

2007 NUTRIENT AND SUSPENDED- SEDIMENT LOADS AND YIELDS

Loads and yields represent two methods for describing nutrient and SS amounts within a basin. Loads refer to the actual amount of the constituent being transported in the water column past a given point over a specific duration of time and are expressed in pounds. Yields compare the transported load with the acreage of the watershed and are expressed in lbs/acre. This allows for easy watershed comparisons. This project reports loads and yields for the constituents listed in Table 6 as computed by the Minimum Variance Unbiased Estimator (ESTIMATOR) described by Cohn and others (1989). This estimator relates the constituent concentration to water discharge, seasonal effects, and long-term trends, and computes the best-fit regression equation. Daily loads of the constituents then were calculated from the daily mean water discharge records. The loads were reported along with the estimates of accuracy.

Identifying sites where the percentage of LTM for a constituent was different than the percentage of LTM for discharge may show potential areas where improvements or degradations have occurred for that particular constituent. One item to note is that nutrients and SS increase with increased flow (Ott and others, 1991; Takita, 1996, 1998). This increase, however, is not as linear at higher flows as at lower ones. Individual high flow

events tend to produce higher loads, especially for TP and SS, than would be predicted by a simple comparison with the LTM.

Tables 7-19 show the loads and yields for the Group A monitoring stations, as well as an associated error value. They also show the average annual concentration for each constituent. Comparisons have been made to the LTMs for all constituents. Seasonal loads and yields for all parameters and all sites are listed in Table 20 for loads and Table 21 for yields. For the purposes of this project, January through March is winter, April through June is spring, July through September is summer, and October through December is fall. Monthly loads and yields for TN, TP, and SS at all long-term sites are listed in Tables 22 and 23.

2007 SUMMARY STATISTICS FOR ALL SITES

Because too few years of data existed for the sites in group B, load and trend analyses were unable to be completed. Therefore, summary statistics have been calculated for these sites, as well as the long-term sites for comparison. Summary statistics are listed in Table 24 and include minimum, maximum, median, mean, and standard deviation values taken from the raw 2007 dataset. Table 25 lists annual mean values of all parameters. Table 26 lists seasonal mean values for TN, TP, and TSS at all sites.

Table 6. List of Analyzed Parameters, Abbreviations, and STORET Codes

Parameter	Abbreviation	STORET Code
Discharge	Q	00060
Total Nitrogen as N	TN	00600
Dissolved Nitrogen as N	DN	00602
Total Organic Nitrogen as N	TON	00605
Dissolved Organic Nitrogen as N	DON	00607
Total Ammonia as N	TNH ₃	00610
Dissolved Ammonia as N	DNH ₃	00608
Total Nitrate + Nitrite as N	TNO _x	00630
Dissolved Nitrate + Nitrite as N	DNO _x	00631
Total Phosphorus as P	TP	00665
Dissolved Phosphorus as P	DP	00666
Dissolved Orthophosphate as P	DOP	00671
Total Organic Carbon	TOC	00680
Suspended sediment (fine)	SSF	70331
Suspended sediment (sand)	SSS	70335
Suspended Sediment (total)	SS	80154

Table 7. Annual Water Discharges, Annual Loads, Yields, and Average Concentration of Total Nitrogen, Calendar Year 2007

Site	2007 Discharge cfs	Discharge % of LTM	2007 Load thousands of lbs	Load % of LTM	Prediction Error %	2007 Ave. Conc. mg/l	LTM Conc. mg/l	2007 Yield lbs/ac/yr	LTM Yield lb/ac/yr
Towanda	11,243	94.7	22,095	77.97	2.99	1.00	1.21	4.43	5.68
Danville	16,466	99.7	33,515	75.81	3.32	1.03	1.36	4.67	6.16
Lewisburg	8,965	82.4	15,495	65.64	4.27	0.88	1.10	3.54	5.39
Newport	3,309	75.6	11,060	68.47	3.27	1.70	1.87	5.15	7.53
Marietta	34,515	88.4	102,649	77.77	4.08	1.51	1.72	6.17	7.94
Conestoga	656	96.6	9,220	85.88	3.17	7.14	8.03	30.65	35.69

Table 8. Annual Water Discharges and Annual Loads and Yields of Total Phosphorus, Calendar Year 2007

Site	2007 Discharge cfs	Discharge % of LTM	2007 Load thousands of lbs	Load % of LTM	Prediction Error %	2007 Ave. Conc. mg/l	LTM Conc. mg/l	2007 Yield lbs/ac/yr	LTM Yield lb/ac/yr
Towanda	11,243	94.7	2,321	95.94	8.61	0.105	0.104	0.465	0.485
Danville	16,466	99.7	3,730	99.16	9.27	0.115	0.116	0.519	0.524
Lewisburg	8,965	82.4	1,052	77.29	11.98	0.060	0.064	0.240	0.311
Newport	3,309	75.6	289	34.85	10.87	0.044	0.096	0.135	0.386
Marietta	34,515	88.4	3,482	44.52	8.66	0.051	0.102	0.209	0.470
Conestoga	656	96.6	235	34.32	9.18	0.182	0.512	0.781	2.275

Table 9. Annual Water Discharges and Annual Loads and Yields of Total Suspended Sediment, Calendar Year 2007

Site	2007 Discharge cfs	Discharge % of LTM	2007 Load thousands of lbs	Load % of LTM	Prediction Error %	2007 Ave. Conc. mg/l	LTM Conc. mg/l	2007 Yield lbs/ac/yr	LTM Yield lb/ac/yr
Towanda	11,243	94.7	1,766,801	56.70	13.45	79.8	133.4	354	624
Danville	16,466	99.7	1,682,342	50.06	10.81	51.9	103.4	234	468
Lewisburg	8,965	82.4	432,397	33.76	15.37	24.5	59.8	99	292
Newport	3,309	75.6	117,464	22.97	16.16	18.0	59.3	55	238
Marietta	34,515	88.4	2,410,372	35.04	14.60	35.5	89.5	145	414
Conestoga	656	96.6	93,328	25.41	19.18	72.3	274.6	310	1,221

Table 10. Annual Water Discharges and Annual Loads and Yields of Total Ammonia, Calendar Year 2007

Site	2007 Discharge cfs	Discharge % of LTM	2007 Load thousands of lbs	Load % of LTM	Prediction Error %	2007 Ave. Conc. mg/l	LTM Conc. mg/l	2007 Yield lbs/ac/yr	LTM Yield lb/ac/yr
Towanda	11,243	94.7	1,364	92.87	10.97	0.062	0.063	0.273	0.294
Danville	16,466	99.7	2,153	95.61	11.79	0.066	0.069	0.300	0.314
Lewisburg	8,965	82.4	845	76.79	11.93	0.048	0.051	0.193	0.251
Newport	3,309	75.6	338	87.78	13.49	0.052	0.045	0.158	0.180
Marietta	34,515	88.4	5,101	105.33	13.00	0.075	0.063	0.307	0.291
Conestoga	656	96.6	116	44.25	13.82	0.900	0.196	0.386	0.872

Table 11. Annual Water Discharges and Annual Loads and Yields of Total NOx Nitrogen, Calendar Year 2007

Site	2007 Discharge cfs	Discharge % of LTM	2007 Load thousands of lbs	Load % of LTM	Prediction Error %	2007 Ave. Conc. mg/l	LTM Conc. mg/l	2007 Yield lbs/ac/yr	LTM Yield lb/ac/yr
Towanda	11,243	94.7	13,540	81.44	3.56	0.612	0.712	2.713	3.332
Danville	16,466	99.7	20,115	78.00	3.99	0.621	0.793	2.801	3.591
Lewisburg	8,965	82.4	11,175	73.84	3.94	0.633	0.707	2.550	3.453
Newport	3,309	75.6	9,078	74.56	3.43	1.394	1.412	4.229	5.672
Marietta	34,515	88.4	80,690	87.10	4.71	1.188	1.205	4.851	5.570
Conestoga	656	96.6	7,919	92.87	4.47	6.136	6.375	26.327	28.347

Table 12. Annual Water Discharges and Annual Loads and Yields of Total Organic Nitrogen, Calendar Year 2007

Site	2007 Discharge cfs	Discharge % of LTM	2007 Load thousands of lbs	Load % of LTM	Prediction Error %	2007 Ave. Conc. mg/l	LTM Conc. mg/l	2007 Yield lbs/ac/yr	LTM Yield lb/ac/yr
Towanda	11,243	94.7	6,987	66.86	6.28	0.316	0.447	1.400	2.094
Danville	16,466	99.7	9,923	60.97	6.55	0.306	0.501	1.382	2.266
Lewisburg	8,965	82.4	3,852	50.04	10.91	0.218	0.359	0.879	1.757
Newport	3,309	75.6	1,936	49.87	11.66	0.297	0.450	0.902	1.808
Marietta	34,515	88.4	20,122	48.80	8.76	0.296	0.537	1.210	2.479
Conestoga	656	96.6	1,379	64.99	10.44	1.069	1.586	4.584	7.054

Table 13. Annual Water Discharges and Annual Loads and Yields of Dissolved Phosphorus, Calendar Year 2007

Site	2007 Discharge cfs	Discharge % of LTM	2007 Load thousands of lbs	Load % of LTM	Prediction Error %	2007 Ave. Conc. mg/l	LTM Conc. mg/l	2007 Yield lbs/ac/yr	LTM Yield lb/ac/yr
Towanda	11,243	94.7	1,028	121.41	9.93	0.047	0.036	0.206	0.170
Danville	16,466	99.7	1,705	153.21	11.59	0.053	0.034	0.237	0.155
Lewisburg	8,965	82.4	660	126.72	15.17	0.037	0.243	0.151	0.119
Newport	3,309	75.6	170	42.63	10.67	0.026	0.046	0.079	0.185
Marietta	34,515	88.4	1,080	44.43	9.99	0.016	0.032	0.065	0.146
Conestoga	656	96.6	128	48.65	6.91	0.099	0.197	0.425	0.874

Table 14. Annual Water Discharges and Annual Loads and Yields of Dissolved Orthophosphate, Calendar Year 2007

Site	2007 Discharge cfs	Discharge % of LTM	2007 Load thousands of lbs	Load % of LTM	Prediction Error %	2007 Ave. Conc. mg/l	LTM Conc. mg/l	2007 Yield lbs/ac/yr	LTM Yield lb/ac/yr
Towanda	11,243	94.7	820	183.85	11.69	0.037	0.019	0.164	0.089
Danville	16,466	99.7	1,537	259.72	14.61	0.047	0.018	0.214	0.082
Lewisburg	8,965	82.4	554	235.83	17.83	0.031	0.011	0.126	0.054
Newport	3,309	75.6	128	56.98	12.39	0.020	0.026	0.060	0.105
Marietta	34,515	88.4	733	56.68	11.84	0.011	0.017	0.044	0.078
Conestoga	656	96.6	113	53.48	7.30	0.087	0.157	0.374	0.700

Table 15. Annual Water Discharges and Annual Loads and Yields of Dissolved Ammonia, Calendar Year 2007

Site	2007 Discharge cfs	Discharge % of LTM	2007 Load thousands of lbs	Load % of LTM	Prediction Error %	2007 Ave. Conc. mg/l	LTM Conc. mg/l	2007 Yield lbs/ac/yr	LTM Yield lb/ac/yr
Towanda	11,243	94.7	1,135	98.45	10.23	0.051	0.049	0.227	0.231
Danville	16,466	99.7	2,010	102.32	12.18	0.062	0.060	0.280	0.274
Lewisburg	8,965	82.4	801	84.56	11.37	0.045	0.044	0.183	0.216
Newport	3,309	75.6	290	86.54	13.52	0.044	0.039	0.135	0.156
Marietta	34,515	88.4	4,522	107.98	12.83	0.067	0.055	0.272	0.252
Conestoga	656	96.6	116	48.75	13.14	0.090	0.178	0.385	0.790

Table 16. Annual Water Discharges and Annual Loads and Yields of Dissolved Nitrogen, Calendar Year 2007

Site	2007 Discharge cfs	Discharge % of LTM	2007 Load thousands of lbs	Load % of LTM	Prediction Error %	2007 Ave. Conc. mg/l	LTM Conc. mg/l	2007 Yield lbs/ac/yr	LTM Yield lb/ac/yr
Towanda	11,243	94.7	19,060	77.48	3.40	0.861	1.053	3.820	4.930
Danville	16,466	99.7	28,767	76.52	3.43	0.887	1.157	4.006	5.236
Lewisburg	8,965	82.4	14,177	68.05	3.92	0.803	0.973	3.235	4.754
Newport	3,309	75.6	10,352	70.34	3.02	1.589	1.707	4.823	6.857
Marietta	34,515	88.4	92,432	80.38	4.38	1.360	1.496	5.557	6.914
Conestoga	656	96.6	8,987	92.16	3.60	6.964	7.291	29.876	32.419

Table 17. Annual Water Discharges and Annual Loads and Yields of Dissolved NOx Nitrogen, Calendar Year 2007

Site	2007 Discharge cfs	Discharge % of LTM	2007 Load thousands of lbs	Load % of LTM	Prediction Error %	2007 Ave. Conc. mg/l	LTM Conc. mg/l	2007 Yield lbs/ac/yr	LTM Yield lb/ac/yr
Towanda	11,243	94.7	13,221	80.21	3.78	0.597	0.706	2.649	3.303
Danville	16,466	99.7	19,974	78.11	3.98	0.616	0.787	2.782	3.561
Lewisburg	8,965	82.4	11,084	74.04	3.92	0.628	0.699	2.529	3.417
Newport	3,309	75.6	9,028	74.87	3.40	1.386	1.398	4.203	5.618
Marietta	34,515	88.4	79,464	86.72	4.75	1.169	1.192	4.777	5.509
Conestoga	656	96.6	7,637	92.10	4.43	5.918	6.200	25.390	27.567

Table 18. Annual Water Discharges and Annual Loads and Yields of Dissolved Organic Nitrogen, Calendar Year 2007

Site	2007 Discharge cfs	Discharge % of LTM	2007 Load thousands of lbs	Load % of LTM	Prediction Error %	2007 Ave. Conc. mg/l	LTM Conc. mg/l	2007 Yield lbs/ac/yr	LTM Yield lb/ac/yr
Towanda	11,243	94.7	4,945	68.57	6.84	0.223	0.309	0.991	1.445
Danville	16,466	99.7	6,191	60.79	7.43	0.191	0.313	0.862	1.418
Lewisburg	8,965	82.4	2,886	54.39	9.39	0.164	0.248	0.659	1.211
Newport	3,309	75.6	1,262	48.43	9.12	0.194	0.302	0.588	1.214
Marietta	34,515	88.4	12,187	44.84	9.68	0.179	0.354	0.733	1.624
Conestoga	656	96.6	1,426	107.53	10.26	1.105	0.991	4.740	4.408

Table 19. Annual Water Discharges and Annual Loads and Yields of Total Organic Carbon, Calendar Year 2007

Site	2007 Discharge cfs	Discharge % of LTM	2007 Load thousands of lbs	Load % of LTM	Prediction Error %	2007 Ave. Conc. mg/l	LTM Conc. mg/l	2007 Yield lbs/ac/yr	LTM Yield lb/ac/yr
Towanda	11,243	94.7	74,024	88.37	2.70	3.344	3.586	14.834	16.786
Danville	16,466	99.7	104,499	90.45	2.63	3.224	3.554	14.553	16.088
Lewisburg	8,965	82.4	33,973	74.60	4.02	1.925	2.126	7.753	10.393
Newport	3,309	75.6	18,939	67.23	4.86	2.907	3.267	8.823	13.123
Marietta	34,515	88.4	183,473	76.72	3.57	2.700	3.112	11.030	14.378
Conestoga	656	96.6	5,307	70.72	4.90	4.112	5.611	17.643	24.947

Table 20. Seasonal Mean Water Discharges and Loads of Nutrients and Suspended Sediment, Calendar Year 2007

Station	Season	Mean Q cfs	TN	DN	TNH ₃	DNH ₃	TON	Thousands of pounds										SS
								DON	TNOx	DNOx	TP	DP	DOP	TOC				
Towanda	Winter	18,968	9,894	8,466	604	514	3,031	2,050	6,168	6,030	1,077	393	316	29,501	1,051,796			
	Spring	12,500	5,805	4,989	295	264	1,960	1,423	3,418	3,342	580	268	207	20,117	372,680			
	Summer	1,761	689	553	33	28	357	232	331	316	84	59	46	3,375	8,855			
	Fall	11,922	5,707	5,072	433	329	1,640	1,240	3,623	3,533	580	309	251	21,032	333,469			
Danville	Winter	26,863	14,554	12,574	949	891	4,128	2,538	9,072	9,004	1,653	662	576	39,948	899,942			
	Spring	18,268	8,583	7,278	464	432	2,841	1,704	4,839	4,799	908	422	371	27,957	381,619			
	Summer	2,775	1,016	770	49	46	526	311	429	425	96	64	51	5,026	9,896			
	Fall	18,202	9,362	8,145	691	641	2,428	1,639	5,775	5,745	1,073	557	539	31,567	390,886			
Lewisburg	Winter	17,936	8,005	7,209	432	420	2,023	1,411	5,739	5,694	578	281	232	16,860	305,998			
	Spring	9,729	3,758	3,469	180	174	970	757	2,643	2,614	237	172	154	8,423	67,456			
	Summer	1,695	732	673	37	30	211	171	492	487	37	40	32	1,908	3,256			
	Fall	6,704	3,001	2,825	196	176	648	547	2,302	2,289	200	167	136	6,782	55,688			
Newport	Winter	6,084	5,329	4,961	144	122	875	549	4,425	4,405	130	69	53	8,041	63,072			
	Spring	3,602	2,698	2,527	89	77	530	346	2,173	2,159	75	43	31	4,930	29,205			
	Summer	1,270	879	818	40	35	213	143	661	654	37	25	19	2,318	10,649			
	Fall	2,342	2,154	2,046	65	55	318	224	1,819	1,810	47	33	26	3,649	14,538			
Marietta	Winter	61,172	46,838	42,013	2,418	2,139	9,071	5,306	36,915	36,288	1,799	470	328	77,118	1,454,511			
	Spring	38,689	24,927	21,972	1,008	902	5,447	3,223	19,073	18,749	857	264	177	49,437	540,084			
	Summer	7,558	4,246	3,753	183	161	1,264	838	2,807	2,800	130	66	41	12,172	30,717			
	Fall	31,267	26,638	24,695	1,493	1,320	4,340	2,820	21,895	21,627	697	279	188	44,746	385,060			
Conestoga	Winter	1,025	3,559	3,385	58	56	645	604	2,871	2,779	114	47	41	2,182	58,443			
	Spring	776	2,628	2,560	30	30	388	400	2,289	2,203	62	31	27	1,547	25,964			
	Summer	315	1,096	1,119	7	8	101	131	1,064	1,022	22	21	19	593	2,406			
	Fall	516	1,938	1,923	21	22	244	291	1,697	1,634	37	29	26	984	6,515			

Table 21. Seasonal Mean Water Discharges and Yields of Nutrients and Suspended Sediment, Calendar Year 2007

Station	Season	Mean Q cfs	lbs/acre													SS
			TN	DN	NH ₃	DNH ₃	TON	DON	TNOx	DNOx	TP	DP	DOP	TOC		
Towanda	Winter	18,968	1.98	1.70	0.61	0.41	0.10	0.12	1.24	1.21	0.216	0.079	0.063	5.91	210.8	
	Spring	12,500	1.16	1.00	0.39	0.29	0.05	0.06	0.68	0.67	0.116	0.054	0.041	4.03	74.7	
	Summer	1,761	0.14	0.11	0.07	0.05	0.01	0.01	0.07	0.06	0.017	0.012	0.009	0.68	1.8	
	Fall	11,922	1.14	1.02	0.33	0.25	0.07	0.09	0.73	0.71	0.116	0.062	0.050	4.21	66.8	
Danville	Winter	26,863	2.03	1.75	0.13	0.12	0.57	0.35	1.26	1.25	0.230	0.092	0.080	5.56	125.3	
	Spring	18,268	1.20	1.01	0.06	0.06	0.40	0.24	0.67	0.67	0.126	0.059	0.052	3.89	53.1	
	Summer	2,775	0.14	0.11	0.01	0.01	0.07	0.04	0.06	0.06	0.013	0.009	0.007	0.70	1.4	
	Fall	18,202	1.30	1.13	0.10	0.09	0.34	0.23	0.80	0.80	0.149	0.078	0.075	4.40	54.4	
Lewisburg	Winter	17,936	1.83	1.65	0.10	0.10	0.46	0.32	1.31	1.30	0.132	0.064	0.053	3.85	69.8	
	Spring	9,729	0.86	0.79	0.04	0.04	0.22	0.17	0.60	0.60	0.054	0.039	0.035	1.92	15.4	
	Summer	1,695	0.17	0.15	0.01	0.01	0.05	0.04	0.11	0.11	0.008	0.009	0.007	0.44	0.7	
	Fall	6,704	0.68	0.64	0.04	0.04	0.15	0.12	0.53	0.52	0.046	0.038	0.031	1.55	12.7	
Newport	Winter	6,084	2.48	2.31	0.07	0.06	0.41	0.26	2.06	2.05	0.060	0.032	0.024	3.75	29.4	
	Spring	3,602	1.26	1.18	0.04	0.04	0.25	0.16	1.01	1.01	0.035	0.020	0.014	2.30	13.6	
	Summer	1,270	0.41	0.38	0.02	0.02	0.10	0.07	0.31	0.30	0.017	0.012	0.009	1.08	5.0	
	Fall	2,342	1.00	0.95	0.03	0.03	0.15	0.10	0.85	0.84	0.022	0.015	0.012	1.70	6.8	
Marietta	Winter	61,172	2.82	2.53	0.15	0.13	0.55	0.32	2.22	2.18	0.108	0.028	0.020	4.64	87.4	
	Spring	38,689	1.50	1.32	0.06	0.05	0.33	0.19	1.15	1.13	0.052	0.016	0.011	2.97	32.5	
	Summer	7,558	0.26	0.23	0.01	0.01	0.08	0.05	0.17	0.17	0.008	0.004	0.002	0.73	1.8	
	Fall	31,267	1.60	1.48	0.09	0.08	0.26	0.17	1.32	1.30	0.042	0.017	0.011	2.69	23.1	
Conestoga	Winter	1,025	11.83	11.25	0.19	0.19	2.14	2.01	9.54	9.24	0.380	0.156	0.135	7.26	194.3	
	Spring	776	8.74	8.51	0.10	0.10	1.29	1.33	7.61	7.32	0.205	0.103	0.089	5.14	86.3	
	Summer	315	3.64	3.72	0.02	0.03	0.34	0.44	3.54	3.40	0.074	0.069	0.062	1.97	8.0	
	Fall	516	6.44	6.39	0.07	0.07	0.81	0.97	5.64	5.43	0.122	0.097	0.088	3.27	21.7	

Table 22. 2007 Monthly Flow in CFS and TN, TP, and SS in Thousands of Pounds

Station	Parameter	January	February	March	April	May	June	July	August	September	October	November	December	Annual#
Towanda	Q	574,610	107,100	1,025,450	779,100	267,150	91,260	62,750	51,880	47,395	137,170	336,400	623,250	11,243
	TN	3,349	620	5,925	4,122	1,278	405	265	218	206	633	1,687	3,387	22,095
	TP	264	29	784	442	101	37	31	28	26	61	163	355	2,321
	SS	136,518	2,908	912,370	338,928	28,607	5,145	3,574	2,861	2,421	13,134	68,864	251,472	1,766,801
Danville	Q	859,800	174,570	1,383,280	1,115,200	415,520	131,650	93,560	93,010	68,740	221,660	522,640	930,300	16,466
	TN	5,342	1,003	8,209	6,041	1,991	550	367	367	282	1,067	2,822	5,473	33,515
	TP	499	48	1,106	697	168	43	33	36	27	110	315	648	3,730
	SS	165,158	4,095	730,688	337,344	39,209	5,065	3,652	3,866	2,378	22,070	94,701	274,115	1,682,342
Lewisburg	Q	617,180	129,710	867,390	471,880	315,130	98,330	46,040	72,630	37,278	39,258	156,100	421,370	8,965
	TN	3,196	739	4,071	2,044	1,292	421	219	317	196	223	761	2,017	15,495
	TP	218	28	333	133	83	21	10	18	9	10	46	144	1,052
	SS	88,284	2,959	214,755	41,928	23,110	2,417	695	2,009	552	586	9,117	45,985	432,397
Newport	Q	160,890	58,740	327,890	200,850	84,580	42,364	34,913	61,864	20,103	19,936	43,330	152,200	3,309
	TN	1,732	505	3,092	1,764	653	280	226	529	124	131	391	1,632	11,060
	TP	37	9	84	48	17	9	9	24	5	4	9	34	289
	SS	11,712	1,459	49,902	23,420	4,251	1,533	1,365	8,739	545	423	1,590	12,525	117,464
Marietta	Q	1,960,300	453,900	3,091,300	2,174,600	997,500	348,560	218,930	303,300	173,110	305,890	803,100	1,767,600	34,515
	TN	18,645	3,574	24,619	16,123	6,760	2,045	1,216	1,952	1,078	2,394	7,352	16,892	102,649
	TP	584	58	1,157	603	198	55	37	61	31	57	175	465	3,482
	SS	330,874	12,780	1,110,857	431,572	93,717	14,795	8,218	16,699	5,800	15,150	73,174	296,737	2,410,372
Conestoga	Q	28,592	12,364	51,254	40,709	17,571	12,330	11,860	11,412	5,668	10,651	12,144	24,706	656
	TN	1,195	532	1,832	1,472	685	470	443	434	219	409	509	1,020	9,220
	TP	24	6	84	44	10	8	9	9	4	11	8	18	235
	SS	5,894	768	51,781	23,373	1,652	939	1,277	1,005	124	2,282	713	3,520	93,328

Annual flow is average for the year; Annual loads are total for the year

Table 23. 2007 Monthly Flow in CFS and TN, TP, and SS Yields in lbs/acre

Station	Parameter	January	February	March	April	May	June	July	August	September	October	November	December	Annual#
Towanda	Q	574,610	107,100	1,025,450	779,100	267,150	91,260	62,750	51,880	47,395	137,170	336,400	623,250	11,243
	TN	0.67	0.12	1.19	0.83	0.26	0.08	0.05	0.04	0.04	0.13	0.34	0.68	4.43
	TP	0.053	0.006	0.157	0.089	0.020	0.007	0.006	0.006	0.005	0.012	0.033	0.071	0.465
	SS	27.36	0.58	182.84	67.92	5.73	1.03	0.72	0.57	0.49	2.63	13.80	50.39	354.06
Danville	Q	859,800	174,570	1,383,280	1,115,200	415,520	131,650	93,510	93,010	68,740	221,660	522,640	930,300	16,466
	TN	0.74	0.14	1.14	0.84	0.28	0.08	0.05	0.05	0.04	0.15	0.39	0.76	4.67
	TP	0.069	0.007	0.154	0.097	0.023	0.006	0.005	0.005	0.004	0.015	0.044	0.090	0.519
	SS	23.00	0.57	101.76	46.98	5.46	0.71	0.51	0.54	0.33	3.07	13.19	38.17	234.28
Lewisburg	Q	617,180	129,710	867,390	471,880	315,130	98,330	46,040	72,630	37,278	39,258	156,100	421,370	8,965
	TN	0.73	0.17	0.93	0.47	0.29	0.10	0.05	0.07	0.04	0.05	0.17	0.46	3.54
	TP	0.050	0.006	0.076	0.030	0.019	0.005	0.002	0.004	0.002	0.002	0.011	0.033	0.240
	SS	20.15	0.68	49.01	9.57	5.27	0.55	0.16	0.46	0.13	0.13	2.08	10.49	98.67
Newport	Q	160,890	58,740	327,890	200,850	84,580	42,364	34,913	61,864	20,103	19,936	43,330	152,200	3,309
	TN	0.81	0.24	1.44	0.82	0.30	0.13	0.11	0.25	0.06	0.06	0.18	0.76	5.15
	TP	0.017	0.004	0.039	0.023	0.008	0.004	0.004	0.011	0.002	0.002	0.004	0.016	0.135
	SS	5.46	0.68	23.25	10.91	1.98	0.71	0.64	4.07	0.25	0.20	0.74	5.83	54.72
Marietta	Q	1,960,300	453,900	3,091,300	2,174,600	997,500	348,560	218,930	303,300	173,110	305,890	803,100	1,767,600	34,515
	TN	1.12	0.21	1.48	0.97	0.41	0.12	0.07	0.12	0.06	0.14	0.44	1.02	6.17
	TP	0.035	0.003	0.070	0.036	0.012	0.003	0.002	0.004	0.002	0.003	0.011	0.028	0.209
	SS	19.89	0.77	66.78	25.95	5.63	0.89	0.49	1.00	0.35	0.91	4.40	17.84	144.91
Conestoga	Q	28,592	12,364	51,254	40,709	17,571	12,330	11,860	11,412	5,668	10,651	12,144	24,706	656
	TN	3.97	1.77	6.09	4.89	2.28	1.56	1.47	1.44	0.73	1.36	1.69	3.39	30.65
	TP	0.080	0.022	0.279	0.146	0.034	0.026	0.030	0.031	0.014	0.036	0.026	0.059	0.781
	SS	19.60	2.55	172.14	77.70	5.49	3.12	4.24	3.34	0.41	7.59	2.37	11.70	310.27

Annual flow is average for the year

Table 24. Enhanced Monitoring Station Concentration Summary Statistics for 2007 in mg/L

Station	Minimum Value		Maximum Value		Median Value		Mean Value		Standard Deviation						
	TN	TP	TSS	TN	TP	TSS	TN	TP	TSS	TN	TP	TSS			
Original Sites (Group A)															
Towanda *	0.64	0.021	<2	1.67	0.526	705	1.00	0.067	12	1.00	0.090	67	0.25	0.082	132
Danville *	0.58	0.022	<2	1.68	0.360	298	0.99	0.065	18	1.03	0.085	50	0.27	0.065	62
Lewisburg *	0.53	0.010	<2	2.29	0.164	106	0.82	0.028	8	0.93	0.046	17	0.32	0.040	23
Newport *	0.75	0.021	<2	2.46	0.296	176	1.50	0.048	8	1.54	0.076	28	0.39	0.066	47
Marietta *	0.86	0.021	<2	2.71	0.223	244	1.38	0.043	10	1.47	0.059	29	0.45	0.045	50
Conestoga *	3.83	0.025	<2	9.09	0.817	252	6.60	0.188	12	6.49	0.249	43	1.51	0.207	76
Enhanced Sites (Groups B)															
Unadilla #	0.01	0.014	NA	1.00	0.215	NA	<1.0	0.034	NA	<1.0	0.051	NA	0.29	0.052	NA
Conklin #	0.23	0.021	NA	1.32	0.551	NA	<1.0	0.050	NA	<1.0	0.086	NA	0.28	0.128	NA
Smithboro #	0.23	0.021	NA	1.04	0.398	NA	<1.0	0.059	NA	<1.0	0.096	NA	0.32	0.100	NA
Cohocton #	0.22	0.027	NA	1.46	0.397	NA	<1.0	0.048	NA	<1.0	0.081	NA	0.30	0.099	NA
Chemung #	0.64	0.015	NA	0.88	0.713	NA	<1.0	0.083	NA	<1.0	0.155	NA	0.10	0.174	NA
Wilkes-Barre	0.71	0.018	<2	1.69	0.515	296	0.97	0.057	14	1.01	0.103	56	0.26	0.136	95
Karthauss	0.32	<0.010	<2	0.93	0.100	70	0.69	0.016	12	0.68	0.031	18	0.20	0.030	20
Castanea	0.92	0.011	<2	1.91	0.080	22	1.49	0.022	7	1.52	0.028	8	0.32	0.019	7
Jersey Shore	0.45	0.010	<2	1.04	0.138	132	0.68	0.022	4	0.72	0.034	18	0.16	0.036	35
Penns Creek	0.60	0.014	<2	1.99	0.105	42	1.21	0.044	9	1.24	0.052	12	0.37	0.032	12
Saxton	1.59	0.010	<2	2.32	0.116	110	1.77	0.028	10	1.86	0.049	30	0.21	0.042	37
Dromgold	0.90	0.020	<2	3.57	0.881	376	1.56	0.032	6	1.70	0.114	42	0.67	0.220	98
Hogestown	3.15	0.012	<2	4.84	0.371	174	3.85	0.029	4	3.82	0.075	35	0.11	0.009	5
Hershey	3.05	0.018	<2	6.74	0.750	418	4.36	0.059	2	4.48	0.115	38	1.09	0.186	111
Manchester	1.12	0.046	<2	3.99	0.791	502	1.92	0.168	12	2.21	0.198	46	0.92	0.182	127
Martic Forge	4.77	0.015	<2	9.29	2.754	2,080	6.93	0.167	35	7.09	0.499	206	1.37	0.700	515
Octoraro	5.01	0.044	<2	7.58	0.742	96	6.63	0.061	2	6.38	0.151	14	1.03	0.203	26

* Total suspended-sediment concentrations were substituted for total suspended solids (TSS) at these sites as there were more data points available

Total Kjeldahl Nitrogen substituted for Total Nitrogen.

NA - Not Available

Table 25. Enhanced Monitoring Station Average Concentration Data for 2007

Station	Flow cfs	Temp C°	Cond umhos/cm	pH S.U.	TN	DN	TNH ₄	DNH ₄	TNOx	DNOx mg/L	TP	DP	DOP	TOC	TSS
Original Sites (Group A)															
Towanda *	23,671	10.2	231	7.01	1.00	0.92	0.042	0.039	0.600	0.594	0.090	0.037	0.028	3.23	67
Danville *	33,650	11.6	246	7.05	1.03	0.91	0.044	0.042	0.622	0.622	0.086	0.028	0.022	3.17	50
Lewisburg *	20,459	12.8	217	6.87	0.93	0.88	0.036	0.034	0.632	0.630	0.046	0.026	0.022	2.16	17
Newport *	4,710	14.6	263	7.92	1.54	1.44	0.049	0.048	1.142	1.148	0.076	0.043	0.034	3.64	28
Marietta *	55,727	14.5	316	7.54	1.48	1.34	0.054	0.052	1.068	1.063	0.059	0.023	0.017	2.89	29
Conestoga *	1,052	15.0	584	7.87	6.49	6.40	0.094	0.091	5.769	5.616	0.249	0.170	0.150	4.58	43
Enhanced Sites (Group B)															
Unadilla #	1,825	10.4	203	6.98	<1	<1	0.039	0.032	0.533	0.532	0.051	0.017	0.015	3.03	NA
Conklin #	5,376	11.1	165	6.93	<1	<1	0.039	0.038	0.468	0.480	0.086	0.028	0.022	2.89	NA
Smithboro #	15,738	11.2	212	7.25	<1	<1	0.048	0.042	0.574	0.573	0.096	0.026	0.020	3.11	NA
Cohocton #	802	9.1	394	7.26	<1	<1	0.038	0.037	0.930	0.938	0.081	0.029	0.021	4.32	NA
Chemung #	6,773	7.6	259	7.23	<1	<1	0.041	0.041	0.692	0.689	0.178	0.038	0.030	4.26	NA
Wilkes-Barre	25,702	12.3	278	7.02	1.01	0.82	0.053	0.052	0.515	0.504	0.103	0.024	0.019	3.54	56
Karthaus	4,064	12.9	431	6.33	0.68	0.63	0.053	0.045	0.446	0.443	0.031	0.013	0.012	2.26	18
Castanea	NA	10.9	299	7.32	1.52	1.48	0.034	0.029	1.281	1.293	0.028	0.018	0.015	2.06	8
Jersey Shore	14,812	12.6	258	7.05	0.72	0.70	0.029	0.024	0.507	0.505	0.034	0.016	0.014	1.85	18
Penns Creek	492	13.4	205	7.63	1.24	1.21	0.033	0.034	0.919	0.924	0.052	0.036	0.028	2.85	12
Saxton	1,584	15.2	270	7.80	1.86	1.72	0.037	0.035	1.425	1.426	0.049	0.018	0.013	3.72	30
Dromgold	576	14.0	198	7.70	1.70	1.55	0.297	0.434	1.206	1.210	0.114	0.066	0.054	4.08	42
Hogestown	1,213	14.0	380	7.57	3.82	3.72	0.070	0.064	3.352	3.319	0.075	0.033	0.026	4.10	35
Hershey	1,093	14.0	371	7.65	4.48	4.39	0.089	0.077	3.963	3.937	0.115	0.063	0.056	3.26	38
Manchester	1,274	14.9	311	7.49	2.21	2.11	0.084	0.076	1.668	1.651	0.198	0.144	0.128	5.01	46
Martic Forge	343	14.0	424	7.66	7.09	6.69	0.130	0.122	6.039	5.895	0.499	0.221	0.206	5.14	207
Octoraro	170	15.1	266	7.48	6.38	6.30	0.158	0.147	5.516	5.472	0.151	0.109	0.095	3.91	14

* Total suspended-sediment concentrations were substituted for total suspended solids (TSS) at these sites as there were more data points available

Total Kjeldahl Nitrogen substituted for Total Nitrogen.

NA - Not Available

Table 26. Enhanced Monitoring Station Average Seasonal Concentration Data for 2007 in mg/L

Station	Winter			Spring			Summer			Fall		
	Flow	TN	TP	Flow	TN	TP	Flow	TN	TP	Flow	TN	TP
	cfs	mg/L	TSS	cfs	mg/L	TSS	cfs	mg/L	TSS	cfs	mg/L	TSS
Original Sites (Group A)												
Towanda *	40,575	1.15	0.124	95	0.056	14	2,065	0.79	0.059	9	16,259	0.86
Danville *	55,926	1.22	0.123	84	0.048	16	2,859	0.78	0.039	6	21,449	0.90
Lewisburg *	41,923	0.89	0.061	27	0.033	6	1,831	0.93	0.044	8	8,449	0.94
Newport *	9,703	1.94	0.115	66	0.057	17	2,275	1.36	0.087	25	3,227	1.52
Marietta *	116,252	1.59	0.083	40	0.038	10	6,710	1.35	0.035	8	38,167	1.88
Conestoga *	1,884	7.43	0.225	38	0.186	36	307	6.16	0.215	15	961	6.01
Enhanced Sites (Group B)												
Unadilla #	4,372	<1.0	0.087	NA	<1.0	0.028	NA	175	<1.0	0.031	NA	<1.0
Conklin #	8,130	<1.0	0.161	NA	<1.0	0.078	NA	725	<1.0	0.038	NA	<1.0
Smithboro #	31,566	<1.0	0.163	NA	<1.0	0.029	NA	1,788	<1.0	0.058	NA	<1.0
Cohocton #	1,835	<1.0	0.143	NA	<1.0	0.051	NA	83	<1.0	0.038	NA	<1.0
Chemung #	15,751	<1.0	0.224	NA	<1.0	0.015	NA	467	<1.0	0.092	NA	<1.0
Wilkes-Barre	57,389	1.22	0.203	130	0.037	13	2,877	0.84	0.039	7	3,842	0.90
Karthauss	8,690	0.82	0.045	25	0.042	11	2,013	0.68	0.022	19	1,190	0.69
Castanea	NA	1.32	0.042	12	NA	0.022	9	NA	1.71	0.023	4	NA
Jersey Shore	35,878	0.80	0.066	42	5,785	0.53	0.015	10	1,499	0.69	2	2,043
Penns Creek	1,175	1.45	0.780	22	338	1.18	0.074	15	141	1.07	0.033	5
Saxton	1,405	1.76	0.020	6	2,493	1.82	0.050	40	1,062	1.84	0.061	28
Dromgold	1,572	2.32	0.270	104	242	1.29	0.033	9	263	1.59	0.090	36
Hogestown	2,439	3.66	0.148	74	1,584	3.62	0.072	35	581	3.80	0.058	23
Hershey	3,749	3.54	0.274	141	390	3.94	0.055	6	404	4.59	0.095	16
Manchester	5,009	2.21	0.198	46	331	1.94	0.119	13	227	1.58	0.171	9
Martie Forge	290	7.68	0.297	91	417	7.42	0.326	131	125	6.77	0.328	53
Octoraro	397	6.37	0.429	36	136	7.46	0.058	13	75	5.58	0.069	2

* Suspended-sediment concentrations were substituted for total suspended solids (TSS) at these sites as there were more data points available

Total Kjeldahl Nitrogen substituted for Total Nitrogen.