SUMMARY

Bimonthly and stormflow samples were collected during 2003 from the Susquehanna River at Towanda, Danville, and Marietta; the West Branch Susquehanna River at Lewisburg; the Juniata River at Newport; and the Conestoga River at Conestoga, Pa. Collected samples were analyzed for various nitrogen and phosphorus species and SS.

Precipitation for 2003 was above average for all sites. Highest departures from the long-term averages were recorded at Conestoga with 14.68 inches above the LTM leading to the highest flow at 176.2 percent of the LTM. Lowest departure from the mean was at Danville for rainfall, 1.54 inches above LTM, and at Lewisburg for flow at 147.3 percent of the LTM. No trends were found for flow.

2003 data were analyzed in five ways: comparison with LTMs; comparison with similar water year data (1996); comparison with initial 5-year baselines; comparison with full program baselines; and analysis of FAC trends. Results of these methods are shown in Table 39. For LTM comparisons, this chart shows the percentages of LTM as compared to the percentages of the LTM for discharge. Strongest evidence for improvements or degradation was shown where all methods agree. This was the case for TN at all sites except Newport where loads were shown to be higher for 4-of-5 methods and Conestoga, which showed higher load values as compared to the 1996 loads. All other sites showed improving TN conditions for all analysis methods. This was also the case for TP at Towanda, Danville, Lewisburg, and Conestoga. Newport showed degrading signs for TP in 4 of the 5 analysis methods and Marietta showed degrading trends for 3 of the 5 for TP. SS showed improving signs at all sites except Newport, which had degrading signs when compared to the LTM percentage and the full program baseline.

Table 40 shows the FAC trends for 2003. Increasing trends were shown for DON at Conestoga and Marietta while Towanda, Danville, Marietta, and Newport all showed increasing trends in DOP. All other trends were either decreasing or not significant. Lewisburg and Newport also showed total kjedahl nitrogen (TKN) and dissolved kjedahl nitrogen (DKN) as below method detection limit meaning that more than 20 percent of the data was BMDL and a trend could not be reported. This also occurred at Lewisburg for DOP.

The percentages of LTM have shown that the dissolved fractions of nitrogen and phosphorus were degrading. Newport showed the most degrading constituents including TN, DN, DNH3, TNO23, DNO23, TP, DP and DOP. Marietta showed degrading conditions in TNO23, DNO23, DN, TP, DP, and DOP. All six sites showed degrading conditions when compared to the percentages of LTM for DOP. Conestoga showed degrading conditions in TNO23, DNO23, DN, and DON. Lewisburg showed degrading conditions in TNO23 and TOC which could be due to the leaf drop from the mostly forested watershed.

Table 39. Summary of 2003 Data Comparison to Percentage of LTM, 1996 Loads, Initial 5-Year Baseline, and Full Program Baseline, and Trends in Flow-Adjusted Concentration for TN, TP, and SS

Parameter	Site	LTM %	1996	Basline 89	Baseline 0	Trend
FLOW	Towanda	**INC**	DEC	N/A	N/A	None
	Danville	**INC**	DEC	N/A	N/A	None
	Lewisburg	**INC**	DEC	N/A	N/A	None
	Newport	**INC**	DEC	N/A	N/A	None
	Marietta	**INC**	DEC	N/A	N/A	None
	Conestoga	**INC**	**INC**	N/A	N/A	None
TN	Towanda	DEC	DEC	DEC	DEC	DEC
	Danville	DEC	DEC	DEC	DEC	DEC
	Lewisburg	DEC	DEC	DEC	DEC	DEC
	Newport	**INC**	**INC**	**INC**	**INC**	DEC
	Marietta	DEC	DEC	DEC	DEC	DEC
	Conestoga	DEC	**INC**	DEC	DEC	DEC
TP	Towanda	DEC	DEC	DEC	DEC	DEC
	Danville	DEC	DEC	DEC	DEC	DEC
	Lewisburg	DEC	DEC	DEC	DEC	DEC
	Newport	**INC**	**INC**	**INC**	**INC**	DEC
	Marietta	**INC**	DEC	**INC**	**INC**	**NS**
	Conestoga	DEC	DEC	DEC	DEC	DEC
SS	Towanda	DEC	DEC	DEC	DEC	DEC
	Danville	DEC	DEC	DEC	DEC	DEC
	Lewisburg	DEC	DEC	DEC	DEC	DEC
	Newport	**INC**	DEC	DEC	**INC**	DEC
	Marietta	DEC	DEC	DEC	DEC	DEC
	Conestoga	DEC	DEC	DEC	DEC	DEC

INC = Increasing Trends DEC = Decreasing Trends N/A = Not Applicable

Table 40. Summary of 2003 Flow-Adjusted Concentration Trends at all Sites

Parameter	Towanda	Danville	Lewisburg	Newport	Marietta	Conestoga
TN	DEC	DEC	DEC	DEC	DEC	DEC
DN	DEC	DEC	DEC	DEC	DEC	NS
TON	DEC	DEC	DEC	DEC	NS	DEC
DON	DEC	DEC	DEC	DEC	**INC**	**INC**
DNH	DEC	DEC	DEC	DEC	DEC	DEC
TNH	DEC	DEC	BMDL	BMDL	DEC	DEC
DKN	DEC	DEC	BMDL	BMDL	DEC	DEC
TKN	DEC	DEC	DEC	DEC	DEC	DEC
TNOX	DEC	DEC	DEC	NS	DEC	DEC
DNOX	DEC	DEC	DEC	NS	DEC	NS
TP	DEC	DEC	DEC	DEC	NS	DEC
DP	DEC	DEC	DEC	DEC	NS	DEC
DOP	**INC**	**INC**	BMDL	**INC**	**INC**	DEC
TOC	DEC	DEC	NS	DEC	DEC	DEC
SS	DEC	DEC	DEC	DEC	DEC	DEC