RAPPAHANNOCK RIVER BASIN

01668000 RAPPAHANNOCK RIVER NEAR FREDERICKSBURG, VA

LOCATION.--Lat 38°19'20", long 77°31'05", Spotsylvania County, Hydrologic Unit 02080104, on right bank 1.6 mi upstream from Virginia Power dam, 2.2 mi downstream from Motts Run, and 3.8 mi upstream from Fredericksburg.

DRAINAGE AREA.--1,596 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1907 to current year. Monthly discharge only for some periods, published in WSP 1302.

REVISED RECORDS.--WSP 801: 1924(M). WSP 951: 1937(M). WSP 1302: 1907-12, 1913(M), 1916(M), 1918(M), 1920-21(M). WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 55.18 ft above sea level. Prior to Jan. 15, 1922, nonrecording gage, and Jan. 15, 1922, to Aug. 2, 1966, water-stage recorder at same site at datum 1.00 ft higher.

REMARKS.--Records good except those for periods of doubtful gage-height record, Nov. 18-21, and Dec. 2, 3, 13-17, which are fair. Maximum discharge, 140,000 ft^3/s, from rating curve extended above 76,000 ft^3/s on basis of flow-over-dam and slope-area measurements at gage heights 26.1 ft and 26.9 ft, present datum.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1889 was probably several feet lower than that of Oct. 16, 1942.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 16,000 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 8	1000	28,800	10.81	Feb. 18	2300	39,900	12.70
Jan. 9	1400	20,700	9.26	Mar. 19	1830	17,200	8.52
Jan. 24	0500	19,800	9.08	Mar. 22	1300	40,200	12.75
Jan. 29	0900	35,300	11.92	May 9	0800	29,300	10.90
Feb. 5	1400	*43,000	*13.20				

Minimum discharge, 75 ft^3/s, Sept. 30; minimum gage height, 1.18 ft, Sept. 17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	679	406	769	1160	4160	3200	2260	1550	1150	860	251	120
2	441	983	e780	916	3360	3120	2520	2780	1170	707	233	112
3	349	1900	e720	952	2930	3690	2290	4570	1050	609	215	106
4	312	1350	692	1030	10300	3210	2370	3650	988	559	196	100
5	291	932	709	1140	39800	2680	3650	4980	936	531	182	93
6	278	745	726	1190	23100	2440	2620	5560	940	515	171	89
7	258	7200	688	1280	11300	2270	2250	3670	920	496	162	86
8	236	25500	654	3400	7840	3080	2070	13600	856	485	155	94
9	231	9290	648	17900	5440	13000	3010	23000	816	557	155	92
10	218	4440	670	7190	4160	9850	9490	7950	872	593	163	90
11	211	2930	735	4050	3520	5420	4850	5460	1220	555	199	112
12	208	2320	864	3010	4780	4110	3530	5400	1190	487	295	111
13	208	1950	e790	2500	4470	3440	2950	6460	1230	433	323	104
14	204	2040	e685	2180	3550	3050	2630	4260	2100	403	310	98
15	209	2660	e615	1890	3100	2760	2440	3410	1640	383	243	93
16	207	2070	e565	5940	2770	2470	2250	2920	3010	370	256	90
17	215	1660	e545	4400	7620	2300	2530	2600	3200	359	303	83
18	453	e1380	565	3100	34800	2640	2850	2420	2190	377	288	103
19	557	e1200	558	2620	17800	11600	2220	2130	1350	515	464	98
20	436	e1050	545	2290	7560	8250	5460	1940	1110	444	403	88
21	333	e960	539	2000	6040	31300	4400	1790	1080	371	293	92
22	275	1260	540	1760	4650	25100	3140	1660	911	349	239	110
23	245	1580	568	5950	5000	8450	2690	1530	1050	340	212	113
24	232	1210	761	14100	12100	5770	2420	1480	3050	308	195	103
25	251	1020	1210	6360	6610	4560	2190	1610	1640	321	183	92
26	288	908	2040	4230	4570	3850	1990	1940	983	316	170	97
27	660	873	1410	3190	3860	3410	1870	1540	801	295	160	92
28	863	826	1440	18300	3450	3090	1770	1470	722	273	150	85
29	611	778	1450	31300	---	2820	1630	1460	798	257	138	82
30	447	767	1270	9910	---	2590	1540	1320	1030	254	132	79
31	377	---	1360	5660	---	2410	---	1220	---	253	128	---
TOTAL	10783	82188	26111	170898	248640	185930	87880	125330	40003	13575	6967	2907
MEAN	348	2740	842	5513	8880	5998	2929	4043	1333	438	225	96.9
MAX	863	25500	2040	31300	39800	31300	9490	23000	3200	860	464	120
MIN	204	406	539	916	2770	2270	1540	1220	722	253	128	79
CFSM	.22	1.72	.53	3.45	5.56	3.76	1.84	2.53	.84	.27	.14	.06
IN.	.25	1.92	.61	3.98	5.80	4.33	2.05	2.92	.93	.32	.16	.07

e Estimated.

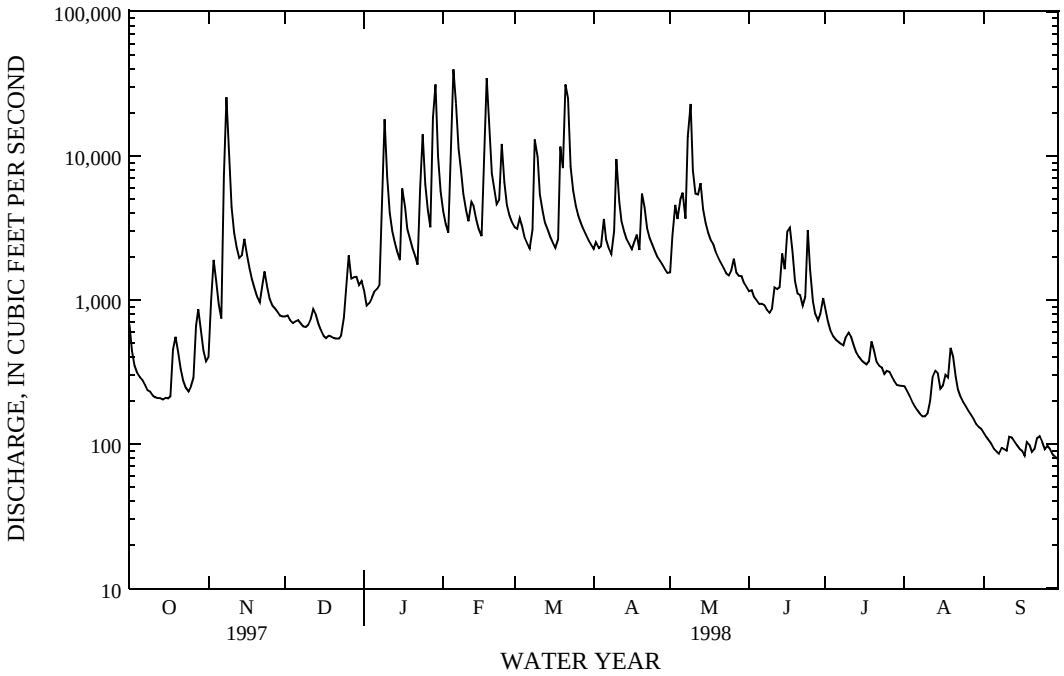
01668000 RAPPAHANNOCK RIVER NEAR FREDERICKSBURG, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1907 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1157	1335	1685	2234	2538	2719	2508	1920	1433	920	1022	949
MAX	11090	6522	5357	6472	8880	8505	9484	10310	7112	3368	7190	6924
(WY)	1943	1986	1949	1996	1998	1993	1983	1924	1972	1949	1955	1996
MIN	15.3	75.4	147	268	224	526	587	492	224	78.6	21.1	46.5
(WY)	1931	1931	1931	1966	1931	1931	1981	1956	1977	1930	1930	1930

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1907 - 1998	
ANNUAL TOTAL	529511		1001212			
ANNUAL MEAN	1451		2743		1697	
HIGHEST ANNUAL MEAN					3072	1996
LOWEST ANNUAL MEAN					440	1931
HIGHEST DAILY MEAN	25500	Nov 8	39800	Feb 5	127000	Oct 16 1942
LOWEST DAILY MEAN	109	Sep 9	79	Sep 30	5.0	aOct 11 1930
ANNUAL SEVEN-DAY MINIMUM	123	Sep 4	90	Sep 24	8.3	Oct 9 1930
INSTANTANEOUS PEAK FLOW			43000	Feb 5	140000	Oct 16 1942
INSTANTANEOUS PEAK STAGE			13.20	Feb 5	b26.90	Oct 16 1942
INSTANTANEOUS LOW FLOW			75	Sep 30	5.0	Oct 11 1930
ANNUAL RUNOFF (CFSM)	.91		1.72		1.06	
ANNUAL RUNOFF (INCHES)	12.34		23.34		14.45	
10 PERCENT EXCEEDS	2920		5840		3340	
50 PERCENT EXCEEDS	910		1170		1000	
90 PERCENT EXCEEDS	208		158		237	

a Also Oct. 12, 1930.
b From floodmarks.



01668000 RAPPAHANNOCK RIVER NEAR FREDERICKSBURG, VA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1929-30, 1956, 1967-74, 1978 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1955 to September 1956, April 1968 to August 1974. October 1991 to September 1993.
WATER TEMPERATURE: October 1955 to September 1956, April 1968 to August 1974.

COOPERATION.--Chemical data as noted were provided by the Virginia Division of Consolidated Laboratory Services (VDCLS) and reviewed by the U.S. Geological Survey.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	AGENCY ANA-LYZING SAMPLE (CODE NUMBER) (00028)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)
OCT 1997										
08...	0900	243	77	6.8	16.0	22.0	776	VDCLS	2.9	7.5
20...	1030	437	82	6.6	10.0	13.0	766	VDCLS	4.9	9.4
NOV										
05...	0900	953	87	7.0	8.0	9.0	780	VDCLS	11	10.6
09...	1200	8130	68	6.4	13.0	10.0	757	VDCLS	74	10.4
21...	0930	934	84	6.8	8.0	5.0	769	VDCLS	5.7	12.8
DEC										
03...	1300	710	85	6.8	9.0	5.5	769	VDCLS	4.1	11.6
*03...	1315	710	85	6.8	9.0	5.5	769	VDCLS	3.3	11.6
17...	1100	573	86	6.9	5.5	4.0	758	VDCLS	5.3	13.0
JAN 1998										
05...	0915	1150	69	7.2	6.5	3.5	751	VDCLS	5.9	14.1
08...	1000	2340	82	6.8	21.0	11.0	757	VDCLS	8.5	10.6
09...	1000	19600	48	6.7	17.0	13.0	758	VDCLS	790	9.0
*09...	1015	19700	48	6.7	17.0	13.0	758	VDCLS	790	9.0
10...	1145	6470	61	7.0	9.5	11.0	771	VDCLS	170	10.8
22...	1130	1750	79	7.0	5.0	4.0	776	VDCLS	13	13.2
24...	1000	16300	66	5.7	5.5	4.0	762	VDCLS	180	12.4
28...	1000	15200	65	7.4	4.0	5.0	759	VDCLS	57	12.5
*28...	1015	15600	65	7.4	4.0	5.0	759	USGS	--	12.5
31...	1000	5760	62	6.5	4.0	6.0	768	VDCLS	65	12.0
FEB										
03...	1030	2940	68	6.2	6.0	5.0	772	VDCLS	28	12.5
06...	1100	21700	59	--	5.0	5.0	764	VDCLS	56	12.0
08...	1000	7960	63	6.8	6.5	5.0	765	VDCLS	62	12.9
19...	1100	14300	54	5.7	13.0	9.0	761	VDCLS	91	11.0
27...	1030	3860	65	6.6	10.0	7.0	764	VDCLS	19	12.0
MAR										
04...	0930	3250	71	6.4	6.0	7.0	764	VDCLS	28	11.6
10...	0915	11000	58	6.7	8.5	10.0	733	VDCLS	110	10.7
19...	1000	11500	68	7.2	10.0	7.0	764	VDCLS	35	12.0
26...	1000	3870	62	6.8	17.0	8.0	779	VDCLS	24	11.9
APR										
02...	0930	2330	67	6.6	20.5	18.0	763	VDCLS	9.6	8.9
*02...	0945	2340	67	6.6	20.5	18.0	763	USGS	--	8.9
10...	1030	11600	62	6.8	8.0	14.0	759	VDCLS	150	9.6
*10...	1045	11600	62	6.8	8.0	14.0	759	VDCLS	190	9.6
14...	1000	2650	62	6.5	18.0	13.5	762	VDCLS	7.2	10.2
20...	1030	5870	66	6.9	17.5	14.3	760	VDCLS	20	10.1
MAY										
04...	1045	3980	85	7.0	18.0	17.1	757	VDCLS	68	8.2
06...	0930	5140	61	6.4	16.0	15.0	771	VDCLS	230	8.8
08...	0915	8200	58	6.7	20.0	16.7	752	VDCLS	56	8.9
*09...	1020	29200	52	6.6	19.0	16.0	758	USGS	--	8.6
09...	1035	29200	52	6.6	19.0	16.0	758	VDCLS	130	8.6
20...	0930	1980	69	6.6	22.0	22.0	764	VDCLS	8.7	8.2
JUN										
10...	0930	861	76	6.6	16.0	19.0	774	VDCLS	2.0	8.9
11...	1330	1320	76	6.6	20.0	19.0	770	VDCLS	--	9.1
16...	1000	1800	74	7.2	25.0	22.5	760	VDCLS	24	7.4
24...	1415	4390	81	6.1	30.0	26.0	769	VDCLS	110	7.3
JUL										
08...	1200	478	78	7.1	25.0	26.0	764	VDCLS	2.3	8.1
23...	0930	340	92	7.6	27.5	29.5	752	VDCLS	1.5	5.8
AUG										
05...	1030	182	87	7.9	24.0	26.0	760	VDCLS	1.3	7.1
21...	1000	299	87	6.5	24.5	23.5	760	VDCLS	1.7	7.8
SEP										
02...	0945	113	84	7.7	23.0	26.0	748	VDCLS	1.6	5.8
16...	1030	91	91	6.8	28.5	26.0	775	VDCLS	1.6	7.6

* Replicate sample.

RAPPAHANNOCK RIVER BASIN

01668000 RAPPAHANNOCK RIVER NEAR FREDERICKSBURG, VA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530) *	RESIDUE FIXED NON FILTER-ABLE (MG/L) (00540) *	RESIDUE VOLA-TILE, SUS-PENDED (MG/L) (00535) *	NITRO-GEN DIS-SOLVED (MG/L AS N) (00602) *	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613) *	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631) *	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608) *
OCT 1997										
08...	84	6.3	<3	<3	<3	.209	.013	.002	.013	.010
20...	89	6.4	<3	<3	<3	.246	.047	.002	.047	.004
NOV										
05...	90	12	5	3	<3	.704	.385	.002	.387	.017
09...	93	8.9	127	111	16	1.00	.675	.002	.677	.010
21...	99	13	3	3	3	.879	.730	.002	.730	.008
DEC										
03...	91	13	<3	<3	<3	.784	.624	<.002	.624	<.004
*03...	91	13	<3	<3	<3	.730	.630	<.002	.630	<.004
17...	100	10	3	3	<3	.586	.498	<.002	.498	.005
JAN 1998										
05...	108	11	3	<3	<3	.788	.659	<.002	.659	<.004
08...	97	10	19	15	4	.703	.552	.002	.554	<.004
09...	86	7.1	664	568	96	.800	.385	.004	.389	.029
*09...	86	7.1	725	620	105	.697	.380	.004	.384	.028
10...	97	11	182	160	22	.740	.554	.002	.556	.011
22...	99	13	8	6	<3	.865	.752	.002	.754	.008
24...	95	7.8	219	189	30	1.01	.480	.003	.483	.050
28...	98	9.5	68	60	8	.927	.516	.002	.518	.035
*28...	98	8.7	124	114	10	.94	--	--	.52	.050
31...	96	11	59	52	7	.411	.609	<.002	.609	.012
FEB										
03...	97	13	16	13	3	.830	.715	<.002	.715	.010
06...	94	7.4	99	86	13	.720	.423	.002	.425	.032
08...	101	10	53	45	8	.805	.568	<.002	.568	.020
19...	95	8.8	135	120	15	.652	.437	.003	.440	<.004
27...	99	12	16	13	3	.719	.561	<.002	.561	.006
MAR										
04...	95	12	23	19	4	.773	.548	.003	.551	<.004
10...	99	9.0	106	91	15	.764	.396	.003	.399	.017
19...	99	10	103	90	13	.658	.464	.003	.467	.046
26...	98	12	21	18	<3	.662	.550	<.002	.550	.005
APR										
02...	94	11	9	7	<3	.552	.428	<.002	.428	.004
*02...	94	11	<1	--	4	.58	--	--	.43	<.002
10...	93	8.0	286	--	--	.742	.336	.005	.341	.050
*10...	93	8.1	308	--	--	.724	.338	.005	.343	.053
14...	98	12	--	--	--	.445	.046	.002	.048	.014
20...	99	2.2	--	--	--	.527	.325	<.002	.325	.008
MAY										
04...	86	11	64	53	11	.829	.418	.005	.423	.043
06...	86	8.9	224	192	32	.906	.464	.007	.471	.067
08...	93	12	--	--	--	.616	.409	.002	.411	.020
*09...	88	7.1	182	150	32	.45	--	--	.048	.027
09...	88	7.6	210	168	42	.856	.362	.005	.367	.047
20...	94	13	8	6	<3	.658	.452	<.002	.452	.004
JUN										
10...	94	2.2	<3	<3	<3	.534	.372	.002	.374	.016
11...	97	12	<3	<3	<3	.575	.421	.002	.423	.022
16...	86	--	21	16	5	.811	--	--	--	--
24...	89	12	208	177	31	.789	.565	.005	.570	.020
JUL										
08...	100	9.0	<3	<3	<3	.341	.150	<.002	.150	.013
23...	77	7.5	<3	<3	<3	.324	.109	.002	.111	.016
AUG										
05...	88	5.0	<3	<3	<3	.172	.007	<.002	.007	.007
21...	92	5.4	<3	<3	<3	.238	.043	<.002	.043	<.004
SEP										
02...	73	4.3	<3	<3	<3	.266	.005	<.002	.005	.008
16...	92	4.1	<3	<3	<3	.171	.005	<.002	.005	--

* Replicate sample.
* For these constituents, there are differences in the minimum constituent reporting levels between the analyzing agencies.
< Actual value is known to be less than the value shown.

01668000 RAPPAHANNOCK RIVER NEAR FREDERICKSBURG, VA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN,AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITROGN TOTAL SEDIMNT SUSP TOTAL AS N (MG/L) (00601)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666) *	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	PHOS TOTAL SEDIMNT SUSP TOTAL AS P (MG/L) (00667)	CARBON, INORG + ORGANIC SUSP. TOTAL (MG/L AS C) (00694)
OCT 1997								
08...	--	--	.015	--	.011	.005	.002	.21
20...	--	--	.028	--	.013	.010	.003	.24
NOV								
05...	--	--	.346	--	.027	.018	.007	4.26
09...	--	--	.333	--	.044	.025	.080	3.77
21...	--	--	.022	--	.018	.011	.009	.21
DEC								
03...	--	--	.026	--	.010	.010	.006	.25
*03...	--	--	.020	--	.010	.010	.010	.22
17...	--	--	.020	--	.007	.008	.008	.28
JAN 1998								
05...	--	--	.032	--	.010	.006	.010	.31
08...	--	--	.137	--	.020	.004	.035	.96
09...	--	--	1.920	--	.030	.016	.771	19.66
*09...	--	--	1.499	--	.038	.020	.663	14.53
10...	--	--	.424	--	.020	.016	.199	4.40
22...	--	--	.026	--	.019	.013	.013	.29
24...	--	--	.700	--	.047	.038	.240	6.56
28...	--	--	.362	--	.030	.023	.131	3.53
*28...	.5	.4	--	.09	<.01	.021	--	--
31...	--	--	.139	--	.020	.016	.074	1.23
FEB								
03...	--	--	.065	--	.010	.010	.027	.64
06...	--	--	.246	--	.030	.031	.114	2.15
08...	--	--	.160	--	.031	.023	.066	1.45
19...	--	--	.295	--	.003	.016	.146	2.85
27...	--	--	.070	--	.019	.012	.027	.68
MAR								
04...	--	--	.097	--	.028	.009	.041	.83
10...	--	--	.310	--	.041	.017	.138	3.08
19...	--	--	.223	--	.022	.019	.076	2.08
26...	--	--	.061	--	.019	.013	.028	.57
APR								
02...	--	--	.043	--	.014	.011	.015	.38
*02...	.1	.2	--	.03	.015	.008	--	--
10...	--	--	.991	--	.044	.031	.321	9.17
*10...	--	--	.891	--	.040	.025	.262	8.47
14...	--	--	.052	--	.016	.005	.020	.49
20...	--	--	.137	--	.016	.008	.043	1.25
MAY								
04...	--	--	.292	--	.033	.015	.093	2.37
06...	--	--	.907	--	.191	.020	.349	8.43
08...	--	--	.294	--	.020	.017	.098	2.91
*09...	.6	.4	--	.11	.03	.009	--	--
09...	--	--	.600	--	.066	.028	.258	5.37
20...	--	--	.042	--	.019	.008	.015	.34
JUN								
10...	--	--	.021	--	.009	.004	.007	.13
11...	--	--	.032	--	.008	.002	.008	.47
16...	--	--	.096	--	.025	--	.031	.78
24...	--	--	.821	--	.031	.020	.208	7.82
JUL								
08...	--	--	.022	--	.019	.009	.006	.14
23...	--	--	.021	--	.011	.008	.006	.15
AUG								
05...	--	--	.009	--	.014	.005	.004	.07
21...	--	--	.013	--	.009	.002	.004	.12
SEP								
02...	--	--	.021	--	.012	.002	.007	.23
16...	--	--	.028	--	.011	.002	.006	.19

* Replicate sample.
* For these constituents, there are differences in the minimum constituent reporting levels between the analyzing agencies.
< Actual value is known to be less than the value shown.

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