	127	38	50	159	119	423	15
5	3.3	67	11	e8.5	e9.7	452	34	47	143	153	147	31
6	3.3	30	11	e6.8	e10	293	31	49	131	251	91	213
7	2.9	19	9.9	e7.9	e11	190	28	46	113	162	70	123
8	2.3	15	13	e8.5	e10	138	26	49	97	108	59	69
9	2.8	14	22	e9.3	e10	108	23	98	92	438	51	49
10	2.8	15	e13	e9.3	e11	94	22	e60	112	322	41	35
11	4.1	16	e14	e8.8	e11	78	21	e60	101	680	38	29
12	5.5	15	e10	e11	e11	64	20	40	88	895	e37	24
13	8.2	13	e8.8	e11	e12	61	19	82	103	414	e37	21
14	20	12	e9.6	e9.9	e12	65	19	47	139	249	e36	19
15	6.1	12	e10	e9.3	e12	58	18	38	92	173	e40	20
16	5.2	12	e8.9	e16	e12	67	21	36	183	132	30	18
17	5.2	16	e8.4	e19	e14	77	60	97	186	103	20	16
18	4.5	22	e9.1	e13	e19	119	27	496	118	87	34	15
19	3.9	14	e7.7	e9.9	e30	191	24	170	89	78	32	15
20	3.6	12	e8.9	e9.3	e265	158	134	110	81	69	27	13
21	3.2	12	e10	e9.8	e244	107	402	82	87	69	23	11
22	2.9	e15	e11	e9.4	561	90	201	179	136	85	22	11
23	3.2	19	e6.6	e9.0	788	82	120	3,100	104	61	21	11
24	3.4	14	e6.4	e9.7	332	75	104	1,390	89	53	38	11
25	2.9	13	e8.2	e9.6	121	68	146	1,940	80	47	32	11
26	3.4	12	13	e9.3	93	66	108	734	74	41	32	10
27	4.5	11	15	e9.0	106	67	85	550	68	37	43	11
28	2.4	e13	23	e8.5	122	234	76	428	81	34	71	9.9
29	e4.0	15	24	e9.0	119	179	66	352	60	33	44	9.2
30	3.3	e9.5	e8.9	e8.7	---	e140	58	343	56	32	35	8.4
31	2.6	---	e7.0	e9.5	---	e60	---	327	---	28	28	---
TOTAL	132.1	1,213.8	346.9	293.0	2,982.7	3,878	2,072	11,159	3,504	5,265	2,183	892.5
MEAN	4.26	40.5	11.2	9.45	103	125	69.1	360	117	170	70.4	29.8
MAX	20	512	24	19	788	452	402	3,100	259	895	476	213
MIN	2.3	3.3	6.4	5.1	9.0	58	18	36	56	28	20	8.4
AC-FT	262	2,410	688	581	5,920	7,690	4,110	22,130	6,950	10,440	4,330	1,770
CFSM	0.05	0.44	0.12	0.10	1.11	1.35	0.75	3.88	1.26	1.83	0.76	0.32
IN.	0.05	0.49	0.14	0.12	1.20	1.56	0.83	4.48	1.41	2.11	0.88	0.36

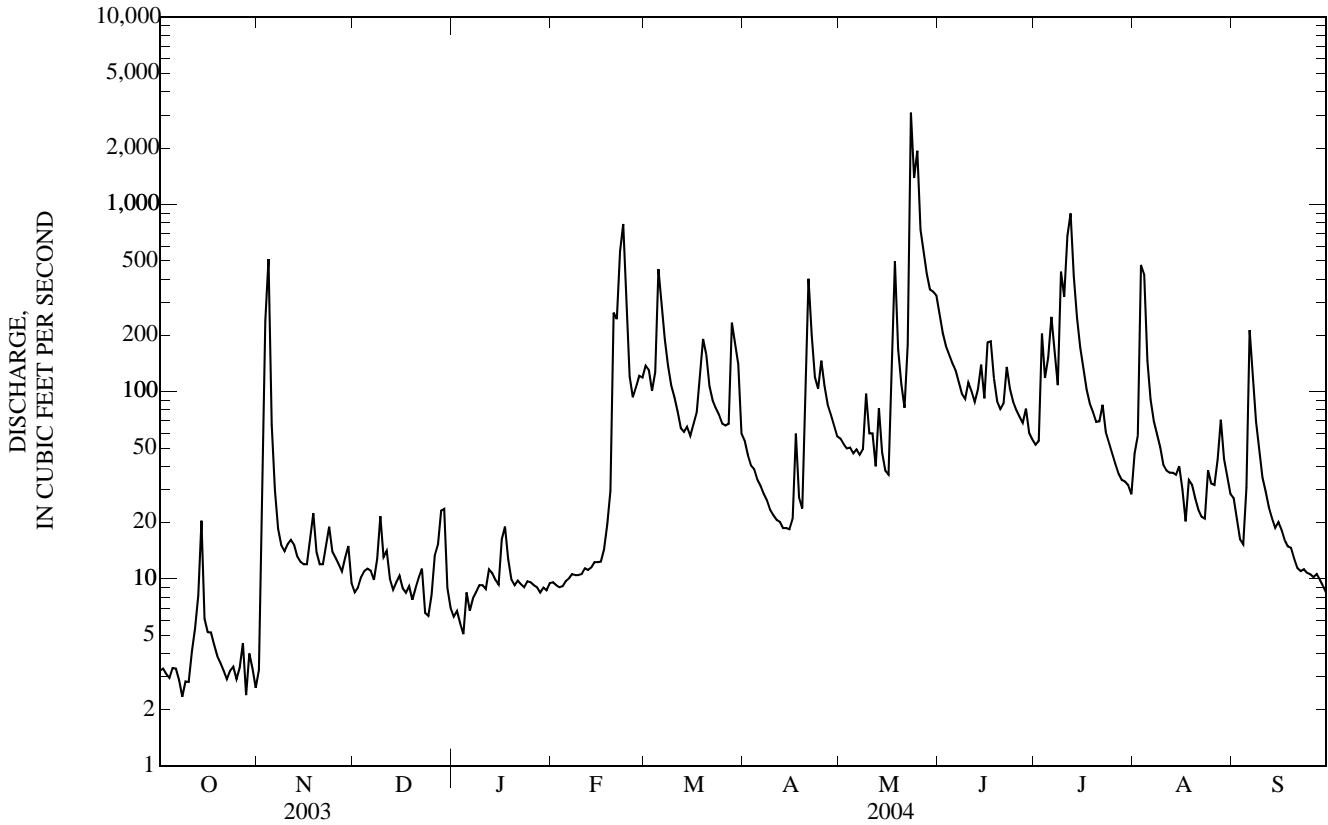
## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1972 - 2004, BY WATER YEAR (WY)

MEAN	36.6	42.0	31.6	22.1	48.1	96.8	116	153	154	99.5	46.5	34.0
MAX	258	317	124	118	206	292	354	462	505	607	363	270
(WY)	(1987)	(1984)	(1983)	(1974)	(1973)	(1979)	(1973)	(1974)	(1998)	(1993)	(1993)	(1993)
MIN	1.36	1.57	0.25	0.00	0.55	4.04	3.67	6.67	0.73	0.07	1.66	1.37
(WY)	(1989)	(1977)	(1977)	(1977)	(1977)	(1981)	(1981)	(1977)	(1977)	(1977)	(1988)	(1988)

05485640 FOURMILE CREEK AT DES MOINES, IA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1972 - 2004	
ANNUAL TOTAL	16,978.5		33,922.0		73.3	
ANNUAL MEAN	46.5		92.7		204	
HIGHEST ANNUAL MEAN					1993	
LOWEST ANNUAL MEAN					7.97	
HIGHEST DAILY MEAN	1,220	May 9	3,100	May 23	3,570	Jun 9, 1974
LOWEST DAILY MEAN	1.0	Jan 17	2.3	Oct 8	0.00	Jan 2, 1977
ANNUAL SEVEN-DAY MINIMUM	2.1	Jan 9	2.9	Oct 4	0.00	Jan 2, 1977
MAXIMUM PEAK FLOW			4,960	May 23	5,600	Jun 18, 1998
MAXIMUM PEAK STAGE			14.57	May 23	15.00	Jun 18, 1998
INSTANTANEOUS LOW FLOW			2.0	Oct 8 a	0.00	Jan 2, 1977
ANNUAL RUNOFF (AC-FT)	33,680		67,280		53,140	
ANNUAL RUNOFF (CFSM)	0.502		1.000		0.791	
ANNUAL RUNOFF (INCHES)	6.81		13.61		10.75	
10 PERCENT EXCEEDS	79		190		172	
50 PERCENT EXCEEDS	10		30		25	
90 PERCENT EXCEEDS	3.3		6.8		3.2	

a Also Oct. 11.  
e Estimated.



## 05486000 NORTH RIVER NEAR NORWALK, IA

LOCATION.--(revised) Lat 41°27'29", long 93°39'17", in NW<sup>1</sup>/<sub>4</sub> SW<sup>1</sup>/<sub>4</sub> sec.20, T.77 N., R.24 W., Warren County, Hydrologic Unit 07100008, on left bank 10 ft downstream from bridge on county highway R57, 1.7 mi southeast of Norwalk, 5.2 mi upstream from Middle Creek, and 6.2 mi downstream from Badger Creek.

DRAINAGE AREA.--349 mi<sup>2</sup>.

PERIOD OF RECORD.--February 1940 to current year.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1946. WDR IA-76-1: 1975 (P).

GAGE.--Water-stage recorder. Datum of gage is 788.45 ft above NGVD of 1929 (levels by U.S. Army Corps of Engineers). Prior to June 12, 1946, nonrecording gage at same site and datum. Jan. 7 to Oct. 11, 1960, nonrecording gage at site 2.1 mi upstream at different datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and data collection platform with satellite telemetry at station. Precipitation records are available online at the U.S. Army Corps of Engineers website: [www2.mvr.usace.army.mil/WaterControl/datamining2.cfm](http://www2.mvr.usace.army.mil/WaterControl/datamining2.cfm).

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	0.83	2.4	3.8	28	e14	e321	354	126	685	109	90	41
2	0.59	2.6	4.4	20	e16	320	312	117	506	104	84	33
3	0.53	12	4.5	e19	e14	269	278	110	428	164	107	28
4	0.41	234	5.2	e13	e16	211	250	103	388	215	1,290	23
5	0.35	419	6.3	e5.3	e17	569	223	95	352	173	934	19
6	0.21	174	7.7	e3.6	e17	745	206	91	331	148	385	80
7	0.09	62	7.8	e4.1	e16	453	190	84	317	201	247	238
8	0.17	30	7.9	e4.4	e17	315	173	79	282	163	184	162
9	0.28	17	9.5	e3.9	e19	243	156	787	251	130	143	73
10	0.41	13	e7.3	e4.4	e18	204	141	1,990	245	583	118	50
11	0.53	11	e6.9	e5.4	e19	178	130	2,370	265	e1,230	99	38
12	0.58	9.7	e6.6	e5.7	e16	150	121	914	253	e1,570	86	31
13	0.54	8.7	e6.9	e5.8	e17	127	116	576	257	e1,010	79	25
14	1.6	6.4	7.9	e6.6	e15	121	111	699	606	501	73	21
15	1.4	5.4	7.8	e6.9	e6.6	121	107	559	1,150	342	66	19
16	1.2	3.9	8.7	e8.6	e8.8	121	102	489	684	270	60	18
17	1.1	3.8	e8.6	e27	e9.3	144	99	424	433	229	56	19
18	1.1	4.8	8.4	e40	e10	198	94	1,500	346	200	51	16
19	1.2	5.4	e7.1	e57	e12	451	91	1,940	298	168	51	14
20	1.3	7.2	11	e48	e125	521	101	2,030	265	151	47	14
21	1.3	8.2	8.0	e36	e234	478	161	888	248	140	44	12
22	1.4	6.8	9.2	e26	e402	338	213	629	245	151	39	10
23	1.4	8.6	e7.5	e18	e569	280	252	1,360	225	172	35	10
24	1.4	7.7	e11	e16	e704	255	186	1,830	189	163	35	9.6
25	1.4	7.0	e7.6	e15	e420	238	192	2,560	172	139	52	8.8
26	1.4	6.0	10	e16	e245	220	213	6,060	164	128	109	8.0
27	1.5	5.8	12	e11	e223	201	214	3,340	149	112	85	7.8
28	1.7	4.9	15	e12	e241	476	176	1,820	139	100	74	7.8
29	1.9	4.1	12	e12	e289	977	152	650	133	91	73	7.7
30	2.2	3.9	40	e12	---	550	141	657	121	91	53	7.8
31	2.3	---	50	e13	---	424	---	927	---	100	46	---
TOTAL	32.32	1,095.3	326.6	503.7	3,729.7	10,219	5,255	35,804	10,127	9,048	4,895	1,051.5
MEAN	1.04	36.5	10.5	16.2	129	330	175	1,155	338	292	158	35.0
MAX	2.3	419	50	57	704	977	354	6,060	1,150	1,570	1,290	238
MIN	0.09	2.4	3.8	3.6	6.6	121	91	79	121	91	35	7.7
AC-FT	64	2,170	648	999	7,400	20,270	10,420	71,020	20,090	17,950	9,710	2,090
CFSM	0.00	0.10	0.03	0.05	0.37	0.94	0.50	3.31	0.97	0.84	0.45	0.10
IN.	0.00	0.12	0.03	0.05	0.40	1.09	0.56	3.82	1.08	0.96	0.52	0.11

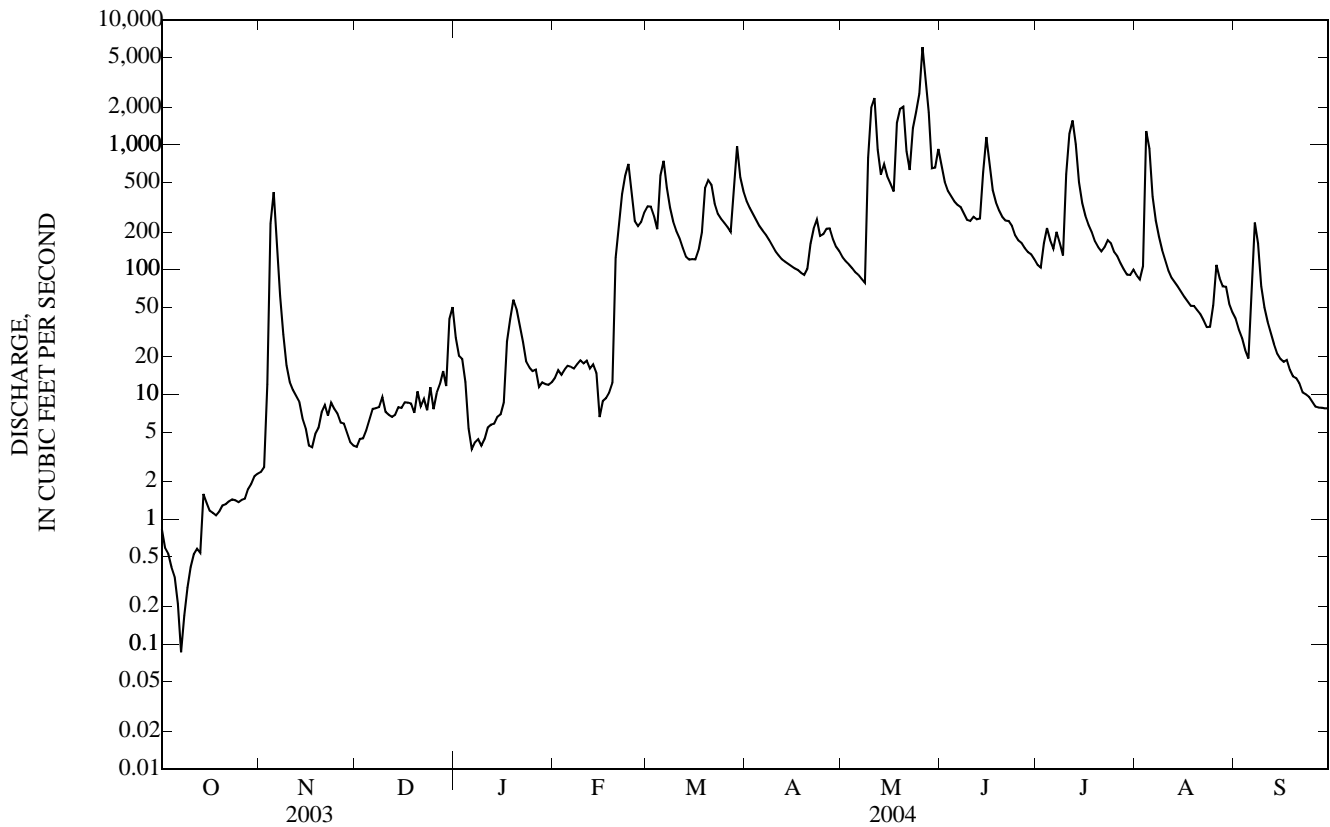
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 2004, BY WATER YEAR (WY)

MEAN	73.5	96.7	71.0	73.8	154	327	339	371	373	190	108	87.4
MAX	593	747	567	739	911	1,041	1,401	1,699	3,260	1,722	1,185	1,007
(WY)	(1987)	(1973)	(1993)	(1973)	(1973)	(1965)	(1973)	(1996)	(1947)	(1993)	(1993)	(1993)
MIN	0.20	0.37	0.36	0.38	3.21	3.90	1.22	3.71	1.58	1.10	0.21	0.26
(WY)	(1950)	(1956)	(1956)	(1954)	(1956)	(1954)	(1956)	(1967)	(1977)	(1977)	(1968)	(1957)

05486000 NORTH RIVER NEAR NORWALK, IA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1941 - 2004	
ANNUAL TOTAL	29,139.02		82,087.12		189	
ANNUAL MEAN	79.8		224		709	
HIGHEST ANNUAL MEAN					1993	
LOWEST ANNUAL MEAN					1968	
HIGHEST DAILY MEAN	1,750	May 6	6,060	May 26	21,600	Jun 13, 1947
LOWEST DAILY MEAN	0.09	Oct 7	0.09	Oct 7	0.00	Jul 20, 1954 a
ANNUAL SEVEN-DAY MINIMUM	0.27	Oct 4	0.27	Oct 4	0.00	Jul 25, 1954
MAXIMUM PEAK FLOW			7,770	May 26	32,000	Jun 13, 1947 b
MAXIMUM PEAK STAGE			23.05	May 26	25.30	Jun 13, 1947 c
INSTANTANEOUS LOW FLOW			0.00	Oct 7	0.00	Jul 20, 1954
ANNUAL RUNOFF (AC-FT)	57,800		162,800		136,600	
ANNUAL RUNOFF (CFSM)	0.229		0.643		0.540	
ANNUAL RUNOFF (INCHES)	3.11		8.75		7.34	
10 PERCENT EXCEEDS	188		553		432	
50 PERCENT EXCEEDS	7.8		79		42	
90 PERCENT EXCEEDS	1.5		3.9		2.5	

- a Many days 1954-58, Oct. 7-9, 2001.
- b From rating curve extended above 9,000 ft<sup>3</sup>/s on basis of velocity-area studies.
- c From floodmark.
- e Estimated.



## 05487470 SOUTH RIVER NEAR ACKWORTH, IA

LOCATION.--Lat 41°20'14", long 93°29'10", in SE $\frac{1}{4}$  SE $\frac{1}{4}$  sec.34, T.76 N., R.23 W., Warren County, Hydrologic Unit 07100008, on right bank 15 ft downstream from bridge on county highway, 0.5 mi downstream from Otter Creek, and 2.2 mi southwest of Ackworth.

DRAINAGE AREA.--460 mi<sup>2</sup>.

PERIOD OF RECORD.--March 1940 to current year.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1941, 1945 (M), 1946.

GAGE.--Water-stage recorder. Datum of gage is 769.97 ft above NGVD of 1929. Prior to June 12, 1946, nonrecording gage, June 13, 1946 to Apr. 13, 1960, water-stage recorder, and Apr. 14, 1960 to Sept. 30, 1961, nonrecording gage, all at site 4.0 mi downstream at datum 8.06 ft lower.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and data collection platform with satellite telemetry at station. Precipitation records are available online at the U.S. Army Corps of Engineers website: [www2.mvr.usace.army.mil/WaterControl/datamining2.cfm](http://www2.mvr.usace.army.mil/WaterControl/datamining2.cfm).

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1930 reached a stage of 24.5 ft, from information by local residents, discharge, about 30,000 ft<sup>3</sup>/s, at site 4.0 mi downstream.

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	3.6	3.6	4.6	9.3	e17	223	172	97	224	25	35	e68
2	3.9	13	4.6	8.8	e19	200	146	96	150	26	33	49
3	3.5	134	5.7	e7.0	e15	154	126	88	120	140	169	39
4	3.6	484	7.0	e3.7	e17	227	113	83	102	129	6,300	32
5	4.0	176	7.5	e2.5	e18	2,720	103	78	91	52	995	28
6	3.5	65	8.2	e4.4	e17	851	95	75	85	45	300	758
7	3.5	34	7.1	e5.4	e16	359	89	65	77	36	e170	226
8	3.5	19	6.9	e7.4	e17	248	81	61	66	30	e119	103
9	3.4	12	e7.8	e7.0	e19	194	74	118	57	1,360	e90	69
10	3.5	9.4	e5.9	e8.2	e17	149	67	89	159	1,000	e72	53
11	4.0	8.3	e2.8	e10	e20	127	64	74	529	1,870	e59	42
12	4.3	6.2	e6.4	e9.3	e18	105	62	61	153	3,780	e50	36
13	4.3	5.6	e11	e11	e20	102	59	77	156	510	e42	30
14	8.5	5.2	e14	e16	e17	109	56	138	2,200	236	e33	27
15	5.1	5.0	e17	20	e15	107	54	101	1,090	150	e27	31
16	4.2	4.8	18	27	e19	118	53	72	302	109	e24	32
17	4.1	5.1	e17	195	e26	173	48	93	222	86	23	30
18	4.0	6.0	e14	e102	e40	729	44	324	144	73	23	26
19	4.3	5.4	e15	e30	e50	1,580	41	166	113	62	22	23
20	3.4	5.0	e12	e12	e970	587	113	145	92	55	18	20
21	3.5	4.7	e12	e30	e798	286	570	128	83	49	16	18
22	3.4	4.8	12	e11	e612	216	214	303	74	532	13	15
23	3.3	5.8	e11	e25	e570	192	133	2,790	61	294	12	15
24	3.5	6.8	e6.6	e19	e228	178	113	1,500	53	120	20	14
25	3.5	5.2	e8.5	e17	e154	158	189	4,360	50	91	118	13
26	3.4	5.1	10	e15	e126	149	175	830	44	69	158	13
27	3.6	5.1	13	e14	e145	145	123	372	39	57	115	13
28	4.1	5.4	15	e14	e187	776	105	270	36	46	1,160	12
29	3.9	4.8	10	e12	e206	574	92	214	31	42	498	11
30	3.9	4.7	e7.5	e13	---	268	87	381	28	40	e148	11
31	3.5	---	e8.3	e15	---	205	---	467	---	49	e100	---
TOTAL	121.8	1,059.0	306.4	681.0	4,393	12,209	3,461	13,716	6,631	11,163	10,962	1,857
MEAN	3.93	35.3	9.88	22.0	151	394	115	442	221	360	354	61.9
MAX	8.5	484	18	195	970	2,720	570	4,360	2,200	3,780	6,300	758
MIN	3.3	3.6	2.8	2.5	15	102	41	61	28	25	12	11
AC-FT	242	2,100	608	1,350	8,710	24,220	6,860	27,210	13,150	22,140	21,740	3,680
CFSM	0.01	0.08	0.02	0.05	0.33	0.86	0.25	0.96	0.48	0.78	0.77	0.13
IN.	0.01	0.09	0.02	0.06	0.36	0.99	0.28	1.11	0.54	0.90	0.89	0.15

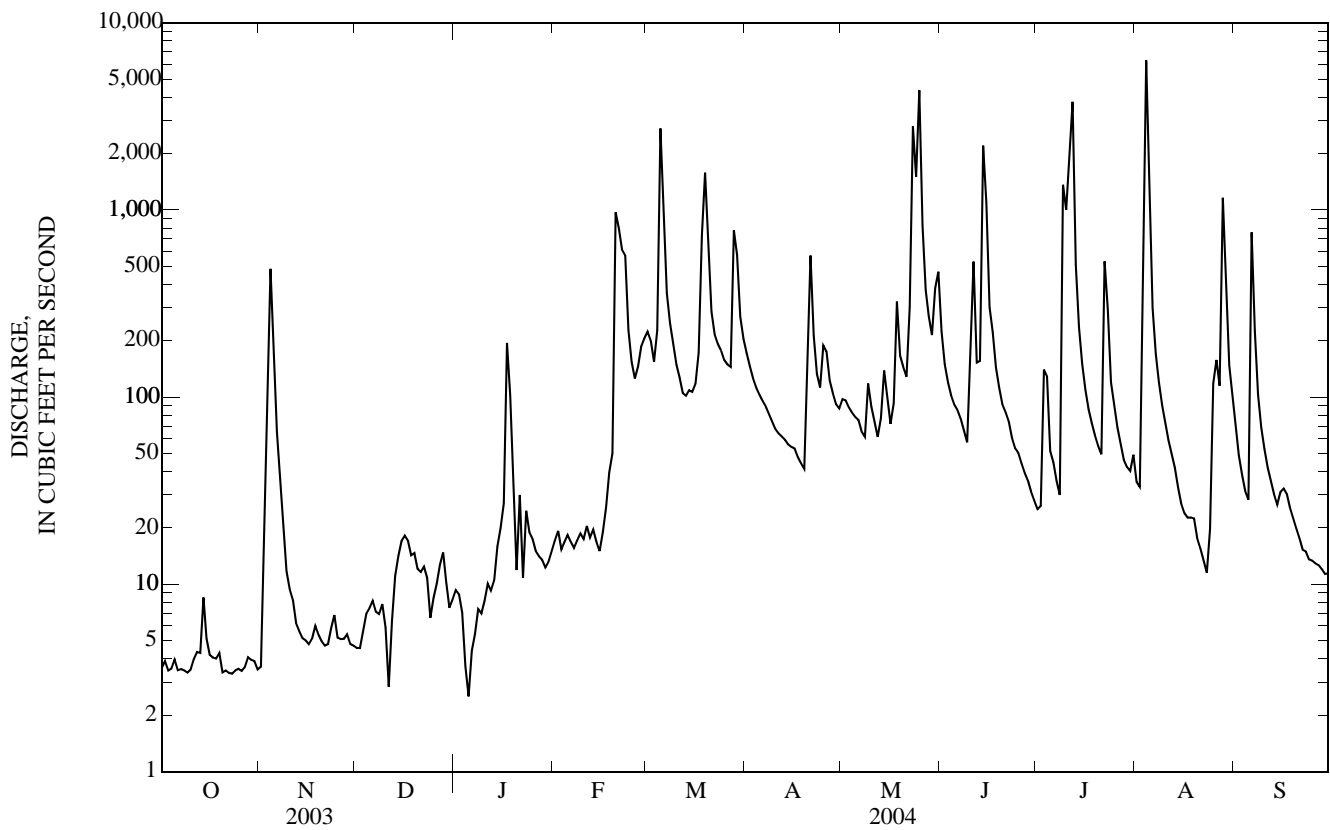
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 2004, BY WATER YEAR (WY)

MEAN	105	120	104	97.3	208	436	445	469	465	253	129	146
MAX	1,283	906	1,022	901	1,209	1,568	1,937	1,962	4,305	3,870	1,546	1,332
(WY)	(1974)	(1962)	(1983)	(1974)	(1973)	(1960)	(1973)	(1959)	(1947)	(1993)	(1993)	(1993)
MIN	0.35	1.05	0.88	1.05	3.70	3.61	1.70	6.88	1.79	1.48	2.02	1.05
(WY)	(1957)	(1957)	(1956)	(1956)	(1989)	(1957)	(1956)	(2000)	(1977)	(1977)	(1957)	(1957)

05487470 SOUTH RIVER NEAR ACKWORTH, IA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1941 - 2004	
ANNUAL TOTAL	24,925.8		66,560.2		248	
ANNUAL MEAN	68.3		182		966	
HIGHEST ANNUAL MEAN					1993	
LOWEST ANNUAL MEAN					1989	
HIGHEST DAILY MEAN	3,820	Jun 26	6,300	Aug 4	31,400	Jun 17, 1990
LOWEST DAILY MEAN	1.0	Jan 23	2.5	Jan 5 a	0.00	Sep 19, 1956 b
ANNUAL SEVEN-DAY MINIMUM	1.7	Jan 17	3.4	Oct 20	0.00	Sep 19, 1956
MAXIMUM PEAK FLOW			9,660	Aug 4	38,100	Jun 17, 1990
MAXIMUM PEAK STAGE			19.18	Aug 4	32.85	Jul 5, 1981
INSTANTANEOUS LOW FLOW					0.00	Sep 19, 1956 b
ANNUAL RUNOFF (AC-FT)	49,440		132,000		179,600	
ANNUAL RUNOFF (CFSM)	0.148		0.395		0.539	
ANNUAL RUNOFF (INCHES)	2.02		5.38		7.32	
10 PERCENT EXCEEDS	92		309		470	
50 PERCENT EXCEEDS	8.5		43		39	
90 PERCENT EXCEEDS	3.6		4.7		3.4	

a Ice affected.  
 b Also Sept. 30 to Oct. 13, 1956.  
 e Estimated.



## 05486490 MIDDLE RIVER NEAR INDIANOLA, IA

LOCATION.--Lat 41°25'27", long 93°35'14"(revised), in SW<sup>1</sup>/<sub>4</sub> SE<sup>1</sup>/<sub>4</sub> sec.35, T.77 N., R.24 W., Warren County, Hydrologic Unit 07100008, on right bank 10 ft downstream from bridge on county highway, 0.4 mi upstream from Cavitt Creek, 1.5 mi upstream from bridge on U.S. Highway 69, and 4.6 mi northwest of Indianola.

DRAINAGE AREA.--503 mi<sup>2</sup>.

PERIOD OF RECORD.--March 1940 to current year.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1940 (M), 1941, 1944, 1946, 1949 (M).

GAGE.--Water-stage recorder. Datum of gage is 776.15 ft above NGVD of 1929 (U.S. Army Corps of Engineers bench mark). Prior to June 11, 1946, June 9, 1947 to Nov. 23, 1948, and Sept. 8, 1951 to Oct. 30, 1952, nonrecording gage; and June 11, 1946 to June 8, 1947 (destroyed by flood), Nov. 24, 1948 to Sept. 7, 1951, Oct. 31, 1952 to Sept. 30, 1962, water-stage recorder at site 1.6 mi downstream at datum 2.81 ft lower.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and data collection platform with satellite telemetry at station. Precipitation records are available online at the U.S. Army Corps of Engineers website: [www2.mvr.usace.army.mil/WaterControl/datamining2.cfm](http://www2.mvr.usace.army.mil/WaterControl/datamining2.cfm).

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	4.7	13	31	e60	e30	e491	488	141	893	95	94	126
2	4.5	18	30	e53	e32	503	413	133	636	93	90	104
3	5.1	78	32	e41	e26	414	347	126	529	253	160	90
4	4.9	815	33	e21	e29	354	298	118	472	141	3,390	80
5	5.2	488	34	e14	e30	1,960	263	111	424	150	1,050	74
6	5.3	218	34	e17	e29	1,090	239	105	380	139	585	71
7	5.5	117	35	e20	e28	725	221	98	343	120	333	353
8	5.6	76	35	e24	e33	478	202	93	300	112	229	217
9	5.9	61	e34	e21	e35	350	182	727	256	144	181	122
10	6.2	52	e24	e26	e33	273	166	1,870	249	1,100	151	92
11	6.7	47	e17	e34	e35	232	156	775	257	1,580	131	77
12	7.9	42	e20	e30	e29	198	148	525	247	1,320	117	69
13	7.6	37	e26	e30	e33	180	141	476	300	850	107	62
14	11	35	e33	e31	e28	174	135	628	1,310	486	99	57
15	11	33	e36	e19	e24	179	130	587	1,200	337	92	54
16	9.2	33	e30	e29	e29	189	125	462	725	262	85	54
17	9.3	32	e27	e202	e36	211	117	521	477	216	79	52
18	9.7	34	e32	e188	e55	418	113	1,870	353	200	76	51
19	8.8	34	e34	e97	e83	1,340	109	2,360	280	169	72	48
20	8.6	32	e39	e58	e1,080	975	156	977	237	149	68	45
21	8.8	31	e44	e84	e829	678	379	702	219	137	65	44
22	9.0	35	e48	e72	e643	504	259	712	207	274	62	43
23	9.6	41	e42	e94	e711	390	281	2,770	188	467	59	40
24	10	38	e30	e65	e820	331	229	4,050	163	237	61	39
25	10	39	e39	e62	e458	290	288	8,040	147	176	259	37
26	11	36	e50	e46	e298	261	260	3,760	136	145	1,010	36
27	11	34	e55	e33	e239	244	228	1,400	127	127	396	35
28	13	34	e48	e27	e272	1,270	190	972	117	112	565	32
29	14	41	e38	e26	e416	1,460	162	750	108	102	521	32
30	13	35	e35	e25	---	816	150	876	102	97	223	30
31	13	---	e47	e27	---	595	---	1,400	---	94	166	---
TOTAL	265.1	2,659	1,092	1,576	6,423	17,573	6,575	38,135	11,382	9,884	10,576	2,266
MEAN	8.55	88.6	35.2	50.8	221	567	219	1,230	379	319	341	75.5
MAX	14	815	55	202	1,080	1,960	488	8,040	1,310	1,580	3,390	353
MIN	4.5	13	17	14	24	174	109	93	102	93	59	30
AC-FT	526	5,270	2,170	3,130	12,740	34,860	13,040	75,640	22,580	19,600	20,980	4,490
CFSM	0.02	0.18	0.07	0.10	0.44	1.13	0.44	2.45	0.75	0.63	0.68	0.15
IN.	0.02	0.20	0.08	0.12	0.48	1.30	0.49	2.82	0.84	0.73	0.78	0.17

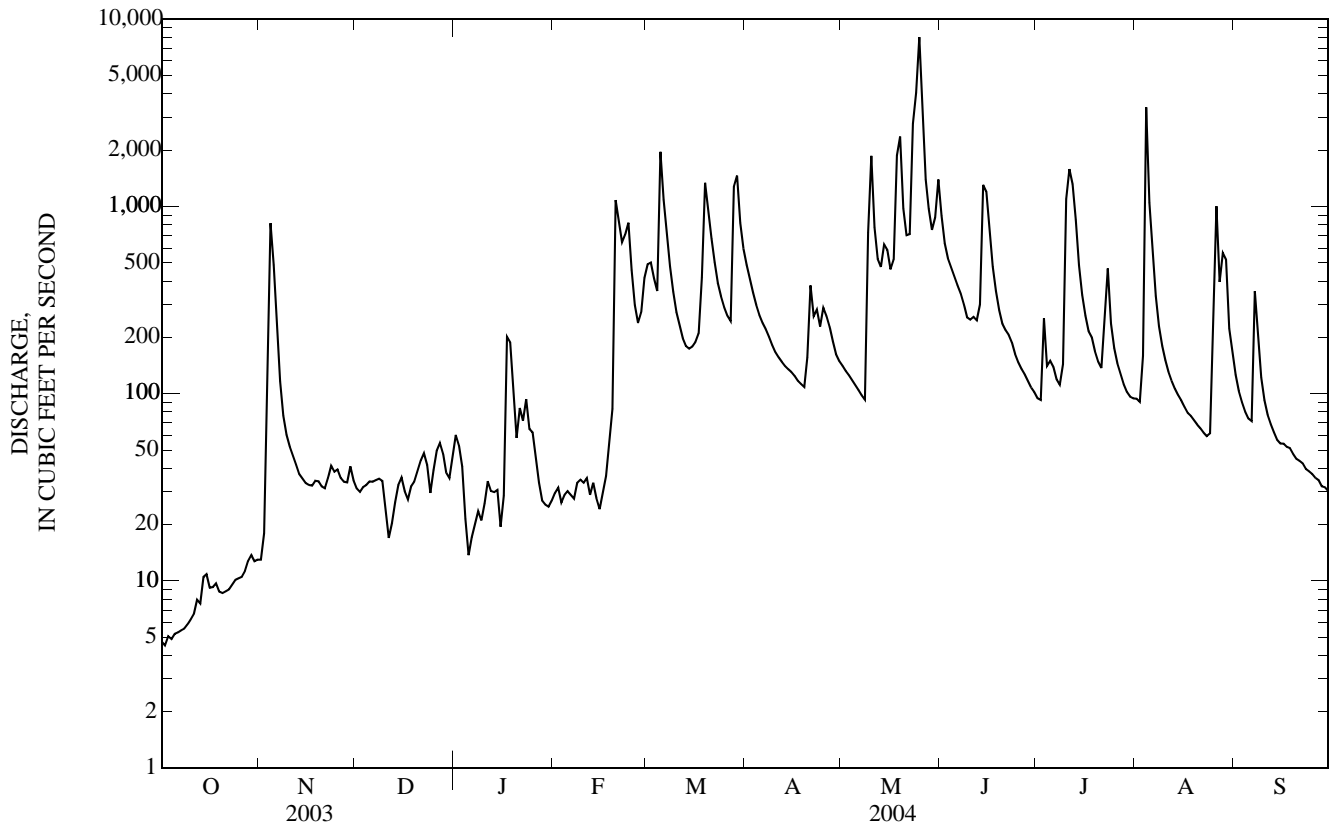
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 2004, BY WATER YEAR (WY)

MEAN	108	128	110	100	222	459	476	524	500	268	164	166
MAX	928	961	1,070	646	1,415	1,417	1,983	2,053	4,094	3,121	1,419	1,460
(WY)	(1974)	(1973)	(1983)	(1973)	(1973)	(1962)	(1973)	(1996)	(1947)	(1993)	(1993)	(1992)
MIN	4.28	2.80	1.62	1.02	4.68	7.35	4.81	10.1	3.81	5.20	4.47	3.92
(WY)	(1969)	(1956)	(1956)	(1977)	(1977)	(1954)	(1956)	(1956)	(1977)	(1977)	(1968)	(1968)

05486490 MIDDLE RIVER NEAR INDIANOLA, IA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1941 - 2004	
ANNUAL TOTAL	40,099.6		108,406.1			
ANNUAL MEAN	110		296		269	
HIGHEST ANNUAL MEAN					1,006	1993
LOWEST ANNUAL MEAN					17.8	1968
HIGHEST DAILY MEAN	2,950	May 5	8,040	May 25	21,400	Jun 13, 1947
LOWEST DAILY MEAN	1.4	Jan 24	4.5	Oct 2	0.11	Jul 2, 1977
ANNUAL SEVEN-DAY MINIMUM	3.3	Jan 21	5.0	Oct 1	0.51	Jun 29, 1977
MAXIMUM PEAK FLOW			9,990	May 25	34,000	Jun 13, 1947
MAXIMUM PEAK STAGE			21.03	May 25	28.27	Jun 13, 1947 a
INSTANTANEOUS LOW FLOW			4.3	Oct 2	0.11	Jul 2, 1977
ANNUAL RUNOFF (AC-FT)	79,540		215,000		194,600	
ANNUAL RUNOFF (CFSM)	0.218		0.589		0.534	
ANNUAL RUNOFF (INCHES)	2.97		8.02		7.26	
10 PERCENT EXCEEDS	185		726		600	
50 PERCENT EXCEEDS	33		104		68	
90 PERCENT EXCEEDS	6.7		19		9.0	

a From floodmark.  
e Estimated.





## 05487500 DES MOINES RIVER NEAR RUNNELLS, IA

LOCATION.--Lat 41°29'19", long 93°20'17", in SE¼ NW¼ sec.12, T.77 N., R.22 W., Polk County, Hydrologic Unit 07100008, on left bank 10 ft downstream from bridge on State Highway 316, 0.2 mi downstream from South River River, 0.5 mi upstream from Camp Creek, 2.2 mi southeast of Runnels, 37.2 mi upstream from Red Rock Dam, and at mi 179.5.

DRAINAGE AREA.--11,655 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1985 to current year.

GAGE.--Water-stage recorder. Datum of gage is 700.00 ft above NGVD of 1929 (U.S. Army Corps of Engineers bench mark).

REMARKS.--Records good except those for estimated daily discharge, which are poor. Flow regulated by Saylorville Lake (station 05481630) 34.2 mi upstream. Stage-discharge relation is affected at times by backwater from Lake Red Rock (05488100). U.S. Army Corps of Engineers rain gage and data collection platform with satellite telemetry at station. Precipitation records are available online at the U.S. Army Corps of Engineers website: [www2.mvr.usace.army.mil/WaterControl/datamining2.cfm](http://www2.mvr.usace.army.mil/WaterControl/datamining2.cfm).

EXTREMES OUTSIDE PERIOD OF RECORD.--Floods occurred on May 31, 1903; June 14, 1947; June 26, 1947; and June 24, 1954. No gage height or discharge was determined. Gage height and discharge information is available for these floods at other sites on the Des Moines River.

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	453	557	691	582	e476	e10,100	e10,300	7,100	e27,200	14,900	4,910	1,210
2	470	685	978	601	e494	e12,000	e8,220	6,750	e24,800	14,200	4,490	e1,100
3	362	1,660	991	587	e503	e11,600	7,260	5,990	22,400	13,400	5,730	e1,060
4	391	6,700	843	e542	e503	e10,600	7,070	5,250	21,700	12,800	e15,000	e1,060
5	440	4,590	719	e515	e494	12,800	6,720	4,790	20,600	e13,000	e10,000	e1,280
6	430	3,030	875	e495	e511	12,200	5,710	4,420	19,400	e12,400	7,810	e2,590
7	391	2,230	927	e495	e528	e13,700	5,250	4,120	18,400	e12,200	7,410	2,660
8	413	2,010	841	e489	e528	e13,500	4,940	3,910	17,300	e12,600	6,780	2,240
9	415	1,900	e765	e469	e578	e11,500	4,670	5,840	16,800	e13,700	5,320	e1,240
10	449	1,730	e847	e443	e528	e9,310	4,160	e9,670	16,600	e14,000	4,470	e976
11	408	1,560	693	e443	e536	7,370	3,880	e8,890	e17,100	e15,500	e4,200	e835
12	421	1,030	678	e409	e528	7,040	3,740	7,320	16,200	e16,900	e3,720	e810
13	406	1,180	e635	e409	e578	6,290	3,280	6,610	e17,000	e14,000	2,980	e804
14	475	1,200	441	e403	e609	5,300	3,090	6,750	e21,900	e11,800	2,680	e791
15	565	1,120	415	e476	e584	4,930	3,030	7,080	e20,200	e11,600	2,460	e795
16	515	999	445	e522	e660	4,870	2,910	6,900	e19,100	e10,800	2,060	e766
17	495	1,090	569	e630	e710	5,730	3,010	6,580	18,600	9,910	e2,160	e738
18	514	815	509	e598	e778	6,150	2,940	e10,200	e19,400	9,710	1,950	e1,410
19	532	836	428	e494	e870	7,400	2,830	11,600	e20,500	9,500	e2,530	e4,110
20	488	854	397	e485	e2,480	7,220	3,180	e9,540	e22,300	9,280	2,320	e6,110
21	494	915	385	e439	e2,190	7,040	5,240	7,530	e24,800	9,060	2,050	e7,410
22	503	840	371	e476	e2,050	6,660	5,410	7,210	e26,200	e9,090	e1,940	e7,890
23	932	557	e380	e458	e2,970	5,890	5,010	e19,900	e23,400	e9,050	e1,980	e7,920
24	567	579	e364	e494	e3,910	5,570	4,780	e34,400	e20,200	8,490	e2,290	e7,700
25	400	748	e451	e467	e3,300	5,190	5,320	40,900	18,600	8,250	e2,490	7,120
26	479	750	e489	e467	e3,190	4,680	6,000	40,400	18,000	8,030	e2,900	7,080
27	552	624	516	e476	e3,400	4,440	6,260	30,800	17,300	7,830	e2,450	6,890
28	e662	428	e527	e467	e5,330	e7,460	e7,370	25,600	16,500	7,640	3,440	6,430
29	696	767	e548	e503	6,780	e11,800	e8,540	e26,200	15,900	7,390	4,900	5,860
30	586	705	486	e458	---	e12,700	e7,740	e24,300	15,400	7,180	2,620	5,100
31	453	---	e576	e485	---	e13,000	---	e26,000	---	6,250	1,820	---
TOTAL	15,357	42,689	18,780	15,277	46,596	264,040	157,860	422,550	593,800	340,460	127,860	101,985
MEAN	495	1,423	606	493	1,607	8,517	5,262	13,630	19,790	10,980	4,125	3,400
MAX	932	6,700	991	630	6,780	13,700	10,300	40,900	27,200	16,900	15,000	7,920
MIN	362	428	364	403	476	4,440	2,830	3,910	15,400	6,250	1,820	738
AC-FT	30,460	84,670	37,250	30,300	92,420	523,700	313,100	838,100	1,178,000	675,300	253,600	202,300
CFSM	0.04	0.12	0.05	0.04	0.14	0.73	0.45	1.17	1.70	0.94	0.35	0.29
IN.	0.05	0.14	0.06	0.05	0.15	0.84	0.50	1.35	1.90	1.09	0.41	0.33

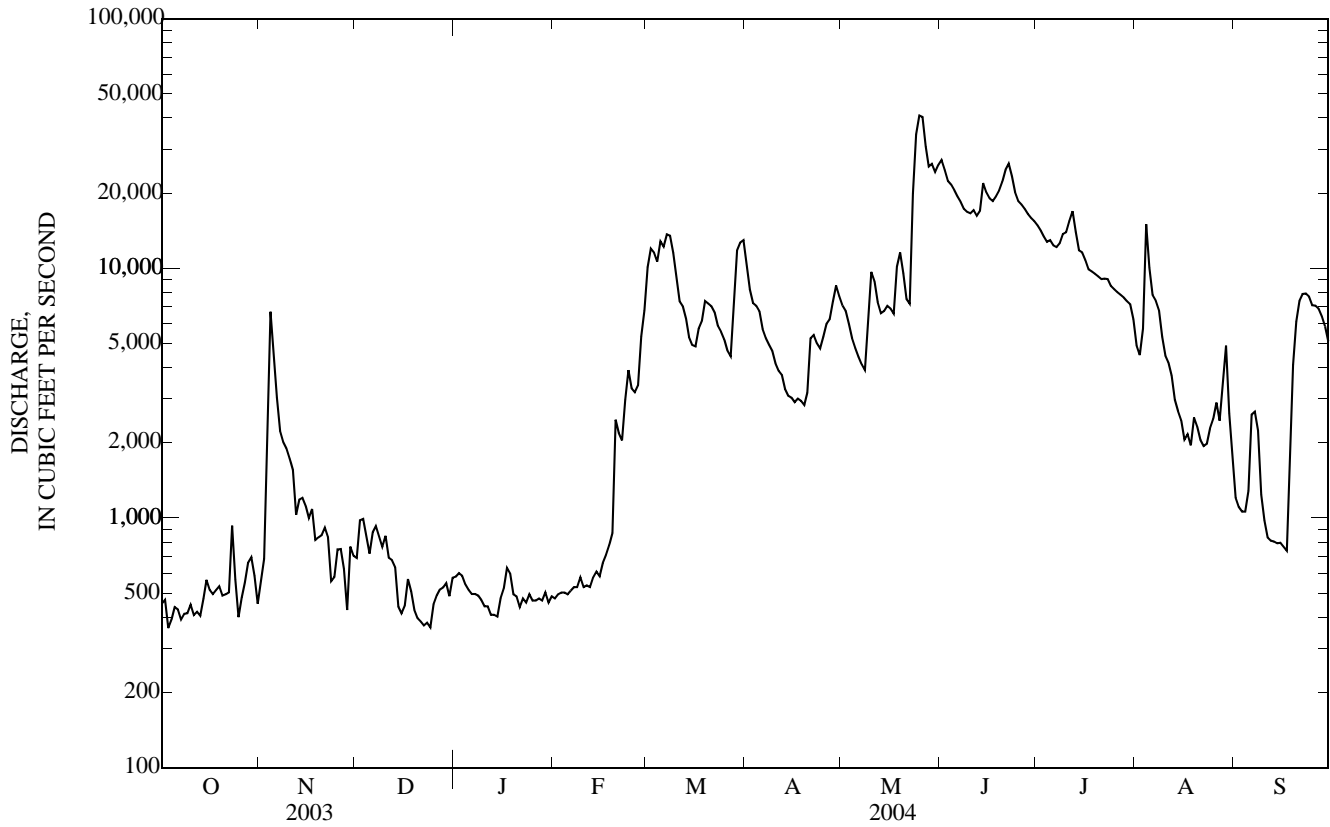
## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1986 - 2004, BY WATER YEAR (WY)

MEAN	3,306	3,489	3,158	1,795	3,065	8,655	12,490	14,950	15,830	13,610	6,238	3,631
MAX	18,040	12,660	10,000	6,237	8,557	18,390	30,380	32,740	40,530	68,140	32,990	26,320
(WY)	(1987)	(1993)	(1992)	(1992)	(1997)	(1993)	(1993)	(1993)	(1991)	(1993)	(1993)	(1993)
MIN	352	524	473	450	500	1,136	773	1,272	1,777	840	534	503
(WY)	(2001)	(1990)	(1990)	(1990)	(1990)	(2000)	(2000)	(2000)	(1988)	(1988)	(1988)	(2000)

05487500 DES MOINES RIVER NEAR RUNNELLS, IA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1986 - 2004	
ANNUAL TOTAL	1,797,755		2,147,254			
ANNUAL MEAN	4,925		5,867		7,536	
HIGHEST ANNUAL MEAN					22,980	1993
LOWEST ANNUAL MEAN					1,200	1989
HIGHEST DAILY MEAN	29,900	May 9	40,900	May 25	133,000	Jul 11, 1993
LOWEST DAILY MEAN	321	Sep 9	362	Oct 3	297	Sep 17, 2000
ANNUAL SEVEN-DAY MINIMUM	370	Sep 5	397	Dec 19	319	Oct 16, 2000
MAXIMUM PEAK FLOW			45,300	May 26	134,000	Jul 11, 1993
MAXIMUM PEAK STAGE			60.65	Jun 24	82.88	Jul 11, 1993
ANNUAL RUNOFF (AC-FT)	3,566,000		4,259,000		5,460,000	
ANNUAL RUNOFF (CFSM)	0.423		0.503		0.647	
ANNUAL RUNOFF (INCHES)	5.74		6.85		8.79	
10 PERCENT EXCEEDS	16,500		16,500		20,500	
50 PERCENT EXCEEDS	1,090		3,030		3,620	
90 PERCENT EXCEEDS	473		468		604	

e Estimated



## 05487540 WALNUT CREEK NEAR PRAIRIE CITY, IA

LOCATION.--(revised) Lat 41°36'03", long 93°16'26", in NE<sup>1</sup>/<sub>4</sub> NE<sup>1</sup>/<sub>4</sub> sec.5, T.78 N., R.21 W., Jasper County, Hydrologic Unit 07100008, on left bank downstream side of bridge on Highway 163.

DRAINAGE AREA.--6.78 mi<sup>2</sup>.

## WATER DISCHARGE RECORDS

PERIOD OF RECORD.--May 1995 to current year.

GAGE.--Water-stage recorder. Concrete control. Datum of gage is 826.33 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharge, which are poor. U.S. Geological Survey rain gage and data collection platform with satellite and telephone modem telemetry at station. Precipitation records are not published, but are available.

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	0.10	0.14	1.3	1.8	e0.80	e4.3	5.8	5.5	13	2.9	3.5	2.4
2	0.10	0.58	1.4	1.9	e1.0	4.3	5.4	5.3	12	3.2	3.5	2.2
3	0.10	23	1.6	1.7	e0.92	4.2	5.2	5.0	11	7.8	15	2.2
4	0.11	50	1.4	e1.2	e1.0	10	5.0	4.9	9.9	4.9	23	2.1
5	0.09	9.7	1.5	e1.6	1.1	31	4.8	4.5	9.5	4.1	9.5	2.0
6	0.09	5.9	1.4	e1.5	1.1	15	4.6	4.4	9.0	3.9	6.9	2.0
7	0.08	4.6	1.5	e1.5	1.1	11	4.4	4.3	8.3	3.6	6.0	1.7
8	0.08	3.8	1.7	e1.6	1.3	9.3	4.1	4.2	7.5	3.4	5.3	1.7
9	0.08	3.5	2.9	e1.6	1.1	7.8	3.9	5.9	7.2	3.9	4.7	1.7
10	0.08	3.3	5.5	1.4	1.1	7.3	3.9	4.9	7.9	3.5	4.3	1.6
11	0.76	3.0	2.8	1.6	1.0	6.4	3.8	4.7	7.4	55	4.1	1.5
12	0.17	2.5	2.5	1.6	1.00	5.9	3.7	4.6	6.8	23	3.9	1.4
13	0.16	2.2	2.4	1.5	1.0	5.8	3.6	4.9	7.2	13	3.6	1.4
14	0.51	2.2	2.4	1.5	1.00	5.5	3.5	4.6	8.0	10	3.4	1.4
15	0.21	2.2	2.4	1.4	0.93	5.3	3.5	4.4	7.3	8.5	3.2	1.5
16	0.16	2.0	2.3	3.6	0.94	5.7	3.3	4.2	6.8	7.6	3.2	1.3
17	0.24	2.0	2.3	3.8	0.93	6.2	4.1	5.6	6.2	6.6	3.1	1.3
18	0.18	2.1	2.0	3.3	1.3	13	3.5	14	5.9	6.0	3.3	1.3
19	0.16	1.8	1.9	2.2	e1.9	15	3.3	10	5.4	5.5	3.1	1.2
20	0.15	1.7	1.8	2.0	e52	11	14	8.5	5.4	5.0	3.0	1.1
21	0.14	1.6	2.1	1.8	e15	9.3	14	7.5	5.5	4.9	2.8	1.1
22	0.13	1.6	2.3	1.8	e19	8.4	10	17	5.1	12	2.6	1.1
23	0.12	2.0	2.2	1.7	9.1	7.7	8.6	46	4.7	8.3	2.6	1.1
24	0.13	1.6	2.0	1.5	e4.6	6.9	8.3	45	4.6	6.3	2.9	1.1
25	0.14	1.7	1.9	1.5	e3.7	6.3	8.2	55	4.5	5.6	2.8	0.97
26	0.13	1.6	2.0	e1.3	e3.8	6.0	7.3	22	4.0	5.0	2.8	0.94
27	0.15	1.6	2.5	e1.1	e3.7	6.1	6.8	17	3.3	4.6	3.5	0.94
28	0.17	1.5	2.4	e0.97	e3.7	7.9	6.5	14	3.2	4.3	11	0.88
29	0.14	1.6	2.0	e0.77	e4.2	7.0	5.9	13	3.0	4.2	4.3	0.82
30	0.16	1.4	1.9	e0.77	---	6.6	5.9	15	3.0	4.0	3.1	0.84
31	0.13	---	1.8	e0.82	---	6.3	---	14	---	3.7	2.6	---
TOTAL	5.15	142.42	66.1	52.33	139.32	262.5	174.9	379.9	202.6	244.3	156.6	42.79
MEAN	0.17	4.75	2.13	1.69	4.80	8.47	5.83	12.3	6.75	7.88	5.05	1.43
MAX	0.76	50	5.5	3.8	52	31	14	55	13	55	23	2.4
MIN	0.08	0.14	1.3	0.77	0.80	4.2	3.3	4.2	3.0	2.9	2.6	0.82
AC-FT	10	282	131	104	276	521	347	754	402	485	311	85
CFSM	0.02	0.70	0.31	0.25	0.71	1.25	0.86	1.81	1.00	1.16	0.75	0.21
IN.	0.03	0.78	0.36	0.29	0.76	1.44	0.96	2.08	1.11	1.34	0.86	0.23

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1996 - 2004, BY WATER YEAR (WY)

MEAN	1.15	1.95	1.24	1.22	5.54	5.95	4.93	12.4	12.9	6.59	3.29	0.89
MAX	3.48	5.69	3.22	3.73	19.8	19.4	13.1	25.0	31.8	13.8	10.5	1.97
(WY)	(1999)	(1999)	(1998)	(1998)	(1996)	(2001)	(1998)	(1996)	(1998)	(1998)	(1999)	(1999)
MIN	0.17	0.36	0.12	0.28	0.87	1.29	1.41	3.95	6.61	2.67	1.07	0.22
(WY)	(2004)	(2001)	(2001)	(2002)	(2002)	(2000)	(1996)	(2001)	(1997)	(2001)	(2001)	(2003)

05487540 WALNUT CREEK NEAR PRAIRIE CITY, IA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1996 - 2004	
ANNUAL TOTAL	1,598.10		1,868.91		4.83	
ANNUAL MEAN	4.38		5.11		9.24 1998	
HIGHEST ANNUAL MEAN					2.68 2002	
LOWEST ANNUAL MEAN					210 May 24, 1996	
HIGHEST DAILY MEAN	69	May 9	55	May 25 a		
LOWEST DAILY MEAN	0.04	Sep 8	0.08	Oct 7 b	0.04 Jan 7, 1996 c	
ANNUAL SEVEN-DAY MINIMUM	0.06	Sep 4	0.09	Oct 4	0.06 Sep 4, 2003	
MAXIMUM PEAK FLOW			281	Jul 11	1,350 Jun 18, 1998	
MAXIMUM PEAK STAGE			6.16	Jul 11	9.66 Jun 18, 1998	
INSTANTANEOUS LOW FLOW			0.07	Oct 7 b	0.00 Nov 10, 1995	
ANNUAL RUNOFF (AC-FT)	3,170		3,710		3,500	
ANNUAL RUNOFF (CFSM)	0.646		0.753		0.713	
ANNUAL RUNOFF (INCHES)	8.77		10.25		9.68	
10 PERCENT EXCEEDS	11		10		11	
50 PERCENT EXCEEDS	1.7		3.3		2.0	
90 PERCENT EXCEEDS	0.14		0.81		0.30	

- a Also July 11.
- b Also Oct. 8, 9, 10.
- c Also Sept. 8-10, 2003.
- e Estimated.

