Nutrient Reduction Technology Cost Estimations for Point Sources in the Chesapeake Bay Watershed

Prepared by

The Nutrient Reduction Technology Cost Task Force
A Stakeholder Group of the Chesapeake Bay Program

Chesapeake Bay Program
A Watershed Partnership

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EXECUTIVE SUMMARY

The purpose of this report is to provide costs estimates for treatment technologies associated with varying concentration levels of nitrogen and phosphorus removal from industrial and municipal wastewater plants in the Chesapeake Bay watershed. The data will be used by the Chesapeake Bay Program to estimate costs of nutrient removal programs for all point-source categories across the Bay watershed during the nutrient and sediment water quality criteria and use development process.

A multi-stakeholder Nutrient Reduction Technology Cost Task Force was assimilated by the Chesapeake Bay Program in March of 2002 for the purpose of developing these costs. The Task Force consisted of representatives of municipal wastewater associations, state governments, EPA, local government organizations, and consultants with extensive expertise in the Nutrient Reduction Technology (NRT) field.

Costs were derived according to specific effluent discharge levels defined across four Tiers. These tiers were part of a larger effort intended to estimate varying levels of nutrient removal from all sources (non-point as well as point sources) across the watershed. The Task Force defined what would be logical Tiers (or different nutrient reduction levels) for point sources and then estimated costs by Tier, specific to each facility. Using flows estimated/projected for the year 2010, the tiers range from the current (year 2000) treatment levels to the limit of technology (LOT).

The point sources analyzed in this effort include facilities located in the Chesapeake Bay Watershed (from PA, MD, VA, DE, WV, NY, and the District of Columbia), which the Bay jurisdictions have determined discharge significant amounts of nitrogen and phosphorus. These point sources are divided into several categories for purposes of this exercise and include:

- Significant Municipal facilities (which generally are municipal wastewater treatment plants that discharge flows of equal to or greater than 0.5 MGD);
- Significant Industrial facilities (which have been identified to discharge equivalent or greater amounts of nutrient as compared to a municipal wastewater treatment plant of 0.5 MGD);
- Non-significant municipal facilities (which are generally discharge flows smaller than 0.5 MGD and limited to facilities in MD and VA due to availability of data); and
- Combined Sewer Overflows (which for this exercise, includes the CSO for the District of Colombia because this is the only CSO for which the Bay Program has nutrient load data).

Exhibit 1 below provides a summary description of the levels of nutrient reduction by point source category for each tier.

EXHIBIT 1: DESCRIPTION OF TIERS FOR POINT SOURCES*
(concentrations given in terms of an annual average in mg/l)

Point Source Category	Tier 1	Tier 2	Tier 3	Tier 4
Significant Municipals	**TN = 8 for POTW's operating (or planned) NRT; TN for remainder = 2000 concentrations. TP =2000 concentrations, except TP =1.5 at those targeted by VA.**	**TN = 8;** **TP = 1.0 or permit limit if less**	**TN= 5.0;** **TP = 0.5 or permit limit if less**	**TN = 3.0;** **TP = 0.1**
Significant Industrials	**TN and TP = 2000 concentrations or permit limit if less**	**Generally a 50% reduction from Tier 1 (2000 concentrations) or permit conditions if less**	**Generally an 80% reduction from Tier 1 (2000 concentrations) or permit conditions if less**	**TN = 3.0;** **TP = 0.1 or permit conditions if less**
Non-significant Municipals	**TN and TP = 2000 concentrations**	**TN and TP = 2000 concentrations**	**TN and TP = 2000 concentrations**	**TN = 8 & TP = 2.0 Or 2000 concentrations if less**
CSOs	**See Appendix B for a complete description of the tiers for the DC CSO**			

* Note that all flows are in terms of those projected by 2010

Wherever costs were provided by a facility, their respective associations, or a state agency, these direct costs were used. Where no other data was available, estimates were calculated using different methodologies depending on the technology. Chapters III and VI provide information on the estimating methods employed wherever costs were otherwise unavailable.

Exhibit 2 below provides a summary on the numbers of significant municipal facilities which provided cost data versus those for which cost estimates were calculated.

Exhibit 2: Summary on the Numbers of Significant Municipal Facilities

	Tier 1		Tier 2		Tier 3		Tier 4	
	TN CC	TP CC	TN CC	TP CC	TN CC	TP CC	TN CC	TP CC
Provided	54	0	25	1	44	0	3	3
Calculated	9	0	132	111	251	0	252	295
Total	63	0	157	112	295	0	255	298

Note: CC = Capital Cost

For municipal facilities, the technologies priced for each tier varied depending on the tiers' nutrient reduction levels. For Tier 2, the costs for technologies to achieve 8 mg/l total nitrogen include extended aeration processes and denitrification zones, along with chemical addition to achieve a phosphorus discharge of 1.0 mg/l where facilities are not already achieving these levels. For Tier 3, the costs for technologies to achieve 5.0mg/l total nitrogen include additional aeration, a secondary anoxic zone plus methanol addition, additional clarification tankage, and additional chemical costs to achieve a phosphorus discharge of 0.5 mg/l. For Tier 4, the costs for technologies to achieve 3.0mg/l total nitrogen include deep bed denitrification filters and microfiltration to achieve a phosphorus discharge of 0.1 mg/l. (Note: Costs for Tier 1 are generally equal to zero because this tier represents actions already being taken or planned). Capital costs and operation and maintenance costs were developed as well as annualized costs. Due to seasonal fluctuation, the effluent/discharge levels for each tier were defined as an annual average.

For industries, site specific information on costs and reductions by facility was obtained via phone contacts or site visits. Where known costs were available for a like industry (SIC code), those codes may have been applied to another like discharger. Where cost information was otherwise unavailable, a methodology (similar to that developed for POTWs) was applied to reflect cost estimates by facility by tier. There are no costs associated with Tier 1 because it represents current conditions or plans for reductions that are already in progress. Tier 2 and 3, in general, reflect levels of reduction of 50% and 80% from Tier 1, respectively, unless permit conditions are less than this or site specific information provides alternate data. Tier 4 reflects TN and TP concentrations of 3.0 and 0.1 mg/l respectively unless permit conditions or actual 2000 concentrations are less than this. For tier 4, some industrial facilities would be incapable of achieving the discharge concentration/level, so the cost/alternative reflects connecting to a POTW.

Costs for the Blue Plains CSO were provided by the District of Columbia Water and Sewer Authority.

Overall, the costs derived from this effort represent order of magnitude estimates based on applying a multi-stakeholder developed methodology uniformly to all facilities across the watershed and will vary from actual costs incurred on a site-specific basis. This report provides the cost information by facility. Exhibit 3 on next page provides a summary of these costs both by jurisdiction and by point source category.

Exhibit 3: Cost Summary by State and by Point Source Category

		DESIGN	TIER 1 COSTS ($MIL)		TIER 2 COST ($MIL)				TIER 3 COST ($MIL)				TIER 4 COST ($MIL)			
	# OF	FLOW	INCREMENTAL		INCREMENTAL		CUMULATIVE		INCREMENTAL		CUMULATIVE		INCREMENTAL		CUMULATIVE	
	PLANTS	(MGD)	TN CC	TP CC	TN CC	TP CC	TN CC	TP CC	TN CC	TP CC	TN CC	TP CC	TN CC	TP CC	TN CC	TP CC
WATERSHED TOTAL																
SIGNIFICANT	304	2,336.01	597.91	0	921.44	40.09	1,519.36	40.09	1,190.49	0	2,709.85	40.09	1,663.59	1,301.89	4,373.44	1,341.98
NON-SIGNIFICANT	185	21.17	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	83.09	11.30	83.09	11.30
INDUSTRIAL	49	459.51	0.00	0	48.57	2.36	48.57	2.36	46.02	0.8	94.58	3.16	112.58	83.91	207.17	87.07
DC-CSO	1	7.61	130.00	0	0	0	130.00	0	0	0	130.00	0	3,500.00	0	3,630.00	0
TOTAL	**539**	**2,824.30**	**727.91**	**0**	**970.01**	**42.45**	**1,697.92**	**42.45**	**1,236.51**	**0.8**	**2,934.43**	**43.25**	**5,359.27**	**1,397.11**	**8,293.70**	**1,440.35**
TOTAL BY STATE																
DC																
SIGNIFICANT	1	169.40	0.00	0	15.11	9.16	15.11	9.16	103.01	0	118.12	9.16	167.11	11.45	285.23	20.60
CSO	1	7.61	130.00	0	0.00	0.00	130.00	0.00	0.00	0	130.00	0.00	3,500.00	0.00	3,630.00	0.00
DC TOTAL	**2**	**177.01**	**130.00**	**0**	**15.11**	**9.16**	**145.11**	**9.16**	**103.01**	**0**	**248.12**	**9.16**	**3,667.11**	**11.45**	**3,915.23**	**20.60**
DE																
SIGNIFICANT	3	3.30	3.19	0	2.37	0.25	5.56	0.25	3.18	0	8.74	0.25	4.15	4.26	12.90	4.51
INDUSTRIAL	1	37.83	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
DE TOTAL	**4**	**41.13**	**3.19**	**0**	**2.37**	**0.25**	**5.56**	**0.25**	**3.18**	**0**	**8.74**	**0.25**	**4.15**	**4.26**	**12.90**	**4.51**
MD																
SIGNIFICANT	65	725.82	384.75	0	25.13	11.79	409.88	11.79	356.36	0	766.24	11.79	658.43	398.36	1,424.66	410.14
NON-SIGNIFICANT	181	20.59	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	80.97	10.99	80.97	10.99
INDUSTRIAL	10	53.30	0.00	0	12.25	0.21	12.25	0.21	5.89	0	18.14	0.21	5.70	15.76	23.84	15.97
MD TOTAL	**256**	**799.71**	**384.75**	**0**	**37.38**	**12.00**	**422.13**	**12.00**	**362.25**	**0**	**784.38**	**12.00**	**745.09**	**425.10**	**1,529.47**	**437.10**
NY																
SIGNIFICANT	18	82.57	0.00	0	61.87	3.29	61.87	3.29	40.60	0	102.47	3.29	71.58	65.43	174.05	68.71
NY TOTAL	**18**	**82.57**	**0.00**	**0**	**61.87**	**3.29**	**61.87**	**3.29**	**40.60**	**0**	**102.47**	**3.29**	**71.58**	**65.43**	**174.05**	**68.71**
PA																
SIGNIFICANT	123	469.21	72.08	0	277.87	4.79	349.94	4.79	319.81	0	669.76	4.79	241.32	396.12	911.08	400.91
INDUSTRIAL	19	75.62	0.00	0	17.34	0.79	17.34	0.79	16.95	0	34.29	0.79	47.98	23.89	82.27	24.67
PA TOTAL	**142**	**544.84**	**72.08**	**0**	**295.20**	**5.58**	**367.28**	**5.58**	**336.77**	**0**	**704.05**	**5.58**	**289.30**	**420.00**	**993.35**	**425.58**
VA																
SIGNIFICANT	86	871.95	137.90	0	515.90	9.72	653.80	9.72	356.55	0	1,010.35	9.72	505.21	411.00	1,515.56	420.72
NON-SIGNIFICANT	1	0.05	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.40	0.07	0.40	0.07
INDUSTRIAL	16	292.44	0.00	0	13.79	1.27	13.79	1.27	22.72	0.8	36.51	2.07	58.37	44.27	94.88	46.34
VA TOTAL	**103**	**1,164.44**	**137.90**	**0**	**529.68**	**10.99**	**667.58**	**10.99**	**379.28**	**0.8**	**1,046.86**	**11.79**	**563.98**	**455.35**	**1,610.84**	**467.13**
WV																
SIGNIFICANT	8	13.75	0.00	0	23.19	1.09	23.19	1.09	10.97	0	34.16	1.09	15.79	15.28	49.96	16.37
NON-SIGNIFICANT	3	0.53	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	1.71	0.25	1.71	0.25
INDUSTRIAL	3	0.32	0.00	0	5.19	0.10	5.19	0.10	0.45	0	5.64	0.10	0.54	0.00	6.18	0.10
WV TOTAL	**14**	**14.60**	**0.00**	**0**	**28.38**	**1.19**	**28.38**	**1.19**	**11.42**	**0**	**39.81**	**1.19**	**18.05**	**15.53**	**57.85**	**16.71**

NOTE: Blue Plains costs are allocated among DC, MD and VA according to the Blue Plains cost allocation methodology by MWCOG.

Non-significant category covers only plants with existing data in the database, which are mainly MD facilities. Most VA non-significant plants are not yet included due to no loading data.

Many industrial facilities do not have design flow data available. 2010 flows were used for industrial design flows. Actual design flows were used for several MD plants that have the data.

TN CC = Total Nitrogen Capital Costs; TP CC = Total Phosphorus Capital Costs

ACKNOWLEDGMENTS

This document compiles the work of the Nutrient Reduction Technology Cost Task Force which developed methodologies for estimating costs of nutrient removal at Chesapeake Bay watershed point sources. This effort was performed by a multi stakeholder group comprised of individuals that volunteered their time to support this work. The Chesapeake Bay Program would like to thank all the members of the Task Force. Special thanks go out to Tom Sadick, of CH2M HILL and Thor Young of Sterns and Wheler, two consultants who generously donated their exceptional expertise in assisting the Cost Task Force in developing the cost methodologies. Additionally, appreciation is extended to Lisa Bacon, Tara Ajello and Alta Turner of CH2M HILL who volunteered their expertise in designing statistically accurate cost curves as part of the estimation techniques described herein. Special thanks also go to Ning Zhou, Point Source Data Manager under grant with Virginia Tech, at the Chesapeake Bay Program Office, who took the cost methodologies developed by the consultants and the Task Force and applied them to all individual point sources in the watershed to develop facility specific cost estimates. In addition, thanks go to representatives of many municipal and industrial wastewater treatment plants around the watershed for providing cost estimates on their own at the request of the Task Force for varying levels of nutrient removal for their respective facilities. These individual facility estimates were used where available instead of developing costs based on the Task Force cost methodologies, and provided for a more credible and accurate database overall.

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I. PURPOSE, BACKGROUND AND GENERAL METHODOLOGY

The purpose of this report is to present costs estimated for technologies to achieve varying effluent levels of nitrogen and phosphorus removal from industrial and municipal wastewater treatment plants in the Chesapeake Bay watershed. The data will be used by the Chesapeake Bay Program in estimating costs of nutrient removal programs for all source categories across the Bay watershed during its nutrient and sediment water quality criteria and use development process.

A multi-stakeholder Nutrient Removal Technology Cost Task (NRT) Force was assimilated by the Chesapeake Bay Program in March of 2002 for the purpose of developing these costs. The Task Force consisted of representatives of municipal wastewater associations, state governments, EPA, local government organizations, and consultants with extensive expertise in the NRT field. A list of the members of this Task Force can be found in Appendix A.

Costs were derived according to specific effluent discharge levels defined by Tiers. These Tiers were part of a larger effort intended to estimate varying levels of nutrient removal from all sources (non-point as well as point sources) across the watershed. The NRT Task Force defined what would be logical Tiers (or different nutrient reduction levels) for point sources and then estimated costs by Tier. Descriptions of the four tiers can be found in the subsequent section, however, generally they range from current (year 2000) reduction levels extrapolated out to 2010 flows to limits of technology.

The point sources analyzed in this effort included facilities located in the Chesapeake Bay Watershed (from PA, MD, VA, DE, WV, NY, and the District of Columbia) that have been identified by the State as significant discharge sources of nitrogen and phosphorus. These point sources are divided into several categories for purposes of this exercise and include:

- Significant Municipal facilities, which generally are municipal wastewater treatment plants that discharge flows of equal to or greater than 0.5 MGD. More specifically, significant municipal facilities are defined slightly differently for each jurisdiction. For Virginia, these facilities are those that 1) have a design flow of 0.5 MGD or greater, and 2) are located below the fall line, regardless of flow. For MD, significant facilities are those having a current flow of 0.5 MGD or greater. For PA, significant facilities are those having average annual 1985 flows of 0.4 MGD or greater. For DE, WV and NY the Chesapeake Bay Program selected facilities in the EPA Permit Compliance System database with current flows of 0.5 or greater.

- Significant Industrial facilities, which have been identified to discharge equivalent or greater amounts of nutrient as compared to a municipal wastewater treatment of 0.5 MGD. These discharge loads would roughly be equivalent to those of municipalities with flows of 0.5 MGD or greater, and a Total Nitrogen load of 75 lbs/day, and a Phosphorus load of 25 lbs/day or greater (based on a municipal discharge of 6 mg/l TP and 18 mg/l TN).

- Non-significant municipal facilities are those, which are generally smaller than discharge flows of 0.5 MGD. Only facilities permitted by MDE are included in this analysis due to availability of data.

- Combine Sewer Overflows: only the CSO for the District of Colombia has been costed in this exercise because this is the only CSO for which the Bay Program has nutrient load data. Certainly there are other CSOs in the Bay watershed, but to date, these have not been quantified in terms of nitrogen and phosphorus load discharges and thus, are not included for analysis here.

Table I -A provides a summary profile of these facilities in the watershed.

TABLE I – A: Point Source Summary Profile

Point Source Category	Description	Number of Facilities	Total 2000 Flow (MGD)
Significant Municipals*	Generally ≥ 0.5 MGD	304	1554.4
Significant Industrials	Discharge loads generally > 75 lb/day TN & 25 lb/day TP	49	524.7
Non-significant Municipals	Generally < 0.5 MGD	185	10.8
CSOs	Only for Blue Plains	1	7.6
Total	–	540	2,097.5

* including the 6 VA plants to be built by 2010.

Costs for technologies to achieve various nutrient reduction levels are estimated in this report in one of two ways:

1) Costs were obtained directly from individual facilities, or their respective state agencies, or site visit reports and etc.

2) In cases where data was otherwise unavailable, costs were estimated by applying methodologies described in this report.

Costs were obtained either through a survey of the point source facilities issued by the state municipal authorities, or from individual contacts. Appendix B provides the point source survey and a collection of the survey responses received. Appendix C provides other correspondences from facilities. These cost data were used in the costing methodology development and costing analysis.

Wherever costs were obtained directly from facility operators or their respective associations, these costs were used. Then, if no other data was available, estimates were calculated using different methodologies depending on the technology level of reduction. Chapters III – VI provide information on the estimating methods employed wherever costs were otherwise unavailable. Chapter VIII is a description of how the cost methodologies were actually applied on a facility specific base. Chapter IX is a description of how the loads for each tier were calculated. Both concentrations and flows, which are factors of the loads, are important elements to applying the cost methodologies.

II. TIER DESCRIPTIONS

The Chesapeake Bay Program, as part of an effort to estimate water quality responses as well as costs of varying nutrient reduction measures for all sources across the watershed, developed a series of technological reduction tiers. The four tiers spanned technological implementation ranging from current practices to limits of technology. The NRT Cost Task Force developed four tiers for point sources, which range from current (or planned) levels of technological implementation and operation to limits of technology for nutrient and phosphorus removal at wastewater treatment plants. Different levels of technological implementation are indicated by the discharge concentration of nitrogen and phosphorus for each tier. The types of technologies necessary to achieve these effluent levels were then matched to the concentrations and costs. All concentrations, and calculations performed on them, are assumed on an annual average basis. The discharge flows represented for each facility are those projected for the year 2010. It is important to note however that capital cots for these technologies are calculated on design flows by facilities, whereas the O&M costs as well as the discharge loads represented by each tier are estimated assuming the 2010 projected flows. Table II-A and II-B summarize the nitrogen and phosphorus loads respectively represented by each Tier for each point source category.

TABLE II – A: Total Nitrogen Discharge Loads (lbs/yr) Summary

Facility Type	2000	Tier 1	Tier 2	Tier 3	Tier 4
SIGNIFICANT MUNICIPAL	61,113,341	54,675,431	42,510,365	26,894,197	16,136,518
INDUSTRIAL	9,099,737	7,633,234	6,858,729	5,892,916	3,534,150
NON-SIG MUNICIPAL	493,649	540,258	540,258	540,258	287,977
CSO	162,706	70,298	70,298	70,298	0
Total	70,869,434	62,919,222	49,979,650	33,397,669	19,958,644

TABLE II – B: Total Phosphorus Discharge Loads (lbs/yr) Summary

Facility Type	2000	Tier 1	Tier 2	Tier 3	Tier 4
SIGNIFICANT MUNICIPAL	4,387,008	5,252,012	3,685,449	2,046,441	537,884
INDUSTRIAL	1,121,750	1,074,316	623,023	398,245	154,120
NON-SIG MUNICIPAL	74,615	82,174	82,174	82,174	56,219
CSO	46,353	15,330	15,330	15,330	0
Total	5,629,728	6,423,832	4,405,976	2,542,189	748,223

For non-significant facilities, current conditions are assumed for Tiers 1 - 3, and then Tier 4 assumes a TN of 8 mg/l and a TP of 2.0 mg/l.

CSO assumptions for all Tiers for the District of Columbia were provided by the Washington Council of Governments with load estimates from the DC Washington Area Sanitary Authority CSO study in 2001. A description of the tiers for this CSO can be found in Appendix D.

Table II - C summarizes the Tier assumptions, which are described in more detail below.

2.1 Tier 1

Tier 1 assumes NRT implementation either current or planned extrapolated out to 2010 flows. For example, as of the date of this writing, there exist 304 significant municipal facilities in the Bay watershed, 84 of which currently operate NRT for nitrogen removal. This number will increase to a total of 154 facilities operating NRT for nitrogen by the year 2010. Thus, for significant municipalities, NRT is assumed for all 154 facilities, and the Tier 1 discharge level relative to these is 8 mg/l Total Nitrogen (TN) that is the generally accepted effluent performance for the types of NRT operating in the watershed now. There are some exceptions to this effluent concentration for nitrogen however depending on specific situations that exist at certain facilities. Blue Plains for example has a goal of 7.5 mg/l TN, and Back River has a goal of 10 mg/l (see Section IX).

Note that the concentrations for many facilities may actually be increased from one Tier to the next due to an artifact in the Tier definitions and their applications to the point source database. There exist many facilities in the watershed that are operating at TN concentrations actually less than 8 mg/l in 2000. In these cases, the Tier 1 concentrations for these facilities are actually raised to 8 mg/l (from the year 2000 to the year 2010). The NRT Cost Task Force believed that at 2000 flows some facilities might be able to operate more efficiently than at 2010 flows, thus the 2000 concentrations may not be realistic for 2010 conditions and that these concentrations should be elevated to the Tier definition of 8 mg/l TN.

For all other facilities (industrial and non-significant municipalities), Tier 1 for nitrogen equals the total nitrogen annual average concentration that existed for them in 2000, which is accepted as being representative of currant conditions.

Again, Tier 1 flows, as well as flows for Tiers 2 - 4, are equal to those projected out to the year 2010. These projections were either obtained directly from individual facilities, or derived from related population projections performed by the Chesapeake Bay Program (see Section IX).

Phosphorus removal, whether it is by physical/chemical or biological means, is operating in about half of the municipal facilities in the watershed (especially MD) due to state and local water quality requirements. Generally, effluents range from 0.18 - 4.0 mg/l. Tier 1 therefore, for phosphorus, assumes an effluent concentration equaling the facilities' annual average discharge for this parameter that existed in the year 2000.

For industries, Tier 1 represents the industries' current discharge levels unless it is known that NRT will be implemented at a given facility by 2010.

For non-significant facilities, current 2000 conditions are assumed for Tier 1.

2.2 Tier 2

Total Nitrogen for ALL significant municipals is brought to 8 mg/l, which then carries over the NRT for the 154 operating NRT and adds NRT for the remaining facilities. Total Phosphorus is set equal to 1.0 mg/l or a permit level if less than 1.0 mg/l.

Section VI more thoroughly describes the tiers for industrial facilities. In general, the tiers reflect levels of reduction on the order of 50% from Tier 1 unless permit conditions are less that this, in which case, permit conditions would apply.

For non-significant municipal facilities Tier 1 = Tier 2 = current conditions.

2.3 Tier 3

Tier 3 for significant municipals equals a TN of 5.0 mg/l and a TP of 0.5 mg/l. Tier 3 for industrial facilities generally reflects a reduction of 80% from Tier 1 unless permit conditions are less than this. Tier 1 = Tier 2 = Tier 3 = current conditions for non-significant municipals.

2.4 Tier 4

Tier 4 for significant municipals equals a TN of 3.0mg/l and a TP of 0.1 mg/l. Tier 4 for industrial facilities generally equals Tier 4 for significant municipals unless permit conditions are less than that. Tier 4 for non-significant municipal facilities is equal to a TN of 8 mg/l and a TP of 2.0 mg/l. It was determined by the NRT Cost Task Force that it would not be feasible and in most cases non-cost effective to consider a level of implementation greater than this for small facilities.

Note that for TP, as in the case for TN previously described, loads for certain facilities may actually increase depending on the tiers. For example, a facility may have an actual 2000 TP effluent concentration of 0.87 mg/l TP, but the concentration is raised to 1.0 mg/l to match the Tier 1 definition (assuming there is no permit limits requiring an effluent less than 1.0 mg/l). The NRT Task Force believed that this is more appropriate than holding the effluent concentration in 2000 constant throughout the Tiers because operations efficiency may decrease at higher 2010 flows.

TABLE II - C: Description Of Tiers For Point Sources*
(concentrations given in terms of an annual average in mg/l)

Point Source Category	Tier 1	Tier 2	Tier 3	Tier 4
Significant Municipals	TN= 8 for those with BNR operating or planned; TN and TP for rest of facilities = 2000 concentrations	TN = 8 TP = 1.0 Or permit limit if less	TN= 5.0 TP = 0.5 Or permit limit if less	TN = 3.0 TP = 0.1
Significant Industrials	TN and TP = 2000 concentrations or permit limit if less	Generally a 50% reduction from Tier 1 (or 2000 concentrations) or permit conditions if less	Generally an 80% reduction from Tier 1 (or 2000 concentrations) or permit conditions if less	TN = 3.0 and TP = 0.1 or permit conditions if less
Non-significant Municipals	TN and TP = 2000 concentrations	TN and TP = 2000 concentrations	TN and TP = 2000 concentrations	TN = 8 & TP = 2.0 Or 2000 concentrations if less
CSOs	See Appendix B for a complete description of the tiers for the DC CSO			

* Note that all flows are in terms of those projected by 2010

III. COST METHODOLOGY FOR ESTIMATING THE COSTS FOR SIGNIFICANT MUNICIPALS FOR TIER 2 & 3

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3.1 Purpose

The purpose of this report is to develop a methodology for estimating the capital and operating costs of upgrading all significant municipal wastewater treatment plants in the Chesapeake Bay watershed for:

- Tier 2 Nitrogen Goal of 8.0 mg/L effluent annual average total nitrogen (TN) for all plants not included in Tier 1 nitrogen removal upgrades.
- Tier 2 Phosphorus Goal of 1.0 mg/L effluent monthly average total phosphorus (TP) for all plants not currently capable of meeting this goal.
- Tier 3 Phosphorus Goal of 0.5 mg/L effluent monthly average TP for all plants that were upgraded for Tier 2 Phosphorus Goals or were already operating with less than 1.0 mg/L effluent TP.

These estimates may be used for scenario planning and cost/benefit analysis, especially for plants that do not already have specific cost estimates developed.

3.2 Background and Approach

Actual and estimated capital cost data is available for nitrogen removal system upgrades to 8.0 mg/L effluent TN for many plants in the Chesapeake Bay watershed. These estimates were tabulated by the EPA's Chesapeake Bay Program Office. Because the actual data date from the late 1990s to 2002, for the purposes of this cost estimating method, all costs were converted to 2000 dollars. The year 2000 was selected as the base year for the cost estimates for two reasons. First, the data in the EPA's database was collected in the year 2000. Secondly, 2000 is the approximate mid-point of the different cost estimates in this database. The cost data was converted to 2000 dollars using *Engineering News-Record, Building Cost Index*.

The EPA's Chesapeake Bay Program Office had no previously tabulated capital cost data for phosphorus removal systems.

Nitrogen and phosphorus removal processes involve different associated operations and maintenance costs. Therefore, separate approaches were taken for nitrogen and phosphorus removal cost estimating. Both capital and operations and maintenance costs are assumed to be in July 2000 dollars, and should be updated to the anticipated date of construction.

3.3 Tier 2 Nitrogen Removal System Upgrades

About half of the significant municipal treatment plants in the Chesapeake Bay watershed have already been upgraded to meet Tier 1 nitrogen removal goals of 8.0 mg/L effluent TN or less. The Tier 2 nitrogen removal goals are the same as the Tier 1 goals (8 mg/L TN or less), therefore it was determined that the cost of upgrading non-BNR facilities for Tier 2 nitrogen goals could be estimated from an extrapolation of the cost of upgrading similar facilities for the Tier 1 nitrogen removal goals.

3.3.1 Capital Cost Estimating – Tier 2 Nitrogen Removal Upgrades

The available capital cost data for Tier 1 nitrogen removal upgrades at significant municipal wastewater treatment plants in the Chesapeake Bay watershed are listed in Appendix E. Only cost data produced from actual construction costs, engineering design estimates, or preliminary engineering reports/facilities plans are included in Appendix E. The list, provided by the EPA, includes accurate capital cost estimates for upgrading 67 facilities. A statistical analysis on the data was performed, and a best-fit line equation was calculated. A summary of the statistical analysis is shown in Appendix F. The calculated equation is representative of the capital cost associated with nitrogen removal for any wastewater treatment facility in the Chesapeake Bay watershed. A graph of the data is shown in Figure III -A. The equation can be used to extrapolate cost estimates for all plants requiring upgrades that do not have current cost estimates available, based on each plant's specific design flow.

As Appendix B shows, capital costs from facilities in VA, MD, and PA were used to determine the average price for nitrogen removal upgrades and much of the cost information was obtained from as-bid costs provided by the facility or State as part of their state grant cost share programs. It should be noted that while cost estimates from all states were collectively used to determine average values, capital costs may be somewhat less for the Virginia facilities due to differences in state grant cost share eligibility requirements. Because Virginia's existing grant program is considered "Voluntary Cooperative", the Commonwealth has not funded nitrification process components and/or tanks if the need to nitrify year round was based on a permitted requirement; only the share/percentage of nitrification capacity lost/needed as a result of installing denitrification has been considered grant eligible.

The equation for Tier 2 Nitrogen Capital Cost Estimating:

$$Cost = 2023829 + 704350.8039 \times Q - 5986.733 \times Q^2$$

where Q = design flow rate (mgd) between 0.5 and 30.0 mgd

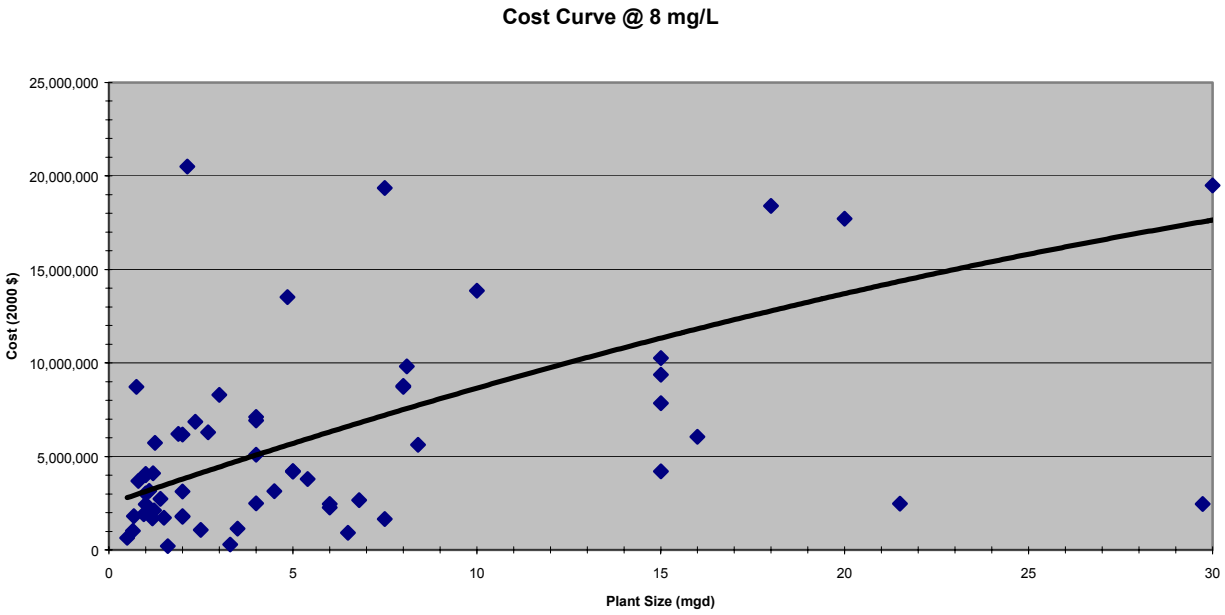


Figure III- A: Graph showing capital cost to reduce total nitrogen effluent concentrations to 8mg/L for plants Chesapeake Bay watershed.

For treatment plants larger than 30.0 mgd, specific cost data furnished by the facilities themselves will be used instead of the cost curve shown in Figure III -A.

3.3.2 O&M Cost Estimating – Nitrogen Removal

The primary impact on operations costs associated with biological nitrogen removal is the change in electrical requirements for aeration. The current effluent ammonia and nitrate concentration for each facility can be used to determine the impacts on aeration requirements. Plants with ammonia concentrations greater than 2 mg/L require additional nitrification to convert ammonia-nitrogen to nitrate-nitrogen. The nitrification process requires oxygen. Specifically, 4.57 lbs of oxygen are required per pound of ammonia nitrogen removed. Thus, the oxygen requirement can be calculated given a plant's effluent ammonia concentration. Once the oxygen requirement is known, the brake horsepower can be determined using a simplified calculation method. This method is based on the following assumptions that have been developed from typical aeration systems:

- The typical actual oxygen requirement/standard oxygen requirement (AOR/SOR) ratio for a fine bubble aeration system is 0.33.
- The typical fine bubble oxygen transfer efficiency (SOTE) is 2.0% per foot of diffuser submergence. Assume 25% on average.
- 1 SCFM of air contains 0.0173 pounds of oxygen.
- 40 HP is required to adiabatically compress 1000 SCFM

First, the airflow rate (SCFM) is calculated based on the oxygen requirement, AOR/SOR, and SOTE. Then, the brake horsepower is calculated based on the airflow rate, blower discharge pressure, and blower efficiency. Finally the cost is determined based on the brake horsepower and the cost of electricity. $0.05 per kilowatt-hour of electricity was assumed. An example spreadsheet utilizing this methodology has been provided. The calculations are summarized below:

- $O_2\ req'd = \left([NH_3]_{2000} - [NH_3]_{goal}\right) \times 8.34 \times Q_{2010} \times\ 4.57\ {}^{lbsO_2}\!/_{lb\ N\ nitrify}$
- $SCFM\ req'd = O_2\ req'd\ /\ \left(AOR/SOR\right)/\ SOTE\ /\ 1440\,(m/day)\ /\ 0.0173\,(lbs\,O_2\ /\ SCFM)$
- $BHP = SCFM \times {}^{40\,HP}\!/_{1000\,SCFM}$

Denitrification processes lower the biochemical oxygen demand of the wastewater stream, thus lowering the overall oxygen requirement of the plant. Therefore, denitrification processes provide an electrical cost savings to the operation of the plant. To determine the electrical cost savings, the amount of oxygen saved is calculated using the relationship: 2.86 pounds of oxygen saved per pound of nitrate denitrified. The calculated amount of oxygen saved is converted to an electrical cost in the same procedure used for nitrification processes. An example spreadsheet utilizing this methodology has been provided. The calculation to determine the amount of oxygen saved by denitrification is shown below:

$$O_2\ saved = \left([NO_3]_{2000} - [NO_3]_{goal}\right) \times 8.34 \times Q_{2010} \times\ 2.86\ {}^{lbsO_2}\!/_{lb\ N\ denitrify}$$

In both nitrification and denitrification process operation and maintenance cost calculations, the anticipated plant flow rate for the year 2010 should be used. In terms of additional operations and maintenance cost, there is a negligible change in solids production, and there is no additional labor required. Capital replacement cost is not included in the operations and maintenance cost. Maintenance cost can be estimated as 2% of capital costs per year.

3.4 Tier 2 Phosphorus Removal System Upgrades

Significant municipal wastewater treatment plants in the Chesapeake Bay watershed should be divided into three categories: “TP<1mg/L”, “1<TP<2mg/L”, and “TP>2mg/L”.

For the purposes of this evaluation, it was assumed that all treatment plants will use chemical precipitation to remove phosphorus. This is not intended as a recommendation of chemical precipitation over biological phosphorus removal. On the contrary, biological phosphorus removal is often the preferred alternative when feasible. However, for the task of assigning cost for the Tier 2 phosphorus removal standards, it is easier to generate capital and operating costs if the assumption is made that all systems use chemical precipitation methods.

Plants with total phosphorus concentration less than 1 mg/L are already achieving Tier 2 nutrient levels and are not included in the evaluation. Plants with total phosphorus concentrations greater than 1 mg/L and less than 2 mg/L are assumed to already have chemical addition systems for phosphorus removal. There are no additional capital costs associated with these plants; however, there are operations and maintenance costs associated with increased chemical addition and sludge handling. The plants with total phosphorus concentrations greater than 2 mg/L require new chemical addition facilities and subsequent operations and maintenance costs.

3.4.1 Capital Cost Estimating – Phosphorus Removal

For all plants with total phosphorus greater than 2 mg/L, capital costs for a new chemical addition facility including chemical feed pumps and chemical storage tanks will be incurred. For this methodology, we selected alum as the chemical for phosphorus removal. Alum is readily available, cost-effective, and precipitates phosphorus efficiently. Since chemical feed facilities' design does not vary greatly between plants, it was determined for this evaluation that capital costs for a 0.5, 1, 10, and 30 mgd plant would be representative of the range of costs for all plants. Capital costs for plants with flow capacities of 0.5 to 10 mgd were obtained from the *EPA Handbook – Retrofitting POTWs for Phosphorus Removal in the Chesapeake Bay Drainage Basin* (Sept, 1987). Capital cost for a plant with flow capacity of 30 mgd was obtained from the *Innovative and Alternative Technology Assessment Manual* (Feb, 1980). Both sources of cost data were converted to July 2000 dollars using the *Engineering News-Record – Construction Cost Index.* The results are summarized in Table III - A. These typical cost estimates are graphed versus plant design flow capacity. The graph is shown in Figure III-B. Cost estimates for individual plants can be extrapolated from Figure III-B based on each plant's specific design flow.

Capital costs can be extrapolated by determining the equations of the lines between the data points on Figure III - B. The equations for Figure III-B are as follows:

For, $0.1 < Q \leq 1.0$ mgd $\quad$ Cost = $94444 \times Q_{design} + 65556$

$1.0 < Q < 30.0$ mgd $\quad$ Cost = $15172 \times Q_{design} + 144828$

From these equations, the facility capital cost based on design flow is given. Facility cost for plants with flows outside the range of this graph can be approximated by using the maximum and minimum cost.

Table III - A: Capital Cost Data Summary – Phosphorus Removal

Plant Flow (mgd)	0.1	1	30
Cost ($)	$75,000	$160,000	$600,000

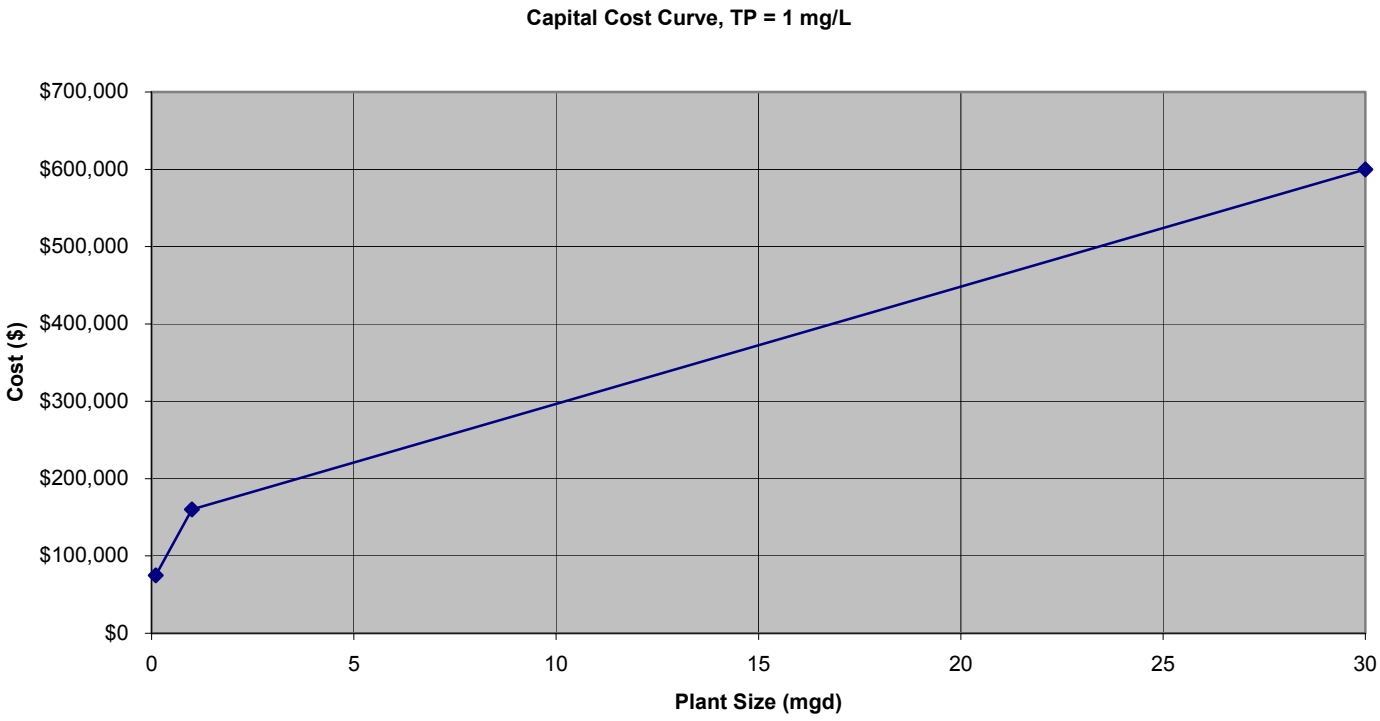


Figure III - B: Graph showing capital cost/mgd plant flow to reduce total phosphorus concentrations to 1 mg/L

3.4.2 O&M Cost Estimating – Phosphorus Removal

In chemical phosphorus precipitation, liquid alum, or aluminum sulfate, is added to the wastewater stream. The aluminum sulfate reacts with soluble phosphorus to form aluminum phosphate, which is insoluble and precipitates out of solution as sludge. Competing reactions occur simultaneously and thus aluminum hydroxide sludge is also a byproduct of phosphorus removal. For plants with total phosphorus concentrations greater than 1 mg/L, operations and maintenance costs associated with chemical costs and sludge handling costs were calculated.

To estimate the cost of liquid alum per facility, the amount of liquid alum required to reduce the plant's total phosphorus concentration to 1 mg/L is calculated. For this methodology, the aluminum dose required is calculated using the aluminum to phosphorus molar ratio of 1.5:1 for Tier 2 nutrient levels. Therefore, 14.4 mg/L alum is required per 1 mg/L total phosphorus removed. 50 % alum solution should be assumed for all calculations with an alum bulk density of 11.09 lb/gal. For this methodology, use a budget cost of $269/ton alum, per *EPA Wastewater Technology Fact Sheet for Chemical Precipitation* (September, 2000). An example spreadsheet utilizing this methodology has been provided. The calculation is summarized below:

- $TP_{removed}$ *(mg/L)* $= TP_{2000} - TP_{goal}$
- *Alum Mass Flow (lb/day)* $= TP_{removed} \times MFR \times WR \times Q_{2010} \times 8.34$

  where: MFR = Al:P molar feed ratio (1.5:1, for Tier 2)
  WR = Alum:P weight ratio (9.6:1)
  Q_{2010} *= Anticipated Flow for Year 2010, mgd*

- *Alum Cost = Alum (lb/day) x (365days/year) / (2000lbs/ton) x ($269/ton)*

To estimate the sludge production from alum chemical addition, calculations detailed in the *EPA Design Manual for Phosphorus Removal* (September, 1987) should be used. The following stoichiometric equations govern the sludge producing reactions:

$Al + PO_4 = AlPO_4$ and $Al + 3\ OH = Al(OH)_3$

Each plant's specific effluent phosphorus concentration should be used along with the anticipated 2010 plant flow rate to calculate the sludge produced to reach a total phosphorus concentration of 1 mg/L. For this methodology, sludge handling and disposal costs should be assumed to be $300/dry ton sludge. No additional labor costs are required for phosphorus precipitation and additional energy costs are negligible. Maintenance cost can be estimated as 2% of capital costs per year. Capital replacement costs should not be included in the operations and maintenance cost. An example spreadsheet utilizing this methodology has been provided. The calculations are summarized below:

- *Al dose(mg/L) = MFR x $TP_{removed}$ x AWR*

  where: MFR = Al:P molar feed ratio (1.5:1, for Tier 2)
  AWR = Al:P atomic weight ratio (27/31)

- *[$AlPO_4$] =* $\frac{TP_{removed}}{P_{aw}} \times (AlPO_4)_{aw}$

  where: [$AlPO_4$] = concentration of aluminum phosphate (mg/L)
  P_{aw} = atomic weight of phosphorus (31)
  $(AlPO_4)_{aw}$ = atomic weight of aluminum phosphate (122)

- *[$Al(OH_3)$] =* $\left[\left(\frac{Al\ dose}{Al_{aw}}\right) - \left(\frac{TP_{removed}}{P_{aw}}\right)\right] \times (Al(OH)_3)_{aw}$

  where: [$Al(OH)_3$] = concentration of aluminum hydroxide (mg/L)
  Al_{aw} = atomic weight of aluminum (27)
  $(Al(OH)_3)_{aw}$ = atomic weight of aluminum hydroxide (78)

- *Total Sludge (lb/d) = ([$AlPO_4$] + [$Al(OH)_3$]) x Q_{2010} x 8.34*

- *Sludge Handling Cost = Total Sludge x (365d/yr) / (2000lbs/ton) x ($300/ton)*

3.5 Tier 3 Phosphorus Removal System Upgrades

In formulating the cost of Tier 3 phosphorus removal system upgrades, it was again assumed that all treatment plants will use chemical precipitation to remove phosphorus. Furthermore, it was assumed that Tier 3 goals would be enacted after Tier 2 goals were already in place, so that all of the significant wastewater treatment plants in the watershed would already have chemical phosphorus removal systems in place. Thus, the capital cost of implementing Tier 3 phosphorus removal system upgrades will be zero.

The operating cost of implementing Tier 3 phosphorus removal upgrades can be found using the same methodology used to determine the operating cost of Tier 2 phosphorus removal upgrades, with the following exceptions:

- All facilities are assumed to already be operating with an effluent TP of 1.0 mg/L or less.
- The goal molar feed ratio to achieve 0.5 mg/L effluent TP will be 2:1 instead of 1.5:1, as was used to achieve an effluent TP of 1.0 mg/L.

IV. COST METHODOLOGY FOR TIER 3 AND TIER 4 NUTRIENT REMOVAL FOR SIGNIFICANT MUNICIPAL FACILITIES

By Tom Sadick, CH2M HILL, Herndon, VA

Cost estimates were developed to assist in the evaluation of the benefits and potential costs of various levels of nutrient removal at wastewater treatment plants in the Chesapeake Bay watershed. Four tiers or levels of treatment were analyzed. The first tier represents the current (2002) level of treatment being achieved by plants within the watershed (DC, Maryland, Virginia and Pennsylvania). Tier 1 is the baseline for comparison. The second tier represents the incremental costs required to achieve total nitrogen (TN) concentrations of 8 mg/L and total phosphorus (TP) concentrations of 1.0 mg/L for those plants without this level of treatment in operation or construction. Tier 3 provides incremental costs for TN of 5 mg/L and TP of 0.5 mg/L. The highest level of treatment, Tier 4, represents incremental costs for going from Tier 3 to Tier 4 – the limit of technology (LOT). LOT is generally considered to be 3 mg/L TN and 0.1 mg/L TP. The tiers are summarized in Table IV- A. The purpose of this document is to present the results of this work and to describe the methodology used to estimate costs.

Table IV – A Summary of Tiered Nitrogen and Phosphorus Levels

Tier	Total Nitrogen	Total Phosphorus
1	Current limit	Current limit
2	8 mg/L	1 mg/L
3	5 mg/L	0.5 mg/L
4	3 mg/L	0.1 mg/L

Appendix G provides details of cost assumptions used in this methodology.

4.1 Tier 3 Results and Methodology

Cost information for achieving Tier 2 limits were available for approximately one half of the treatment plants in the watershed. These data were analyzed statistically and used to estimate costs for the plants without specific cost information. However, unlike Tier 2, costs for achieving Tier 3 limits is very limited and unavailable within the time frame needed for this evaluation. Therefore, a generic approach using was developed to estimate approximate costs for this level of treatment.

Capital costs were estimated by assuming certain improvements were necessary to achieve treatment levels to plants with capacities of 0.1, 1.0, 10 and 30 mgd. Operations and maintenance (O&M) costs were also calculated for the plants of these sizes. Cost

curves were then developed from this data and were used for estimating costs for plants within these ranges that do not have actual costs available for this level of treatment.

The results from this type of analysis will provide an "order-of-magnitude" estimate on the basis of design flow that will have value for estimating basin-wide costs, but not for the development of budgets for individual facilities (an individual facility may cost more or less, but the aggregate numbers should be reasonable). Site specific factors such as wastewater characteristics, site constraints, geotechnical conditions, and the condition and layout of the existing facility can have a dramatic impact on the ultimate cost of a WWTP renovation project. Unfortunately, a detailed evaluation of each facility that considers site specific factors requires considerable effort, and few facilities have done the planning for Tier 3 and Tier 4 nutrient removal, thus this approach was used as an approximation of costs.

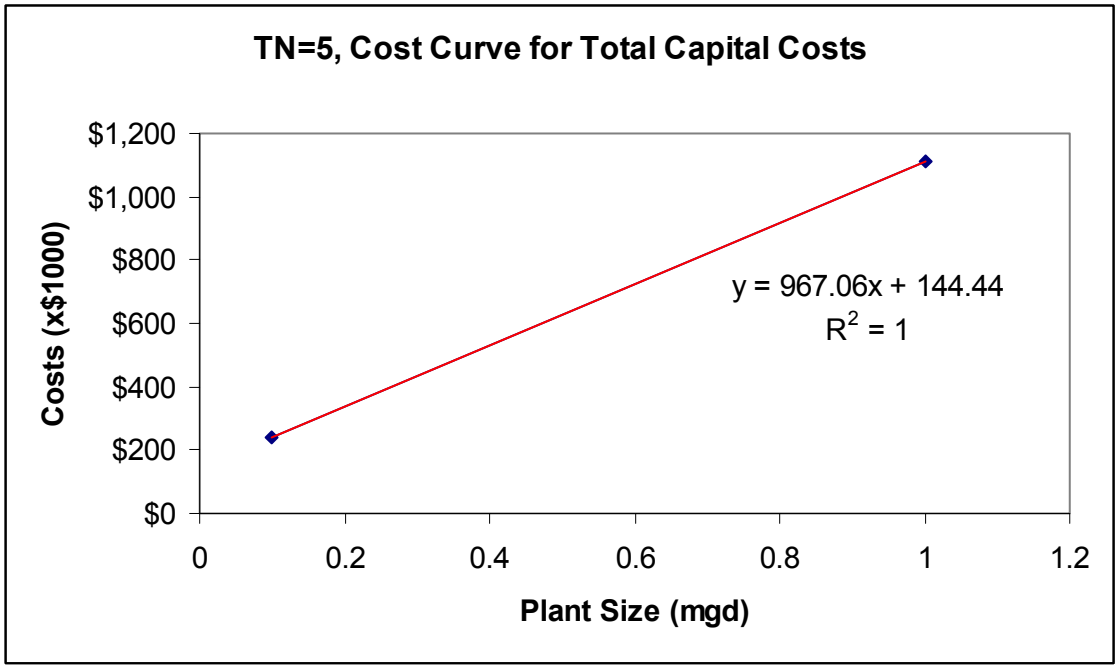
4.1.1 Costs for TN = 5 mg/L

Capital and O&M costs for achieving Tier 3 nitrogen limits for the four generic plant sizes are presented in Table IV- B.

Table IV- B
Summary of Capital and Operating Costs for Tier 3 Nitrogen Removal TN = 5 mg/L

	Plant Design Capacity			
	0.1 MGD	1.0 MGD	10 MGD	30 MGD
Capital Cost	$ 241,000	$ 1,112,000	$ 4,927,000	$ 12,383,000
Annual O&M Cost	$ 7,046	$ 29,218	$ 157,469	$ 293,938

Figure IV-A presents the capital cost curves for TN = 5 and Figure IV-B shows the O&M cost curves developed from the generic costs.



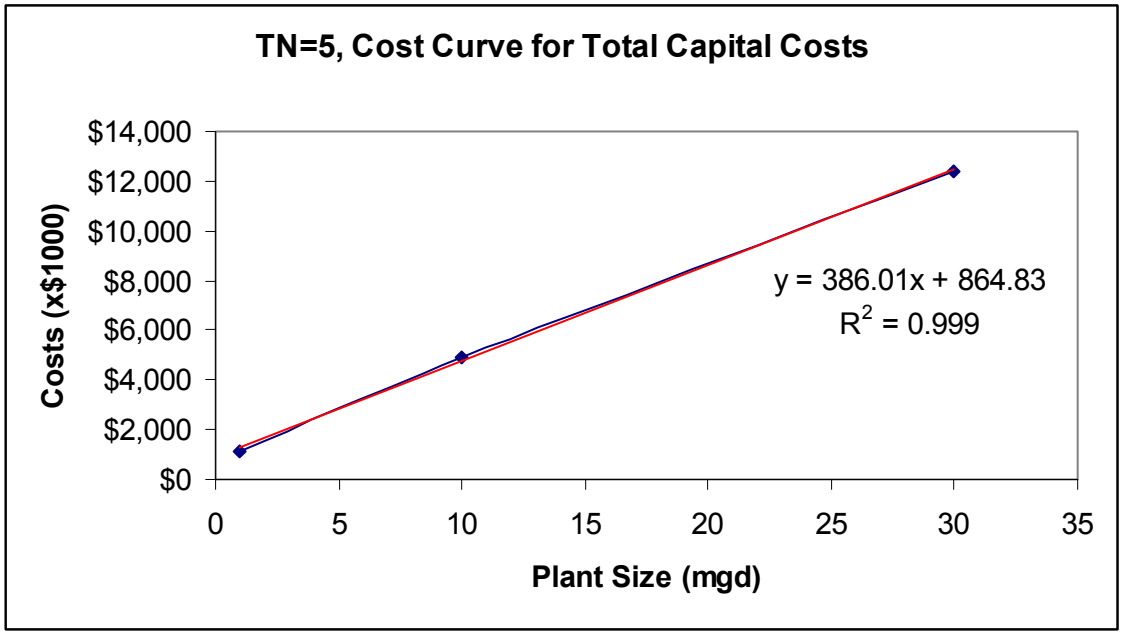
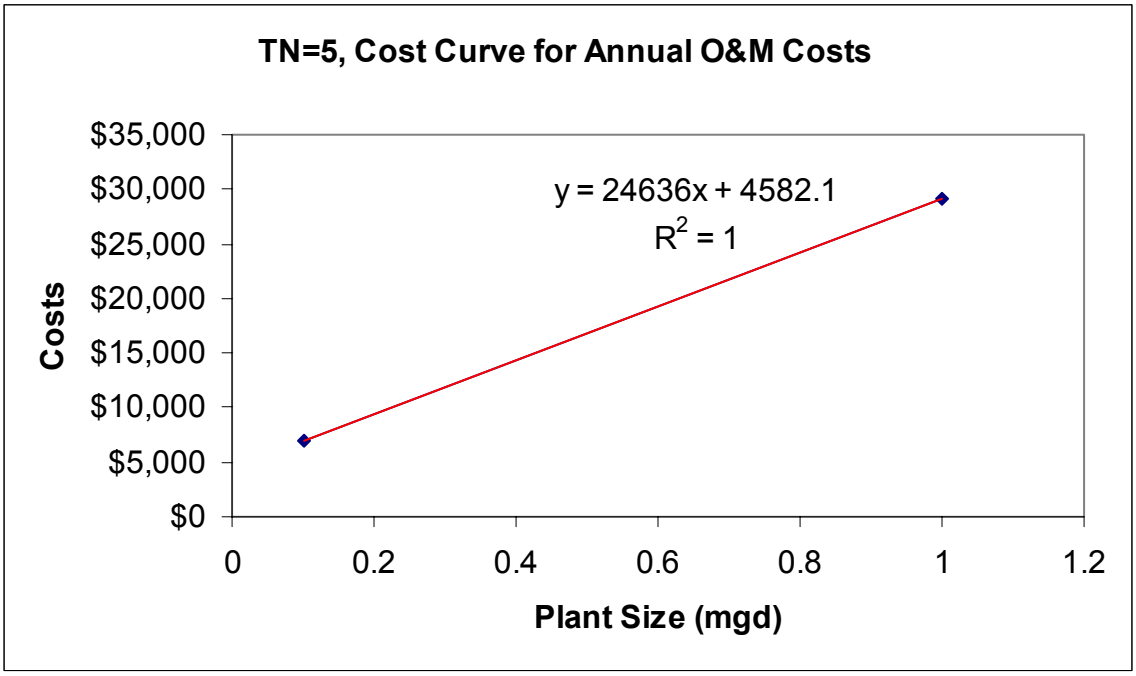


Figure IV- A: Cost Curves for Total Capital Costs with TN = 5 mg/L



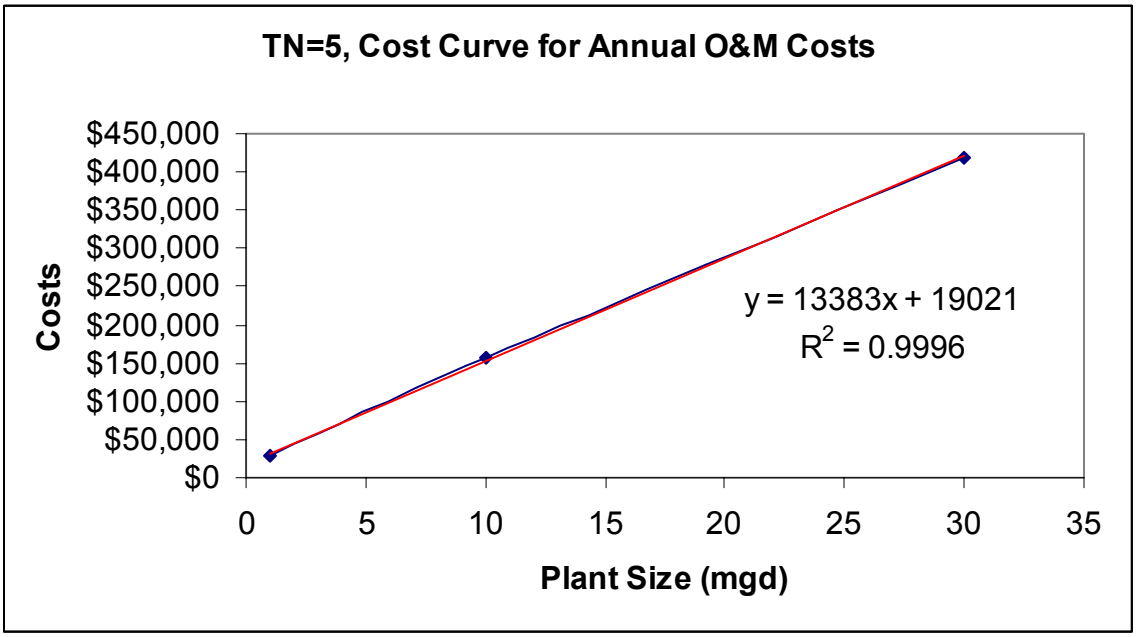


Figure IV- B: Cost Curves for Total O&M Costs with TN = 5 mg/L

4.1.2 Methodology for estimating TN = 5 mg/L costs

The methodology for development for costs for TN = 5 consisted of assuming certain improvements would be needed to bring a standard activated sludge plant to this level of treatment. The following assumptions were made in order to develop the costs.

4.1.2.1. The plant is already capable of achieving an annual average TN of 8 mg/L

4.1.2.2. In order to achieve 5 mg/L, improvements would be required to improve nitrification, clarification, and to remove an additional 3 mg/L of TN

4.1.2.3. For increased nitrogen removal, it was further assumed that a secondary anoxic zone (following aeration) would be used. The zone was sized for a one hour hydraulic detention time at design flow. Methanol addition was also assumed to be needed to achieve the additional denitrification in the secondary anoxic zone. The costs for additional tankage for the secondary anoxic zone were estimated at $2.50 per gallon installed. An allowance was also provided for mixing and miscellaneous mechanical equipment not specifically identified. Estimates were also made for methanol storage and feed facilities for each size plant.

4.1.2.4. Because the additional nitrogen removal requires more nitrification capacity and reliability an allowance was provided for improvements such as improved flow splitting, more tankage, or aeration improvements. These were based on an allowance per gallon - $ 0.50/gal for the 0.1 mgd plant, $0.25/gal for the 1.0 mgd plant , and $ 0.10/gal for the 10 and 30 mgd plants.

4.1.2.5. It was further assumed that additional clarification capacity would be required to handle the additional MLSS needed for more reliable nitrification as well as improving overall clarification and TSS removal. Additional clarification equivalent to 25% of the design flow was assumed. For example, the 1 mgd plant would receive 250,000 gpd of additional capacity, 2.5 mgd of clarification capacity was added for the 10 mgd plant and the 30 mgd plant would increase clarifier capacity by 7.5 mgd. Costs for the additional clarification capacity was estimated using EPA cost curves for clarifiers (EPA 430/9-78-009 Innovative and Alternative Technology Assessment) and adjusted for inflation using the Engineering News Record Construction Cost Indexes (ENR CCI).

4.1.2.6. The sum of the improvements was then added for each facility and then a 30% program implementation cost was added for program costs associated with engineering, construction management, legal, bonding and administrative fees. The sum of the construction and the implementation cost is the capital cost.

4.1.2.7. O&M costs were developed using costs for methanol, increased solids production, energy, and maintenance. Additional labor for operations was not considered necessary for this alternative. The assumptions for each are as follows:

- Methanol: 3.1 lbs of methanol per pound of nitrate reduced (3 mg/L nitrate in this case) Methanol costs of $1.00 per gallon were used except for the 0.1 mgd plant where $2.00 per gallon was used for 55 gallon drum feed instead of bulk storage.
- Additional solids production: Yield of 0.12 lbs of solids per lb of methanol applied. $300.00 per dry ton was used for solids handling, stabilization and disposal or reuse.

- Energy was estimated on the basis of mixing and other uses for each plant size at $0.05/kW-hr.
- Maintenance costs were developed using two percent of the plants capital cost.

Note: the O&M costs for all Tiers were developed using design flow for each facility. When used to develop basin wide costs, the 2010 flows will be used to prorate the annual O&M costs.

4.1.3 Methodology for fitting equations to TN = 5 mg/L data

Several different types of equation fits were tested with each data set: linear, power, logarithmic, and polynomial. Linear, power, and polynomial (specifically quadratic) were found to be the closest matches depending on the data set. One measure of the success of the fit of an equation to the line is a high coefficient of determination (R^2). However, in the case of these data sets, frequently more than one type of equation fit the line with an R^2 value of over 0.99. The difference in R^2 values between equation fits is therefore meaningless. However, given the few data points available, it is most appropriate to use a linear fit.

In addition to testing different types of equations, different data sets were also examined. The first round involved determining the equation of both the total capital costs and O&M costs of the entire upgrade. Then, the equation for the capital costs of each component of the upgrade (i.e. secondary anoxic reactor, denite filters, etc.) was determined. It was found that the equations for the total capital costs were a close enough fit that there was no need to look at the equations for the data subsets.

The equation fits for the entire upgrade still had some inherent degree of error in them. That is, they underestimated costs in some places and overestimated in others. In order to minimize this error and refine the equations, the data set was split in two subsets (POTWs 0.1 to 1.0 mgd and POTWs greater than 1.0 mgd to 30 mgd) based on plant size. This provided the most precise set of equations for both Total Capital Costs and Annual O&M Costs. This same methodology was used to determine the equations associated with the TN= 3 mg/L data.

4.1.4 Capital Costs for TP = 0.5 mg/L

In formulating the cost of Tier 3 phosphorus removal system upgrades, it was again assumed that all treatment plants will use chemical precipitation to remove phosphorus. Furthermore, it was assumed that Tier 3 goals would be enacted after Tier 2 goals were already in place, so that all of the significant wastewater treatment plants in the watershed would already have chemical phosphorus removal systems in place. Thus, the capital cost of implementing Tier 3 phosphorus removal system upgrades will be zero.

4.1.5 Methodology for estimating operating costs for TP = 0.5 mg/L

In chemical phosphorus precipitation, liquid alum, or aluminum sulfate, is added to the wastewater stream. The aluminum sulfate reacts with soluble phosphorus to form aluminum phosphate which is insoluble and precipitates out of solution as sludge. Competing reactions occur simultaneously and thus aluminum hydroxide sludge is also a byproduct of phosphorus removal. For plants with total phosphorus concentrations greater than 0.5 mg/L, operations and maintenance costs associated with chemical costs and sludge handling costs were calculated. All facilities are assumed to already be operating with an effluent TP of 1.0 mg/L or less.

To estimate the cost of liquid alum per facility, the amount of liquid alum required to reduce the plant's total phosphorus concentration to 0.5 mg/L is calculated. For this methodology, the aluminum dose required is calculated using the aluminum to phosphorus molar ratio of 2.0:1 for Tier 3 nutrient levels. Therefore, 19.2 mg/L alum is required per 1 mg/L total phosphorus removed. 50 % alum solution should be assumed for all calculations with an alum bulk density of 11.09 lb/gal. For this methodology, use a budget cost of $269/ton alum, per *EPA Wastewater Technology Fact Sheet for Chemical Precipitation* (September, 2000). The calculation is summarized below:

- $TP_{removed}$ *(mg/L)* = $TP_{2000} - TP_{goal}$

- *Alum Mass Flow (lb/day)* = $TP_{removed}$ *x MFR x WR x* Q_{2010} *x 8.34*

  where: MFR = Al:P molar feed ratio (2.0:1, for Tier 3)
  WR = Alum:P weight ratio (9.6:1)
  Q_{2010} *= Anticipated Flow for Year 2010, mgd*

- *Alum Cost = Alum (lb/day) x (365days/year) / (2000lbs/ton) x ($269/ton)*

To estimate the sludge production from alum chemical addition, calculations detailed in the *EPA Design Manual for Phosphorus Removal* (September, 1987) should be used. The following stoichiometric equations govern the sludge producing reactions:

$Al + PO_4 = AlPO_4$ and $Al + 3\ OH = Al(OH)_3$

Each plant's specific effluent phosphorus concentration should be used along with the anticipated 2010 plant flow rate to calculate the sludge produced to reach a total phosphorus concentration of 1 mg/L. For this methodology, sludge handling and disposal costs should be assumed to be $300/dry ton sludge. No additional labor costs are required for phosphorus precipitation and additional energy costs are negligible. Maintenance cost can be estimated as 2% of capital costs per year. Capital replacement costs should not be included in the operations and maintenance cost. The calculations are summarized below:

- *Al dose(mg/L) = MFR x $TP_{removed}$ x AWR*

  where: MFR = Al:P molar feed ratio (2.0:1, for Tier 3)
  AWR = Al:P atomic weight ratio (27/31)

- $[AlPO_4] = \frac{TP_{removed}}{P_{aw}} \times (AlPO_4)_{aw}$

  where: $[AlPO_4]$ = concentration of aluminum phosphate (mg/L)
  P_{aw} = atomic weight of phosphorus (31)
  $(AlPO_4)_{aw}$ = atomic weight of aluminum phosphate (122)

- $[Al(OH_3)] = \left[\left(\frac{Al\ dose}{Al_{aw}}\right) - \left(\frac{TP_{removed}}{P_{aw}}\right)\right] \times (Al(OH)_3)_{aw}$

  where: $[Al(OH)_3]$ = concentration of aluminum hydroxide (mg/L)
  Al_{aw} = atomic weight of aluminum (27)
  $(Al(OH)_3)_{aw}$ = atomic weight of aluminum hydroxide (78)

- *Total Sludge (lb/d) = ($[AlPO_4]$ + $[Al(OH)_3]$) x Q_{2010} x 8.34*

- *Sludge Handling Cost = Total Sludge x (365d/yr) / (2000lbs/ton) x ($300/ton)*

4.2 Tier 4 Results and Methodology

For Tier 4 generic plant cost development, it was assumed that the technology used to achieve an effluent TN of 3 mg/L was deep bed denitrification filters. Metal salt addition with microfiltration was assumed as the technology of choice for LOT for 0.1 mg/L TP.

4.2.1 Deep Bed Denitrifying Filters

A proven technology that can achieve this level of nitrogen removal and provide a reasonable estimate of costs is deep bed denitrifying filters (DBDF). Another significant advantage of DBDFs is the filtering action that can aid TSS and phosphorus removal. Other technologies can achieve a TN level of 3 mg/L (e.g., fluidized beds, denitrifying biological filters, suspended growth systems with multiple anoxic zones and supplemental carbon addition), however, applying the simplifying assumption that DBDF technology will be used at all facilities will provide reasonable capital and operating costs that can be used for preliminary planning and cost benefit analysis.

Deep bed denitrifying filtration is a down-flow, packed-bed process performing both suspended solids removal (as in a typical filter) and biological nitrogen removal. Denitrifying bacteria grow on the media using an external source of carbon, such as methanol, as a food source and nitrate in the effluent as a source of respiration (under

anoxic conditions). The DBDFs are similar to water filters except the media is usually a coarse, high density sand consisting of round hard particles. Bed depths are typically on the order of 5 feet and have a gravel underdrain system. DBDFs use both air and water during backwashing.

In operation, the denitrification process reduces nitrate-nitrogen to nitrogen gas, and results in the formation of cell mass, water, and alkalinity. The beds are occasionally removed from service and are "bumped" using washwater to remove trapped gas from the bed. Conventional hydraulic loading rates of 1 to 2 gpm/sq ft are typical for municipal wastewater. At these loading rates backwash intervals can range from 1 to 4 days. Nitrogen gas bumping cycles are typically between 4 and 8 hrs.

DBDFs are widely used for nitrogen removal, particularly in smaller plants in Florida where TN limits of 3 mg/L are being achieved. Tampa, Florida and Munich, Germany have large installations.

4.2.2 Microfiltration

Low pressure membrane treatment (micro or ultra filtration) is a suitable technology to achieve very low effluent phosphorus concentrations if metal salts are used just upstream to precipitate soluble phosphorus. Some existing plants in the region with tertiary clarification and filtration can reliably achieve TP concentrations below 0.1 mg/L. However, microfiltration is considerably less expensive than an additional clarification and filtration process and was therefore selected for use in this exercise as a reasonable add on process for plants without these facilities. Another factor in the selection of this technology is its use with denitrification filters. The denitrification filters must have sufficient phosphorus for cell synthesis of the denitrifiying organisms. Approximately 0.1 to 0.2 mg/L of soluble phosphorus must pass on to the filters to support growth and therefore they cannot be relied upon as the final barrier for phosphorus. Adding a small dose of metal salts and then processing the flow through microfilters can reduce effluent TP to below 0.1 mg/L.

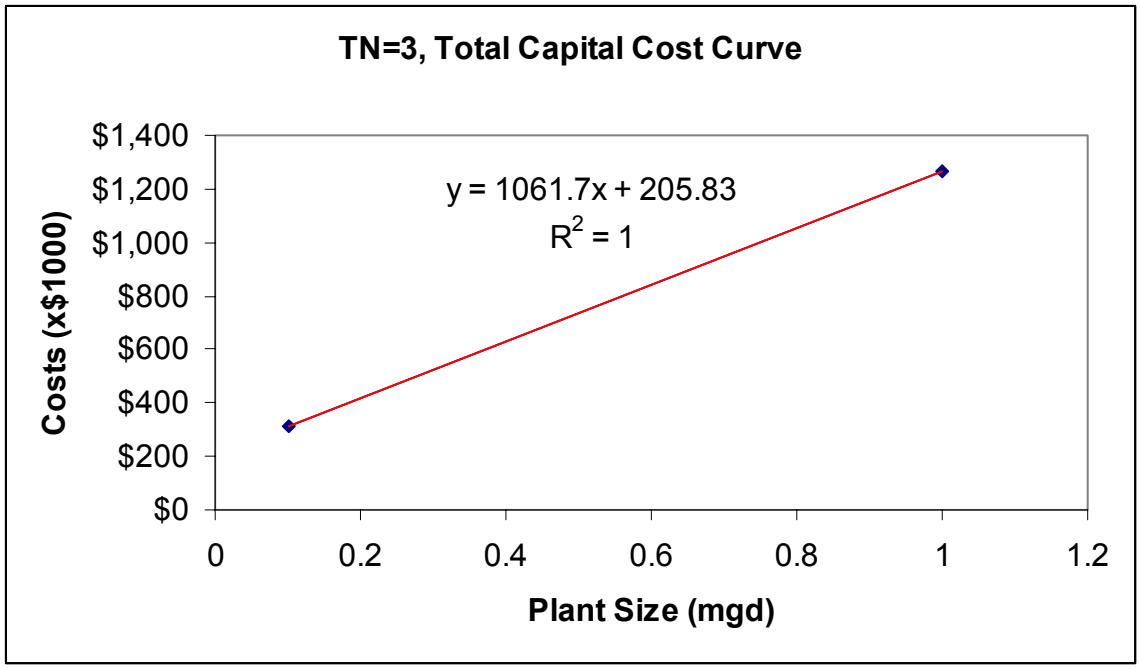
4.2.3 Costs for TN = 3 mg/L

Capital and O&M costs for achieving Tier 4 nitrogen limits for the four generic plant sizes are presented in Table IV- C.

Table IV- C
Summary of Capital and Operating Costs for Tier 4 Nitrogen Removal TN = 3 mg/L

	Plant Design Capacity			
	0.1 MGD	1.0 MGD	10 MGD	30 MGD
Capital Cost	$ 312,000	$ 1,268,000	$ 9,620,000	$ 26,520,000
Annual O&M Cost	$ 22,993	$ 69,925	$ 311,634	$ 841,120

Figure IV- C presents the capital cost curves for TN = 3 and Figure IV- D shows the O&M cost curves developed from the generic costs.



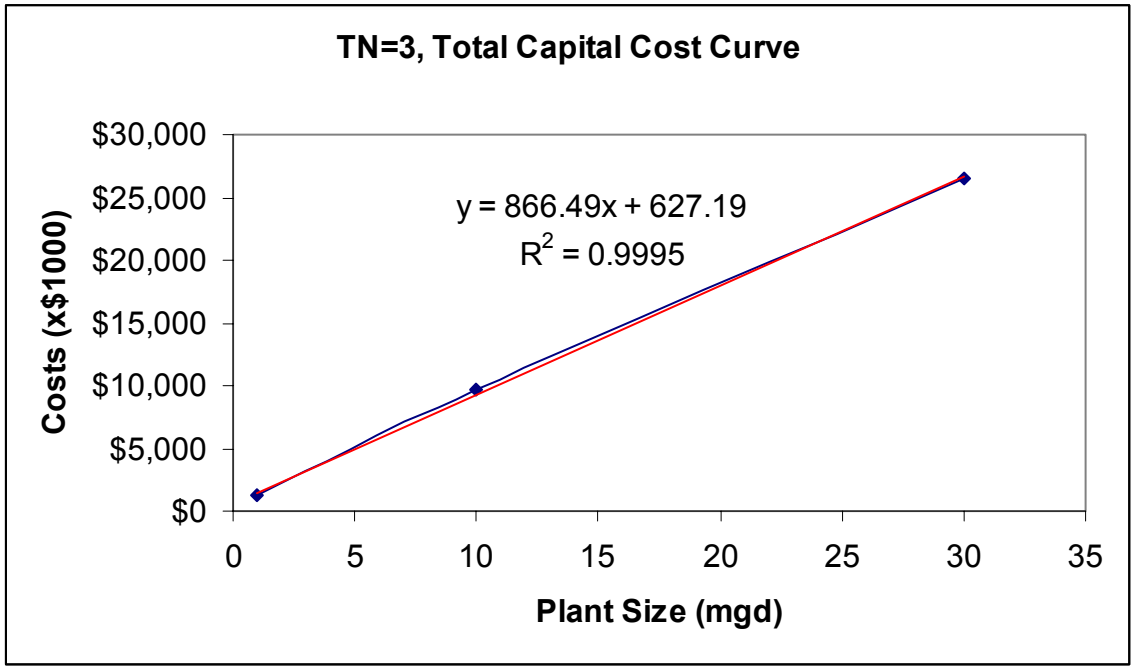
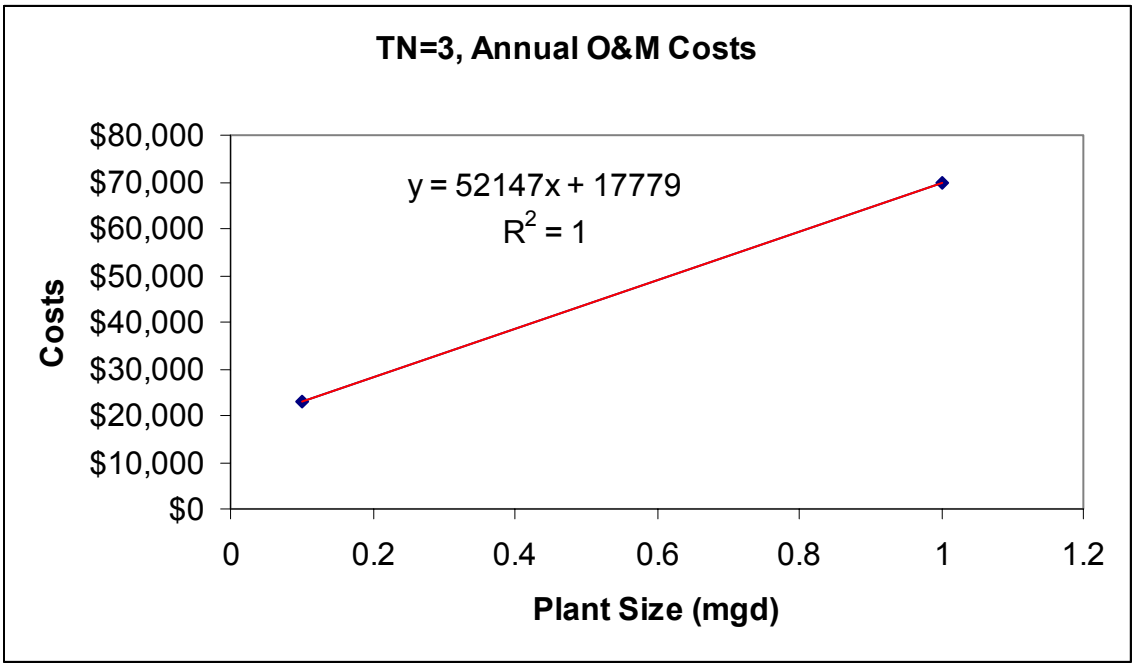


Figure IV- C: Cost Curves for Total Capital Costs with TN = 3 mg/L



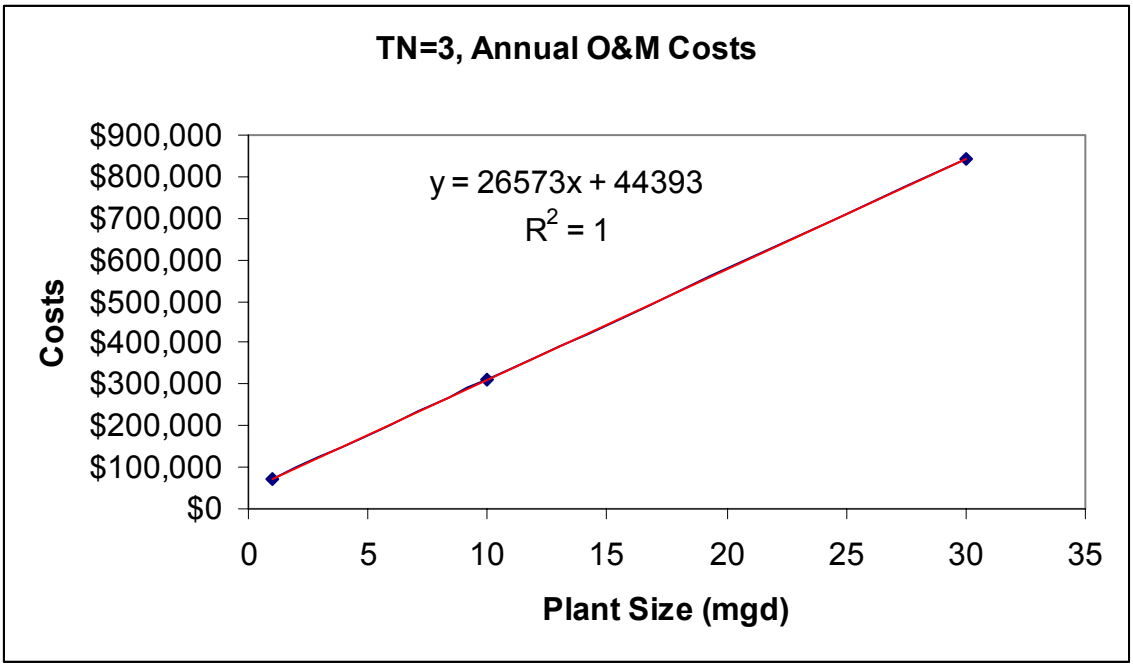


Figure IV- D: Cost Curves for Annual O&M Costs with TN = 3 mg/L

4.2.4 Methodology for estimating TN = 3 mg/L costs

As discussed above deep bed denitrification filters were assumed. Costs were developed for plant sizes of 0.1, 1.0, 10 and 30 mgd. Capital costs consisted of the following:

4.2.4.1. A pumping station capable of providing 30 ft TDH to the denitrification filters and three times the annual design flow to handle peak flows. The cost for the

station was developed using two sets of EPA cost curves (EPA 430/9-78-009 Innovative and Alternative Technology Assessment, and the EPA cost curves in the Cost of Wastewater Conveyance Manual) with indexing of the cost to the present using the ENR CCI.

4.2.4.2. Denitrification filter costs were developed using a design hydraulic loading of 2 gpm/sq ft and adding redundancy factors for filters being backwashed or out of service for maintenance. (50% additional filters for the 0.1 mgd plant, 20% for the 1 mgd plant, 15% for the 10 mgd plant and 10% for the 30 mgd plant). A flat cost of $1,500 per square foot of filter surface was used. This cost is typically used to cover the cost of the filters, building and appurtenances.

4.2.4.3. A 30 % program implementation factor was used to arrive at the final capital cost for each generic plant.

4.2.4.4. NOTE: <u>These capital costs are only valid for plants without filtration as a final process. Plants with filtration and pumping stations in place will be considerably less costly to retrofit for this level of nitrogen removal.</u>

4.2.4.5. O&M costs were developed using costs for methanol, increased solids production, energy, and maintenance, and additional labor on the basis of plant size. The assumptions for each are as follows:

- Methanol: 3.1 lbs of methanol per pound of nitrate reduced (3 mg/L nitrate in this case 5 mg/L to 2 mg/L – treatment target) Methanol costs of $1.00 per gallon were used except for the 0.1 mgd plant where $2.00 per gallon was used for 55 gallon drum feed instead of bulk storage.
- Additional solids production: Yield of 0.12 lbs of solids per lb of methanol applied. $300.00 per dry ton was used for solids handling, stabilization and disposal or reuse.
- Energy was estimated on the basis of pumping and other uses for each plant size at $0.05/kW-hr.
- Labor was based on plant size 0.1 mgd = 2 hrs/day, 1.0 = 4 hrs/day, 10 mgd = 6 hrs/day and 30 mgd = 12 hrs/day. Labor was considered for a 5 day work week. $30 was used per hour to cover salary and fringe benefits.
- Maintenance costs were developed using two percent of the plants capital cost.

4.2.5 Methodology for fitting equations to TN = 3 mg/L data

The same methodology was used to determine the equations associated with the TN= 3 mg/L data as was used to determine the equations for TN = 5 mg/L. Please refer to that section for more detailed information.

4.2.6 Costs for TP= 0.1 mg/L

Capital and O&M costs for achieving Tier 4 phosphorus limits for the four generic plant sizes are presented in Table IV- D.

Table IV- D
Summary of Capital and Operating Costs for Tier 4 Phosphorus Removal TP = 0.1 mg/L

	Plant Design Capacity			
	0.1 MGD	1.0 MGD	10 MGD	30 MGD
Capital Cost	$ 388,000	$ 1,315,000	$ 6,969,000	$ 18,330,000
Annual O&M Cost	$ 54,385	$ 189,800	$ 1,095,000	$ 3,066,000

Figures IV-E and IV-F present the capital cost curves for TP=0.1 and Figure IV-G shows the O&M cost curves developed from the generic costs. Figure IV- E was taken directly from *EPA 815-C-01-001 Low-Pressure Membrane Filtration for Pathogen Removal: Application, Implementation and Regulatory Issues*. Figure IV- F shows cost curves for additional allowances made for chemical system and instrumentation improvements. These costs are explained in more detail in the methodology section. Figure IV- G shows the cost curves for O&M associated with a TP = 0.1 mg/L based on data from the EPA source cited earlier.

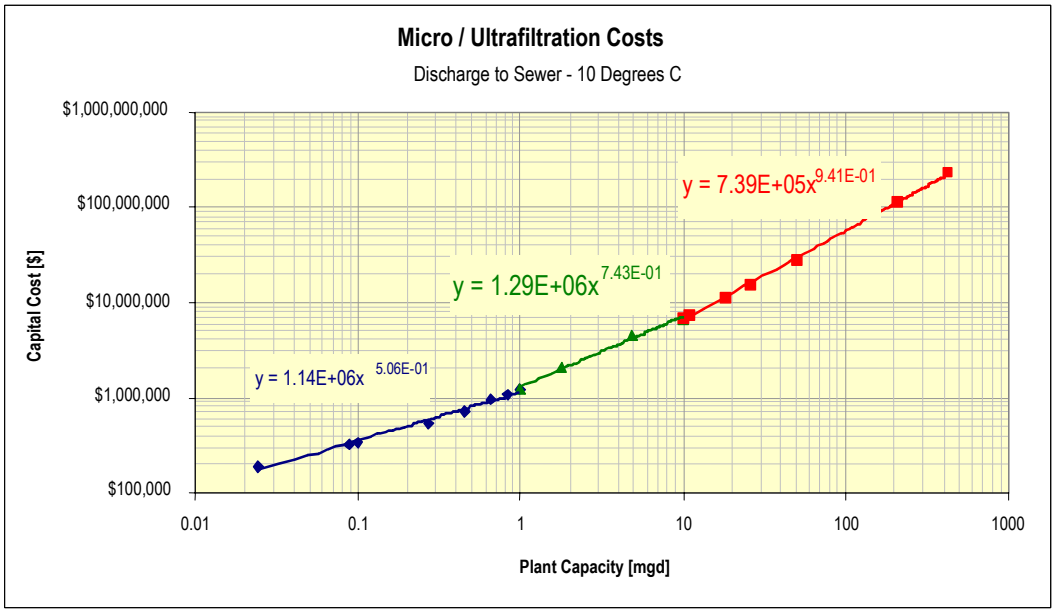


Figure IV- E: Cost Curves for Capital Costs for TP = 0.1 mg/L (Taken directly from *EPA 815-C-01-001 Low-Pressure Membrane Filtration for Pathogen Removal: Application, Implementation and Regulatory Issues*)

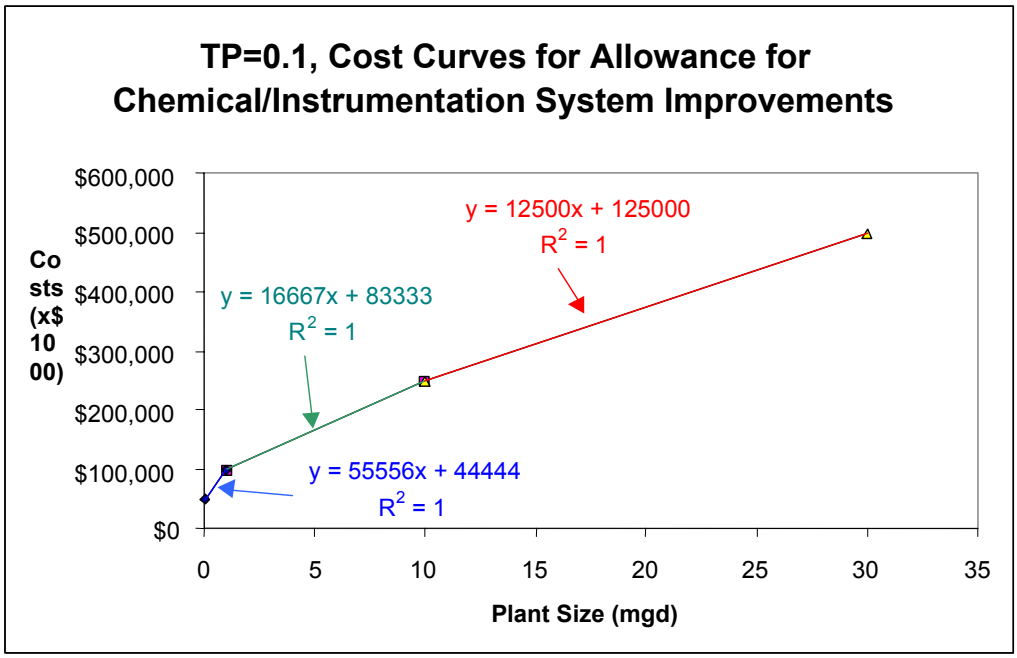


Figure IV- F: Cost Curves for Allowance for Chemical/Instrumentation System Improvements for TP = 0.1 mg/L

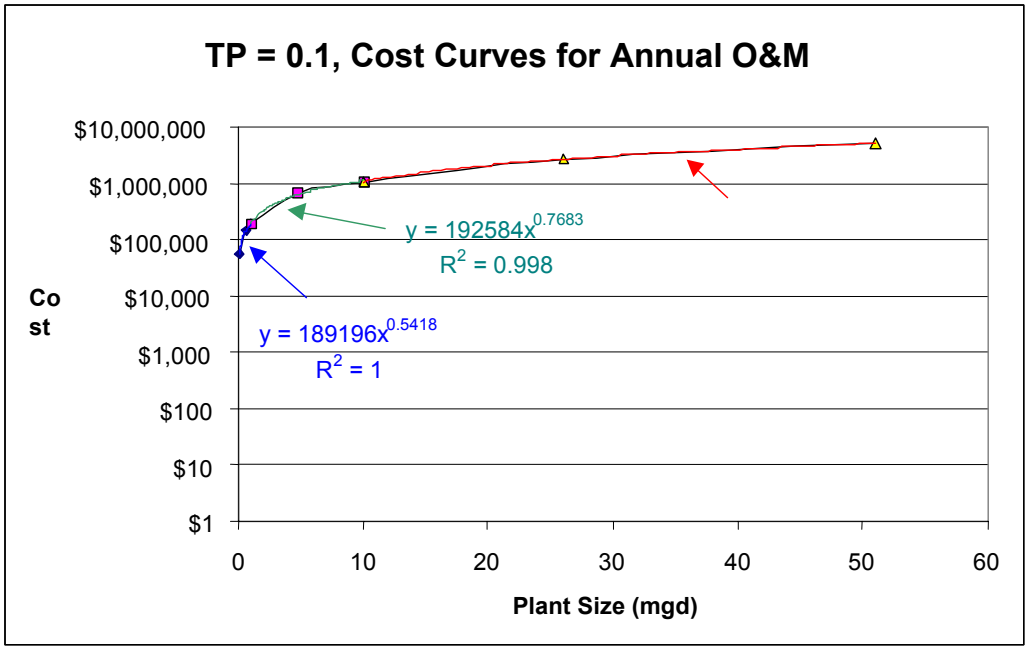


Figure IV- G: Cost Curves for Annual O&M Costs for TP = 0.1 mg/L

4.2.7 Methodology for estimating TP = 0.1 mg/L costs and for fitting equations to TP = 0.1 mg/L data

As discussed above, microfiltration was assumed as the technology of choice for LOT phosphorus removal for the generic plants. Both capital and O&M costs were developed using cost curves for low pressure membrane filtration for drinking water (EPA 815-C-01-001 Low-Pressure Membrane Filtration for Pathogen Removal: Application, Implementation and Regulatory Issues). This application will be reasonably similar to water treatment in terms water quality and membrane flux at this point in the waste water treatment process (highly treated denitrification filter effluent TSS < 3 mg/L) and thus, it should be applicable. The curve used (shown above in Figure IV- E) was directly from the "microfiltration/ultrafiltration costs with discharge to sewer (back to the plant) with a minimum water temperature of 10 degrees C."

4.2.7.1. In addition to the construction cost of the facilities, an allowance was provided for each for improvements to instrumentation and control systems to improve chemical application prior to the membranes. The allowances were as follows: 0.1mgd = $50k, 1.0 mgd = $ 100, 10 mgd = $250k, 30 mgd = $ 500k. This data was plotted in Figure IV- F. The same methodology was used to fit an equation to the line as was used in analyzing the TN data. The data was split into three subsets based on the way the EPA source data divided their equations.

4.2.7.2. Capital costs include non-construction costs such as engineering, legal and permitting. Figure IV- E shows the capital cost curves. These curves and equations were taken directly from the EPA document referenced earlier. Therefore, to determine the total capital cost for a given design flow, the equations in Figure IV- E and F need to be added together.

4.2.7.3. O&M costs were also taken directly from the EPA curves and include: power, 5 year membrane replacement, labor 2 hrs/week for very small systems < 1 mgd, 40 hrs for larger systems, and chemical cleaning once per month. The O&M costs were based on the data in the EPA document referenced earlier. Costs per 1,000 gallons were taken from that source, multiplied by the number of thousands of gallons in the design flow and multiplied by 365 days. This provided O&M costs per year at design flow. This data was plotted in Figure IV- G on a logarithmic scale. It was determined that the best fit for these curves were power equations. The data was split into three subsets based on the way the capital cost curves were split.

V. METHODOLOGY FOR ESTIMATING INDUSTRIAL LOADS and COSTS BY TIER

Estimates of industrial nutrient load reductions by tier and related costs to achieve those reductions are presented in this section. The tiers applied to industries conceptually mirror the tiers for the significant municipal facilities in that Tier 1 reflects current implementation and Tiers 2 – 4 reflect additional reduction measures ultimately leading up to limits of technology. There are 49 industrial direct dischargers in the CBPO nutrient point source database that the Bay jurisdictions have indicated are substantial sources of nutrients to the watershed. Site specific information on many of these facilities was obtained via phone contacts or site visits which provided individualized data on what appropriate load reductions and/or costs would be by tier. A cost estimation methodology applied wherever site specific information was unavailable. Certain assumptions were applied using the methodology described below. These costs and reduction levels are to be used only as a means to estimate potential reduction and resulting costs watershed wide according to Tiers. This is not information that should be used to determine or verify actual site specific load reductions and costs by facility for actual implementation measures.

Table V-A below provides a summary of the costs resulting from the theoretical implementation of the tiers grouped by SIC code. Table V-B provides the same summary information grouped by major Bay Basins. Tables V-C, V-D, V-D and V-F in this section provide costs and loads by facility by Tier as described below.

Note that the source of some of the following information on loads or costs may come from individual facility or state contacts. Reference numbers are placed after such information which link the information to a hard copy describing the communication. Appendix H to this report compiles all of these contacts and is available at the Chesapeake Bay Program Office by contacting Ning Zhou at 410-267-5727.

Table V-A: TOTAL INCREMENTAL CAPITAL COST (for Nitrogen and Phosphorus Reductions) SUMMARY BY INDUSTRY ($)

INDUSTRY	TIER 1 TOTAL CC	TIER 2 TOTAL CC	TIER 3 TOTAL CC	TIER 4 TOTAL CC
CHEMICALS Total	0	448,884	800,000	20,850,184
FISH HATCHERIES Total	0	0	3,180,697	10,676,419
MEAT PROCESSING Total	0	13,337,166	3,433,441	8,684,998
METALS Total	0	0	0	9,149,406
MISC Total	0	24,984,572	15,256,703	28,127,595
PAPER MILLS Total	0	4,928,496	17,535,141	115,812,973
PETRO-CHEMICALS Total	0	0	398,764	1,124,068
TEXTILES Total	0	7,000,000	6,212,016	2,073,175
Grand Total	0	50,699,118	46,816,762	196,498,818

Table V-B: TOTAL INCREMENTAL CAPITAL COST (Nitrogen and Phosphorus Reductions) SUMMARY BY BASIN ($) FOR INDUSTRIAL FACILITIES

INDUSTRY	TIER 1 TOTAL CC	TIER 2 TOTAL CC	TIER 3 TOTAL CC	TIER 4 TOTAL CC
JAMES RIVER Total	0	5,754,176	21,432,241	70,252,886
MD EASTERN SHORE Total	0	0	0	1,106,448
MD WESTERN SHORE Total	0	0	398,764	5,273,474
PATUXENT RIVER Total	0	7,350,910	489,332	1,325,353
POTOMAC RIVER Total	0	19,593,007	6,916,466	16,979,396
SUSQUEHANNA RIVER Total	0	17,994,525	16,954,959	71,866,171
VA EASTERN SHORE Total	0	6,500	625,000	1,250,000
YORK RIVER Total	0	0	0	28,445,090
Grand Total	0	50,699,118	46,816,762	196,498,818

5.1 LOADS

Loads for industrial facilities were determined by a combination of facility contacts, estimates based on an application of POTW technologies, or simply by applying increasing non-technology based percentages of reductions by tier. In general, Tier 1 for industries reflects nutrient concentrations that existed in 2000, or plans known to be in place by 2010, or permit limits if less than this. Tier 2 and 3 for industries generally reflects a 50 and 80% reduction respectively from Tier 1 or permit limits if less than this. Tier 4 reflects the same concentrations as for significant municipal facilities at limits of technology, or 3 mg/l for TN and 0.1 mg/l for TP. More site specific decisions for loads by facility are described below. It should be noted that loads for Tier 4 are really an artifact of how the tiers were constructed (which basically equaled LOT for municipals) rather than a reflection of the capability of the individual industrial facilities to meet this level.

See Table V-C for a list of industry concentrations, flows, and codes by Tier for loads and costing (see Section 5.2 below).

See Table V-D for a list of industry concentrations and flows as a result of applying the codes by tier listed in Table V-C. The information is organized by nutrient parameter for easy reference.

Flows: Flows for the year 2010 are the same as those for 2000. This is because industrial flows do not necessarily increase due to population, as in the case of municipal facilities, and there exist no data for 2010 projections other than data we have for 2000.

The following methodology (code) was used to determine TN and TP concentrations for the industrial facilities for the different tiers. However, in all cases, the permit concentrations will be used if lower than those determined by applying the codes below.

5.1.1. Concentrations will be held constant from Tier 1 because significant reductions have already been made (equal or greater than 85%). Code: R

5.1.2. Concentrations will be held constant from Tier 1 because they are already equal to or below 3.0 and 0.1 mg/l TN and TP respectively. Code: HC

5.1.3. The same tier levels are applied as are used for significant municipals where Tier 1 concentrations are equal or below 20.0 and 7.0 mg/l TN and TP respectively. Code: POTW

5.1.4. Tier 2 = 50% of 1985 concentration (or 2000 concentration, whichever is lower), Tier 3 = 80% reduction from 1985 concentration (or 2000 concentration, whichever is lower). But in any case, do not go lower than 3.0 and 0.1 mg/l for TN and TP respectively. Use in cases where facilities have experienced an increase in 50% or less in load since 1985. Code: AC1

5.1.5. Tier 2 = 50% of 2000 concentration (or 1985 concentration, whichever is lower), Tier 3 = 80% reduction from 2000 concentration (or 1985 concentration, whichever is lower). But

in any case, do not go lower than 3.0 and 0.1 mg/l TN and TP respectively. Use in cases where facilities have experienced an increase in load of greater than 50%. Code: AC2 Note: used in only two facilities: Hienz Pet Foods in PA, and Lee's Commercial Carpet in VA. Also note that 2010 concentrations are set equal to 2000 concentrations (as presented in the following tables) unless it was known that reductions would occur between 2000 and 2010.

5.1.6. Some loads are applied according to site specific information provided by either the respective state, or facility. Such site specific information is available for Osram in PA, Chemetals in MD, Rocco Farm Foods in VA, Tysons Foods in VA (4031) and others. Loads for Wampler Foods - Timberville, VA, Wampler Longacre in WV, and Hester Industries WV are all considered to be zero because spray irrigation technology has been employed at these facilities. Note: if loads do appear in the final tiers for these facilities, it is because the draft data set was finalized prior to input of this information. References for load and cost information are cited specifically under Section 5.2: Costs.

5.1.7. Poultry Processing Plants: TP is set to 2.0 mg/l or lower for all poultry processing plants for Tier 2 and 3 because many facilities have this concentration as a permit limit. Tysons Foods (4031) has a permit limit of 0.3 mg/l TP. Tysons Foods (4049) has a permit limit of 2.0 mg/l TP.

A different category code may be applied to either TN or TP for a given facility depending on the situation.

5.2 COSTS

It should be noted that costs were generated in this report assuming nutrient reduction was implemented through construction of wastewater treatment or transportation to a POTW. There may also exist methods to reduce nutrient levels through pollution prevention efforts industrial facilities may employ but which were not costed.

See Table V-E for a list of capital and O&M costs by Tier for TN and TP reduction measures.

See Table V-F for a list of industrial flows, TN and TP concentrations, and TN and TP combined capital costs by Tier.

5.2.1 Tier 1

All costs for industrial facilities are assumed to be zero for Tier 1 because this represents either conditions existing in 2000 or incorporates plans for reductions that were already in process.

5.2.2 Tiers 2 - 3

Costs for many facilities in these tiers were assumed to be zero whenever their TN or TP concentrations that existed in 2000 were equal to, fairly close to if higher, or less than, the

concentrations defined in the tiers. Where concentrations of TN and/or TP were near POTW influent concentrations, the POTW methodology was applied to obtain a reasonable estimate of costs, even where it is known that some industrial wastewater is not treatable biologically. In applying the POTW methodology, which is based, in part on knowing a facility s design flow, industrial facility design flows were assumed to be equal to 2000 flow . For poultry processing plants in general, it was agreed that the Tier 3 TN concentration should be 10.0 mg/l or lower because this is a performance level or permitted effluent concentration demonstrated by many currently operating facilities. Costs for these facilities are based on a TN of 10 for tier 3 for the Virginia plants. However, there may be a few cases where a level of 10 mg/l TN is in fact not reflected in the database for Tier 3 due to decision making after the database was completed. Where additional considerations other than those above were applied to estimate costs, they are explained below:

Allen Family Foods: TN is already low so no costs for TN reduction are assumed. No costs are assumed in general for poultry facilities to meet an effluent TP of 2.0 mg/l because this is a standard permit requirement for this industry.

Bethlehem Steel: Costs are assumed to be zero for this facility as its influent comes from Back River and any reductions will be implemented and paid for by Back River.

Chemetals: Based on correspondence with Chemetals and planned reductions via P2 - see Chesapeake Bay Point Source 2005 and 2010 Scenario Nutrient Data Compiling, April , 2000, CBPO.(Attachment 1, Appendix H) Chemetals planned on getting reductions via P2 since 1999. These reductions were estimated to result in a TN concentration of 223 mg/l TN, or an 81% reduction from 2000 levels. Costs are assumed to be zero as they were already planned. Costs are zero for TP because their effluent is less than Tier 3 concentrations.

Congoleum: TP and TN are already below Tier 2 levels so costs are zero. Costs for Tier 3 are for TN only to go from TN of 6.6 to 5.0. POTW cost methodology is applied here.

Garden State Tanning: No costs for TP because it is already very low. During a 1999 facility visit, Garden State Tanning stated that they were going to incorporate a recycle line in their wastewater treatment system that would result in a 20% reduction of TN in the effluent(Attachment 1, Appendix H). The Tier 1 TN concentration reflects this 20% reduction from 2000 concentrations. Subsequent information from EPA Region 3 stated that an NPDES permit is currently under review which will ask for a 40% reduction within 3 years. (Attachment 2, Appendix H) Current TN is 121 mg/l based on a 4/18/02 email from Peter Weber from EPA Region 3 which stated that the permit will have a load cap of 155,250 lbs TN per year. At their current flow of 0.42 MGD, this equates to a TN of 121 mg/l now. A 40% reduction would equate to an effluent of 72.5 mg/l TN. However this is not as low as the calculated Tier 2 concentration of 54.77 mg/l. MDE has requested costing information from this facility but at the time of this writing, no information has been provided. Because the facility already has nitrification and denitrification capability at its wastewater treatment plant, a Best Professional Judgement estimate is approximately $5 million to reduce the TN concentration from 72.5 mg/l to 54.77 mg/l. An additional $5 million is estimated to go to the Tier 3 calculated TN effluent of 21.9 mg/l. 8% O&M is assumed in both tiers.

MD & VA Milk Producers: Costs were determined by applying the POTW methodology because TN and TP levels were in the range of municipal influents.

Indian Head: TN costs are assumed to be zero because TN concentrations are already low. Costs for TP are determined using the POTW methodology.

Upper Potomac River Commission in MD: TN costs are assumed to be zero because TN concentrations are already low. Costs for TP are determined using the POTW methodology. It should be noted that this facility is a POTW yet it is primarily funded by an industry.

WR Grace: Concentrations for TN have been substantially reduced since 1985 thus no costs are assumed for this facility. TP values are also already low and below Tier 2 and 3 definitions.

Appleton Paper: Costs are for TP only to go from 1.16 to 0.5 mg/l. The POTW methodology was applied.

Georgia Pacific: 1985 TN and TP concentrations are based on a 3/18/02 email from Bob Ehrhart.(Attachment 3, Appendix H) Zero costs are assumed for TN reductions based on an 3/20/02 email from John Moore, Georgia Pacific which states that the source of nitrogen in the effluent should be removed by plans in place already to remove the sludge in the final settling pond (which is the source of the nitrogen in the effluent).(Attachment 4, Appendix H) Costs for TP are calculated using the POTW methodology.

Osram: Based on a 3/14/02 email from Carmen Venezia, OSRAM, this facility is incorporating P2 into their process by reducing the amount of nitrate used which would result in approximately a 20% reduction by end of 2001, a 30% reduction by mid 2002, and a 50% reduction by end of 2002.(Attachment 5, Appendix H) Hence, Tiers 2 - 3 reflect the 20 and 30% reductions, or 88 mg/l and 77 mg/l TN respectively.

Hoecht-Celanese: Based on an 4/11/02 email from Bob Ehrhart, TN has been significantly reduced since 1985 and thus no costs are applied.(Attachment 6, Appendix H) TP levels are also very low. Its direct discharge has been substantially reduced and thus it is no longer considered a significant source of nutrients by VADEQ.

Lees Commercial Carpet: Based on a 4/4/02 email from Bob Ehrhart which states that achieving reductions would only be achievable by jointly constructing a POTW w/ the Town of Glasgow the estimate would be approximately $2 million and would apply unilaterally (not incrementally) across the tiers. (Attachment 7, Appendix H) Thus, this cost is placed in Tier 2.

Merck in VA: No costs are assumed for TN as its concentration is already low. Costs are for TP reduction only. Based on a 3/22/02 email from Stephen Klevickis at Merck, costs to get to a TP of 1.0 would be zero because of source reduction. (Attachment 8, Appendix H) Costs to go to 0.5 mg/l TP would be about $800,000 to employ precipitation and filtration, also based on the same correspondence from Merck.

Phillip Morris: Based on a 4/29/02 email from Bob Ehrhart which states that achieving Tier 4 would be achievable by constructing a pump station and force main, the estimate would be approximately $12 million. (Attachment 9, Appendix H) Costs associated with Tier 2 & Tier 3 were provided by Mrs. Ethel Tatum by letter dated April 29, 2002. (Attachment 9A, Appendix H)

Proctor and Gamble in PA: Based on a 4/2/02 email from Drew Hadley at Proctor and Gamble (Attachment 10, Appendix H), this facility discontinued the pulp production in 1999 and permanently shut down the sulfite pulp process in May of that year. The wastewater treatment plant was also reconfigured at that time to a relatively low load aerated stabilization system. Ammonia Nitrogen discharge is now less than 2% of historical discharge levels. However, the 2000 TN concentration estimates provided by PADEP show a TN estimate of 17.58 mg/l TN. Apparently, as this is the same value since 1997, this is an estimate not based on actual data and may not reflect this facility s current discharge levels which are most likely something much less than that. However, without confirmation from Proctor and Gamble that the TOTAL Nitrogen is low, and not just the ammonia nitrogen, we proceeded with assuming POTW tiered concentrations, and used the POTW methodology to estimate costs.

Chicken George's (formerly, Rocco Farm Foods): This facility's NPDES permit requires a TN of 10 and TP of 2.0 be met. Costs are estimated to meet a TN of 10 mg/l for Tier 2 which is a part of a 2001-02 upgrade for this facility. Costs were estimated by Bob Ehrhart using costs from other similar facilities (Attachment 15, Appendix H).

Tysons Foods Glen Allen(4031): No costs are assumed in Tier 2 for this facility because its TN and TP concentrations are already low. TN of 6.0 is estimated based on the early 2000 performance of BNR recently implemented at that facility. (Attachment 1, Appendix H) However, a more accurate projection of TN for this facility for Tiers 2 and 3 would be 10 mg/l based on demonstrated performance of similar facilities, however, this was decided after completion of the database. Costs to achieve Tiers 3 and 4 are provided by Doug Baxter in a 4/25/02 email. (Attachment 1B, Appendix H)

Tysons Foods Temporanceville(4049): The Tier 2 concentration of 60 reflects the early 2000 performance of BNR that was recently implemented.(Attachment 1, Appendix H) Costs to achieve the Tier 3 & Tier 4 concentrations have been provided by Doug Baxter in an email and attachment dated: April 24, 2002. (Attachment 1A, Appendix H)

Wampler-Timberville: This facility is currently offline due to land application (Attachment 11, Appendix H). Thus the discharge is essentially zero and no costs are applied to any of the Tiers.

Hester: This facility has plans already for land application, thus no costs are applied to this facility for nutrient reduction. (Attachment 12, Appendix H)

Wampler-Longacre, WV: This facility has plans already for land application, thus no costs are applied to this facility for nutrient reduction. (Attachment 12, Appendix H)

DuPont: Nutrients are already low for the DuPont facilities and therefore no additional costs are estimated as confirmed in a telephone conversation with Bob Dunn of DuPont (Attachment 13, Appendix H). The Waynesboro facility has a new BNR facility currently operating.

BWXT: Costs are based on a 4/24/02 email from Bob Ehrhart which states that pumping the waste to the Lynchburg facility would cost approximately $5 million for Tier 4 (Attachment 14, Appendix H).

Smurfit Stone: Note that the concentration for Tier 2 should have been 5.26 mg/l TN instead of 8 mg/l to reflect its 2000 performance levels (or Tier 1). This was an inadvertent error.

5.2.3 Tier 4

Costs for Tier 4 are zero where reductions are already low or P2 is planned. For poultry facilities in general, it was agreed that a more reasonable effluent level for Tier 4 would be a TN concentration of 0.3 mg/l instead of 0.1 mg/l because this reflects best performance currently operating. However, the database does not reflect a concentration of 0.3, but rather 0.1 mg/l because of decision making after the completion of the database. However, costs are based on an effluent concentration of 0.3 mg/l instead of 0.1 mg/l. All other costs are based on the POTW methodology for getting to a TN of 3.0 mg/l and/or a TP of 0.1 mg/l except for individual assumptions for the following facilities:

Chemetals, Garden State Tanning, Osram, and Merck: No Tier 4 costs were estimated because no information was available on which to base a reasonable assumption.

Lees Commercial Carpet and Phillip Morris: See explanation under Tier 2-3 costs for these facilities for a description of Tier 3 cost assumptions.

Tysons Foods (4031): Costs to achieve Tier 4 have been provided by Doug Baxter in an email and attachment dated: 4/25/02 (Attachment 1A, Appendix H).

Table V-C: INDUSTRIAL FACILITY COSTING AND CONCENTRATION CODES BY TIER

			DESIGN	2000	1985		2010		TIER 1			TIER 2			TIER 3			TIER 4		
STAT	FACILITY	NPDES	FLOW (MGD)	FLOW (MGD)	TN (mg/l)	TP (mg/l)	TN (mg/l)	TP (mg/l)	COST	TN (mg/l)	TP (mg/l)	COST	TN (mg/l)	TP (mg/l)	COST	TN (mg/l)	TP (mg/l)	COST	TN (mg/l)	TP (mg/l)
DE	DUPONT-SEAFORD	DE0000035		37.83	2.03	0.12	2.03	0.12	0	2.03	0.12	0	HC	HC	0	HC	HC	0	2.03	0.10
MD	ALLEN FAMILY FOO	MD0067857	0.75	0.26	4.69	0.09	3.63	2.40	0	3.63	2.40	0	POTW	POTW	0	POTW	POTW	PN	3.00	0.10
MD	BETHLEHEM STEEL	MD0001201	23.18	88.25	24.15	0.35	6.25	0.30	0	6.25	0.30	0	R	R	0	R	R	0	3.00	0.10
MD	CHEMETALS	MD0001775		0.13	158.66	0.02	223.00	0.03	0	223.0	0.03	0	223	0.03	0	223	0.03	?	3.00	0.03
MD	CONGOLEUM	MD0001384		0.26	0.50	0.18	6.60	0.20	0	6.60	0.20	0	POTW	POTW	N	POTW	POTW	PN	3.00	0.10
MD	GARDEN STATE TAI	MD0053431		0.42	109.54	0.05	112.65	0.05	0	112.65	0.05	5	AC1	AC1	5	AC1	AC1	?	3.00	0.05
MD	MD & VA MILK PROD	MD0000469	0.325	0.36	4.05	27.25	16.19	12.92	0	16.19	12.92	PN	POTW	POTW	PN	POTW	POTW	PN	3.00	0.10
MD	NSWC-INDIAN HEAD	MD0003158		0.49	620.05	4.84	1.20	3.00	0	1.20	3.00	P	R	POTW	P	R	POTW	P	1.20	0.10
MD	UPPER POTOMAC R	MD0021687	21.5	20.21	3.58	0.84	1.29	0.79	0	1.29	0.79	0	R	POTW	P	R	POTW	P	1.29	0.10
MD	W R GRACE	MD0000311	4.066	4.06	460.17	0.30	25.10	0.15	0	47.99	0.15	0	R	R	0	R	R	N	3.00	0.10
MD	WESTVACO CORPO	MD0001422		2.18	1.92	0.09	1.92	0.09	0	1.92	0.09	0	HC	HC	0	HC	HC	0	1.92	0.09
PA	APPLETON PAPER S	PA0008265		4.32	0.37	0.16	4.17	1.16	0	4.17	1.16	0	POTW	POTW	P	POTW	POTW	PN	3.00	0.10
PA	CHLOE TEXTILES IN	PA0009172		0.27	0.76	3.88	8.18	0.81	0	8.18	0.81	0	POTW	POTW	PN	POTW	POTW	PN	3.00	0.10
PA	CONSOLIDATED RA	PA0009229		0.16	0.48	0.92	2.86	0.22	0	2.86	0.22	0	HC	POTW	0	HC	POTW	P	2.86	0.10
PA	EMPIRE KOSHER PO	PA0007552		1.17	3.32	1.00	8.46	0.40	0	8.46	0.40	0	POTW	POTW	N	POTW	POTW	P	3.00	0.10
PA	GOLD MILLS DYEHO	PA0008231		0.68	2.92	0.49	8.40	0.15	0	8.40	0.15	0	POTW	POTW	N	POTW	POTW	N	3.00	0.10
PA	HEINZ PET FOODS	PA0009270		0.52	4.58	2.78	41.73	11.80	0	41.73	11.80	N	AC2	AC2	N	AC2	AC2	PN	3.00	0.10
PA	MERCK & COMPANY	PA0008419		12.70	8.01		4.61	1.49	0	4.61	1.49	P	POTW	POTW	P	POTW	POTW	PN	3.00	0.10
PA	NATIONAL GYPSUM	PA0008591		0.31	3.74	3.20	2.93	1.28	0	2.93	1.28	0	R	POTW	P	R	POTW	P	2.93	0.10
PA	OSRAM SYLVANIA P	PA0009024		1.09	70.57	0.16	109.98	0.70	0	109.98	0.70	0	88	POTW	0	77	POTW	?	3.00	0.10
PA	P-H GLATFELTER C	PA0008869		12.45	0.37	0.16	11.07	0.07	0	11.07	0.07	N	POTW	R	N	POTW	R	N	3.00	0.07
PA	PENNSYLVANIA FIS	PA0040835	2.291	6.40	1.50	0.30	1.03	0.10	0	1.03	0.10	0	R	R	0	R	R	0	1.03	0.10
PA	PENNSYLVANIA FIS	PA0010553		6.00	1.50	0.57	6.52	0.15	0	6.52	0.15	0	POTW	POTW	N	POTW	POTW	N	3.00	0.10
PA	PENNSYLVANIA FIS	PA0010561		4.87	1.50	0.21	4.25	0.13	0	4.25	0.13	0	POTW	POTW	0	POTW	POTW	N	3.00	0.10
PA	PENNSYLVANIA FIS	PA0112127		13.00	1.40	0.11	0.10	0.03	0	0.10	0.03	0	R	R	0	R	R	0	0.10	0.03
PA	PENNSYLVANIA FIS	PA0044032		0.20	1.50	0.30	1.03	0.10	0	1.03	0.10	0	R	R	0	R	R	0	1.03	0.10
PA	POPE & TALBOT WI	PA0007919		1.65	18.00	6.00	6.86	1.02	0	6.86	1.02	0	POTW	POTW	PN	POTW	POTW	PN	3.00	0.10
PA	PROCTOR & GAMBL	PA0008885	11.5	4.88	24.64	1.50	17.58	2.44	0	17.58	2.44	PN	POTW	POTW	PN	POTW	POTW	PN	3.00	0.10
PA	TYSON FOODS	PA0035092		0.55	111.02	19.53	25.00	2.00	0	25.00	2.00	N	AC1	POTW	N	AC1	POTW	PN	3.00	0.10
PA	USFW-LAMAR NATI	PA0009857		4.40	0.37	0.09	0.25	0.03	0	0.25	0.03	0	R	R	0	R	R	0	0.25	0.03
VA	HONEYWELL	VA0005291	42	132.14	10.65	0.07	1.98	0.13	0	1.98	0.13	0	R	R	0	R	R	0	1.98	0.10
VA	AMOCO-YORKTOWN	VA0003018	56.4	60.77	36.24	0.51	0.90	0.12	0	0.90	0.12	0	R	R	0	R	R	0	0.90	0.10
VA	BROWN & WILLIAMS	VA0002780	1.998	0.82	12.19	3.36	8.27	1.76	0	8.27	1.76	P	POTW	POTW	PN	POTW	POTW	PN	3.00	0.10
VA	BWXT	VA0003697	2.9	0.48	854.40	0.48	76.50	1.06	0	76.50	1.06	0	R	POTW	P	R	POTW	5	3.00	0.10

Table V-C: INDUSTRIAL FACILITY COSTING AND CONCENTRATION CODES BY TIER

			DESIGN	2000	1985		2010		TIER 1			TIER 2			TIER 3			TIER 4		
STAT	FACILITY	NPDES	FLOW (MGD)	FLOW (MGD)	TN (mg/l)	TP (mg/l)	TN (mg/l)	TP (mg/l)	COST	TN (mg/l)	TP (mg/l)	COST	TN (mg/l)	TP (mg/l)	COST	TN (mg/l)	TP (mg/l)	COST	TN (mg/l)	TP (mg/l)
VA	DUPONT-SPRUANCI	VA0004669	81.1	23.33	2.15	0.26	2.83	0.11	0	2.83	0.11	0	HC	HC	0	HC	HC	0	2.83	0.10
VA	DUPONT-WAYNESB	VA0002160	0.5	2.97	22.74	4.33	3.21	0.14	0	3.21	0.14	0	HC	HC	0	HC	HC	0	3.00	0.10
VA	GEORGIA PACIFIC C	VA0003026	12	7.21	0.06	0.03	13.00	7.40	0	13.00	7.40	P	POTW	AC2	P	POTW	AC2	P	3.00	0.10
VA	LEES COMMERCIAL	VA0004677	2	0.80	11.28	17.52	33.09	38.79	0	33.09	38.79	2	AC2	AC2	0	AC2	AC2	0	3.00	0.10
VA	MERCK & COMPANY	VA0002178	1.2	10.09	11.93	3.17	3.13	2.61	0	3.13	2.61	0	POTW	POTW	0.8	POTW	POTW	?	3.00	0.10
VA	PHILLIP MORRIS-PA	VA0026557	2.9	1.92	34.66	13.77	33.93	1.27	0	33.93	1.27	3.5	AC1	R	8	AC1	R	12	3.00	0.10
VA	PILGRIMS PRIDE-HI	VA0002313		0.54	53.66	33.00	53.66	33.00	0	53.66	33.00	PN	AC1	AC1	PN	AC1	AC1	PN	3.00	0.10
VA	GEORGE'S CHICKEN	VA0077402	1.2	1.21	84.90	11.00	10.00	2.00	0	138.85	33.33	2.96	10	2	0	10	2	0.503	3.00	0.10
VA	SMURFIT STONE	VA0003115	36	18.45	14.08	5.80	8.00	1.50	0	5.26	1.23	0	POTW	POTW	P	POTW	POTW	PN	3.00	0.10
VA	TYSON FOODS, INC	VA0004031		0.95	73.76	0.08	6.00	0.30	0	7.37	0.27	0	6	POTW	0.15	6	POTW	0.38	3.00	0.10
VA	TYSON FOODS, INC	VA0004049	0.98	1.05	113.91	1.15	60.00	2.00	0	79.81	14.40	0	AC1	AC1	0.625	AC1	AC1	0.625	3.00	0.10
VA	WESTVACO CORPO	VA0003646	26.48	29.73	8.00	0.29	8.00	0.29	0	8.00	0.29	0	POTW	POTW	N	POTW	POTW	PN	3.00	0.10
WV	HESTER INDUSTRIE	WV0047236		0.53	3.87	1.09	12.60	0.94	0	12.60	0.94	0	0	0	0	0	0	0	3.00	0.10
WV	SPECRATECH INTE	WV0005533		0.32	27.13	0.14	29.66	3.00	0	29.66	3.00	N	AC1	POTW	N	AC1	POTW	N	3.00	0.10
WV	WAMPLER-LONGAC	WV0005495		1.54	62.41	0.88	52.91	9.79	0	52.91	9.79	0	0	0	0	0	0	0	3.00	0.10

Table V-D: Flow and Concentration Codes and Data For Industrial Facilities by Nutrient Parameter

			2010	TN Concentrations (mg/l)						TN Codes		TP Concentrations (mg/l)						TP Codes	
STA	FACILITY	NPDES	FLOW	85	2010	TIER 1	TIER 2	TIER 3	TIER 4	TIER 2	TIER 3	85	2010	TIER 1	TIER 2	TIER 3	TIER 4	TIER 2	TIER 3
DE	DUPONT-SEAFORD	DE0000035	37.83	2.03	2.03	2.03	2.03	2.03	2.03	HC	HC	0.12	0.12	0.12	0.12	0.12	0.10	HC	HC
MD	ALLEN FAMILY FOOD	MD0067857	0.26	4.69	3.63	3.63	3.63	3.63	3.00	POTW	POTW	0.09	2.40	2.40	2.00	2.00	0.10	2	2
MD	BETHLEHEM STEEL (	MD0001201	88.25	24.15	6.25	6.25	6.25	6.25	3.00	R	R	0.35	0.30	0.30	0.30	0.30	0.10	R	R
MD	CHEMETALS	MD0001775	0.13	158.66	223.00	223.00	223.00	223.00	3.00	223	223	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03
MD	CONGOLEUM	MD0001384	0.26	0.50	6.60	6.60	6.60	5.00	3.00	POTW	POTW	0.18	0.20	0.20	0.20	0.20	0.10	POTW	POTW
MD	GARDEN STATE TAN	MD0053431	0.42	109.54	112.65	112.65	54.77	21.91	3.00	AC1	AC1	0.05	0.05	0.05	0.05	0.01	0.01	R	R
MD	MD & VA MILK PRODU	MD0000469	0.36	4.05	16.19	16.19	8.00	5.00	3.00	POTW	POTW	27.25	12.92	12.92	1.00	0.50	0.10	POTW	POTW
MD	NSWC-INDIAN HEAD	MD0003158	0.49	620.05	1.20	1.20	1.20	1.20	1.20	R	R	4.84	3.00	3.00	1.00	0.50	0.10	POTW	POTW
MD	UPPER POTOMAC RI	MD0021687	20.21	3.58	1.29	1.29	1.29	1.29	1.29	R	R	0.84	0.79	0.79	0.79	0.50	0.10	POTW	POTW
MD	W R GRACE	MD0000311	4.06	460.17	25.10	25.10	25.10	25.10	3.00	25.1	25.1	0.30	0.15	0.15	0.15	0.15	0.10	R	R
MD	WESTVACO CORPOR	MD0001422	2.18	1.92	1.92	1.92	1.92	1.92	1.92	HC	HC	0.09	0.09	0.09	0.09	0.09	0.09	HC	HC
PA	APPLETON PAPER SI	PA0008265	4.32	0.37	4.17	4.17	4.17	4.17	3.00	POTW	POTW	0.16	1.16	1.16	1.00	0.50	0.10	POTW	POTW
PA	CHLOE TEXTILES INC	PA0009172	0.27	0.76	8.18	8.18	8.00	5.00	3.00	POTW	POTW	3.88	0.81	0.81	0.81	0.50	0.10	POTW	POTW
PA	CONSOLIDATED RAIL	PA0009229	0.16	0.48	2.86	2.86	2.86	2.86	2.86	HC	HC	0.92	0.22	0.22	0.22	0.22	0.10	POTW	POTW
PA	EMPIRE KOSHER PO	PA0007552	1.17	3.32	8.46	8.46	8.00	5.00	3.00	POTW	POTW	1.00	0.40	0.40	0.40	0.40	0.10	POTW	POTW
PA	GOLD MILLS DYEHOU	PA0008231	0.68	2.92	8.40	8.40	8.00	5.00	3.00	POTW	POTW	0.49	0.15	0.15	0.15	0.15	0.10	POTW	POTW
PA	HEINZ PET FOODS	PA0009270	0.52	4.58	41.73	41.73	4.58	4.58	3.00	AC2	AC2	2.78	11.80	11.80	2.78	2.36	0.10	AC2	AC2
PA	MERCK & COMPANY	PA0008419	12.70	8.01	4.61	4.61	4.61	4.61	3.00	POTW	POTW		1.49	1.49	1.00	0.50	0.10	POTW	POTW
PA	NATIONAL GYPSUM (	PA0008591	0.31	3.74	2.93	2.93	2.93	2.93	2.93	R	R	3.20	1.28	1.28	1.00	0.50	0.10	POTW	POTW
PA	OSRAM SYLVANIA PF	PA0009024	1.09	70.57	109.98	109.98	88.00	77.00	3.00	88	77	0.16	0.70	0.70	0.70	0.50	0.10	POTW	POTW
PA	P-H GLATFELTER CO	PA0008869	12.45	0.37	11.07	11.07	8.00	5.00	3.00	POTW	POTW	0.16	0.07	0.07	0.07	0.07	0.07	R	R
PA	PENNSYLVANIA FISH	PA0040835	6.40	1.50	1.03	1.03	1.03	1.03	1.03	R	R	0.30	0.10	0.10	0.10	0.10	0.10	R	R
PA	PENNSYLVANIA FISH	PA0010553	6.00	1.50	6.52	6.52	6.52	5.00	3.00	POTW	POTW	0.57	0.15	0.15	0.15	0.15	0.10	POTW	POTW
PA	PENNSYLVANIA FISH	PA0010561	4.87	1.50	4.25	4.25	4.25	4.25	3.00	POTW	POTW	0.21	0.13	0.13	0.13	0.13	0.10	POTW	POTW
PA	PENNSYLVANIA FISH	PA0112127	13.00	1.40	0.10	0.10	0.10	0.10	0.10	R	R	0.11	0.03	0.03	0.03	0.03	0.03	R	R
PA	PENNSYLVANIA FISH	PA0044032	0.20	1.50	1.03	1.03	1.03	1.03	1.03	R	R	0.30	0.10	0.10	0.10	0.10	0.10	R	R
PA	POPE & TALBOT WIS	PA0007919	1.65	18.00	6.86	6.86	6.86	5.00	3.00	POTW	POTW	6.00	1.02	1.02	1.00	0.50	0.10	POTW	POTW
PA	PROCTOR & GAMBLE	PA0008885	4.88	24.64	17.58	17.58	8.00	5.00	3.00	POTW	POTW	1.50	2.44	2.44	1.00	0.50	0.10	POTW	POTW
PA	TYSON FOODS	PA0035092	0.55	111.02	25.00	25.00	25.00	22.20	3.00	25	AC1	19.53	2.00	2.00	2.00	2.00	0.10	2	2
PA	USFW-LAMAR NATIO	PA0009857	4.40	0.37	0.25	0.25	0.25	0.25	0.25	R	R	0.09	0.03	0.03	0.03	0.03	0.03	R	R
VA	HONEYWELL	VA0005291	132.14	10.65	1.98	1.98	1.98	1.98	1.98	R	R	0.07	0.13	0.13	0.13	0.13	0.10	R	R
VA	AMOCO-YORKTOWN	VA0003018	60.77	36.24	0.90	0.90	0.90	0.90	0.90	R	R	0.51	0.12	0.12	0.12	0.12	0.10	R	R
VA	BROWN & WILLIAMS(	VA0002780	0.82	12.19	8.27	8.27	8.00	5.00	3.00	POTW	POTW	3.36	1.76	1.76	1.00	0.50	0.10	POTW	POTW
VA	BWXT	VA0003697	0.48	854.40	76.50	76.50	76.50	76.50	3.00	R	R	0.48	1.06	1.06	1.00	0.50	0.10	POTW	POTW

Table V-D: Flow and Concentration Codes and Data For Industrial Facilities by Nutrient Parameter

			2010	TN Concentrations (mg/l)						TN Codes		TP Concentrations (mg/l)						TP Codes	
STA	FACILITY	NPDES	FLOW	85	2010	TIER 1	TIER 2	TIER 3	TIER 4	TIER 2	TIER 3	85	2010	TIER 1	TIER 2	TIER 3	TIER 4	TIER 2	TIER 3
VA	DUPONT-SPRUANCE	VA0004669	23.33	2.15	2.83	2.83	2.83	2.83	2.83	HC	HC	0.26	0.11	0.11	0.11	0.11	0.10	HC	HC
VA	DUPONT-WAYNESBC	VA0002160	2.97	22.74	3.21	3.21	3.21	3.21	3.00	HC	HC	4.33	0.14	0.14	0.14	0.14	0.10	HC	HC
VA	GEORGIA PACIFIC C(	VA0003026	7.21	2.43	13.00	13.00	2.43	2.43	2.43	2.43	2.43	4.95	7.40	7.40	4.95	0.50	0.10	4.95	0.5
VA	LEES COMMERCIAL (	VA0004677	0.80	11.28	33.09	33.09	11.28	6.62	3.00	AC2	AC2	17.52	38.79	38.79	17.52	7.76	0.10	AC2	AC2
VA	MERCK & COMPANY	VA0002178	10.09	11.93	3.13	3.13	3.13	3.13	3.00	POTW	POTW	3.17	2.61	2.61	1.00	0.50	0.10	POTW	POTW
VA	PHILLIP MORRIS-PAF	VA0026557	1.92	34.66	33.93	33.93	17.33	6.93	3.00	AC1	AC1	13.77	1.27	1.27	1.27	1.27	0.10	R	R
VA	PILGRIMS PRIDE-HIN	VA0002313	0.54	53.66	53.66	53.66	26.83	10.73	3.00	AC1	AC1	33.00	33.00	33.00	2.00	2.00	0.10	2	2
VA	GEORGE'S CHICKEN	VA0077402	1.21	84.90	10.00	10.00	10.00	10.00	3.00	10	10	11.00	2.00	33.33	2.00	2.00	0.10	2	2
VA	SMURFIT STONE	VA0003115	18.45	14.08	8.00	5.26	8.00	5.00	3.00	POTW	POTW	5.80	1.50	1.23	1.00	0.50	0.10	POTW	POTW
VA	TYSON FOODS, INC.	VA0004031	0.95	73.76	6.00	6.00	6.00	6.00	3.00	6	6	0.08	0.30	0.27	0.30	0.30	0.10	0.3	0.3
VA	TYSON FOODS, INC.-	VA0004049	1.05	113.91	60.00	60.00	56.96	22.78	3.00	AC1	AC1	1.15	2.00	14.40	2.00	2.00	0.10	2	2
VA	WESTVACO CORPOF	VA0003646	29.73	8.00	8.00	8.00	8.00	5.00	3.00	POTW	POTW	0.29	0.29	0.29	0.29	0.29	0.10	POTW	POTW
WV	HESTER INDUSTRIES	WV0047236	0.00	3.87	12.60	12.60	0.00	0.00	0.00	0	0	1.09	0.94	0.94	0.00	0.00	0.00	0	0
WV	SPECRATECH INTER	WV0005533	0.32	27.13	29.66	29.66	13.57	5.43	3.00	AC1	AC1	0.14	3.00	3.00	1.00	0.50	0.10	POTW	POTW
WV	WAMPLER-LONGACR	WV0005495	0.00	62.41	52.91	52.91	0.00	0.00	0.00	0	0	0.88	9.79	9.79	0.00	0.00	0.00	0	0

Table V-E: INDUSTRIAL FACILITY INCREMENTAL COST DATA FOR ALL FOUR TIERS

			TIER 1	TIER 2				TIER 3				TIER 4			
STAT	FACILITY	NPDES	ALL COST	TN CC	TN O&M	TP CC	TP O&M	TN CC	TN O&M	TP CC	TP O&M	TN CC	TN O&M	TP CC	TP O&M
DE	DUPONT-SEAFOR	DE0000035	0	0	0	0	0	0	0	0	0	0	0	0	0
MD	ALLEN FAMILY FO	MD0067857	0	0	0	0	0	0	0	0	0	476,717	31,083	629,731	90,259
MD	BETHLEHEM STE	MD0001201	0	0	0	0	0	0	0	0	0	0	0	0	0
MD	CHEMETALS	MD0001775	0	0	0	0	0	0	0	0	0				
MD	CONGOLEUM	MD0001384	0	0	0	0	0	398,764	11,061	0	0	485,063	31,493	639,005	91,755
MD	GARDEN STATE T	MD0053431	0	5,000,000	400,000			5,000,000	400,000						
MD	MD & VA MILK PR	MD0000469	0	7,251,672	144,428	99,238	37,120	489,332	13,368	0	1,927	584,494	36,377	740,859	108,221
MD	NSWC-INDIAN HE	MD0003158	0	0	0	111,434	10,261	0	0	0	2,625	0	0	862,547	127,944
MD	UPPER POTOMAC	MD0021687	0	0	0	0	0	0	0	0	109,197	0	0	12,884,637	2,132,534
MD	W R GRACE	MD0000311	0	0	0	0	0	0	0	0	0	4,149,406	152,410	0	0
MD	WESTVACO CORF	MD0001422	0	0	0	0	0	0	0	0	0	0	0	0	0
PA	APPLETON PAPEF	PA0008265	0	0	0	0	0	0	0	0	23,341	4,370,145	159,180	3,981,196	592,703
PA	CHLOE TEXTILES	PA0009172	0	0	0	0	0	406,239	11,251	0	908	493,269	31,896	647,998	93,207
PA	CONSOLIDATED F	PA0009229	0	0	0	0	0	0	0	0	0	0	0	504,840	70,177
PA	EMPIRE KOSHER	PA0007552	0	0	0	0	0	1,315,629	33,331	0	0	0	0	1,550,422	216,966
PA	GOLD MILLS DYE	PA0008231	0	0	0	0	0	805,777	21,430	0	0	931,908	53,440	0	0
PA	HEINZ PET FOOD	PA0009270	0	4,037,698	78,106	128,833	48,885	646,001	17,359	0	2,802	756,495	44,825	891,024	132,565
PA	MERCK & COMPA	PA0008419	0	0	0	337,450	58,179	0	0	0	68,602	11,628,038	381,760	8,359,599	1,370,929
PA	NATIONAL GYPSU	PA0008591	0	0	0	0	718	0	0	0	1,675	0	0	691,947	100,307
PA	OSRAM SYLVANIA	PA0009024	0	0	0	0	0	0	0	0	5,863				
PA	P-H GLATFELTER	PA0008869	0	4,905,080	86,637	0	0	5,671,393	169,385	0	0	11,416,648	375,278	0	0
PA	PENNSYLVANIA F	PA0040835	0	0	0	0	0	0	0	0	0	0	0	0	0
PA	PENNSYLVANIA F	PA0010553	0	0	0	0	0	3,180,697	102,575	0	0	5,825,697	203,818	0	0
PA	PENNSYLVANIA F	PA0010561	0	0	0	0	0	0	0	0	0	4,850,722	173,918	0	0
PA	PENNSYLVANIA F	PA0112127	0	0	0	0	0	0	0	0	0	0	0	0	0
PA	PENNSYLVANIA F	PA0044032	0	0	0	0	0	0	0	0	0	0	0	0	0
PA	POPE & TALBOT V	PA0007919	0	0	0	0	0	1,502,717	42,306	0	8,929	2,059,077	88,305	1,984,452	283,283
PA	PROCTOR & GAM	PA0008885	0	4,355,014	77,780	319,306	64,532	2,750,183	89,061	0	26,392	4,859,307	174,181	4,356,183	651,359
PA	TYSON FOODS	PA0035092	0	4,039,977	79,131	0	0	676,323	18,132	0	0	789,785	46,460	917,419	136,849
PA	USFW-LAMAR NA	PA0009857	0	0	0	0	0	0	0	0	0	0	0	0	0
VA	HONEYWELL	VA0005291	0	0	0	0	0	0	0	0	0	0	0	0	0
VA	AMOCO-YORKTO	VA0003018	0	0	0	0	0	0	0	0	0	0	0	0	0
VA	BROWN & WILLIA	VA0002780	0	0	0	0	5,173	942,156	24,904	0	4,457	1,081,634	60,794	1,124,462	170,457
VA	BWXT	VA0003697	0	0	0	0	0	0	0	0	2,588	0	0	5,000,000	126,955

Table V-E: INDUSTRIAL FACILITY INCREMENTAL COST DATA FOR ALL FOUR TIERS

			TIER 1	TIER 2				TIER 3				TIER 4			
STAT	FACILITY	NPDES	ALL COST	TN CC	TN O&M	TP CC	TP O&M	TN CC	TN O&M	TP CC	TP O&M	TN CC	TN O&M	TP CC	TP O&M
VA	DUPONT-SPRUAN	VA0004669	0	0	0	0	0	0	0	0	0	0	0	0	0
VA	DUPONT-WAYNES	VA0002160	0	0	0	0	0	0	0	0	0	0	0	0	0
VA	GEORGIA PACIFIC	VA0003026	0	0	0	254,176	386,421	0	0	0	38,944	0	0	5,799,883	878,300
VA	LEES COMMERCIA	VA0004677	0	2,000,000											
VA	MERCK & COMPA	VA0002178	0	0	0	0	0	0	0	800,000	54,503				
VA	PHILLIP MORRIS-I	VA0026557	0	3,500,000	1,300,000			8,000,000	1,900,000			12,000,000	1,000,000		
VA	PILGRIMS PRIDE-	VA0002313	0	5,326,149	102,538	116,540	145,144	666,489	17,881	0	2,917	778,988	45,930	908,936	135,472
VA	GEORGE'S CHICK	VA0077402	0	2,960,000	0	888,000	0	0	0	0	0	503,000	40,000	500,000	100,000
VA	SMURFIT STONE	VA0003115	0	0	0		35,786	0	0	0	99,677	16,611,208	534,581	11,833,882	1,955,433
VA	TYSON FOODS, IN	VA0004031	0			0	0	150,000	1,200	0	0	380,000	1,200	0	0
VA	TYSON FOODS, IN	VA0004049	0	0	0	6,500	150,000	625,000	45,625	0	0	625,000	40,000	625,000	75,000
VA	WESTVACO CORP	VA0003646	0	0	0	0	0	12,340,085	307,945	0	0	26,386,091	834,352	18,480,816	3,077,696
WV	HESTER INDUSTR	WV0047236	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	SPECRATECH INT	WV0005533	0	5,190,884	102,636	95,395	4,520	449,977	12,366	0	1,707	541,288	34,255	0	0
WV	WAMPLER-LONGA	WV0005495	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total			48,566,474	2,371,256	2,356,873	946,739	46,016,759	3,239,180	800,000	457,056	112,583,979	4,575,535	83,914,838	12,718,371

Notes: Costs are in dollar

Table V-F: INDUSTRIAL FACILITY TOTAL INCREMENTAL CAPITAL COST AND CONCENTRATION DATA FOR ALL FOUR TIERS

			DESIGN	2000	1985		2010		TIER 1			TIER 2			TIER 3			TIER 4		
STATE	FACILITY	NPDES	FLOW (mgd)	FLOW (mgd)	TN (mg/l)	TP (mg/l)	TN (mg/l)	TP (mg/l)	TOTAL CC ($mil)	TN (mg/l)	TP (mg/l)	TOTAL CC ($mil)	TN (mg/l)	TP (mg/l)	CC ($mil)	TN (mg/l)	TP (mg/l)	TOTAL CC ($mil)	TN (mg/l)	TP (mg/l)
DE	DUPONT-SEAFORD	DE0000035		37.83	2.03	0.12	2.03	0.12	0	2.03	0.12	0	2.03	0.12	0	2.03	0.12	0	2.03	0.10
DE Total				**37.83**					**0**			**0**			**0**			**0**		
MD	ALLEN FAMILY FOO	MD0067857	0.75	0.26	4.69	0.09	3.63	2.40	0	3.63	2.40	0	3.63	2.00	0	3.63	2.00	1.11	3.00	0.10
MD	BETHLEHEM STEEL	MD0001201	23.18	88.25	24.15	0.35	6.25	0.30	0	6.25	0.30	0	6.25	0.30	0	6.25	0.30	0	3.00	0.10
MD	CHEMETALS	MD0001775		0.13	158.66	0.02	223.00	0.03	0	223.0	0.03	0	223.00	0.03	0	223.00	0.03	0	3.00	0.03
MD	CONGOLEUM	MD0001384		0.26	0.50	0.18	6.60	0.20	0	6.60	0.20	0	6.60	0.20	0.40	5.00	0.20	1.12	3.00	0.10
MD	GARDEN STATE TAN	MD0053431		0.42	109.54	0.05	112.65	0.05	0	112.65	0.05	5	54.77	0.05	5	21.91	0.01	?	3.00	0.05
MD	MD & VA MILK PROD	MD0000469	0.325	0.36	4.05	27.25	16.19	12.92	0	16.19	12.92	7.35	8.00	1.00	0.49	5.00	0.50	1.33	3.00	0.10
MD	NSWC-INDIAN HEAD	MD0003158		0.49	620.05	4.84	1.20	3.00	0	1.20	3.00	0.11	1.20	1.00	0	1.20	0.50	0.86	1.20	0.10
MD	UPPER POTOMAC R	MD0021687	21.5	20.21	3.58	0.84	1.29	0.79	0	1.29	0.79	0	1.29	0.79	0	1.29	0.50	12.88	1.29	0.10
MD	W R GRACE	MD0000311	4.066	4.06	460.17	0.30	25.10	0.15	0	47.99	0.15	0	25.10	0.15	0	25.10	0.15	4.15	3.00	0.10
MD	WESTVACO CORPO	MD0001422		2.18	1.92	0.09	1.92	0.09	0	1.92	0.09	0	1.92	0.09	0	1.92	0.09	0.00	1.92	0.09
MD Total				**116.61**					**0**			**12.46234**			**5.8881**			**21.45**		
PA	APPLETON PAPER S	PA0008265		4.32	0.37	0.16	4.17	1.16	0	4.17	1.16	0	4.17	1.00	0	4.17	0.50	8.35	3.00	0.10
PA	CHLOE TEXTILES IN	PA0009172		0.27	0.76	3.88	8.18	0.81	0	8.18	0.81	0	8.00	0.81	0.41	5.00	0.50	1.14	3.00	0.10
PA	CONSOLIDATED RA	PA0009229		0.16	0.48	0.92	2.86	0.22	0	2.86	0.22	0	2.86	0.22	0.00	2.86	0.22	0.50	2.86	0.10
PA	EMPIRE KOSHER PO	PA0007552		1.17	3.32	1.00	8.46	0.40	0	8.46	0.40	0	8.00	0.40	1.32	5.00	0.40	1.55	3.00	0.10
PA	GOLD MILLS DYEHO	PA0008231		0.68	2.92	0.49	8.40	0.15	0	8.40	0.15	0	8.00	0.15	0.81	5.00	0.15	0.93	3.00	0.10
PA	HEINZ PET FOODS	PA0009270		0.52	4.58	2.78	41.73	11.80	0	41.73	11.80	4.17	4.58	2.78	0.65	4.58	2.36	1.65	3.00	0.10
PA	MERCK & COMPANY	PA0008419		12.70	8.01		4.61	1.49	0	4.61	1.49	0.34	4.61	1.00	0	4.61	0.50	19.99	3.00	0.10
PA	NATIONAL GYPSUM	PA0008591		0.31	3.74	3.20	2.93	1.28	0	2.93	1.28	0	2.93	1.00	0	2.93	0.50	0.69	2.93	0.10
PA	OSRAM SYLVANIA P	PA0009024		1.09	70.57	0.16	109.98	0.70	0	109.98	0.70	0	88.00	0.70	0	77.00	0.50	?	3.00	0.10
PA	P-H GLATFELTER C	PA0008869		12.45	0.37	0.16	11.07	0.07	0	11.07	0.07	4.91	8.00	0.07	5.67	5.00	0.07	11.42	3.00	0.07
PA	PENNSYLVANIA FIS	PA0040835	2.291	6.40	1.50	0.30	1.03	0.10	0	1.03	0.10	0	1.03	0.10	0	1.03	0.10	0	1.03	0.10
PA	PENNSYLVANIA FIS	PA0010553		6.00	1.50	0.57	6.52	0.15	0	6.52	0.15	0	6.52	0.15	3.1807	5.00	0.15	5.83	3.00	0.10
PA	PENNSYLVANIA FIS	PA0010561		4.87	1.50	0.21	4.25	0.13	0	4.25	0.13	0	4.25	0.13	0	4.25	0.13	4.85	3.00	0.10
PA	PENNSYLVANIA FIS	PA0112127		13.00	1.40	0.11	0.10	0.03	0	0.10	0.03	0	0.10	0.03	0	0.10	0.03	0	0.10	0.03
PA	PENNSYLVANIA FIS	PA0044032		0.20	1.50	0.30	1.03	0.10	0	1.03	0.10	0	1.03	0.10	0	1.03	0.10	0	1.03	0.10
PA	POPE & TALBOT WI	PA0007919		1.65	18.00	6.00	6.86	1.02	0	6.86	1.02	0	6.86	1.00	1.50	5.00	0.50	4.04	3.00	0.10
PA	PROCTOR & GAMBL	PA0008885	11.5	4.88	24.64	1.50	17.58	2.44	0	17.58	2.44	4.67	8.00	1.00	2.75	5.00	0.50	9.22	3.00	0.10
PA	TYSON FOODS	PA0035092		0.55	111.02	19.53	25.00	2.00	0	25.00	2.00	4.04	25.00	2.00	0.68	22.20	2.00	1.71	3.00	0.10
PA	USFW-LAMAR NATI	PA0009857		4.40	0.37	0.09	0.25	0.03	0	0.25	0.03	0	0.25	0.03	0	0.25	0.03	0	0.25	0.03
PA Total				**75.62**					**0**			**18.12336**			**16.955**			**71.86617**		
VA	HONEYWELL	VA0005291	42	132.14	10.65	0.07	1.98	0.13	0	1.98	0.13	0	1.98	0.13	0	1.98	0.13	0	1.98	0.10
VA	AMOCO-YORKTOWN	VA0003018	56.4	60.77	36.24	0.51	0.90	0.12	0	0.90	0.12	0	0.90	0.12	0	0.90	0.12	0	0.90	0.10

Table V-F: INDUSTRIAL FACILITY TOTAL INCREMENTAL CAPITAL COST AND CONCENTRATION DATA FOR ALL FOUR TIERS

			DESIGN	2000	1985		2010		TIER 1			TIER 2			TIER 3			TIER 4		
STATE	FACILITY	NPDES	FLOW (mgd)	FLOW (mgd)	TN (mg/l)	TP (mg/l)	TN (mg/l)	TP (mg/l)	TOTAL CC ($mil)	TN (mg/l)	TP (mg/l)	TOTAL CC ($mil)	TN (mg/l)	TP (mg/l)	CC ($mil)	TN (mg/l)	TP (mg/l)	TOTAL CC ($mil)	TN (mg/l)	TP (mg/l)
VA	BROWN & WILLIAMS	VA0002780	1.998	0.82	12.19	3.36	8.27	1.76	0	8.27	1.76	0	8.00	1.00	0.94	5.00	0.50	2.21	3.00	0.10
VA	BWXT	VA0003697	2.9	0.48	854.40	0.48	76.50	1.06	0	76.50	1.06	0	76.50	1.00	0	76.50	0.50	5	3.00	0.10
VA	DUPONT-SPRUANCI	VA0004669	81.1	23.33	2.15	0.26	2.83	0.11	0	2.83	0.11	0	2.83	0.11	0	2.83	0.11	0	2.83	0.10
VA	DUPONT-WAYNESB	VA0002160	0.5	2.97	22.74	4.33	3.21	0.14	0	3.21	0.14	0	3.21	0.14	0	3.21	0.14	0	3.00	0.10
VA	GEORGIA PACIFIC C	VA0003026	12	7.21	0.06	0.03	13.00	7.40	0	13.00	7.40	0.25	2.43	4.95	0	2.43	0.50	5.80	3.00	0.10
VA	LEES COMMERCIAL	VA0004677	2	0.80	11.28	17.52	33.09	38.79	0	33.09	38.79	2	11.28	17.52	0	6.62	7.76	0	3.00	0.10
VA	MERCK & COMPANY	VA0002178	1.2	10.09	11.93	3.17	3.13	2.61	0	3.13	2.61	0	3.13	1.00	0.8	3.13	0.50	?	3.00	0.10
VA	PHILLIP MORRIS-PA	VA0026557	2.9	1.92	34.66	13.77	33.93	1.27	0	33.93	1.27	3.5	17.33	1.27	8	6.93	1.27	12	3.00	0.10
VA	PILGRIMS PRIDE-HI	VA0002313		0.54	53.66	33.00	53.66	33.00	0	53.66	33.00	5.44	26.83	2.00	0.67	10.73	2.00	1.69	3.00	0.10
VA	GEORGE'S CHICKEN	VA0077402	1.2	1.21	84.90	11.00	10.00	2.00	0	138.85	33.33	3.85	10.00	2.00	0	10.00	2.00	1.00	3.00	0.10
VA	SMURFIT STONE	VA0003115	36	18.45	14.08	5.80	8.00	1.50	0	5.26	1.23	0	8.00	1.00	0	5.00	0.50	28.45	3.00	0.10
VA	TYSON FOODS, INC	VA0004031		0.95	73.76	0.08	6.00	0.30	0	7.37	0.27	0	6.00	0.30	0.15	6.00	0.30	0.38	3.00	0.10
VA	TYSON FOODS, INC	VA0004049	0.98	1.05	113.91	1.15	60.00	2.00	0	79.81	14.40	0.0065	56.96	2.00	0.625	22.78	2.00	1.25	3.00	0.10
VA	WESTVACO CORPO	VA0003646	26.48	29.73	8.00	0.29	8.00	0.29	0	8.00	0.29	0	8.00	0.29	12.3401	5.00	0.29	44.87	3.00	0.10
VA Total				**292.44**					**0**			**15.05136**			**23.5237**			**102.64**		
WV	HESTER INDUSTRIE	WV0047236		0.53	3.87	1.09	12.60	0.94	0	12.60	0.94	0	0.00	0.00	0	0.00	0.00	0.00	3.00	0.10
WV	SPECRATECH INTEI	WV0005533		0.32	27.13	0.14	29.66	3.00	0	29.66	3.00	5.29	13.57	1.00	0.44998	5.43	0.50	0.54	3.00	0.10
WV	WAMPLER-LONGAC	WV0005495		1.54	62.41	0.88	52.91	9.79	0	52.91	9.79	0	0.00	0.00	0	0.00	0.00	0.00	3.00	0.10
WV Total				**2.38**					**0**			**5.286279**			**0.44998**			**0.54**		
Grand Total				**524.88**					**0**			**50.92335**			**46.8168**			**196.50**		

Note: Total CC = Total Capital Cost = (TN Capital Cost + TP Capital Cost)

VI. COST METHODOLOGY FOR NON-SIGNIFICANT FACILITIES

A total of 185 non-significant municipal plants are included in this analysis. 183 of these 185 plants are registered with MDE, and one of them is a VA facility that discharges into Maryland waters. MDE provided the loading and flow information for these facilities. The other two facilities are WV non-significant plants selected into the database by CBPO. No other jurisdictions have provided non-significant facilities information before the progress 2000 model run. VADEQ has provided some non-significant plant information after the progress 2000 run, and these data have not been processed and loaded into the database at the time of this writing. Therefore, this analysis only covers the non-significant municipal facilities existing in the database with the progress 2000 data.

Among the four Tiers, there is no action on non-significant plants for Tier 1-3. For Tier 4, non-significant municipal facilities are expected to reduce their TN concentrations to 8 mg/l and TP to 2 mg/l.

The NRT cost estimates for non-significant facilities were developed from the following assumption and four different methodologies.

6.1 Assumption:

Since the Tier 4 scenario for non-significant facilities provides that TN = 8 mg/l and TP = 2 mg/l, it is assumed that there are no TN or TP costs where the plant has TN concentration < 8 mg/l or TP < 2 mg/l respectively.

6.2 Methodologies:

6.2.1 TN capital cost estimates for TN at 8 mg/l for facilities with design flow less than 0.5 MGD. This methodology was developed based on the data from 9 VA and 2 MD small plants.

6.2.2 TN capital cost estimates for TN at 8 mg/l for facilities with design flow greater than 0.5 MGD. The TN capital cost for Tier 2 methodology developed by Stearns & Wheler, LLC and CH2M Hill was used to calculate these costs.

6.2.3 TN O&M estimates for TN at 8 mg/l for all non-significant facilities. The Operating and Maintenance Costs (O&M) were assumed to equal 7% of the annualized capital cost assuming a 5.4% amortization factor (based on EPA's 1992 Office of Management and Budget Guidelines) was used.

6.2.4 TP capital cost and O&M estimates for TP at 2mg/l for all non-significant facilities. The spreadsheet application for Tier 2 TP capital cost and O&M estimates developed by Stearns & Wheler, LLC was used with the adjustment of TP goal.

6.3 TN capital cost estimates for TN at 8 mg/l for facilities with design flow < 0.5 MGD

The NRT TN@8 cost curve for non-significant facilities with design flow less than 0.5 MGD was developed based on the cost data from 9 VA and 2 MD small facilities. The selection of these source data was recommended by VADEQ and MDE. The cost and design flow data of the 9 VA non-significant facilities were provided by VADEQ. The MD data were selected from the MDE BNR cost report. There are four MD facilities <0.5 MGD having cost data. But only two of them were selected to put on the cost curve, because another two plants- Pittsville and Centreville have relatively high costs that are far out of the range of the selected data group for the curve. The design flows of the selected facilities range from 0.065 MGD to 0.568 MGD. The following Table VI-A lists all of these facilities, their design flows and NRT capital costs for TN =8 mg/l.

Table VI-A. Source Data For The Cost Curve

STATE	Facilities	Design Flow (mgd)	TN CC@8
VA	Surry County	0.065	405,672
VA	Powhatan	0.1	481,571
VA	Montross	0.13	432,496
VA	Appomattox	0.3	1,353,285
VA	Louisa	0.4	694,988
VA	Shenandoah	0.4	756,339
VA	Crewe	0.5	1,048,720
VA	Kilmarnock	0.5	1,714,566
VA	Parham Landing	0.568	1,988,294
MD	Indian Head	0.5	656,000
MD	Snow Hill	0.5	1,600,000

Based on these source data, several curves were generated and evaluated. The following curve has the highest R value and was selected as the cost curve for TN capital cost curve for non-significant municipal facilities.

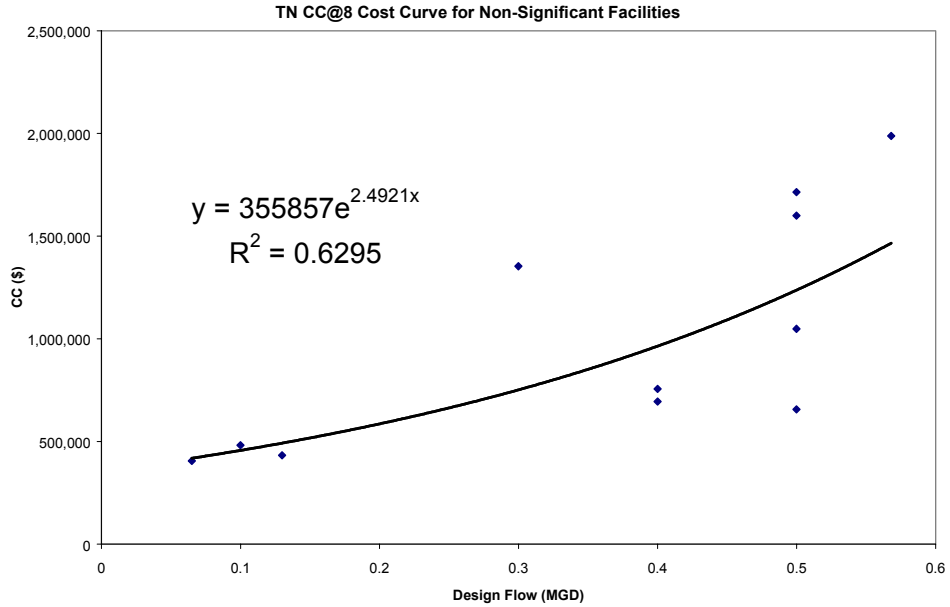


Figure VI - A. TN Capital Cost Curve at 8 mg/l for Non-significant Facilities

The equation of this cost curve is

$$Y = 355857e^{2.4921X}$$

Where Y= Capital Cost in Dollar
X= Design Flow in MGD (or 2010 Flow if Design Flow is less than 2010 Flow)

There are 21 non-significant facilities with projected 2010 flow greater than current design flow. Because we do not have updated design flow information for non-significant facilities, we assumed that the design flow will equal to the projected 2010 flow where 2010 flow is greater than design flow. In such cases, the 2010 flow was used to calculate the cost for both TN and TP costs. Following table lists the 21 plants.

Table VI-B: Non-significant Facilities with Design Flow < 2010 Flow

FACILITY	NPDES	DESIGN_FLOW (MGD)	2010 FLOW (MGD)
BOWLEYS QUARTERS	MD0058807	0.004	0.0067
CHESAPEAKE CITY NORTH	MD0020401	0.075	0.0955
CHESAPEAKE COLLEGE	MD0024384	0.015	0.0157
CRESTVIEW	MD0022683	0.036	0.0384
FLINTSTONE	MD0055620	0.045	0.0587
FOUNTAINDALE	MD0022721	0.2	0.2528
FOXVILLE US NAVAL SUPPORT	MD0025119	0.018	0.0291
HEBRON	MD0059617	0.105	0.1314
I-70 REST AREA	MD0023680	0.028	0.0342
JEFFERSON	MD0020737	0.15	0.1754
KEMPTOWN SCHOOL	MD0056481	0.005	0.0054
MIDDLETOWN	MD0024406	0.25	0.2617
NOTCHCLIFF	MD0022951	0.02	0.0380
PARKWAY INN	MD0052329	0.02	0.0243
PORT DEPOSIT	MD0020796	0.15	0.1503
RAWLINGS HEIGHTS	MD0023213	0.08	0.0956
SOUTHERN CORRECTIONAL CAMP	MD0023914	0.02	0.0349
TAWES VOCATIONAL-TECHNICAL	MD0022993	0.01	0.1728
TRAPPE	MD0020486	0.115	0.1360
TRI-TOWN PLAZA	MD0024937	0.01	0.0135
WILLARDS	MD0051632	0.08	0.0820

6.4 TN capital cost estimates for TN at 8 mg/l for facilities with design flow > 0.5 MGD

The workgroup decided that the TN capital costs for non-significant plants with design flow greater than 0.5 MGD were to be calculated by the Tier 2 TN capital cost methodology developed by Stearns & Wheler, LLC and CH2M Hill. This methodology is described in a document provided Stearns & Wheler, LLC and CH2M Hill.

The equation of this methodology is

$$Y = 2023829 + 704350.8039X - 5986.733X^2$$

Where, Y= TN Capital Cost in dollar
X = Design Flow in MGD

6.5 TN O&M estimates for TN at 8 mg/l for all non-significant facilities

The Operating and Maintenance Costs (O&M) were assumed to equal 7% of the annualized capital cost assuming a 5.4% amortization was used. This assumption is based on EPA Office of Management and Budget, "Memorandum for Heads of Executive Departments and Establishments: Guidelines and Discount Rates for Benefit-Cost Analyses of Federal Programs", Appendix C, Oct. 29, 1992. A discount factor of 0.0830 was chosen for this analysis assuming 5.4% not taking inflation into account.

The equation for TN O&M cost for non-significant plants:

TN O&M Cost = 7% x Annualized Capital Cost

Annualized Capital Cost = 0.083 x Capital Cost

Where, Amortization factor = 0.0830 (@ 5.4% over 20 years)

6.6 TP capital cost and O&M estimates for TP at 2mg/l for all non-significant facilities

The spreadsheet application for Tier 2 TP capital cost and O&M estimates developed by Stearns & Wheler, LLC was used with the adjustment of TP goal. In the original spreadsheet application for Tier 2 TP cost, TP goal was set to 1 mg/l for significant facilities. The scenario for non-significant plants requires TP= 2mg/l. Therefore, the TP goad was set to 2 mg/l for non-significant plant O&M calculation in the spreadsheet application. Other factors such as design flow, 2000 flow, 2010 flow and 2000 TP concentration, were inserted into the different application sheet depends on the plant's 2000 TP concentration level. The original description of the Tier 2 TP cost methodology was documented by Stearns & Wheler, LLC

Results:

Based on the assumptions and methodologies described above, the Tier 4 capital and O&M costs for TN and TP were calculated for the non-significant facilities. The following is the summary of the total costs for 185 non-significant facilities in the current database..

Total TN capital cost: $83,089,000
Total TN O&M cost: $624,534

Total TP capital cost: $11,303,260
Total TN O&M cost: $296,520

Table VI-C lists the detailed cost information for individual non-significant plants.

Table VI - C: NRT Cost for Non-significant Municipal Facilities

			DESIGN	2010 DATA			TIER 1*	TIER 2*	TIER 3*	TIER 4** (TN=8mg/l AND TP=2mg/l)							
STATE	FACILITY	NPDES	FLOW(mgd)	FLOW (mgd)	TN(mg/l)	TP(mg/l)	TOTAL COST	TOTAL COST	TOTAL COST	TN CC	TN O&M	TN NOTE	TP CC	TP O&M	TP NOTE	TOTAL CC	TOTAL O&M
MD	ANTIETAM	MD0062308	0.163	0.1094	18.00	3.00	0	0	0	$534,184	$3,104	1	$80,950	$2,523	5	$615,134	$5,627
MD	BALTIMORE YACHT CL	MD0054542	0.005	0.0019	18.00	3.00	0	0	0	$360,319	$2,093	1	$66,028	$1,337	5	$426,347	$3,430
MD	BELTSVILLE USDA EAS	MD0020842	0.62	0.2358	8.00	2.07	0	0	0	$0	$0	3	$124,111	$2,610	5	$124,111	$2,610
MD	BELTSVILLE USDA WE	MD0020851	0.2	0.1244	11.70	2.20	0	0	0	$585,783	$3,403	1	$84,445	$1,895	5	$670,228	$5,298
MD	BENJAMINS TRAILER F	MD0024961	0.04	0.0190	18.00	3.00	0	0	0	$393,159	$2,284	1	$69,334	$1,544	5	$462,493	$3,828
MD	BETTERTON	MD0020575	0.2	0.0212	18.00	3.00	0	0	0	$585,783	$3,403	1	$84,445	$1,864	5	$670,228	$5,268
MD	BIERS LANE	MD0065749	0.0095	0.0030	18.00	3.00	0	0	0	$364,382	$2,117	1	$66,453	$1,354	5	$430,835	$3,471
MD	BLOOMINGTON	MD0060933	0.05	0.0273	18.00	3.87	0	0	0	$403,080	$2,342	1	$70,278	$1,828	5	$473,358	$4,170
MD	BOHEMIA MANOR HIGI	MD0023469	0.015	0.0067	1.90	3.00	0	0	0	$0	$0	3	$66,973	$1,395	5	$66,973	$1,395
MD	BOONES MOBILE	MD0050903	0.08	0.0652	18.01	1.28	0	0	0	$434,370	$2,524	1	$0	$0	4	$434,370	$2,524
MD	BOONSBORO	MD0020231	0.46	0.4034	18.00	2.41	0	0	0	$1,119,788	$6,506	1	$109,000	$3,552	5	$1,228,788	$10,058
MD	BOWLEYS QUARTERS	MD0058807	0.004	0.0067	18.00	3.00	0	0	0	$361,867	$2,102	1	$65,934	$1,374	5	$427,801	$3,477
MD	BOWLING BROOK PRE	MD0067571	0.025	0.0059	0.68	3.00	0	0	0	$0	$0	3	$67,917	$1,407	5	$67,917	$1,407
MD	BRANDYWINE RECEIV	MD0025658	0.005	0.0012	5.55	3.00	0	0	0	$0	$0	3	$66,028	$1,330	5	$66,028	$1,330
MD	BRETTON WOODS	MD0064777	0.015	0.0097	18.00	3.00	0	0	0	$369,411	$2,146	1	$66,973	$1,420	5	$436,384	$3,566
MD	BROADFORDING	MD0051373	0.01	0.0011	18.00	3.00	0	0	0	$364,837	$2,120	1	$66,500	$1,339	5	$431,337	$3,459
MD	BROOK LANE	MD0053198	0.01	0.0056	18.00	3.00	0	0	0	$364,837	$2,120	1	$66,500	$1,376	5	$431,337	$3,496
MD	BUDGET MOTEL	MD0023027	0.019	0.0021	18.00	3.00	0	0	0	$373,112	$2,168	1	$67,350	$1,364	5	$440,462	$3,532
MD	CAMP SHADOWBROOI	MD0053139	0.04	0.0005	18.00	3.00	0	0	0	$393,159	$2,284	1	$69,334	$1,391	5	$462,493	$3,675
MD	CECILTON	MD0020443	0.05	0.0415	18.00	3.00	0	0	0	$403,080	$2,342	1	$70,278	$1,749	5	$473,358	$4,091
MD	CHARLES COUNTY CC	MD0052311	0.06	0.0364	28.30	2.80	0	0	0	$413,251	$2,401	1	$71,223	$1,665	5	$484,474	$4,066
MD	CHELTENHAM BOYS V	MD0023931	0.07	0.0370	10.53	1.02	0	0	0	$423,679	$2,462	1	$0	$0	4	$423,679	$2,462
MD	CHERRY HILL	MD0052825	0.25	0.1327	18.00	3.00	0	0	0	$663,517	$3,855	1	$89,167	$2,880	5	$752,684	$6,735
MD	CHESAPEAKE CITY NC	MD0020401	0.075	0.0955	8.17	3.63	0	0	0	$451,423	$2,623	1	$72,639	$2,739	5	$524,062	$5,362
MD	CHESAPEAKE CITY SC	MD0020397	0.088	0.0748	10.23	1.97	0	0	0	$443,117	$2,575	1	$0	$0	4	$443,117	$2,575
MD	CHESAPEAKE COLLEG	MD0024384	0.015	0.0157	18.00	3.00	0	0	0	$370,016	$2,150	1	$66,973	$1,469	5	$436,989	$3,619
MD	CHOPTICAN HIGH	MD0051918	0.02	0.0056	18.00	3.00	0	0	0	$374,043	$2,173	1	$67,445	$1,395	5	$441,488	$3,568
MD	CHURCH HILL	MD0050016	0.08	0.0730	6.90	1.95	0	0	0	$0	$0	3	$0	$0	4	$0	$0
MD	CLEARSPRING	MD0053325	0.2	0.0793	18.00	3.00	0	0	0	$585,783	$3,403	1	$84,445	$2,345	5	$670,228	$5,748
MD	CLIFFTON ON THE PO	MD0055557	0.2	0.0514	18.00	3.00	0	0	0	$585,783	$3,403	1	$84,445	$2,113	5	$670,228	$5,517
MD	COLONEL RICHARDSC	MD0055522	0.05	0.0063	18.00	3.00	0	0	0	$403,080	$2,342	1	$70,278	$1,458	5	$473,358	$3,800
MD	CONCORD TRAILER PA	MD0023060	0.015	0.0046	12.31	3.00	0	0	0	$369,411	$2,146	1	$66,973	$1,378	5	$436,384	$3,524
MD	CRESTVIEW	MD0022683	0.036	0.0384	13.64	3.03	0	0	0	$391,570	$2,275	1	$68,956	$1,706	5	$460,526	$3,981
MD	DAN-DEE INC.	MD0023710	0.012	0.0024	18.00	3.00	0	0	0	$366,660	$2,130	1	$66,689	$1,354	5	$433,349	$3,484
MD	DONALDSON BROWN (	MD0054950	0.006	0.0022	18.00	3.00	0	0	0	$361,218	$2,099	1	$66,123	$1,341	5	$427,341	$3,439
MD	DREAMS LANDING	MD0052868	0.02	0.0084	16.03	3.00	0	0	0	$374,043	$2,173	1	$67,445	$1,419	5	$441,488	$3,592

Table VI - C: NRT Cost for Non-significant Municipal Facilities

			DESIGN	2010 DATA			TIER 1*	TIER 2*	TIER 3*	TIER 4** (TN=8mg/l AND TP=2mg/l)							
STATE	FACILITY	NPDES	FLOW(mgd)	FLOW (mgd)	TN(mg/l)	TP(mg/l)	TOTAL COST	TOTAL COST	TOTAL COST	TN CC	TN O&M	TN NOTE	TP CC	TP O&M	TP NOTE	TOTAL CC	TOTAL O&M
MD	EASTERN CORRECTIC	MD0023876	0.03	0.0158	18.00	3.00	0	0	0	$383,482	$2,228	1	$68,389	$1,498	5	$451,871	$3,726
MD	EASTERN CORRECTIC	MD0066613	0.48	0.4159	2.05	0.14	0	0	0	$0	$0	3	$0	$0	4	$0	$0
MD	EDGEMEADE RESIDEN	MD0052680	0.005	0.0022	26.59	4.40	0	0	0	$360,319	$2,093	1	$66,028	$1,364	5	$426,347	$3,458
MD	ELK NECK STATE PAR	MD0023833	0.108	0.0277	17.21	2.53	0	0	0	$465,762	$2,706	1	$75,756	$1,636	5	$541,518	$4,343
MD	EMERGENCY MANAGE	MD0025666	0.01	0.0002	19.56	1.17	0	0	0	$364,837	$2,120	1	$0	$0	4	$364,837	$2,120
MD	ENGLISH GRILL	MD0053104	0.003	0.0004	18.00	3.00	0	0	0	$358,527	$2,083	1	$65,839	$1,320	5	$424,366	$3,403
MD	EWELL	MD0052230	0.065	0.0224	18.00	3.00	0	0	0	$418,432	$2,431	1	$71,695	$1,619	5	$490,127	$4,050
MD	FAHRNEY-KEEDY MEM	MD0053066	0.025	0.0190	18.00	3.00	0	0	0	$378,733	$2,200	1	$67,917	$1,515	5	$446,650	$3,716
MD	FAIRMOUNT	MD0052256	0.05	0.0309	18.00	3.00	0	0	0	$403,080	$2,342	1	$70,278	$1,661	5	$473,358	$4,003
MD	FLINTSTONE	MD0055620	0.045	0.0587	16.59	3.00	0	0	0	$411,924	$2,393	1	$69,806	$1,881	5	$481,730	$4,275
MD	FOREST GREEN	MD0053279	0.013	0.0100	18.00	14.80	0	0	0	$367,575	$2,136	1	$66,784	$2,398	5	$434,359	$4,534
MD	FOUNTAINDALE	MD0022721	0.2	0.2528	19.66	3.82	0	0	0	$668,233	$3,882	1	$84,445	$5,493	5	$752,678	$9,376
MD	FOXVILLE US NAVAL S	MD0025119	0.018	0.0291	18.00	3.00	0	0	0	$382,600	$2,223	1	$67,256	$1,586	5	$449,856	$3,808
MD	FUNKSTOWN	MD0020362	0.15	0.0643	40.53	5.53	0	0	0	$517,156	$3,005	1	$79,723	$3,470	5	$596,879	$6,474
MD	GAITHER MANOR	MD0022845	0.045	0.0226	3.10	3.97	0	0	0	$0	$0	3	$69,806	$1,764	5	$69,806	$1,764
MD	GALENA	MD0020605	0.04	0.0267	26.26	4.51	0	0	0	$393,159	$2,284	1	$69,334	$1,940	5	$462,493	$4,224
MD	GORMAN	MD0060950	0.009	0.0047	18.00	3.00	0	0	0	$363,929	$2,114	1	$66,406	$1,367	5	$430,335	$3,482
MD	GREAT OAKS LANDINC	MD0024945	0.014	0.0058	18.00	3.00	0	0	0	$368,492	$2,141	1	$66,878	$1,385	5	$435,370	$3,526
MD	GREEN RIDGE FORES	MD0024988	0.008	0.0032	18.00	3.72	0	0	0	$363,023	$2,109	1	$66,312	$1,371	5	$429,335	$3,481
MD	GREENBRIAR STATE F	MD0023868	0.05	0.0152	18.00	3.00	0	0	0	$403,080	$2,342	1	$70,278	$1,532	5	$473,358	$3,873
MD	GREENSBORO	MD0020290	0.28	0.1697	21.02	3.48	0	0	0	$715,025	$4,154	1	$92,000	$3,917	5	$807,025	$8,071
MD	HAMPSTEAD	MD0022446	0.9	0.6826	20.13	0.24	0	0	0	$2,652,895	$15,413	6	$0	$0	4	$2,652,895	$15,413
MD	HANCOCK	MD0024562	0.38	0.2239	20.70	2.43	0	0	0	$917,385	$5,330	1	$101,445	$2,825	5	$1,018,830	$8,155
MD	HAPPY TRAILS CAMPC	MD0065757	0.025	0.0035	3.27	3.00	0	0	0	$0	$0	3	$67,917	$1,387	5	$67,917	$1,387
MD	HARBOUR VIEW	MD0024023	0.065	0.0077	18.00	3.00	0	0	0	$418,432	$2,431	1	$71,695	$1,498	5	$490,127	$3,929
MD	HARWOOD SOUTHERN	MD0023728	0.04	0.0059	6.70	7.70	0	0	0	$0	$0	3	$69,334	$1,667	5	$69,334	$1,667
MD	HEBRON	MD0059617	0.105	0.1314	18.00	3.00	0	0	0	$493,725	$2,869	1	$75,473	$2,596	5	$569,198	$5,464
MD	HIGHLAND VIEW	MD0024627	0.03	0.0094	18.00	3.00	0	0	0	$383,482	$2,228	1	$68,389	$1,445	5	$451,871	$3,673
MD	HOLIDAY MOBILE EST/	MD0053082	0.125	0.1071	7.33	1.13	0	0	0	$0	$0	3	$0	$0	4	$0	$0
MD	HUNTER HILL APARTM	MD0022926	0.03	0.0291	18.00	3.00	0	0	0	$383,482	$2,228	1	$68,389	$1,608	5	$451,871	$3,836
MD	I-70 REST AREA	MD0023680	0.028	0.0342	26.77	3.00	0	0	0	$387,563	$2,252	1	$68,200	$1,647	5	$455,763	$3,899
MD	JEFFERSON	MD0020737	0.15	0.1754	0.45	3.00	0	0	0	$0	$0	3	$79,723	$3,045	5	$79,723	$3,045
MD	JUDE HOUSE	MD0057614	0.017	0.0000			0	0	0	$0	$0	3	$0	$0	4	$0	$0
MD	KEMPTOWN SCHOOL	MD0056481	0.005	0.0054	29.00	3.00	0	0	0	$360,712	$2,096	1	$66,028	$1,366	5	$426,740	$3,461
MD	KENNEDYVILLE	MD0052671	0.05	0.0045	18.00	3.00	0	0	0	$403,080	$2,342	1	$70,278	$1,443	5	$473,358	$3,785
MD	KITZMILLER	MD0060941	0.04	0.0175	18.00	3.37	0	0	0	$393,159	$2,284	1	$69,334	$1,585	5	$462,493	$3,869

Table VI - C: NRT Cost for Non-significant Municipal Facilities

			DESIGN	2010 DATA			TIER 1*	TIER 2*	TIER 3*	TIER 4** (TN=8mg/l AND TP=2mg/l)							
STATE	FACILITY	NPDES	FLOW(mgd)	FLOW (mgd)	TN(mg/l)	TP(mg/l)	TOTAL COST	TOTAL COST	TOTAL COST	TN CC	TN O&M	TN NOTE	TP CC	TP O&M	TP NOTE	TOTAL CC	TOTAL O&M
MD	KUNZANG ODSAL PAL(	MD0067539	0.035	0.0008	18.00	3.00	0	0	0	$388,290	$2,256	1	$68,862	$1,384	5	$457,152	$3,640
MD	LACKEY HIGH	MD0023159	0.028	0.0106	18.00	3.00	0	0	0	$381,575	$2,217	1	$68,200	$1,452	5	$449,775	$3,669
MD	LAFAYETTE MOTEL	MD0053201	0.005	0.0013	18.00	3.00	0	0	0	$360,319	$2,093	1	$66,028	$1,331	5	$426,347	$3,424
MD	LEWISTOWN ELEMENT	MD0022900	0.022	0.0030	18.00	3.00	0	0	0	$375,912	$2,184	1	$67,634	$1,377	5	$443,546	$3,561
MD	LIBERTYTOWN	MD0060577	0.05	0.0300	21.45	2.89	0	0	0	$403,080	$2,342	1	$70,278	$1,626	5	$473,358	$3,968
MD	LYONS CREEK MOBILE	MD0053511	0.125	0.0719	10.21	1.91	0	0	0	$485,919	$2,823	1	$0	$0	4	$485,919	$2,823
MD	MANCHESTER	MD0022578	0.25	0.0816	20.94	0.27	0	0	0	$663,517	$3,855	1	$0	$0	4	$663,517	$3,855
MD	MANCHESTER PARK	MD0023108	0.035	0.0273	16.75	4.65	0	0	0	$388,290	$2,256	1	$68,862	$1,974	5	$457,152	$4,230
MD	MAPLE HILL PARK	MD0053171	0.016	0.0061	18.00	3.00	0	0	0	$370,333	$2,152	1	$67,067	$1,392	5	$437,400	$3,543
MD	MAPLE RUN	MD0024970	0.004	0.0031	2.20	3.00	0	0	0	$0	$0	3	$65,934	$1,344	5	$65,934	$1,344
MD	MARDELA HIGH	MD0024279	0.014	0.0024	9.57	3.00	0	0	0	$368,492	$2,141	1	$66,878	$1,357	5	$435,370	$3,498
MD	MARLBORO MEADOWS	MD0022781	0.6	0.3243	12.90	0.97	0	0	0	$2,444,284	$14,201	6	$0	$0	4	$2,444,284	$14,201
MD	MARYLAND MANOR M(	MD0024333	0.07	0.0666	11.00	1.50	0	0	0	$423,679	$2,462	1	$0	$0	4	$423,679	$2,462
MD	MAYO LARGE COMMU	MD0061794	1	0.5526	8.52	0.81	0	0	0	$2,722,193	$15,816	6	$0	$0	4	$2,722,193	$15,816
MD	MIDDLETOWN	MD0024406	0.25	0.2617	26.02	2.45	0	0	0	$683,107	$3,969	1	$89,167	$2,757	5	$772,274	$6,726
MD	MILL BOTTOM	MD0065439	0.1	0.0527	2.21	3.00	0	0	0	$0	$0	3	$75,000	$1,936	5	$75,000	$1,936
MD	MILLINGTON	MD0020435	0.07	0.0581	18.00	3.00	0	0	0	$423,679	$2,462	1	$72,167	$1,924	5	$495,846	$4,386
MD	MONROVIA WWTP	MD0059609	0.2	0.0323	3.72	3.00	0	0	0	$0	$0	3	$84,445	$1,956	5	$84,445	$1,956
MD	MORNING CHEER	MD0052299	0.03	0.0201	18.00	3.00	0	0	0	$383,482	$2,228	1	$68,389	$1,534	5	$451,871	$3,762
MD	MT CARMEL WOODS	MD0053228	0.021	0.0209	13.95	0.79	0	0	0	$374,976	$2,179	1	$0	$0	4	$374,976	$2,179
MD	MT ST MARYS COLLEC	MD0023230	0.16	0.0530	25.49	6.32	0	0	0	$530,206	$3,080	1	$80,667	$3,507	5	$610,873	$6,588
MD	MYERSVILLE	MD0020699	0.3	0.1868	19.88	4.32	0	0	0	$751,566	$4,367	1	$93,889	$5,461	5	$845,455	$9,828
MD	NAS-PATUXENT	MD0020095	0.045	0.0340	8.00	3.00	0	0	0	$0	$0	3	$69,806	$1,677	5	$69,806	$1,677
MD	NATIONAL INSTITUTE (	MD0020931	0.1	0.0567	18.00	3.00	0	0	0	$456,569	$2,653	1	$75,000	$1,969	5	$531,569	$4,622
MD	NATIONAL WILDLIFE V	MD0065358	0.04	0.0014	18.00	2.09	0	0	0	$393,159	$2,284	1	$69,334	$1,388	5	$462,493	$3,672
MD	NEW GERMANY STATE	MD0023981	0.006	0.0014	18.00	3.00	0	0	0	$361,218	$2,099	1	$66,123	$1,334	5	$427,341	$3,433
MD	NEW LIFE FOURSQUAI	MD0057100	0.009	0.0019	18.00	3.00	0	0	0	$363,929	$2,114	1	$66,406	$1,344	5	$430,335	$3,459
MD	NEW MARKET	MD0020729	0.24	0.1208	23.40	4.80	0	0	0	$647,185	$3,760	1	$88,223	$4,560	5	$735,408	$8,321
MD	NEW WINDSOR	MD0022586	0.13	0.0526	15.07	3.97	0	0	0	$492,011	$2,859	1	$77,834	$2,413	5	$569,845	$5,271
MD	NORTH CAROLINE HIG	MD0023621	0.024	0.0023	18.00	3.00	0	0	0	$377,790	$2,195	1	$67,823	$1,376	5	$445,613	$3,571
MD	NORTH HARFORD JR&	MD0023281	0.02	0.0120	18.00	3.00	0	0	0	$374,043	$2,173	1	$67,445	$1,448	5	$441,488	$3,622
MD	NORTHERN HIGH SCH	MD0052167	0.04	0.0158	18.00	3.00	0	0	0	$393,159	$2,284	1	$69,334	$1,518	5	$462,493	$3,802
MD	NOTCHCLIFF	MD0022951	0.02	0.0380	18.00	3.00	0	0	0	$391,194	$2,273	1	$67,445	$1,663	5	$458,639	$3,936
MD	NSWC-INDIAN HEAD	MD0020885	0.5	0.3471	7.35	2.13	0	0	0	$0	$0	3	$112,778	$2,627	5	$112,778	$2,627
MD	OLD SOUTH MOUNTAI	MD0055425	0.018	0.0025	18.00	3.00	0	0	0	$372,183	$2,162	1	$67,256	$1,366	5	$439,439	$3,528
MD	OLDTOWN	MD0024759	0.04	0.0105	18.00	2.15	0	0	0	$393,159	$2,284	1	$69,334	$1,400	5	$462,493	$3,684

Table VI - C: NRT Cost for Non-significant Municipal Facilities

			DESIGN	2010 DATA			TIER 1*	TIER 2*	TIER 3*	TIER 4** (TN=8mg/l AND TP=2mg/l)							
STATE	FACILITY	NPDES	FLOW(mgd)	FLOW (mgd)	TN(mg/l)	TP(mg/l)	TOTAL COST	TOTAL COST	TOTAL COST	TN CC	TN O&M	TN NOTE	TP CC	TP O&M	TP NOTE	TOTAL CC	TOTAL O&M
MD	OXFORD	MD0022543	0.208	0.1085	18.00	0.67	0	0	0	$597,579	$3,472	1	$0	$0	4	$597,579	$3,472
MD	PARKWAY INN	MD0052329	0.02	0.0243	9.40	1.90	0	0	0	$378,088	$2,197	1	$0	$0	4	$378,088	$2,197
MD	PATUXENT MOBILE	MD0024694	0.035	0.0259	15.09	1.41	0	0	0	$388,290	$2,256	1	$0	$0	4	$388,290	$2,256
MD	PATUXENT WILDLIFE H	MD0025623	0.027	0.0209	2.35	3.00	0	0	0	$0	$0	3	$68,106	$1,535	5	$68,106	$1,535
MD	PETER PAN INN	MD0024244	0.03	0.0035	4.15	1.27	0	0	0	$0	$0	3	$0	$0	4	$0	$0
MD	PHEASANT RIDGE	MD0024546	0.125	0.0250	12.97	2.69	0	0	0	$485,919	$2,823	1	$77,362	$1,690	5	$563,281	$4,513
MD	PICCOWAXIN MIDDLE	MD0023451	0.025	0.0027	18.00	3.00	0	0	0	$378,733	$2,200	1	$67,917	$1,381	5	$446,650	$3,581
MD	PINEY ORCHARD	MD0059145	1.2	0.3625	3.83	0.28	0	0	0	$0	$0	3	$0	$0	4	$0	$0
MD	PINTO	MD0022748	0.45	0.2696	9.94	2.77	0	0	0	$1,092,227	$6,346	1	$108,056	$3,877	5	$1,200,283	$10,223
MD	PITTSVILLE	MD0060348	0.14	0.0881	14.75	0.95	0	0	0	$3,469,050	$161,940	2	$0	$0	4	$3,469,050	$161,940
MD	PLEASANT BRANCH	MD0065269	0.1	0.0510	7.94	3.00	0	0	0	$0	$0	3	$75,000	$1,922	5	$75,000	$1,922
MD	PLESANT VALLEY	MD0066745	0.019	0.0093	18.00	3.00	0	0	0	$373,112	$2,168	1	$67,350	$1,424	5	$440,462	$3,592
MD	POCOMOKE TRUCK ST	MD0054330	0.006	0.0024	18.33	3.00	0	0	0	$361,218	$2,099	1	$66,123	$1,342	5	$427,341	$3,441
MD	POINT LOOKOUT STAT	MD0023949	0.25	0.0186	18.00	3.00	0	0	0	$663,517	$3,855	1	$89,167	$1,937	5	$752,684	$5,792
MD	POINT OF ROCKS	MD0020800	0.23	0.0988	17.63	5.05	0	0	0	$631,256	$3,668	1	$87,278	$4,238	5	$718,534	$7,905
MD	PORT DEPOSIT	MD0020796	0.15	0.1503	18.00	3.00	0	0	0	$517,533	$3,007	1	$79,723	$2,837	5	$597,256	$5,844
MD	PRESTON	MD0020621	0.116	0.0600	18.00	3.00	0	0	0	$475,141	$2,761	1	$76,512	$2,026	5	$551,653	$4,787
MD	QUEENSTOWN	MD0023370	0.085	0.0787	15.54	2.44	0	0	0	$439,816	$2,555	1	$73,584	$1,761	5	$513,400	$4,316
MD	RANDLE CLIFFS NAVA	MD0020168	0.06	0.0173	18.00	3.00	0	0	0	$413,251	$2,401	1	$71,223	$1,568	5	$484,474	$3,969
MD	RAWLINGS HEIGHTS	MD0023213	0.08	0.0956	14.66	1.06	0	0	0	$451,623	$2,624	1	$0	$0	4	$451,623	$2,624
MD	RICHLYN MANOR	MD0022713	0.09	0.0881	13.43	2.10	0	0	0	$445,331	$2,587	1	$74,056	$1,554	5	$519,387	$4,141
MD	RISING SUN	MD0020265	0.3	0.2553	18.00	3.00	0	0	0	$751,566	$4,367	1	$93,889	$3,988	5	$845,455	$8,355
MD	ROCK HALL	MD0020303	0.505	0.2707	14.81	0.51	0	0	0	$2,377,999	$13,816	6	$0	$0	4	$2,377,999	$13,816
MD	ROCKY GAP STATE PA	MD0051667	0.12	0.0518	6.48	3.00	0	0	0	$0	$0	3	$76,889	$1,966	5	$76,889	$1,966
MD	ROSE HAVEN	MD0022756	0.06	0.0486	20.59	1.20	0	0	0	$413,251	$2,401	1	$0	$0	4	$413,251	$2,401
MD	RUNNYMEADE SCHOC	MD0065927	0.02	0.0031	18.00	3.00	0	0	0	$374,043	$2,173	1	$67,445	$1,375	5	$441,488	$3,548
MD	SANDY HOOK	MD0064530	0.015	0.0065	18.00	3.00	0	0	0	$369,411	$2,146	1	$66,973	$1,393	5	$436,384	$3,539
MD	SHAMROCK RESTAUR	MD0058050	0.01	0.0029	1.95	3.00	0	0	0	$0	$0	3	$66,500	$1,354	5	$66,500	$1,354
MD	SHARPTOWN	MD0052175	0.15	0.1207	26.00	7.10	0	0	0	$517,156	$3,005	1	$79,723	$6,682	5	$596,879	$9,687
MD	SHEPPARD PRATT WE	MD0067521	0.01	0.0035	18.00	3.00	0	0	0	$364,837	$2,120	1	$66,500	$1,359	5	$431,337	$3,479
MD	SIDELING HILL REST A	MD0062821	0.025	0.0070	21.00	3.00	0	0	0	$378,733	$2,200	1	$67,917	$1,417	5	$446,650	$3,617
MD	SMITHSBURG	MD0024317	0.333	0.2221	7.55	1.89	0	0	0	$0	$0	3	$0	$0	4	$0	$0
MD	SOUTH CARROLL HIGH	MD0024589	0.02	0.0064	18.00	0.14	0	0	0	$374,043	$2,173	1	$0	$0	4	$374,043	$2,173
MD	SOUTHERN CORRECT	MD0023914	0.02	0.0349	20.37	4.50	0	0	0	$388,145	$2,255	1	$67,445	$2,069	5	$455,590	$4,324
MD	SPRING MEADOWS	MD0024953	0.016	0.0106	18.00	3.00	0	0	0	$370,333	$2,152	1	$67,067	$1,429	5	$437,400	$3,581
MD	SPRINGVIEW ESTATES	MD0022870	0.007	0.0067	21.13	3.00	0	0	0	$362,119	$2,104	1	$66,217	$1,380	5	$428,336	$3,484

Table VI - C: NRT Cost for Non-significant Municipal Facilities

			DESIGN	2010 DATA			TIER 1*	TIER 2*	TIER 3*	TIER 4** (TN=8mg/l AND TP=2mg/l)							
STATE	FACILITY	NPDES	FLOW(mgd)	FLOW (mgd)	TN(mg/l)	TP(mg/l)	TOTAL COST	TOTAL COST	TOTAL COST	TN CC	TN O&M	TN NOTE	TP CC	TP O&M	TP NOTE	TOTAL CC	TOTAL O&M
MD	ST TIMOTHY SCHOOL	MD0056103	0.015	0.0056	18.00	3.00	0	0	0	$369,411	$2,146	1	$66,973	$1,385	5	$436,384	$3,532
MD	ST. JAMES SCHOOL	MD0065536	0.016	0.0069	18.00	3.00	0	0	0	$370,333	$2,152	1	$67,067	$1,398	5	$437,400	$3,550
MD	SUDLERSVILLE	MD0020559	0.09	0.0497	18.00	3.00	0	0	0	$445,331	$2,587	1	$74,056	$1,892	5	$519,387	$4,479
MD	SUMMER HILL TRAILEI	MD0023272	0.019	0.0113	13.87	1.31	0	0	0	$373,112	$2,168	1	$0	$0	4	$373,112	$2,168
MD	SWAN HARBOR PARK	MD0023043	0.05	0.0123	18.00	3.00	0	0	0	$403,080	$2,342	1	$70,278	$1,507	5	$473,358	$3,849
MD	SWAN POINT	MD0057525	0.07	0.0367	18.00	3.00	0	0	0	$423,679	$2,462	1	$72,167	$1,746	5	$495,846	$4,208
MD	TALBOT COUNTY REG	MD0023604	0.5	0.3803	14.39	3.09	0	0	0	$1,237,167	$7,188	1	$112,778	$5,680	5	$1,349,945	$12,868
MD	TALBOT COUNTY REG	MD0059463	0.15	0.0767	18.00	3.00	0	0	0	$517,156	$3,005	1	$79,723	$2,229	5	$596,879	$5,234
MD	TAWES VOCATIONAL-T	MD0022993	0.01	0.1728	23.76	3.00	0	0	0	$547,415	$3,180	1	$66,500	$2,759	5	$613,915	$5,939
MD	THUNDERBIRD APART	MD0050334	0.032	0.0133	32.36	2.25	0	0	0	$385,398	$2,239	1	$68,578	$1,399	5	$453,976	$3,638
MD	THUNDERBIRD MOTEL	MD0053155	0.005	0.0046	18.00	3.00	0	0	0	$360,319	$2,093	1	$66,028	$1,359	5	$426,347	$3,452
MD	TOLCHESTER	MD0067202	0.265	0.0901	18.00	3.00	0	0	0	$688,789	$4,002	1	$90,584	$2,557	5	$779,373	$6,559
MD	TRAPPE	MD0020486	0.115	0.1360	18.00	2.62	0	0	0	$499,402	$2,902	1	$76,417	$2,220	5	$575,819	$5,122
MD	TRI-TOWN PLAZA	MD0024937	0.01	0.0135	18.00	1.97	0	0	0	$368,027	$2,138	1	$0	$0	4	$368,027	$2,138
MD	TRIUMPH INDUSTRIAL	MD0024929	0.063	0.0383	18.00	3.00	0	0	0	$416,352	$2,419	1	$71,506	$1,747	5	$487,858	$4,166
MD	TWIN CITIES	MD0055352	0.28	0.1182	18.00	3.00	0	0	0	$715,025	$4,154	1	$92,000	$2,817	5	$807,025	$6,971
MD	TYLERTON	MD0052248	0.02	0.0051	18.00	3.00	0	0	0	$374,043	$2,173	1	$67,445	$1,391	5	$441,488	$3,564
MD	U.S. ARMY-CHESAPEA	MD0020206	0.005	0.0003	18.00	3.00	0	0	0	$360,319	$2,093	1	$66,028	$1,323	5	$426,347	$3,416
MD	UNION BRIDGE	MD0022454	0.2	0.1032	28.07	3.27	0	0	0	$585,783	$3,403	1	$84,445	$2,772	5	$670,228	$6,176
MD	UNITED CONTAINER	MD0024635	0.014	0.0076	18.74	3.00	0	0	0	$368,492	$2,141	1	$66,878	$1,400	5	$435,370	$3,541
MD	URBANA HIGH SCHOO	MD0066940	0.03	0.0029	18.00	3.52	0	0	0	$383,482	$2,228	1	$68,389	$1,404	5	$451,871	$3,632
MD	US NAVAL ACADEMY	MD0023523	1	0.1884	8.00	0.12	0	0	0	$0	$0	3	$0	$0	4	$0	$0
MD	USAF BRANDYWINE H(	MD0025640	0.005	0.0014	19.03	3.63	0	0	0	$360,319	$2,093	1	$66,028	$1,339	5	$426,347	$3,432
MD	USAF TRANSMITTER S	MD0025631	0.01	0.0000			0	0	0	$0	$0	3	$0	$0	4	$0	$0
MD	VICTOR CULLEN CENT	MD0023922	0.25	0.0416	10.69	3.00	0	0	0	$663,517	$3,855	1	$89,167	$2,127	5	$752,684	$5,982
MD	VIENNA	MD0020664	0.06	0.0562	19.28	3.00	0	0	0	$413,251	$2,401	1	$71,223	$1,889	5	$484,474	$4,290
MD	VILLA JULIE COLLEGE	MD0066001	0.05	0.0070	3.96	0.16	0	0	0	$0	$0	3	$0	$0	4	$0	$0
MD	WALKERS TRAILER PA	MD0057487	0.015	0.0141	22.30	3.00	0	0	0	$369,411	$2,146	1	$66,973	$1,456	5	$436,384	$3,603
MD	WAYSONS MOBILE	MD0023647	0.06	0.0456	19.16	2.28	0	0	0	$413,251	$2,401	1	$71,223	$1,530	5	$484,474	$3,931
MD	WHITE HOUSE MOTEL	MD0056553	0.005	0.0016	18.17	3.00	0	0	0	$360,319	$2,093	1	$66,028	$1,333	5	$426,347	$3,427
MD	WHITE ROCK	MD0025089	0.05	0.0171	12.45	3.00	0	0	0	$403,080	$2,342	1	$70,278	$1,547	5	$473,358	$3,889
MD	WILLARDS	MD0051632	0.08	0.0820	18.00	3.00	0	0	0	$436,493	$2,536	1	$73,112	$2,140	5	$509,605	$4,676
MD	WINTERS APARTMENT	MD0057606	0.013	0.0002	18.00	3.00	0	0	0	$367,575	$2,136	1	$66,784	$1,338	5	$434,359	$3,473
MD	WOODLAWN MOBILE H	MD0023337	0.054	0.0000			0	0	0	$0	$0	3	$0	$0	4	$0	$0
MD	WOODSBORO	MD0058661	0.25	0.1220	20.14	2.17	0	0	0	$663,517	$3,855	1	$89,167	$1,955	5	$752,684	$5,810
MD	WOODSTOCK TRAININ	MD0023906	0.05	0.0087	18.00	3.00	0	0	0	$403,080	$2,342	1	$70,278	$1,478	5	$473,358	$3,819

Table VI - C: NRT Cost for Non-significant Municipal Facilities

			DESIGN	2010 DATA			TIER 1*	TIER 2*	TIER 3*	TIER 4** (TN=8mg/l AND TP=2mg/l)							
STATE	FACILITY	NPDES	FLOW(mgd)	FLOW (mgd)	TN(mg/l)	TP(mg/l)	TOTAL COST	TOTAL COST	TOTAL COST	TN CC	TN O&M	TN NOTE	TP CC	TP O&M	TP NOTE	TOTAL CC	TOTAL O&M
MD	WORTON-BUTLERTON	MD0060585	0.15	0.0629	18.00	3.00	0	0	0	$517,156	$3,005	1	$79,723	$2,115	5	$596,879	$5,119
MD Total			**20.5905**	**11.5411**						**$80,973,919**	**$612,243**		**$10,986,221**			**$91,960,140**	**$900,121**
VA	FAIRVIEW BEACH	MD0056464	0.05	0.0392	18.00	3.00	0	0	0	$403,080	$2,342	1	$70,278	$1,729	5	$473,358	$4,071
VA Total			**0.05**	**0.0392**						**$403,080**	**$2,342**		**$70,278**			**$473,358**	**$4,071**
WV	HARPERS FERRY-BOL	WV0039136	0.3	0.1907	18.00	3.00	0	0	0	$751,566	$4,367	1	$93,889	$3,455	5	$845,455	$7,821
WV	MOUNTAIN TOP PSD	WV0101524	0.0504	0.0263	18.83	3.00	0	0	0	$403,482	$2,344	1	$70,316	$1,624	5	$473,798	$3,968
WV	RIVER BEND PARK	WV0105384	0.18	0.0223	24.03	3.00	0	0	0	$557,302	$3,238	1	$82,556	$1,835	5	$639,858	$5,073
WV Total			**0.5304**	**0.2393**						**$1,712,349**	**$9,949**		**$246,761**			**$1,959,110**	**$16,862**
Grand Total			**21.1709**	**11.8195**						**$83,089,348**	**$624,534**		**$11,303,260**			**$94,392,608**	**$921,054**

Note:

* There is no action on non-sigificant plants for Tier 1-3. Therefore, no cost is applied.

** Tier 4 scenario for non-significant plant is that TN =8 mg/l and TP = 2 mg/l.

1 = Calculated with the curve developed for the non-significant plants < or = 0.5MGD based on 9 VA and 2 MD non-significant facilities. This methodology used to develop this curve was agreed by Tom Sadick, CH2M Hill and Thor Young, Stearn & Wheler, LLC.

2 = BNR Capital cost from MDE, 5/15/2002

3 = Assumes that there is no cost for non-significant plants that have TN concentration < 8 mg/l

4 = Assumes that there is no cost for non-significant plants that have TP concentration < 2 mg/l

5 = Calculated from the methodology developed by Thor Young, Stearn & Wheler for Tier 2 TP cost. The TP goal in the calculation is adjusted from 1 mg/l to 2 mg/l.

6 = Due to its design flow >0.5 MGD, the costs were calculated from the methodology developed by Thor Young, Stearn & Wheler for Tier 2 TN cost

VII. COST ESTIMATES FOR COMBINED SEWER OVERFLOWS

CSO cost estimates were provided by the City of Richmond and the Blue Plains CSO for the District of Columbia. However, only Blue Plains CSO costs are considered herein. This is because costs are only included where respective nutrient reductions are known, which is the case only for Blue Plains at this time. Costs for meeting various tiered reductions for the CSO are provided in Table VII. These costs were obtained by the Washington Council of Governments.

The DC CSO tiers are structured to incorporate existing DC-WASA (Washington Area Sanitary Authority) programs and acknowledges that the Draft CSO Long Term Control Plan is a major 20-year capital program, although at the time of this writing, it has yet to be formally approved by EPA. Overall nutrient and sediment loads are expected to be reduced by 43% over the next 8 years and this is reflected in Tier 1, which is also carried over into Tier 2, and again in Tier 3.

For purposes of conceptually estimating limits of technology, zero overflows were assumed for Tier 4. However, as noted by WASA, this is not considered a practical reduction measure, at this time, because it would require complete sewer separation and is not a measure endorsed by WASA.

The costs, therefore, for Tier 1 – 3 are the same and reflect current estimates by WASA for projects already planned. Estimates for the Tier 4 controls are based on the current Draft CSO LTCP and reflect the concept of a major 40-year complete sewer separation that was not adopted in the LTCP due to the immense cost burden and the potential of making water quality worse (due to the lack of treatment the resulting separated stormwater runoff would receive). The O&M costs for the CSO are estimated to be 5% of the capital costs.

Table VII. DC CSO & BLUE PLAINS WWTP COST ESTIMATES - For Chesapeake Bay-wide UAA Cost Analysis (as of 4/02/02)

Tier	Facility	Capital Cost (TN req.'s)	Capital Cost (TP req.'s)	Total Capital Cost (Year 200$'s)	Capital Cost Range (-30%-+50%)	O&M (annual)
Tier I/II	Blue Plains	**$33M**	**$20M**	**$53 M**	**$37.1 to $79.5M**	**$8.9M**
Tier III	Blue Plains	**$225M**		**$225 M**	**$157.5 to $337.5M**	**$13.4M**
Tier IV	Blue Plains	**$365M**	**$25M**	**$390 M**	**$273M to $585M**	**$18.7 M**
Tier I/II/III	DC CSO (Phase I)			**$130 M**	**$91 to $195 M**	**$6.5 M**
(proposed Tier IV)	*DC CSO (LTCP-current draft)*			*$1.1 B*	*$0.77 to $1.65B*	*$55 M*
Tier IV	DC CSO (zero discharges)			**$3.5 B**	**$2.45 to $5.25B**	**$175 M**

Notes:

1) Tiers I & II Blue Plains cost estimates are based on current CIP costs and current O&M costs.

2) Tiers III & IV Blue Plains cost estimates are estimated costs in Year 2002$'s, and represent 'Planning Level' cost estimates (-30% to +50%).

3) Tier I & II cost estimates for Blue Plains assume continued voluntary compliance with TN goals. Tiers III & IV also assume either voluntary goals, or use of "annual average" goals if TN requirements are included in a permit.

4) Tier I, II, & III cost estimates for Blue Plains assume continued compliance with existing TP permit limit. Tier IV assumes compliance with a lower TP permit limit.

5) Blue Plains O&M costs for Tier I & II are based on current costs. Tier III & IV O&M costs estimated from CH2M Hill's 1999 report. All O&M costs are based on 370 MGD average daily flow.

6) Tier I, II & III CSO cost estimates are based on current estimated costs for projects already in the CIP; while estimates for the 'proposed' Tier IV controls are based on the current, Draft CSO LTCP.

7) Cost estimates for the CBP's Tier IV CSO controls reflect the concept of a major 40-year complete sewer separation scenario that was not adopted in the current Draft CSO LTCP (due to the immense cost burden and the result of making water quality worse)

8) CSO cost estimates for O&M costs are estimated to be 5% of the capital costs.

VIII. COST METHODOLOGY APPLICATION FOR THE SIGNIFICANT MUNICIPALS FOR TIERS 1-4

This section explains how the cost estimation methodologies presented in Section III and IV were applied to derive the technology costs by facility for various nutrient reduction levels. This section also explains where actual data received from facilities or municipal representatives was used in lieu of application of the cost estimation methodologies. For information regarding the source codes shown in this section, please see the notes at the ends of Table X-A (pages 98-106) and Table X-B (pages 107-115).

8.1 Allocating Blue Plains Costs to the Jurisdictions

The Blue Plains facility treats wastewater from Maryland, Virginia, as well as the District of Columbia. The loads for the Blue Plains facility are therefore proportional to each jurisdiction according to the flows being treated from each of the three jurisdictions. The flow allocation data were provided by Metropolitan Washington Council of Government(MWCOG) (Attachment 11, part 2, Appendix I). Costs to achieve these load reductions were also provided by MWCOG(see Table VII). These total costs are allocated to each of the jurisdictions according to their percentage of flow treated by Blue Plains. In the tables and graphs presenting costs in this report, it will be noted whether the costs for Blue Plains are in total or divided up among the jurisdictions.

8.2 Tier 1 Costs

Among the 304 significant municipal plants, there are 154 facilities that are currently operating NRT or have plans to implement NRT. Only 65 of these 154 plants have costs associated with NRT for Tier 1 because the funds for the reminding 89 NRT facilities are already in place. Most of the 65 plants with Tier 1 costs are going to implement NRT by 2005 or 2010. Only 3 out of the 65 plants are currently running NRT and are listed in Table VIII- A.

Table VIII- A: Current BNR with T1 Cost

STATE	FACILITY	NPDES	BNR_STATUS	T1TNCC
MD	HURLOCK	MD0022730	CURRENT	5,200,000
MD	PRINCESS ANNE	MD0020656	CURRENT	3,563,500
VA	AQUIA	VA0060968	CURRENT	8,000,000

Most of the TN capital costs for these 65 plants are provided by the state agencies or from the NRT cost survey. Only 9 facilities (listed in following table) used the estimates calculated with the Tier 2 methodology developed by Stearns & Wheler, LLC.

Table VIII- B: Facilities with Tier 1 TN CC Calculated

STATE	FACILITY	NPDES	BNR_STATUS	T1TNCC
PA	ELIZABETHTOWN	PA0023108	BY 2005	4,083,001
PA	LACKAWANNA RIVER	PA0027081	BY 2005	2,513,941
PA	LEWISBURG AREA	PA0044661	BY 2010	3,693,297
PA	LOCK HAVEN	PA0025933	BY 2010	4,580,956
PA	LOGAN TOWNSHIP-	PA0032557	BY 2005	2,444,284
VA	HAYMOUNT STP	VA0089125	BY 2010	2,687,559
VA	ORANGE	VA0021385	BY 2010	3,066,885
VA	SOUTH WALES STP	VA0080527	BY 2010	2,622,367
VA	WIDEWATER WWTP	VA0090387	BY 2010	2,374,508
Total				**28,066,798**

Since the total TN capital cost of Tier 1 is $605,314,959, the calculated estimates accounts for only 4.7% of the total Tier 1 cost.

The following table summarizes the Tier 1 costs, along with TN loads discharged in 2000 in comparison to the Tier 1 load reduction.

Table VIII- C: Tier 1 costs, 2000 and T1 TN discharged loads by state.

STATE	Tier1 TN Capital Cost	2000 TN LOAD (lbs/yr)	TIER 1 TN LOAD (lbs/yr)	REDUCTION (2000TN-T1 TN)
DC Total	**0**	**8,726,084**	**7,805,237**	**920,847**
DE Total	**3,187,400**	**286,701**	**292,404**	**-5,702**
MD Total	**384,749,909**	**14,142,117**	**12,566,335**	**1,575,781**
NY Total	**0**	**4,252,589**	**2,931,661**	**1,320,928**
PA Total	**72,079,813**	**14,326,180**	**11,941,871**	**2,384,309**
VA Total	**145,297,837**	**27,968,574**	**26,559,015**	**1,710,449**
WV Total	**0**	**510,833**	**243,582**	**267,251**
Grand Total	**605,314,959**	**70,213,079**	**62,340,105**	**8,173,863**

The detailed cost and load data for each facility with Tier 1 cost are listed in Table VIII- D. Due to the projected flow increases, many facilities listed in Table VIII- D show load increases (negative reduction values). The Tier 1 TN concentrations for these facilities are 8 mg/l.

Table VIII- D: Facilities with Tier 1 TN Capital Costs

ST	FACILITY	NPDES	T1TNCC ($)	SOURCE	2000TN (lbs/yr)	T1TN (lbs/yr)	Reduction
DE	BRIDGEVILLE	DE0020249	3,187,400	12, M	12,109	5,404	6,705
MD	APG-ABERDEEN	MD0021237	8,000,000	2, M	55,125	22,278	32,847
MD	BRUNSWICK	MD0020958	4,900,000	2, M	34,935	18,562	16,372
MD	CAMBRIDGE	MD0021636	9,934,376	2, M	112,051	124,494	-12,444
MD	CELANESE	MD0063878	5,791,500	2, M	18,422	24,754	-6,332
MD	CENTREVILLE	MD0020834	5,065,400	2, M	12,685	8,587	4,098
MD	CHESTERTOWN	MD0020010	2,600,000	2, M	17,978	15,916	2,062
MD	CONOCOCHEAGUE	MD0063509	5,555,439	2, M	21,512	29,063	-7,551
MD	COX CREEK	MD0021661	9,476,780	2, M	627,021	299,577	327,444

Table VIII- D(continued): Facilities with Tier 1 TN Capital

ST	FACILITY	NPDES	T1TNCC ($)	SOURCE	2000TN (lbs/yr)	T1TN (lbs/yr)	Reduction
MD	CRISFIELD	MD0020001	4,052,200	2, M	27,044	16,547	10,498
MD	DELMAR	MD0020532	1,030,000	2, M	24,745	14,068	10,677
MD	ELKTON	MD0020681	6,360,000	2, M	82,662	42,125	40,537
MD	FEDERALSBURG	MD0020249	1,500,000	2, M	18,117	8,020	10,097
MD	FREDERICK	MD0021610	8,816,824	2, M	485,460	189,096	296,364
MD	FRUITLAND	MD0052990	6,200,000	2, M	25,812	12,612	13,200
MD	GEORGES CREEK	MD0060071	2,000,000	2, M	36,525	16,293	20,231
MD	HAVRE DE GRACE	MD0021750	6,278,550	2, M	48,125	34,020	14,105
MD	HURLOCK	MD0022730	5,200,000	2, M	42,327	25,863	16,464
MD	INDIAN HEAD	MD0020052	656,000	2, M	13,639	8,587	5,052
MD	KENT ISLAND	MD0023485	20,742,570	2, M	87,899	39,970	47,929
MD	LA PLATA	MD0020524	4,120,970	2, M	16,705	20,084	-3,379
MD	LEONARDTOWN	MD0024767	1,840,000	2, M	18,598	11,730	6,868
MD	MATTAWOMAN	MD0021865	7,935,800	2, M	320,637	199,109	121,528
MD	NORTHEAST RIVER	MD0052027	1,800,000	2, M	23,023	15,304	7,719
MD	PATAPSCO	MD0021601	200,000,000	2, M	2,388,559	1,778,607	609,951
MD	POCOMOKE CITY	MD0022551	2,700,000	2,2	24,854	23,435	1,420
MD	POOLESVILLE	MD0023001	1,658,000	2, M	16,660	16,175	485
MD	PRINCESS ANNE	MD0020656	3,563,500	2, M	20,092	15,100	4,992
MD	SALISBURY	MD0021571	15,000,000	2, M	332,099	143,631	188,468
MD	SENECA CREEK	MD0021491	29,520,000	2, M	268,698	458,052	-189,354
MD	SNOW HILL	MD0022764	1,600,000	2, M	21,632	11,331	10,301
MD	WINEBRENNER WWTP	MD0003221	852,000	2, M	12,029	5,378	6,651
PA	CHAMBERSBURG BOROUGH	PA0026051	6,400,000	3, M	130,817	116,352	14,465
PA	EASTERN SNYDER COUNTY	PA0110582	3,000,000	10, M	70,388	39,061	31,327
PA	ELIZABETHTOWN BOROUGH	PA0023108	4,083,001	1	236,180	57,096	179,084
PA	HARRISBURG SEWERAGE	PA0027197	22,682,000	S	1,565,597	639,300	926,297
PA	LACKAWANNA RIVER BASIN	PA0027081	2,513,941	1	21,300	11,984	9,316
PA	LANCASTER AREA SEWER	PA0042269	4,249,333	S,	281,766	189,652	92,114
PA	LANCASTER CITY	PA0026743	1,077,000	3, M	531,348	504,692	26,657
PA	LEWISBURG AREA	PA0044661	3,693,297	1	83,950	29,180	54,769
PA	LOCK HAVEN	PA0025933	4,580,956	1	110,987	53,127	57,860
PA	LOGAN TOWNSHIP-GREENWOOD	PA0032557	2,444,284	1	16,952	8,916	8,035
PA	SUNBURY CITY MUNICIPAL	PA0026557	3,000,000	15, M	107,663	73,446	34,217
PA	SWATARA TOWNSHIP	PA0026735	2,000,000	13, M	190,910	81,310	109,600
PA	UNIVERSITY AREA JOINT	PA0026239	780,000	3, M	236,457	123,537	112,921
PA	WILLIAMSPORT -CENTRAL	PA0027057	6,330,000	3, M	464,040	178,235	285,805
PA	WILLIAMSPORT -WEST	PA0027049	5,246,000	3, M	414,413	64,971	349,443
VA	AQUIA	VA0060968	8,000,000	C9, M	47,259	128,888	-81,629
VA	ASHLAND	VA0024899	2,415,700	S, M	65,842	37,765	28,077
VA	BROAD RUN WRF	VA_BROADR	13,500,000	17		58,475	
VA	COLONIAL BEACH	VA0026409	90,000	3, M	32,298	20,617	11,682
VA	CULPEPER	VA0061590	4,200,000	6, M	57,077	55,312	1,765
VA	DOSWELL	VA0029521	3,045,000	6, M	100,438	164,460	-64,022
VA	FALLING CREEK	VA0024996	395,818	6, M	202,791	200,744	2,047
VA	HAYMOUNT STP	VA0089125	2,687,559	1		23,146	
VA	HRSD-YORK	VA0081311	17,700,000	C14	522,303	309,429	212,874
VA	ORANGE	VA0021385	3,066,885	1	35,684	16,847	18,836
VA	RICHMOND	VA0063177	70,000,000	6, M	1,732,937	1,169,249	563,689
VA	SOUTH CENTRAL	VA0025437	7,800,000	S	276,307	315,033	-38,726
VA	SOUTH WALES STP	VA0080527	2,622,367	1		20,856	
VA	WIDEWATER WWTP	VA0090387	2,374,508	1		2,436	
	Total						4,560,508

MD has the highest Tier 1 cost because all MD significant municipal plants reach TN@8mg/l in Tier 1, and do not have T N capital costs in Tier 2, except Back River using 10 mg/l in Tier 1 and $10 million TN capital cost in Tier 2 to go to 8 mg/l. Other states will have all their significant plants reach 8 mg/l in Tier 2. Also note that costs for Patapsco alone account for 52% of the total MD Tier 1 costs.

PA has lower TN capital costs and higher TN load reduction than MD and VA. As the following table indicates, the biggest load reduction in PA is Harrisburg that will reduce 922,000 pounds TN discharge load in Tier 1 with a TN capital cost of $22.68 million. While, the highest TN cost in MD is $200 million for Patapsco that will reduce only 603,000 pounds in Tier 1. In PA, there are 5 facilities with calculated Tier TN capital costs, 6 facilities with survey costs and 7 plants with the cost data provided by Virginia Tech's NRT cost estimates.

There are dramatic increases in the projected 2010 flows from 2000 levels for both MD and VA, which increase the Tier 1 loads and off set the load reduction. The 2010 flow survey results provided by the state agencies or directly by the facilities are significantly greater than the projected 2010 flow estimated by CBPO based on the population increase. As Table VIII- E presents, the second column lists the 2010 flow increase including the flow survey results, and the third column lists the 2010 flow estimated only with the 2010 flow projection methodology. For example, if all facilities use only the 2010 flow estimates from the flow projection methodology based on the population increase, the total 2010 flow increase for VA will only be 48.9 MGD. However, the state agencies and some facilities provided their own 2010 flow projections for some plants. By using these 2010 flow provided with the 2010 flow estimates for the remaining plants, VA will increase the total flow by 130 MGD by 2010. The difference of 82 MGD represent nearly additional 2 million pounds TN discharge load at TN=8 mg/l. Blue Plains provided a flow slightly lower than the result of its 2000 flow adjusted by the population increase in DC area. And, other states including PA did not provide any their own 2010 flow projections. Therefore, the load reductions in Tier 1 for MD and VA are largely off set by the flow increases that are proportionally higher than other states.

Table VIII- E: Total Flow Increases Between 2010 and 2000 by State

STATE	FLOW INCREASES (mgd) 2010 FLOW-2000 FLOW (Including survey results)	FLOW INCREASES (mgd) 2010 FLOW-2000 FLOW (only estimates)
VA	116.47	48.90
MD	52.50	22.25
DC	23.81	24.36
PA	9.86	9.86
NY	0.72	0.72
DE	0.19	0.19
WV	-1.68	-1.68

The following table lists the top ten facilities with the highest flow increases. All of them are using 2010 flow submitted, not calculated.

Table VIII- F: Top Ten Facilities With The Highest Flow Increases.

STATE	FACILITY	2000	2010
DC	BLUE PLAINS	317.90	341.71
VA	HOPEWELL	29.01	35.12
VA	HENRICO COUNTY	37.10	50
MD	PATAPSCO	60.54	73
MD	SENECA CREEK	6.49	18.8
VA	NOMAN M. COLE JR.	42.89	53
VA	UPPER OCCOQUAN	24.39	34
VA	HRSD-BOAT HARBOR	14.32	23.05
VA	ARLINGTON	27.46	35.29
VA	HRSD-CHESAPEAKE	19.06	26.3

8.3 Tier Two Costs:

There is no cost for MD in Tier 2, except for Back River that has $10 million TN capital cost to go from TN =10 mg/l to 8 mg/l. For other jurisdictions, most of their Tier 2 TN capital costs were calculated with the Tier 2 TN capital cost methodology developed by Stearns & Wheler, LLC. The following facilities listed in Table VIII- G use the costs provided by the state agencies or from the cost surveys provided by the facilities.

Table VIII- G: Facilities with Tier 2 TN Capital Costs from sources other than calculation

STATE	FACILITY	NPDES	T2TNCC	T2TN_SOURCE
DC	BLUE PLAINS	DC0021199	33,000,000	14
MD	BACK RIVER	MD0021555	10,000,000	19
NY	ENDICOTT (V)	NY0027669	6,656,000	7
PA	ALTOONA CITY -EAST	PA0027014	1,200,000	3
PA	ALTOONA CITY -WEST	PA0027022	1,200,000	3
PA	DERRY TOWNSHIP	PA0026484	1,983,000	2
PA	GREATER HAZELTON	PA0026921	7,840,000	3
PA	HANOVER BOROUGH	PA0026875	60,000	3
PA	LEBANON CITY AUTHORITY	PA0027316	4,039,000	3
VA	DAHLGREN	VA0026514	30,000	3
VA	FISHERSVILLE	VA0025291	790,000	3
VA	FRONT ROYAL	VA0062812	50,000	3
VA	HOPEWELL	VA0066630	57,230,000	16
VA	HRSD-ARMY BASE	VA0081230	81,000,000	C14, C15
VA	HRSD-BOAT HARBOR	VA0081256	112,000,000	C14, C15
VA	HRSD-CHESAPEAKE	VA0081264	35,000,000	C14
VA	HRSD-JAMES RIVER	VA0081272	27,300,000	C14
VA	HRSD-NANSEMOND	VA0081299	13,100,000	C14
VA	HRSD-VIP	VA0081281	10,000,000	C14
VA	HRSD-WILLIAMSBURG	VA0081302	15,800,000	C14
VA	LURAY	VA0062642	0	3
VA	LYNCHBURG	VA0024970	54,900,000	C6
VA	PARKINS MILL	VA0075191	97,000	3
VA	STRASBURG	VA0020311	120,000	3
VA	WAYNESBORO	VA0025151	3,500,000	3
VA	WOODSTOCK	VA0026468	700,000	3

Table VIII-H provides a summary of the Tier 2 TN capital costs and the load reduction by state.

Table VIII- H: **Tier 2 TN capital costs and the load reduction by state**

STATE	Tier 2 TN Capital Cost($)	Tier 2 Cumulative Capital Cost ($)	TN Load Reduction (2000-Tier2) (lbs/yr)
DC Total	**33,000,000**	**33,000,000**	**920,847**
DE Total	**2,374,508**	**5,561,908**	**8,129**
MD Total	**10,000,000**	**394,749,909**	**1,454,723**
NY Total	**61,874,054**	**61,874,054**	**2,652,253**
PA Total	**277,865,025**	**349,944,837**	**5,294,979**
VA Total	**406,238,704**	**626,459,541**	**8,190,984**
WV Total	**23,193,004**	**23,193,004**	**42,904**
Grand Total	**804,545,294**	**1,484,783,253**	**18,564,819**

8.4 Tier 3 and Tier 4 TN Capital Costs:

The methodology described in Section IV to estimate the Tier 3 and Tier 4 TN capital costs were developed for plant sizes of 0.5 to 30 MGD. Additionally, the NRT Cost Task Force meeting on March 26, 2002 decided to survey the costs for plants greater than or equal to 30 MGD in design (Attachment 1, Part 1, Appendix I). There are a total of 16 facilities listed below with design flows of this size. Costs on 9 of these 16 plants came either from the survey or Virginia Tech's NRT cost estimates. MDE decided to use the methodology described in Section IV to calculate the costs for Back River and Patapsco (Attachment 1, Part 1, Appendix I). The same methodologies were used for the remaining 5 plants to calculate their costs due to the lack of survey data for them.

Table VIII- I: Municipal Facilities with Design Flow >30 MGD

FACILITY	NPDES	DESIGN_FLOW	T3-4 TN CC Source
BLUE PLAINS	DC0021199	370	SURVEY
PISCATAWAY	MD0021539	30	CALCULATED
BACK RIVER	MD0021555	180	CALCULATED
PATAPSCO	MD0021601	73	CALCULATED
WESTERN BRANCH	MD0021741	30	SURVEY
WYOMING VALLEY	PA0026107	50	SURVEY
HARRISBURG SEWERAGE	PA0027197	37.7	SURVEY
UPPER OCCOQUAN SEWAGE	VA0024988	54	CALCULATED
ARLINGTON	VA0025143	40	CALCULATED
ALEXANDRIA	VA0025160	54	SURVEY
NOMAN M. COLE JR.	VA0025364	67	SURVEY
RICHMOND	VA0063177	70	SURVEY
HENRICO COUNTY	VA0063690	75	SURVEY
HOPEWELL	VA0066630	35.12	SURVEY
HRSD-VIP	VA0081281	40	CALCULATED
HRSD-NANSEMOND	VA0081299	30	CALCULATED

In addition to the cost data obtained for the larger facilities described above, cost data was provided for many facilities to go to 3 mg/l TN. In most cases, the sources of this data did not include costs to go to 5 mg/l. Thus, a dilemma arose as to what costs to include for Tier 3 (to go to 5 mg/l) for facilities for which cost data was available only to go to 8 and 3 mg/l TN. Some options considered by the NRT Cost Task Force included the following:

1) Taking the midpoint of costs to go to 8 mg/l and 3 mg/l, and placing that value both in Tier 3 and Tier 4 so that the cumulative costs still equaled the costs to go to 8 and 3 mg/l combined.

2) Inserting the costs of going to 3 mg/l into the Tier 3 (even though this is the tier to go to 5 mg/l), and setting the costs to go to Tier 4 to zero, again, keeping the cumulative costs equal to the costs to go to 8 and 3 mg/l combined.

Attachment 2 in Part 1 of Appendix I indicates that Option 2 above was implemented because that would keep the cost values in tact that were provided by the various sources. Additionally, it was believed that a facility would most likely expend the amount provided to go to 3 mg/l whether it achieved 5 or 3 mg/l TN anyway.

An exception to the above decision rule is that MDE decided to use calculated estimates for Tier 3 and Tier 4 for all MD facilities (Attachment 3, Appendix I, Part 1)), except for Western Branch that has zero costs for both Tier 3 and Tier 4 because it is already operating @ TN =3mg/l (Attachment 1, Appendix I, Part 1).

Since the actual data for TN@3 costs provided are comparatively lower than the combined calculated Tier 3 and Tier 4 costs, MD Tier 3 and Tier 4 TN capital costs are comparatively higher than other states.

Table VIII-J and Table VIII-K provide summary cost information for Tier 3 and Tier 4 respectively and compare this to TN load reductions achieved by each Tier.

Table VIII- J: Tier 3 TN capital costs and the load reduction by state

STATE	T3TNCC ($)	T3 Cumulative CC ($)	TN Load Reduction (2000-Tier3) (lbs/yr)
DC Total	**225,000,000**	**258,000,000**	**3,522,593**
DE Total	**3,182,908**	**8,744,816**	**24,712**
MD Total	**253,226,556**	**647,976,465**	**5,089,163**
NY Total	**40,600,618**	**102,474,671**	**3,252,379**
PA Total	**319,811,406**	**669,756,244**	**8,048,336**
VA Total	**338,254,142**	**964,713,683**	**14,027,696**
WV Total	**10,971,658**	**34,164,662**	**107,054**
Grand Total	**1,191,047,288**	**2,685,830,541**	**34,071,932**

Table VIII- K: Tier 4 TN capital costs and the load reduction by state

STATE	T4TNCC ($)	T4 Cumulative CC ($)	TN Load Reduction (2000-Tier4) (lbs/yr)
DC Total	**365,000,000**	**623,000,000**	**5,603,990**
DE Total	**4,152,080**	**12,896,896**	**35,766**
MD Total	**491,117,129**	**1,139,093,595**	**7,512,123**
NY Total	**71,577,888**	**174,052,559**	**3,652,463**
PA Total	**241,323,231**	**911,079,475**	**9,883,907**
VA Total	**499,539,463**	**1,464,253,146**	**18,082,178**
WV Total	**15,792,986**	**49,957,647**	**149,821**
Grand Total	**1,688,502,777**	**4,374,333,318**	**44,920,247**

The following two charts present the cumulative TN capital costs ($million) and the TN discharged load reduction from 2000 level by each state for each tier. Blue Plains costs and load reductions were allocated among jurisdictions.

Figure VIII-A: Cumulative TN Capital Costs ($million)

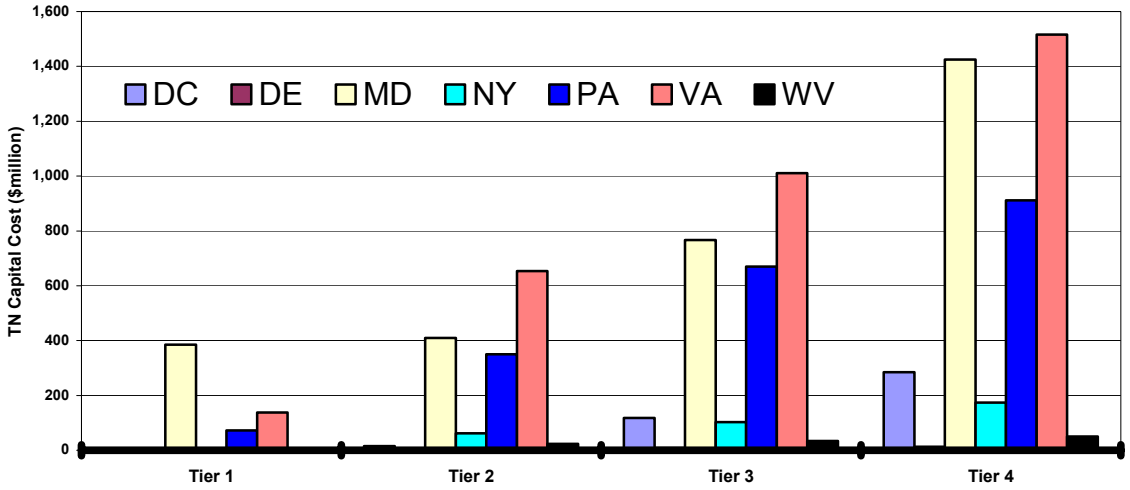
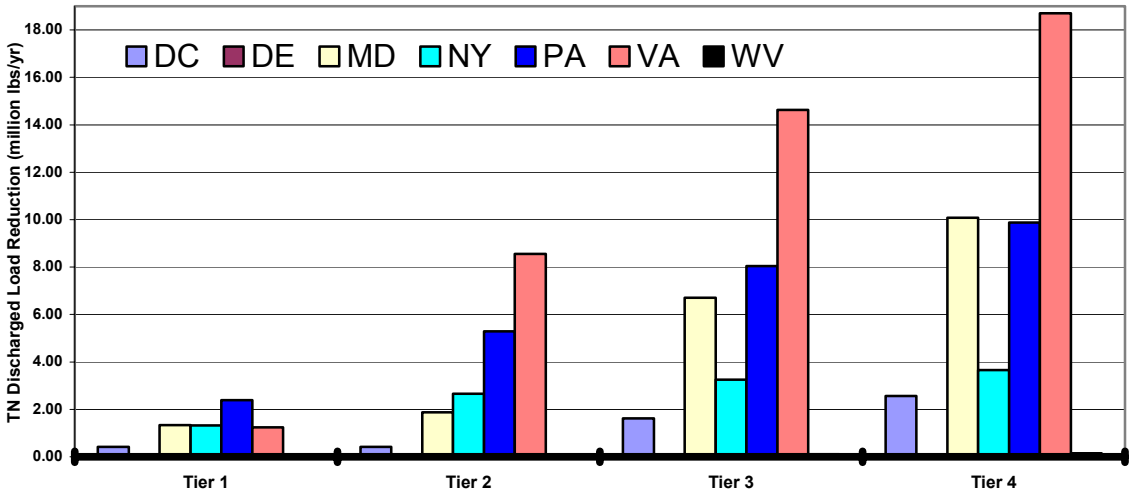


Figure VIII-B: TN Discharged Load Reduction From 2000 Level



IX. LOAD CALCULATION DESCRIPTION AND SUMMARY

This section presents the decision rules for, and results of, estimating TN and TP load reduction estimates by facility by Tier.

9.1 Load Calculation For Significant Municipal Facilities

9.1.1 Tier Definition for Point Sources

The Tier definition was reviewed and discussed by the point source workgroup and the NRT Cost Task Force members, and approved by the workgroup meeting. All concentrations are in mg/l as annual averages. A series of attachments that are referenced in this section are included in Appendix I, Part 2.

9.1.1.1 Tier 1: TN is set to 8 mg/l for all plants currently running NRT or with NRT plans, except following three plants. The rest of facilities use their 2000 TN concentrations.

Blue Plains DC0021199 TN = 7.5 mg/l
Back River MD0021555 TN= 10 mg/l
Hopewell VA0066630 TN =21 mg/l (Attachment 1 – Part 2, Appendix I)

All significant municipal facilities use their 2000 TP concentrations, except VA facilities targeted by VADEQ either under the WQIF Grant program and/or the Tributary Strategy Plan for Lower River Tributaries. For these VA facilities, TP = 1.5 mg/l.

The load reductions listed in the Tables in this section reflecting implementation of NRT to TN = 8 mg/l occur in Tier 1 for the HRSD Nansemond and VIP facilities. However, HRSD requested, after the watershed model runs were conducted, that these load reductions should first appear in Tier 2. Because the model runs were already completed, these load reduction remain in Tier 1, but costs do not show up until Tier 2. Cumulative loads remain the same, as additional load reductions do not show up in Tier 2.

9.1.1.2 Tier 2: TN is set to 8 mg/l for all significant municipal facilities, except Blue Plains, which uses TN = 7.5 mg/l
For TP, all significant municipals use TP = 1mg/l or their lower limits.

9.1.1.3 Tier 3: TN = 5 mg/l for all significant municipal facilities;
TP = 0.5mg/l or lower limit for all significant municipal facilities

9.1.1.4 Tier 4: TN = 3 mg/l for all significant municipal facilities;
TP = 0.1mg/l for all significant municipal facilities

9.1.2 2010 Flow Projection

For most significant municipal facilities, their 2010 flows were projected based on the 2000 flows adjusted by the population increase factors (this factor is set to 1 where population decreases). A population increase factor is based on the US Census estimated population changes between 2010 and 2000 in the county where the facility located. However, actual site specific estimates were obtained for many facilities either from state agencies, facility contacts or the survey. Facilities for which actual 2010 estimated flows were obtained are listed in Table IX-A.

Table IX-A also lists the attachment # (Attachment 2-10 in Appendix I, Part 2) as the sources of these flow data. VADEQ suggested using the design flow or estimated flow for the six VA facilities to be built before 2010. TIMBERVILLE and MOOREFIELD will be off-line by 2010 according to VADEQ and WVDEP.

Table IX-A: Projected 2010 Flows Provided by the State Agency or Facility

			FLOW (MGD)			SOURCE
STA	FACILITY	NPDES	DESIGN	2000	2010	Attachment # App.I, part 2
DC	BLUE PLAINS	DC0021199	370	317.899	341.71	7
MD	DAMASCUS	MD0020982	1.5	0.881	0.86	7
MD	PARKWAY	MD0021725	7.5	5.962	6.2	7
MD	PATAPSCO	MD0021601	73	60.536	73	10
MD	PISCATAWAY	MD0021539	30	21.052	25.3	7
MD	SENECA CREEK	MD0021491	5	6.494	18.8	7
MD	WESTERN BRANCH	MD0021741	30	18.293	23	7
VA	ALLEGHANY CO. LOWER JACKSON	VA0090671	1.5		0.75	VADEQ
VA	AQUIA	VA0060968	6.5	3.326	5.29	8
VA	ARLINGTON	VA0025143	40	27.464	35.29	7
VA	ASHLAND	VA0024899	2	1.153	1.55	4
VA	BROAD RUN WRF	VA_BROADR	15		2.4	3
VA	BROADWAY LAGOONS	VA0021245	0.322	0.521	0	VADEQ
VA	DOSWELL	VA0029521	1	4.135	6.75	4
VA	FISHERSVILLE	VA0025291	2	0.798	1.71	8
VA	H.L. MOONEY	VA0025101	18	9.632	14.63	5
VA	HARRISONBURG-ROCKINGHAM	VA0060640	16	8.571	11.65	8
VA	HAYMOUNT STP	VA0089125	0.95		0.95	VADEQ
VA	HENRICO COUNTY	VA0063690	75	37.096	50	6
VA	HOPEWELL	VA0066630	50	29.007	35.12	2
VA	HRSD-ARMY BASE	VA0081230	18	12.749	17.45	8
VA	HRSD-BOAT HARBOR	VA0081256	25	14.318	23.05	8
VA	HRSD-CHESAPEAKE/ELIZABETH	VA0081264	24	19.056	26.3	8
VA	HRSD-JAMES RIVER	VA0081272	20	14.467	20	8
VA	HRSD-NANSEMOND	VA0081299	30	18.948	20.15	8/VADEQ
VA	HRSD-VIP	VA0081281	40	31.535	35.9	8
VA	HRSD-WILLIAMSBURG	VA0081302	22.5	15.344	15.9	8/VADEQ
VA	HRSD-YORK	VA0081311	15	11.329	12.7	8
VA	LITTLE FALLS RUN	VA0076392	4	2.618	4.16	8
VA	LYNCHBURG	VA0024970	22	13.216	17.4	8
VA	MATHEWS COURTHOUSE	VA0028819	0.1	0.047	0.08	8
VA	MIDDLE RIVER	VA0064793	6.8	3.597	5.65	8
VA	MOORES CREEK-RIVANNA	VA0025518	15	10.343	11.888	9
VA	NOMAN M. COLE JR.	VA0025364	67	42.889	53	8
VA	SOUTH CENTRAL	VA0025437	23	12.035	12.93	8
VA	SOUTH WALES STP	VA0080527	0.856		0.856	VADEQ
VA	STUARTS DRAFT	VA0066877	1.4	0.836	1.5	8
VA	TIMBERVILLE	VA0027111	0.2	0.198	0	VADEQ
VA	TOTOPOTOMOY	VA0089915	5		5	VADEQ
VA	UPPER OCCOQUAN SEWAGE	VA0024988	54	24.391	34	8
VA	URBANNA	VA0026263	0.1	0.056	0.113	8
VA	WEST POINT	VA0075434	0.6	0.623	0.6	8/VADEQ
VA	WEYERS CAVE STP	VA0022349	0.5	0.116	0.4	8
VA	WIDEWATER WWTP	VA0090387	0.5		0.1	VADEQ
WV	MOOREFIELD	WV0020150	0.6	0.315	0	WVDEP

9.1.3 Load calculation

The TN and TP loads for each Tier were calculated with the projected 2010 flows and the concentrations defined above for individual facility for each Tier. The following load calculation formula was used to calculate the TN and TP annual discharge loads.

Annual Discharge Load = Concentration X Flow X 8.344 X 365

9.2 Load Calculation For non-significant Municipal Facilities

9.2.1 Tier definition for non-significant municipal facilities:

There is no action for Tier 1-3 for non-significant facilities, the current 2000 TN and TP concentrations are used for Tier 1-3. NRT is applied to Tier 4 for all non-significant facilities.

Tier 1 – 3: Current 2000 TN and TP were used.

Tier 4: TN is set to 8 mg/l for all non-significant facilities.
TP is set to 2 mg/l or lower 2000 concentrations.

9.2.2 Projected 2010 flow:

For all non-significant municipal facilities**,** their 2010 flows were projected based on the 2000 flows with population increase factors (this factor is set to 1 where population decreases).

9.2.3 Load calculation:

The same formula as used for calculating loads of significant plants was used.

Annual Discharge Load = Concentration X Flow X 8.344 X 365

9.3 Load Calculation for Industrial Plants and CSO

a) Load calculations for industrial facilities were performed individually for each facility by tier and described in Section V.

b) CSO Load Calculation

Only DC CSO is included in this analysis. Based on the scenarios provided by MWCOG, there will be 43% CSO flow reduction from 2000 level for Tier 1-3, and a zero CSO discharge for Tier 4.

Tier 1-3: Since there is no treatment change involved in CSO load reduction scenarios, current default TN concentration of 7.02 mg/l and TP of 2 mg/l were used to calculate the loads.

TN = 7.02 mg/l
TP = 2 mg/l

Flow: Current default flow of 7.61 MGD was used as the base flow.

Flow = 7.61 MGD X (1-43%) = 4.3377 MGD

Tier 4: Due to zero discharge, its flow should be zero.

The discharge loads of DC CSO for each Tier are calculated with the same formula:

Annual Discharge Load = Concentration X Flow X 8.344 X 365

9.4 Blue Plains Load Allocation Among DC, MD and VA

The Blue Plains facility treats wastewater from Maryland, Virginia, as well as the District of Columbia. The loads for the Blue Plains facility are therefore proportional to each jurisdiction according to the flows being treated from each of the three jurisdictions. The flow allocation data were provided by Metropolitan Washington Council of Government(MWCOG) (Attachment 11, part 2, Appendix I)

9.5 Load Summary

Loads are summarized in the following tables by watershed basin, by state and by facility type.

Table IX-A provides discharged nitrogen loads for all facilities by basin by tier.

Table IX-B provides discharged nitrogen loads for all facilities by state by tier.

Table IX-C summarizes discharged nitrogen loads by point source type by tier for the entire Bay watershed.

Table IX-D provides discharged phosphorus loads for all facilities by basin by tier.

Table IX-E provides discharged phosphorus loads for all facilities by state by tier.

Table IX-F summarizes discharged phosphorus loads by point source type by tier for the entire Bay watershed.

Table IX-G details discharged nitrogen loads for all facilities by tier sorted by basin.

Table IX-H details discharged phosphorus loads for all facilities by tier sorted by basin.

Total Nitrogen Discharged Load Summary

TABLE IX-A: NRT TIER TN LOAD (lbs/yr) SUMMARY BY BASIN

CBP_BASIN	2000	T1	T2	T3	T4
SUSQUEHANNA RIVER	18,406,790	14,667,032	10,009,752	6,486,420	3,767,236
MD EASTERN SHORE	1,399,635	1,053,234	1,039,402	807,596	561,581
MD WESTERN SHORE	9,200,882	7,813,372	7,279,015	5,360,611	2,811,084
PATUXENT RIVER	1,105,479	1,642,075	1,633,176	1,032,757	626,068
POTOMAC RIVER	23,815,593	18,694,524	17,106,000	11,234,067	6,671,469
RAPPAHANNOCK RIVER	593,711	603,585	541,832	338,645	203,187
VA EASTERN SHORE	279,936	216,057	192,246	79,270	13,523
YORK RIVER	1,230,918	1,178,066	1,286,798	866,577	586,430
JAMES RIVER	15,030,654	17,175,126	11,015,416	7,303,871	4,729,907
TOTAL	71,063,596	63,043,070	50,103,636	33,509,813	19,970,486

TABLE IX-B: NRT TIER TN LOAD (lbs/yr) SUMMARY BY STATE *

STATE	2000	T1	T2	T3	T4
DC	4,451,433	3,648,026	3,648,026	2,456,848	1,429,413
DE	287,487	292,404	278,572	261,990	250,935
MD	18,090,836	16,743,186	16,125,597	11,251,832	6,294,866
NY	4,264,240	2,931,661	1,600,336	1,000,210	600,126
PA	14,365,430	11,941,871	8,638,350	5,629,036	3,252,912
VA	29,078,389	27,228,746	19,615,040	12,784,164	8,069,366
WV	525,782	257,177	197,716	125,733	72,868
TOTAL	71,063,596	63,043,070	50,103,636	33,509,813	19,970,486

NOTE: * Blue Plains load was allocated among DC, MD and VA according to the flow allocation provided by MWCOG for UAA. (Attachment 11, Part 2, Appendix I)

TABLE IX-C:NRT TIER TN LOAD (lbs/yr) SUMMARY BY FACILITY TYPE

FACILITY TYPE	2000	T1	T2	T3	T4
SIGNIFICANT MUNICIPAL	61,280,775	54,706,871	42,541,943	26,913,933	16,148,360
INDUSTRIAL	9,124,668	7,633,234	6,858,729	5,892,916	3,534,150
NON-SIG MUNICIPAL	495,001	540,258	540,258	540,258	287,977
CSO	163,152	162,706	162,706	162,706	0
Total	71,063,596	63,043,070	50,103,636	33,509,813	19,970,486

Total Phosphorus Discharged Load Summary

TABLE IX-D: NRT TIER TP LOAD (lbs/yr) SUMMARY BY BASIN

CBP_BASIN	2000	T1	T2	T3	T4
SUSQUEHANNA RIVER	1,934,145	1,969,969	1,168,012	597,230	127,191
MD EASTERN SHORE	201,875	214,324	120,721	83,030	38,713
MD WESTERN SHORE	395,719	435,606	510,996	326,904	96,185
PATUXENT RIVER	102,930	118,710	187,940	103,579	23,190
POTOMAC RIVER	1,202,995	1,322,949	845,869	645,156	251,482
RAPPAHANNOCK RIVER	55,802	96,615	67,729	33,864	6,773
VA EASTERN SHORE	49,358	49,235	7,698	7,039	451
YORK RIVER	189,324	222,313	162,071	92,034	32,514
JAMES RIVER	1,513,003	2,031,025	1,369,910	686,350	172,121
TOTAL	5,645,151	6,460,745	4,440,946	2,575,186	748,618

TABLE IX-E: NRT TIER TP LOAD (lbs/yr) SUMMARY BY STATE *

STATE	2000	T1	T2	T3	T4
DC	75,302	72,410	106,987	106,987	47,647
DE	23,839	24,945	19,353	16,590	12,075
MD	1,112,786	1,277,022	1,187,063	794,830	258,611
NY	492,059	495,602	199,551	100,021	20,004
PA	1,508,017	1,542,890	997,049	511,445	109,980
VA	2,326,890	2,985,836	1,906,411	1,031,954	296,609
WV	106,259	62,039	24,532	13,359	3,692
TOTAL	5,645,151	6,460,745	4,440,946	2,575,186	748,618

NOTE: * Blue Plains load was allocated among DC, MD and VA according to the flow allocation provided by MWCOG for UAA. (Attachment 11 Part 2, Appendix I)

TABLE IX-F:NRT TIER TP LOAD (lbs/yr) SUMMARY BY FACILITY TYPE

FACILITY TYPE	2000	T1	T2	T3	T4
SIGNIFICANT MUNICIPAL	4,399,028	5,257,902	3,689,397	2,048,414	538,279
INDUSTRIAL	1,124,824	1,074,316	623,023	398,245	154,120
NON-SIG MUNICIPAL	74,820	82,174	82,174	82,174	56,219
CSO	46,480	46,353	46,353	46,353	0
Total	5,645,151	6,460,745	4,440,946	2,575,186	748,618

TABLE IX-G: Discharged Nitrogen Loads (lbs/yr) for All Point Sources Sorted by Basin

BASIN	FACILITY	NPDES	2000	Tier 1	Tier 2	Tier 3	Tier 4
SUSQUEHANNA RIVE	CAMP SHADOWBROO	MD0053139	25	27	27	27	12
SUSQUEHANNA RIVE	NORTH HARFORD JR&	MD0023281	608	660	660	660	293
SUSQUEHANNA RIVE	PERRYVILLE	MD0020613	10,781	22,845	22,845	14,278	8,567
SUSQUEHANNA RIVE	ADDISON (V)	NY0020320	12,501	12,696	5,728	3,580	2,148
SUSQUEHANNA RIVE	BATH (V)	NY0021431	40,101	40,726	18,499	11,562	6,937
SUSQUEHANNA RIVE	BINGHAMTON-JOHNS(	NY0024414	1,573,153	475,933	475,933	297,458	178,475
SUSQUEHANNA RIVE	COOPERSTOWN	NY0023591	36,932	37,365	15,774	9,859	5,915
SUSQUEHANNA RIVE	CORNING (C)	NY0025721	76,923	78,122	31,612	19,758	11,855
SUSQUEHANNA RIVE	CORTLAND (C)	NY0027561	435,680	207,633	207,633	129,771	77,862
SUSQUEHANNA RIVE	ELMIRA / CHEMUNG C	NY0035742	326,789	328,422	175,159	109,474	65,684
SUSQUEHANNA RIVE	ENDICOTT (V)	NY0027669	542,979	541,495	184,577	115,361	69,216
SUSQUEHANNA RIVE	HAMILTON (V)	NY0020672	38,419	40,050	10,939	6,837	4,102
SUSQUEHANNA RIVE	HORNELL (C)	NY0023647	142,082	144,296	73,340	45,837	27,502
SUSQUEHANNA RIVE	LAKE STREET/CHEMU	NY0036986	424,417	426,538	173,390	108,368	65,021
SUSQUEHANNA RIVE	NORWICH	NY0021423	235,765	245,097	65,272	40,795	24,477
SUSQUEHANNA RIVE	ONEONTA (C)	NY0031151	160,806	162,692	73,269	45,793	27,476
SUSQUEHANNA RIVE	OWEGO #2	NY0025798	52,773	25,363	25,363	15,852	9,511
SUSQUEHANNA RIVE	OWEGO (V)	NY0029262	29,249	29,287	15,194	9,496	5,698
SUSQUEHANNA RIVE	RICHFIELD SPRINGS (	NY0031411	16,082	16,271	7,851	4,907	2,944
SUSQUEHANNA RIVE	SIDNEY (V)	NY0029271	34,527	34,501	16,204	10,128	6,077
SUSQUEHANNA RIVE	WAVERLY (V)	NY0031089	85,062	85,173	24,599	15,374	9,224
SUSQUEHANNA RIVE	ALTOONA CITY AUTHO	PA0027014	252,759	259,659	146,803	91,752	55,051
SUSQUEHANNA RIVE	ALTOONA CITY AUTHO	PA0027022	311,339	319,838	152,304	95,190	57,114
SUSQUEHANNA RIVE	ANNVILLE TOWNSHIP	PA0021806	42,767	43,758	11,577	7,235	4,341
SUSQUEHANNA RIVE	APPLETON PAPER SP	PA0008265	55,010	54,860	54,860	54,860	39,467
SUSQUEHANNA RIVE	ASHLAND MUNICIPAL	PA0023558	19,315	19,262	17,606	11,004	6,602
SUSQUEHANNA RIVE	BEDFORD BOROUGH	PA0022209	38,930	40,404	23,837	14,898	8,939
SUSQUEHANNA RIVE	BELLEFONTE BOROU(	PA0020486	95,751	101,301	50,545	31,591	18,954
SUSQUEHANNA RIVE	BERWICK MUNICIPAL	PA0023248	103,889	104,035	36,205	22,628	13,577
SUSQUEHANNA RIVE	BLOOMSBURG MUNIC	PA0027171	77,109	77,217	64,843	40,527	24,316
SUSQUEHANNA RIVE	BLOSSBURG	PA0020036	6,761	7,018	5,071	3,170	1,902
SUSQUEHANNA RIVE	BROWN TOWNSHIP M	PA0028088	27,149	28,178	8,216	5,135	3,081
SUSQUEHANNA RIVE	BURNHAM BOROUGH	PA0038920	15,694	16,289	14,479	9,049	5,430
SUSQUEHANNA RIVE	CARLISLE BOROUGH	PA0026077	198,197	208,323	83,959	52,474	31,485
SUSQUEHANNA RIVE	CARLISLE SUBURBAN	PA0024384	22,575	17,148	17,148	10,718	6,431
SUSQUEHANNA RIVE	CHLOE TEXTILES INC.	PA0009172	6,760	6,742	6,596	4,122	2,473
SUSQUEHANNA RIVE	CLARKS SUMMIT-SOU	PA0028576	118,078	117,755	55,460	34,662	20,797
SUSQUEHANNA RIVE	CLEARFIELD	PA0026310	88,457	88,215	63,939	39,962	23,977
SUSQUEHANNA RIVE	COLUMBIA	PA0026123	40,435	43,988	20,110	12,569	7,541
SUSQUEHANNA RIVE	CONSOLIDATED RAIL	PA0009229	1,400	1,397	1,397	1,397	1,397
SUSQUEHANNA RIVE	CURWENSVILLE MUNI	PA0024759	20,051	19,996	10,901	6,813	4,088
SUSQUEHANNA RIVE	DANVILLE MUNICIPAL	PA0023531	58,057	58,739	52,407	32,754	19,653
SUSQUEHANNA RIVE	DERRY TOWNSHIP MU	PA0026484	155,620	156,293	84,660	52,912	31,747
SUSQUEHANNA RIVE	DILLSBURG BOROUGH	PA0024431	21,139	22,191	16,037	10,023	6,014
SUSQUEHANNA RIVE	DOVER TOWNSHIP SE	PA0020826	80,927	90,258	90,258	56,411	33,847
SUSQUEHANNA RIVE	DUNCANSVILLE	PA0032883	37,334	38,353	14,851	9,282	5,569
SUSQUEHANNA RIVE	EAST PENNSBORO SC	PA0038415	122,458	128,714	59,071	36,919	22,152
SUSQUEHANNA RIVE	EASTERN SNYDER CC	PA0110582	70,388	39,061	39,061	24,413	14,648
SUSQUEHANNA RIVE	ELIZABETHTOWN BOR	PA0023108	236,180	57,096	57,096	35,685	21,411
SUSQUEHANNA RIVE	ELKLAND MUNICIPAL	PA0113298	29,113	30,216	10,592	6,620	3,972

TABLE IX-G: Discharged Nitrogen Loads (lbs/yr) for All Point Sources Sorted by Basin

BASIN	FACILITY	NPDES	2000	Tier 1	Tier 2	Tier 3	Tier 4
SUSQUEHANNA RIVE	EMPIRE KOSHER POU	PA0007552	30,185	30,103	28,454	17,784	10,670
SUSQUEHANNA RIVE	EMPORIUM BOROUGH	PA0028631	9,524	10,076	11,725	7,328	4,397
SUSQUEHANNA RIVE	EPHRATA BOROUGH \	PA0027405	15,376	16,727	67,664	42,290	25,374
SUSQUEHANNA RIVE	FAIRVIEW TOWNSHIP	PA0081868	12,839	13,478	9,740	6,088	3,653
SUSQUEHANNA RIVE	FAIRVIEW TOWNSHIP	PA0082589					
SUSQUEHANNA RIVE	GOLD MILLS DYEHOU	PA0008231	17,543	17,495	16,662	10,414	6,248
SUSQUEHANNA RIVE	GREATER HAZELTON	PA0026921	211,384	210,807	162,785	101,741	61,044
SUSQUEHANNA RIVE	GREGG TOWNSHIP	PA0114821	12,604	16,195	16,195	10,122	6,073
SUSQUEHANNA RIVE	HAMPDEN TOWNSHIP	PA0028746	54,008	31,565	31,565	19,728	11,837
SUSQUEHANNA RIVE	HAMPDEN TOWNSHIP	PA0080314	54,524	57,310	49,035	30,647	18,388
SUSQUEHANNA RIVE	HANOVER BOROUGH	PA0026875	255,711	277,726	93,616	58,510	35,106
SUSQUEHANNA RIVE	HARRISBURG SEWER	PA0027197	1,565,597	639,300	639,300	399,563	239,738
SUSQUEHANNA RIVE	HEINZ PET FOODS	PA0009270	66,088	65,907	7,234	7,234	4,739
SUSQUEHANNA RIVE	HIGHSPIRE	PA0024040	47,583	47,788	25,534	15,959	9,575
SUSQUEHANNA RIVE	HOLLIDAYSBURG REG	PA0043273	60,176	61,818	72,489	45,306	27,183
SUSQUEHANNA RIVE	HOUTZDALE BOROUG	PA0046159	2,557	2,960	2,960	1,850	1,110
SUSQUEHANNA RIVE	HUNTINGDON BOROU	PA0026191	70,434	71,939	51,989	32,493	19,496
SUSQUEHANNA RIVE	JERSEY SHORE BORC	PA0028665	44,325	46,038	17,476	10,922	6,553
SUSQUEHANNA RIVE	KELLY TOWNSHIP MU	PA0028681	11,527	44,367	44,367	27,729	16,637
SUSQUEHANNA RIVE	LACKAWANNA RIVER	PA0027081	21,300	11,984	11,984	7,490	4,494
SUSQUEHANNA RIVE	LACKAWANNA RIVER	PA0027090	205,831	205,268	124,831	78,019	46,812
SUSQUEHANNA RIVE	LACKAWANNA RIVER	PA0027073	29,313	29,232	8,322	5,202	3,121
SUSQUEHANNA RIVE	LACKAWANNA RIVER	PA0027065	68,252	68,066	59,620	37,262	22,357
SUSQUEHANNA RIVE	LANCASTER AREA SE	PA0042269	281,766	189,652	189,652	118,532	71,119
SUSQUEHANNA RIVE	LANCASTER CITY	PA0026743	531,348	504,692	504,692	315,432	189,259
SUSQUEHANNA RIVE	LEBANON CITY AUTH	PA0027316	551,304	564,084	134,093	83,808	50,285
SUSQUEHANNA RIVE	LEMOYNE BOROUGH	PA0026441	115,152	115,650	40,446	25,279	15,167
SUSQUEHANNA RIVE	LEWISBURG AREA JO	PA0044661	83,950	29,180	29,180	18,238	10,943
SUSQUEHANNA RIVE	LEWISTOWN BOROUG	PA0026280	77,838	80,788	46,165	28,853	17,312
SUSQUEHANNA RIVE	LITITZ SEWAGE AUTH	PA0020320	194,758	211,872	73,694	46,059	27,635
SUSQUEHANNA RIVE	LOCK HAVEN	PA0025933	110,987	53,127	53,127	33,204	19,923
SUSQUEHANNA RIVE	LOGAN TOWNSHIP-GF	PA0032557	16,952	8,916	8,916	5,573	3,344
SUSQUEHANNA RIVE	LOWER ALLEN TOWN	PA0027189	134,376	141,241	82,930	51,831	31,099
SUSQUEHANNA RIVE	LOWER LACKAWANNA	PA0026361	187,419	186,907	85,269	53,293	31,976
SUSQUEHANNA RIVE	LYKENS BOROUGH	PA0043575	8,114	8,149	5,889	3,681	2,208
SUSQUEHANNA RIVE	MAHANOY CITY	PA0070041	14,164	13,928	13,928	8,705	5,223
SUSQUEHANNA RIVE	MANHEIM BOROUGH A	PA0020893	19,614	21,337	19,354	12,096	7,258
SUSQUEHANNA RIVE	MANSFIELD BOROUGH	PA0021814	17,740	18,413	14,029	8,768	5,261
SUSQUEHANNA RIVE	MARIETTA-DONEGAL	PA0021717	13,979	15,207	10,990	6,869	4,121
SUSQUEHANNA RIVE	MARTINSBURG	PA0028347	13,413	13,779	9,958	6,224	3,734
SUSQUEHANNA RIVE	MARYSVILLE MUNICIP	PA0021571	34,158	37,217	26,896	16,810	10,086
SUSQUEHANNA RIVE	MECHANICSBURG BO	PA0020885	60,790	63,896	20,195	12,622	7,573
SUSQUEHANNA RIVE	MERCK & COMPANY	PA0008419	178,739	178,250	178,250	178,250	115,998
SUSQUEHANNA RIVE	MIDDLETOWN	PA0020664	72,184	72,496	28,883	18,052	10,831
SUSQUEHANNA RIVE	MIFFLINBURG BOROU	PA0028461	12,460	17,091	17,091	10,682	6,409
SUSQUEHANNA RIVE	MILLERSBURG BOROU	PA0022535	23,472	23,573	17,036	10,647	6,388
SUSQUEHANNA RIVE	MILLERSVILLE BOROU	PA0026620	3,378	3,675	16,799	10,499	6,299
SUSQUEHANNA RIVE	MILTON MUNICIPAL AU	PA0020273	30,410	30,327	41,725	26,078	15,647
SUSQUEHANNA RIVE	MONTGOMERY BORO	PA0020699	49,016	50,910	12,590	7,869	4,721
SUSQUEHANNA RIVE	MOSHANNON VALLEY	PA0037966	57,735	61,081	34,726	21,703	13,022

TABLE IX-G: Discharged Nitrogen Loads (lbs/yr) for All Point Sources Sorted by Basin

BASIN	FACILITY	NPDES	2000	Tier 1	Tier 2	Tier 3	Tier 4
SUSQUEHANNA RIVE	MOUNT JOY	PA0021067	46,949	51,074	18,200	11,375	6,825
SUSQUEHANNA RIVE	MOUNT UNION BOROU	PA0020214	11,156	11,395	8,235	5,147	3,088
SUSQUEHANNA RIVE	MOUNTAINTOP AREA	PA0045985	73,672	66,933	66,933	41,833	25,100
SUSQUEHANNA RIVE	MT. CARMEL MUNICIP	PA0024406	66,128	65,947	23,043	14,402	8,641
SUSQUEHANNA RIVE	MT. HOLLY SPRINGS B	PA0023183	16,524	17,368	9,313	5,821	3,492
SUSQUEHANNA RIVE	MUNCY BOROUGH MU	PA0024325	15,683	16,289	15,602	9,751	5,851
SUSQUEHANNA RIVE	NATIONAL GYPSUM C	PA0008591	2,774	2,766	2,766	2,766	2,766
SUSQUEHANNA RIVE	NEW CUMBERLAND B	PA0026654	16,550	16,621	12,012	7,507	4,504
SUSQUEHANNA RIVE	NEW FREEDOM WTP	PA0043257	65,363	68,617	28,007	17,504	10,503
SUSQUEHANNA RIVE	NEW HOLLAND BORO	PA0021890	89,240	97,082	26,874	16,796	10,078
SUSQUEHANNA RIVE	NEW OXFORD MUNICI	PA0020923	39,127	30,219	30,219	18,887	11,332
SUSQUEHANNA RIVE	NEWBERRY TOWNSHI	PA0083011	25,277	25,386	10,076	6,298	3,779
SUSQUEHANNA RIVE	NORTHEASTERN YOR	PA0023744	20,748	21,781	15,741	9,838	5,903
SUSQUEHANNA RIVE	NORTHUMBERLAND B	PA0020567	26,234	26,162	10,975	6,860	4,116
SUSQUEHANNA RIVE	OSRAM SYLVANIA PR	PA0009024	364,440	363,444	290,822	254,469	9,914
SUSQUEHANNA RIVE	P-H GLATFELTER COM	PA0008869	420,958	419,808	303,384	189,615	113,769
SUSQUEHANNA RIVE	PALMYRA BOROUGH A	PA0024287	68,723	70,316	19,867	12,417	7,450
SUSQUEHANNA RIVE	PENN TOWNSHIP	PA0037150	45,082	47,327	40,537	25,335	15,201
SUSQUEHANNA RIVE	PENNSYLVANIA FISH &	PA0040835	20,131	20,076	20,076	20,076	20,076
SUSQUEHANNA RIVE	PENNSYLVANIA FISH &	PA0010553	119,459	119,132	119,132	91,359	54,816
SUSQUEHANNA RIVE	PENNSYLVANIA FISH &	PA0010561	63,264	63,091	63,091	63,091	44,535
SUSQUEHANNA RIVE	PENNSYLVANIA FISH &	PA0112127	3,970	3,959	3,959	3,959	3,959
SUSQUEHANNA RIVE	PENNSYLVANIA FISH &	PA0044032	629	627	627	627	627
SUSQUEHANNA RIVE	PINE CREEK MUNICIP	PA0027553	34,071	34,962	15,626	9,766	5,860
SUSQUEHANNA RIVE	PINE GROVE BOROUG	PA0020915	26,040	25,969	10,969	6,856	4,113
SUSQUEHANNA RIVE	POPE & TALBOT WIS I	PA0007919	34,620	34,525	34,525	25,164	15,098
SUSQUEHANNA RIVE	PORTER TOWER JOIN	PA0046272	13,210	13,705	13,705	8,566	5,139
SUSQUEHANNA RIVE	PROCTOR & GAMBLE	PA0008885	262,222	261,505	119,001	74,376	44,625
SUSQUEHANNA RIVE	ROARING SPRING BOI	PA0020249	11,330	16,597	16,597	10,373	6,224
SUSQUEHANNA RIVE	SAYRE	PA0043681	31,705	31,619	15,949	9,968	5,981
SUSQUEHANNA RIVE	SCRANTON SEWER AU	PA0026492	739,403	320,456	320,456	200,285	120,171
SUSQUEHANNA RIVE	SHAMOKIN-COAL TOW	PA0027324	274,373	273,623	86,658	54,161	32,497
SUSQUEHANNA RIVE	SHENANDOAH MUNIC	PA0070386	27,606	27,531	28,980	18,112	10,867
SUSQUEHANNA RIVE	SHIPPENSBURG BORO	PA0030643	97,062	100,617	55,628	34,767	20,860
SUSQUEHANNA RIVE	SILVER SPRING TOWN	PA0083593	2,695	2,833	3,826	2,391	1,435
SUSQUEHANNA RIVE	SOUTH MIDDLETON T	PA0044113	14,497	15,237	11,012	6,882	4,129
SUSQUEHANNA RIVE	SPRINGETTSBURY TO	PA0026808	299,326	275,067	275,067	171,917	103,150
SUSQUEHANNA RIVE	ST. JOHNS	PA0046388	5,746	7,797	7,797	4,873	2,924
SUSQUEHANNA RIVE	STEWARTSTOWN BOI	PA0036269	8,654	9,085	6,623	4,139	2,484
SUSQUEHANNA RIVE	SUNBURY CITY MUNIC	PA0026557	107,663	73,446	73,446	45,904	27,542
SUSQUEHANNA RIVE	SWATARA TOWNSHIP	PA0026735	190,910	81,310	81,310	50,819	30,491
SUSQUEHANNA RIVE	TOWANDA MUNICIPAL	PA0034576	17,722	16,658	16,658	10,411	6,247
SUSQUEHANNA RIVE	TRI-BORO MUNICIPAL	PA0023736	8,512	8,827	6,916	4,323	2,594
SUSQUEHANNA RIVE	TWIN BOROUGHS SAN	PA0023264	11,156	11,637	8,409	5,256	3,154
SUSQUEHANNA RIVE	TYRONE BOROUGH SI	PA0026727	84,453	155,904	155,904	97,440	58,464
SUSQUEHANNA RIVE	TYSON FOODS	PA0035092	41,991	41,876	41,876	37,193	5,025
SUSQUEHANNA RIVE	UNIVERSITY AREA JOI	PA0026239	236,457	123,537	123,537	77,210	46,326
SUSQUEHANNA RIVE	UPPER ALLEN TOWNS	PA0024902	17,778	18,686	13,504	8,440	5,064
SUSQUEHANNA RIVE	USFW-LAMAR NATION	PA0009857	3,359	3,350	3,350	3,350	3,350
SUSQUEHANNA RIVE	WELLSBORO MUNICIP	PA0021687	68,957	71,570	28,784	17,990	10,794

TABLE IX-G: Discharged Nitrogen Loads (lbs/yr) for All Point Sources Sorted by Basin

BASIN	FACILITY	NPDES	2000	Tier 1	Tier 2	Tier 3	Tier 4
SUSQUEHANNA RIVE	WESTERN CLINTON C	PA0043893	2,703	8,599	8,599	5,375	3,225
SUSQUEHANNA RIVE	WHITE DEER TOWNSH	PA0020800	15,943	16,894	6,645	4,153	2,492
SUSQUEHANNA RIVE	WILLIAMSPORT SANIT	PA0027057	464,040	178,235	178,235	111,397	66,838
SUSQUEHANNA RIVE	WILLIAMSPORT SANIT	PA0027049	414,413	64,971	64,971	40,607	24,364
SUSQUEHANNA RIVE	WYOMING VALLEY	PA0026107	379,587	581,266	581,266	363,291	217,975
SUSQUEHANNA RIVE	YORK CITY	PA0026263	445,316	290,627	290,627	181,642	108,985
SUSQUEHANNA RIVER Total			**18,406,790**	**14,667,032**	**10,009,752**	**6,486,420**	**3,767,236**
MD EASTERN SHORE	BRIDGEVILLE	DE0020249	12,109	5,404	5,404	3,377	2,026
MD EASTERN SHORE	DUPONT-SEAFORD	DE0000035	234,995	234,353	234,353	234,353	234,353
MD EASTERN SHORE	LAUREL	DE0020125	19,340	21,558	7,727	4,829	2,898
MD EASTERN SHORE	SEAFORD	DE0020265	21,043	31,088	31,088	19,430	11,658
MD EASTERN SHORE	ALLEN FAMILY FOODS	MD0067857	410	409	409	409	303
MD EASTERN SHORE	BENJAMINS TRAILER F	MD0024961	943	1,041	1,041	1,041	463
MD EASTERN SHORE	BETTERTON	MD0020575	1,137	1,163	1,163	1,163	517
MD EASTERN SHORE	BOHEMIA MANOR HIG	MD0023469	35	39	39	39	163
MD EASTERN SHORE	BUDGET MOTEL	MD0023027	104	115	115	115	51
MD EASTERN SHORE	CAMBRIDGE	MD0021636	112,051	124,494	124,494	77,809	46,685
MD EASTERN SHORE	CECILTON	MD0020443	2,061	2,276	2,276	2,276	1,012
MD EASTERN SHORE	CENTREVILLE	MD0020834	12,685	8,587	8,587	5,367	3,220
MD EASTERN SHORE	CHERRY HILL	MD0052825	6,586	7,274	7,274	7,274	3,233
MD EASTERN SHORE	CHESAPEAKE CITY NC	MD0020401	2,150	2,375	2,375	2,375	2,326
MD EASTERN SHORE	CHESAPEAKE CITY SC	MD0020397	2,109	2,329	2,329	2,329	1,822
MD EASTERN SHORE	CHESAPEAKE COLLEC	MD0024384	752	858	858	858	381
MD EASTERN SHORE	CHESTERTOWN	MD0020010	17,978	15,916	15,916	9,948	5,969
MD EASTERN SHORE	CHURCH HILL	MD0050016	1,345	1,535	1,535	1,535	1,779
MD EASTERN SHORE	COLONEL RICHARDSC	MD0055522	324	347	347	347	154
MD EASTERN SHORE	CRISFIELD	MD0020001	27,044	16,547	16,547	10,342	6,205
MD EASTERN SHORE	DELMAR	MD0020532	24,745	14,068	14,068	8,793	5,276
MD EASTERN SHORE	DENTON	MD0020494	12,134	9,952	9,952	6,220	3,732
MD EASTERN SHORE	DONALDSON BROWN	MD0054950	110	121	121	121	54
MD EASTERN SHORE	EASTERN CORRECTIC	MD0023876	759	866	866	866	385
MD EASTERN SHORE	EASTERN CORRECTIC	MD0066613	2,459	2,592	2,592	2,592	10,134
MD EASTERN SHORE	EASTON	MD0020273	52,633	46,973	46,973	29,358	17,615
MD EASTERN SHORE	ELK NECK STATE PAR	MD0023833	1,315	1,452	1,452	1,452	675
MD EASTERN SHORE	ELKTON	MD0020681	82,662	42,125	42,125	26,328	15,797
MD EASTERN SHORE	ENGLISH GRILL	MD0053104	21	22	22	22	10
MD EASTERN SHORE	EWELL	MD0052230	1,162	1,225	1,225	1,225	545
MD EASTERN SHORE	FAIRMOUNT	MD0052256	1,608	1,695	1,695	1,695	753
MD EASTERN SHORE	FEDERALSBURG	MD0020249	18,117	8,020	8,020	5,013	3,008
MD EASTERN SHORE	FOREST GREEN	MD0053279	498	551	551	551	245
MD EASTERN SHORE	FRUITLAND	MD0052990	25,812	12,612	12,612	7,883	4,730
MD EASTERN SHORE	GALENA	MD0020605	2,084	2,132	2,132	2,132	650
MD EASTERN SHORE	GREAT OAKS LANDIN(	MD0024945	308	315	315	315	140
MD EASTERN SHORE	GREENSBORO	MD0020290	10,135	10,866	10,866	10,866	4,136
MD EASTERN SHORE	HARBOUR VIEW	MD0024023	384	425	425	425	189
MD EASTERN SHORE	HEBRON	MD0059617	6,552	7,203	7,203	7,203	3,201
MD EASTERN SHORE	HURLOCK	MD0022730	42,327	25,863	25,863	16,164	9,699
MD EASTERN SHORE	KENNEDYVILLE	MD0052671	243	249	249	249	111
MD EASTERN SHORE	KENT ISLAND	MD0023485	87,899	39,970	39,970	24,981	14,989
MD EASTERN SHORE	MANCHESTER PARK	MD0023108	1,259	1,390	1,390	1,390	664

TABLE IX-G: Discharged Nitrogen Loads (lbs/yr) for All Point Sources Sorted by Basin

BASIN	FACILITY	NPDES	2000	Tier 1	Tier 2	Tier 3	Tier 4
MD EASTERN SHORE	MAPLE HILL PARK	MD0053171	301	333	333	333	148
MD EASTERN SHORE	MARDELA HIGH	MD0024279	64	70	70	70	59
MD EASTERN SHORE	MILLINGTON	MD0020435	3,114	3,187	3,187	3,187	1,416
MD EASTERN SHORE	MORNING CHEER	MD0052299	1,000	1,104	1,104	1,104	491
MD EASTERN SHORE	NORTH CAROLINE HIG	MD0023621	119	128	128	128	57
MD EASTERN SHORE	NORTHEAST RIVER	MD0052027	23,023	15,304	15,304	9,565	5,739
MD EASTERN SHORE	OXFORD	MD0022543	5,625	5,945	5,945	5,945	2,642
MD EASTERN SHORE	PITTSVILLE	MD0060348	3,601	3,959	3,959	3,959	2,147
MD EASTERN SHORE	POCOMOKE CITY	MD0022551	24,854	23,435	23,435	14,647	8,788
MD EASTERN SHORE	POCOMOKE TRUCK ST	MD0054330	118	131	131	131	57
MD EASTERN SHORE	PORT DEPOSIT	MD0020796	7,460	8,239	8,239	8,239	3,662
MD EASTERN SHORE	PRESTON	MD0020621	3,068	3,290	3,290	3,290	1,462
MD EASTERN SHORE	PRINCESS ANNE	MD0020656	20,092	15,100	15,100	9,437	5,662
MD EASTERN SHORE	QUEENSTOWN	MD0023370	3,266	3,727	3,727	3,727	1,919
MD EASTERN SHORE	RISING SUN	MD0020265	12,670	13,994	13,994	13,994	6,219
MD EASTERN SHORE	ROCK HALL	MD0020303	11,933	12,213	12,213	12,213	6,596
MD EASTERN SHORE	SALISBURY	MD0021571	332,099	143,631	143,631	89,769	53,862
MD EASTERN SHORE	SHARPTOWN	MD0052175	8,691	9,555	9,555	9,555	2,940
MD EASTERN SHORE	SNOW HILL	MD0022764	21,632	11,331	11,331	7,082	4,249
MD EASTERN SHORE	SPRING MEADOWS	MD0024953	537	583	583	583	259
MD EASTERN SHORE	SUDLERSVILLE	MD0020559	2,388	2,725	2,725	2,725	1,211
MD EASTERN SHORE	TALBOT COUNTY REG	MD0023604	15,766	16,664	16,664	16,664	9,265
MD EASTERN SHORE	TALBOT COUNTY REG	MD0059463	3,980	4,207	4,207	4,207	1,870
MD EASTERN SHORE	TAWES VOCATIONAL-	MD0022993	11,862	12,505	12,505	12,505	4,211
MD EASTERN SHORE	TOLCHESTER	MD0067202	4,827	4,940	4,940	4,940	2,196
MD EASTERN SHORE	TRAPPE	MD0020486	7,053	7,455	7,455	7,455	3,313
MD EASTERN SHORE	TRIUMPH INDUSTRIAL	MD0024929	1,902	2,101	2,101	2,101	934
MD EASTERN SHORE	TWIN CITIES	MD0055352	6,313	6,479	6,479	6,479	2,880
MD EASTERN SHORE	TYLERTON	MD0052248	266	280	280	280	124
MD EASTERN SHORE	U.S. ARMY-CHESAPEA	MD0020206	14	16	16	16	7
MD EASTERN SHORE	VIENNA	MD0020664	3,216	3,300	3,300	3,300	1,369
MD EASTERN SHORE	WALKERS TRAILER PA	MD0057487	896	961	961	961	345
MD EASTERN SHORE	WILLARDS	MD0051632	4,087	4,493	4,493	4,493	1,997
MD EASTERN SHORE	WOODLAWN MOBILE H	MD0023337					0
MD EASTERN SHORE	WORTON-BUTLERTON	MD0060585	3,372	3,451	3,451	3,451	1,534
MD EASTERN SHORE Total			**1,399,635**	**1,053,234**	**1,039,402**	**807,596**	**561,581**
MD WESTERN SHORE	ABERDEEN	MD0021563	28,612	42,018	42,018	26,261	15,757
MD WESTERN SHORE	ABERDEEN PROVING	MD0021237	55,125	22,278	22,278	13,924	8,354
MD WESTERN SHORE	ABERDEEN PROVING	MD0021229	22,292	23,400	23,400	14,625	8,775
MD WESTERN SHORE	ANNAPOLIS	MD0021814	165,551	183,701	183,701	114,813	68,888
MD WESTERN SHORE	BACK RIVER	MD0021555	2,470,828	2,671,787	2,137,429	1,335,893	801,536
MD WESTERN SHORE	BALTIMORE YACHT CL	MD0054542	104	106	106	106	47
MD WESTERN SHORE	BETHLEHEM STEEL C	MD0001201	1,685,321	1,680,716	1,680,716	1,680,716	806,277
MD WESTERN SHORE	BOWLEYS QUARTERS	MD0058807	362	368	368	368	164
MD WESTERN SHORE	BROADNECK	MD0021644	68,510	127,415	127,415	79,634	47,781
MD WESTERN SHORE	BROADWATER	MD0024350	15,371	30,890	30,890	19,307	11,584
MD WESTERN SHORE	CHEMETALS	MD0001775	460,274	87,006	87,006	87,006	1,170
MD WESTERN SHORE	CHESAPEAKE BAY INS	MD0022985					
MD WESTERN SHORE	CHESAPEAKE BEACH	MD0020281	8,950	19,690	19,690	12,306	7,384
MD WESTERN SHORE	CONGOLEUM	MD0001384	5,301	5,286	5,286	4,005	2,403

TABLE IX-G: Discharged Nitrogen Loads (lbs/yr) for All Point Sources Sorted by Basin

BASIN	FACILITY	NPDES	2000	Tier 1	Tier 2	Tier 3	Tier 4
MD WESTERN SHORE	COX CREEK	MD0021661	627,021	299,577	299,577	187,235	112,341
MD WESTERN SHORE	DREAMS LANDING	MD0052868	387	411	411	411	205
MD WESTERN SHORE	FREEDOM DISTRICT	MD0021512	65,579	69,535	69,535	43,460	26,076
MD WESTERN SHORE	GAITHER MANOR	MD0022845	181	213	213	213	551
MD WESTERN SHORE	HAMPSTEAD	MD0022446	35,572	41,842	41,842	41,842	16,631
MD WESTERN SHORE	HAVRE DE GRACE	MD0021750	48,125	34,020	34,020	21,262	12,757
MD WESTERN SHORE	HOLIDAY MOBILE EST.	MD0053082	2,252	2,391	2,391	2,391	2,609
MD WESTERN SHORE	JOPPATOWNE	MD0022535	15,465	20,913	20,913	13,071	7,842
MD WESTERN SHORE	MANCHESTER	MD0022578	4,422	5,201	5,201	5,201	1,987
MD WESTERN SHORE	MAYO LARGE COMMU	MD0061794	13,509	14,341	14,341	14,341	13,464
MD WESTERN SHORE	MOUNT AIRY	MD0022527	8,883	16,025	16,025	10,016	6,010
MD WESTERN SHORE	NOTCHCLIFF	MD0022951	2,044	2,083	2,083	2,083	926
MD WESTERN SHORE	PATAPSCO	MD0021601	2,388,559	1,778,607	1,778,607	1,111,629	666,978
MD WESTERN SHORE	PHEASANT RIDGE	MD0024546	839	987	987	987	609
MD WESTERN SHORE	RANDLE CLIFFS NAVA	MD0020168	751	949	949	949	422
MD WESTERN SHORE	RICHLYN MANOR	MD0022713	3,536	3,604	3,604	3,604	2,147
MD WESTERN SHORE	RIVERBOAT MOTEL	MD0051535					
MD WESTERN SHORE	ROSE HAVEN	MD0022756	2,873	3,051	3,051	3,051	1,185
MD WESTERN SHORE	SOD RUN	MD0056545	391,952	306,828	306,828	191,768	115,061
MD WESTERN SHORE	SOUTH CARROLL HIGI	MD0024589	299	352	352	352	157
MD WESTERN SHORE	ST TIMOTHY SCHOOL	MD0056103	299	305	305	305	135
MD WESTERN SHORE	SUMMER HILL TRAILE	MD0023272	451	479	479	479	276
MD WESTERN SHORE	SWAN HARBOR PARK	MD0023043	619	672	672	672	299
MD WESTERN SHORE	UNITED CONTAINER	MD0024635	426	434	434	434	185
MD WESTERN SHORE	US GYPSUM CO	MD0001457					
MD WESTERN SHORE	US NAVAL ACADEMY	MD0023523	3,917	4,591	4,591	4,591	4,591
MD WESTERN SHORE	VILLA JULIE COLLEGE	MD0066001	83	84	84	84	170
MD WESTERN SHORE	W R GRACE	MD0000311	595,770	310,737	310,737	310,737	37,140
MD WESTERN SHORE	WOODSTOCK TRAININ	MD0023906	468	477	477	477	212
MD WESTERN SHORE Total			**9,200,882**	**7,813,372**	**7,279,015**	**5,360,611**	**2,811,084**
PATUXENT RIVER	BOONES MOBILE	MD0050903	3,367	3,574	3,574	3,574	1,588
PATUXENT RIVER	BOWIE	MD0021628	44,442	50,835	50,835	31,772	19,063
PATUXENT RIVER	DORSEY RUN	MD0063207	16,490	35,731	35,731	22,332	13,399
PATUXENT RIVER	EDGEMEADE RESIDEN	MD0052680	162	178	178	178	53
PATUXENT RIVER	EMERGENCY MANAGE	MD0025666	10	11	11	11	4
PATUXENT RIVER	FORT MEADE	MD0021717	10,331	52,924	52,924	33,077	19,846
PATUXENT RIVER	HARWOOD SOUTHERI	MD0023728	114	121	121	121	145
PATUXENT RIVER	LITTLE PATUXENT	MD0055174	366,461	502,683	502,683	314,177	188,506
PATUXENT RIVER	LYONS CREEK MOBILE	MD0053511	2,107	2,236	2,236	2,236	1,752
PATUXENT RIVER	MARLBORO MEADOW	MD0022781	11,654	12,742	12,742	12,742	7,902
PATUXENT RIVER	MARYLAND CITY	MD0062596	20,306	25,934	25,934	16,209	9,725
PATUXENT RIVER	MARYLAND MANOR M	MD0024333	2,102	2,231	2,231	2,231	1,623
PATUXENT RIVER	MD & VA MILK PRODU	MD0000469	17,636	17,588	8,689	5,431	3,258
PATUXENT RIVER	NATIONAL WILDLIFE V	MD0065358	68	75	75	75	33
PATUXENT RIVER	NORTHERN HIGH SCH	MD0052167	686	868	868	868	386
PATUXENT RIVER	PARKWAY	MD0021725	63,213	151,060	151,060	94,412	56,647
PATUXENT RIVER	PARKWAY INN	MD0052329	656	696	696	696	592
PATUXENT RIVER	PATUXENT	MD0021652	33,265	118,047	118,047	73,780	44,268
PATUXENT RIVER	PATUXENT MOBILE	MD0024694	1,121	1,191	1,191	1,191	631
PATUXENT RIVER	PATUXENT WILDLIFE I	MD0025623	137	149	149	149	508

TABLE IX-G: Discharged Nitrogen Loads (lbs/yr) for All Point Sources Sorted by Basin

BASIN	FACILITY	NPDES	2000	Tier 1	Tier 2	Tier 3	Tier 4
PATUXENT RIVER	PINE HILL RUN	MD0021679	84,780	94,832	94,832	59,270	35,562
PATUXENT RIVER	PINEY ORCHARD	MD0059145	3,979	4,224	4,224	4,224	8,833
PATUXENT RIVER	POINT LOOKOUT STAT	MD0023949	902	1,020	1,020	1,020	453
PATUXENT RIVER	USAF BRANDYWINE H	MD0025640	72	79	79	79	33
PATUXENT RIVER	USAF TRANSMITTER S	MD0025631					0
PATUXENT RIVER	WAYSONS MOBILE	MD0023647	2,509	2,663	2,663	2,663	1,112
PATUXENT RIVER	WESTERN BRANCH	MD0021741	418,909	560,383	560,383	350,239	210,144
PATUXENT RIVER Total			**1,105,479**	**1,642,075**	**1,633,176**	**1,032,757**	**626,068**
POTOMAC RIVER	BLUE PLAINS	DC0021199	8,749,992	7,805,237	7,805,237	5,203,492	3,122,095
POTOMAC RIVER	WASHINGTON, D.C. C	DC-CSO	163,152	162,706	162,706	162,706	0
POTOMAC RIVER	ANTIETAM	MD0062308	5,709	5,997	5,997	5,997	2,665
POTOMAC RIVER	BALLENGER CREEK	MD0021822	81,659	100,388	100,388	62,743	37,646
POTOMAC RIVER	BELTSVILLE USDA EA	MD0020842	7,555	5,745	5,745	5,745	5,745
POTOMAC RIVER	BELTSVILLE USDA WE	MD0020851	4,053	4,431	4,431	4,431	3,030
POTOMAC RIVER	BIERS LANE	MD0065749	166	166	166	166	74
POTOMAC RIVER	BLOOMINGTON	MD0060933	1,421	1,498	1,498	1,498	666
POTOMAC RIVER	BOONSBORO	MD0020231	21,055	22,115	22,115	22,115	9,829
POTOMAC RIVER	BOWLING BROOK PRE	MD0067571	10	12	12	12	143
POTOMAC RIVER	BRANDYWINE RECEIV	MD0025658	18	20	20	20	29
POTOMAC RIVER	BRETTON WOODS	MD0064777	484	534	534	534	237
POTOMAC RIVER	BROADFORDING	MD0051373	59	62	62	62	27
POTOMAC RIVER	BROOK LANE	MD0053198	293	308	308	308	137
POTOMAC RIVER	BRUNSWICK	MD0020958	34,935	18,562	18,562	11,602	6,961
POTOMAC RIVER	CELANESE	MD0063878	18,422	24,754	24,754	15,471	9,283
POTOMAC RIVER	CHARLES COUNTY CC	MD0052311	2,714	3,134	3,134	3,134	886
POTOMAC RIVER	CHELTENHAM BOYS V	MD0023931	1,086	1,187	1,187	1,187	902
POTOMAC RIVER	CHOPTICAN HIGH	MD0051918	270	305	305	305	136
POTOMAC RIVER	CLEARSPRING	MD0053325	4,140	4,348	4,348	4,348	1,933
POTOMAC RIVER	CLIFFTON ON THE PO	MD0055557	2,438	2,815	2,815	2,815	1,251
POTOMAC RIVER	CONCORD TRAILER P	MD0023060	144	173	173	173	112
POTOMAC RIVER	CONOCOCHEAGUE	MD0063509	21,512	29,063	29,063	18,164	10,899
POTOMAC RIVER	CRESTVIEW	MD0022683	1,333	1,594	1,594	1,594	935
POTOMAC RIVER	CUMBERLAND	MD0021598	355,300	233,824	233,824	146,140	87,684
POTOMAC RIVER	DAMASCUS	MD0020982	19,999	20,953	20,953	13,096	7,858
POTOMAC RIVER	DAN-DEE INC.	MD0023710	110	131	131	131	58
POTOMAC RIVER	EMMITSBURG	MD0020257	7,575	14,086	14,086	8,804	5,282
POTOMAC RIVER	FAHRNEY-KEEDY MEM	MD0053066	991	1,041	1,041	1,041	462
POTOMAC RIVER	FLINTSTONE	MD0055620	2,955	2,966	2,966	2,966	1,430
POTOMAC RIVER	FORT DETRICK	MD0020877	22,788	27,002	27,002	16,876	10,126
POTOMAC RIVER	FOUNTAINDALE	MD0022721	12,663	15,139	15,139	15,139	6,160
POTOMAC RIVER	FOXVILLE US NAVAL S	MD0025119	1,333	1,594	1,594	1,594	708
POTOMAC RIVER	FREDERICK	MD0021610	485,460	189,096	189,096	118,185	70,911
POTOMAC RIVER	FUNKSTOWN	MD0020362	7,552	7,932	7,932	7,932	1,566
POTOMAC RIVER	GARDEN STATE TANN	MD0053431	145,063	144,667	70,334	28,134	3,853
POTOMAC RIVER	GEORGES CREEK	MD0060071	36,525	16,293	16,293	10,183	6,110
POTOMAC RIVER	GORMAN	MD0060950	246	260	260	260	115
POTOMAC RIVER	GREEN RIDGE FORES	MD0024988	174	174	174	174	77
POTOMAC RIVER	GREENBRIAR STATE F	MD0023868	795	835	835	835	371
POTOMAC RIVER	HAGERSTOWN	MD0021776	265,734	206,287	206,287	128,930	77,358
POTOMAC RIVER	HANCOCK	MD0024562	13,441	14,118	14,118	14,118	5,456

TABLE IX-G: Discharged Nitrogen Loads (lbs/yr) for All Point Sources Sorted by Basin

BASIN	FACILITY	NPDES	2000	Tier 1	Tier 2	Tier 3	Tier 4
POTOMAC RIVER	HAPPY TRAILS CAMPC	MD0065757	33	35	35	35	86
POTOMAC RIVER	HIGHLAND VIEW	MD0024627	489	513	513	513	228
POTOMAC RIVER	HUNTER HILL APARTM	MD0022926	1,518	1,595	1,595	1,595	709
POTOMAC RIVER	I-70 REST AREA	MD0023680	2,336	2,792	2,792	2,792	834
POTOMAC RIVER	INDIAN HEAD	MD0020052	13,639	8,587	8,587	5,367	3,220
POTOMAC RIVER	JEFFERSON	MD0020737	203	243	243	243	4,275
POTOMAC RIVER	JUDE HOUSE	MD0057614					0
POTOMAC RIVER	KEMPTOWN SCHOOL	MD0056481	402	480	480	480	132
POTOMAC RIVER	KITZMILLER	MD0060941	911	961	961	961	427
POTOMAC RIVER	KUNZANG ODSAL PAL	MD0067539	41	46	46	46	20
POTOMAC RIVER	LA PLATA	MD0020524	16,705	20,084	20,084	12,553	7,532
POTOMAC RIVER	LACKEY HIGH	MD0023159	504	582	582	582	259
POTOMAC RIVER	LAFAYETTE MOTEL	MD0053201	59	69	69	69	31
POTOMAC RIVER	LEONARDTOWN	MD0024767	18,598	11,730	11,730	7,332	4,399
POTOMAC RIVER	LEWISTOWN ELEMENT	MD0022900	137	163	163	163	73
POTOMAC RIVER	LIBERTYTOWN	MD0060577	1,640	1,961	1,961	1,961	731
POTOMAC RIVER	LUPPINO RESIDENCE	MD0063070					
POTOMAC RIVER	MAPLE RUN	MD0024970	21	21	21	21	76
POTOMAC RIVER	MARYLAND CORRECT	MD0023957	6,931	22,990	22,990	14,369	8,621
POTOMAC RIVER	MATTAWOMAN	MD0021865	320,637	199,109	199,109	124,443	74,666
POTOMAC RIVER	METTIKI COAL D	MD0064149					
POTOMAC RIVER	MIDDLETOWN	MD0024406	17,345	20,737	20,737	20,737	6,376
POTOMAC RIVER	MILL BOTTOM	MD0065439	296	354	354	354	1,285
POTOMAC RIVER	MONROVIA WWTP	MD0059609	306	366	366	366	788
POTOMAC RIVER	MT CARMEL WOODS	MD0053228	771	890	890	890	510
POTOMAC RIVER	MT ST MARYS COLLEC	MD0023230	3,443	4,116	4,116	4,116	1,292
POTOMAC RIVER	MYERSVILLE	MD0020699	9,461	11,311	11,311	11,311	4,552
POTOMAC RIVER	NAS-PATUXENT	MD0020095	1,646	827	827	827	827
POTOMAC RIVER	NATIONAL INSTITUTE	MD0020931	2,822	3,111	3,111	3,111	1,383
POTOMAC RIVER	NEW GERMANY STATE	MD0023981	73	77	77	77	34
POTOMAC RIVER	NEW LIFE FOURSQUA	MD0057100	89	107	107	107	47
POTOMAC RIVER	NEW MARKET	MD0020729	7,200	8,608	8,608	8,608	2,943
POTOMAC RIVER	NEW WINDSOR	MD0022586	2,051	2,412	2,412	2,412	1,281
POTOMAC RIVER	NORBECK COUNTRY C	MD0024309					
POTOMAC RIVER	NORTH INDIAN HEAD I	MD0024601					
POTOMAC RIVER	NSWC-INDIAN HEAD	MD0003158	1,782	1,777	1,777	1,777	1,777
POTOMAC RIVER	NSWC-INDIAN HEAD	MD0020885	6,730	7,772	7,772	7,772	8,456
POTOMAC RIVER	OLD SOUTH MOUNTAI	MD0055425	114	137	137	137	61
POTOMAC RIVER	OLDTOWN	MD0024759	571	573	573	573	255
POTOMAC RIVER	PETER PAN INN	MD0024244	37	44	44	44	85
POTOMAC RIVER	PICCOWAXIN MIDDLE	MD0023451	127	147	147	147	65
POTOMAC RIVER	PINTO	MD0022748	8,131	8,161	8,161	8,161	6,569
POTOMAC RIVER	PISCATAWAY	MD0021539	669,955	616,421	616,421	385,263	231,158
POTOMAC RIVER	PLEASANT BRANCH	MD0065269	1,033	1,234	1,234	1,234	1,244
POTOMAC RIVER	PLESANT VALLEY	MD0066745	435	512	512	512	228
POTOMAC RIVER	POINT OF ROCKS	MD0020800	4,439	5,307	5,307	5,307	2,408
POTOMAC RIVER	POOLESVILLE	MD0023001	16,660	16,175	16,175	10,109	6,066
POTOMAC RIVER	RAWLINGS HEIGHTS	MD0023213	4,255	4,271	4,271	4,271	2,330
POTOMAC RIVER	ROCKY GAP STATE PA	MD0051667	1,019	1,023	1,023	1,023	1,263
POTOMAC RIVER	RUNNYMEADE SCHOC	MD0065927	146	172	172	172	77

TABLE IX-G: Discharged Nitrogen Loads (lbs/yr) for All Point Sources Sorted by Basin

BASIN	FACILITY	NPDES	2000	Tier 1	Tier 2	Tier 3	Tier 4
POTOMAC RIVER	SANDY HOOK	MD0064530	339	356	356	356	158
POTOMAC RIVER	SENECA CREEK	MD0021491	268,698	458,052	458,052	286,283	171,770
POTOMAC RIVER	SHAMROCK RESTAUR	MD0058050	14	17	17	17	70
POTOMAC RIVER	SHEPPARD PRATT WE	MD0067521	160	191	191	191	85
POTOMAC RIVER	SIDELING HILL REST A	MD0062821	429	450	450	450	171
POTOMAC RIVER	SMITHSBURG	MD0024317	4,862	5,107	5,107	5,107	5,411
POTOMAC RIVER	SOUTHERN CORRECT	MD0023914	1,872	2,162	2,162	2,162	849
POTOMAC RIVER	SPRING MILLS	WV1031613					
POTOMAC RIVER	SPRINGVIEW ESTATES	MD0022870	361	432	432	432	164
POTOMAC RIVER	ST. JAMES SCHOOL	MD0065536	361	379	379	379	168
POTOMAC RIVER	SWAN POINT	MD0057525	1,741	2,010	2,010	2,010	893
POTOMAC RIVER	TANEYTOWN	MD0020672	15,929	22,186	22,186	13,866	8,320
POTOMAC RIVER	THUNDERBIRD APART	MD0050334	1,136	1,311	1,311	1,311	324
POTOMAC RIVER	THUNDERBIRD MOTEL	MD0053155	220	254	254	254	113
POTOMAC RIVER	THURMONT	MD0021121	9,722	24,449	24,449	15,281	9,168
POTOMAC RIVER	TRI-TOWN PLAZA	MD0024937	737	740	740	740	329
POTOMAC RIVER	UNION BRIDGE	MD0022454	7,500	8,823	8,823	8,823	2,514
POTOMAC RIVER	UPPER POTOMAC RIV	MD0021687	79,436	79,219	79,219	79,219	79,219
POTOMAC RIVER	URBANA HIGH SCHOC	MD0066940	133	159	159	159	71
POTOMAC RIVER	VICTOR CULLEN CENT	MD0023922	1,132	1,353	1,353	1,353	1,013
POTOMAC RIVER	WESTMINSTER	MD0021831	70,103	104,838	104,838	65,524	39,314
POTOMAC RIVER	WESTVACO CORPORA	MD0001422	12,768	12,733	12,733	12,733	12,733
POTOMAC RIVER	WHITE HOUSE MOTEL	MD0056553	75	86	86	86	38
POTOMAC RIVER	WHITE ROCK	MD0025089	542	647	647	647	416
POTOMAC RIVER	WINEBRENNER WWTF	MD0003221	12,029	5,378	5,378	3,361	2,017
POTOMAC RIVER	WINTERS APARTMENT	MD0057606	12	13	13	13	6
POTOMAC RIVER	WOODSBORO	MD0058661	6,259	7,482	7,482	7,482	2,973
POTOMAC RIVER	ANTRIM TOWNSHIP	PA0080519	21,731	12,076	12,076	7,548	4,529
POTOMAC RIVER	CHAMBERSBURG BOR	PA0026051	130,817	116,352	116,352	72,720	43,632
POTOMAC RIVER	FRANKLIN COUNTY AU	PA0020834	3,321	3,442	26,352	16,470	9,882
POTOMAC RIVER	GETTYSBURG MUNICI	PA0021563	23,181	39,416	39,416	24,635	14,781
POTOMAC RIVER	HYNDMAN BOROUGH	PA0020851	2,714	2,817	2,028	1,268	761
POTOMAC RIVER	LITTLESTOWN BOROU	PA0021229	17,803	19,336	12,365	7,728	4,637
POTOMAC RIVER	WASHINGTON TOWNS	PA0080225	21,323	22,700	22,700	14,188	8,513
POTOMAC RIVER	WAYNESBORO BORO	PA0020621	13,403	13,894	21,176	13,235	7,941
POTOMAC RIVER	ALEXANDRIA	VA0025160	2,721,661	924,460	924,460	577,788	346,673
POTOMAC RIVER	AQUIA	VA0060968	47,259	128,888	128,888	80,555	48,333
POTOMAC RIVER	ARLINGTON	VA0025143	920,587	859,822	859,822	537,389	322,433
POTOMAC RIVER	BROAD RUN WRF	R		58,475	58,475	36,547	21,928
POTOMAC RIVER	CHICKEN GEORGES	VA0077402	513,909	36,910	36,910	36,910	11,073
POTOMAC RIVER	COLONIAL BEACH	VA0026409	32,298	20,617	20,617	12,886	7,731
POTOMAC RIVER	DAHLGREN (DAHLGRE	VA0026514	5,596	6,317	7,410	4,631	2,779
POTOMAC RIVER	DALE CITY #1	VA0024724	72,361	74,585	74,585	46,616	27,969
POTOMAC RIVER	DALE CITY #8	VA0024678	86,966	69,368	69,368	43,355	26,013
POTOMAC RIVER	DUPONT-WAYNESBOR	VA0002160	29,128	29,048	29,048	29,048	27,125
POTOMAC RIVER	FAIRVIEW BEACH	MD0056464	1,901	2,146	2,146	2,146	954
POTOMAC RIVER	FISHERSVILLE	VA0025291	38,546	82,406	41,663	26,040	15,624
POTOMAC RIVER	FRONT ROYAL	VA0062812	81,507	94,353	67,316	42,072	25,243
POTOMAC RIVER	FWSA OPEQUON	VA0065552	137,829	143,520	143,520	89,700	53,820
POTOMAC RIVER	H.L. MOONEY	VA0025101	634,056	356,452	356,452	222,783	133,670

TABLE IX-G: Discharged Nitrogen Loads (lbs/yr) for All Point Sources Sorted by Basin

BASIN	FACILITY	NPDES	2000	Tier 1	Tier 2	Tier 3	Tier 4
POTOMAC RIVER	HARRISONBURG-ROC	VA0060640	418,813	283,846	283,846	177,404	106,442
POTOMAC RIVER	LEESBURG	MD0066184	140,776	72,079	72,079	45,049	27,030
POTOMAC RIVER	LURAY	VA0062642	6,456	6,867	36,625	22,890	13,734
POTOMAC RIVER	MASSANUTTEN PUBLI	VA0024732	20,687	21,603	9,242	5,776	3,466
POTOMAC RIVER	MERCK & COMPANY I	VA0002178	96,556	96,293	96,293	96,293	92,159
POTOMAC RIVER	MIDDLE RIVER	VA0064793	101,906	137,659	137,659	86,037	51,622
POTOMAC RIVER	MONTROSS - WESTMC	VA0072729		618	756	473	284
POTOMAC RIVER	NAVAL SURFACE WAF	VA0021067	6,449	10,572	10,572	6,608	3,965
POTOMAC RIVER	NEW MARKET STP	VA0022853	29,402	31,880	13,639	8,524	5,114
POTOMAC RIVER	NOMAN M. COLE JR. P	VA0025364	2,822,421	1,291,317	1,291,317	807,073	484,244
POTOMAC RIVER	PARKINS MILL	VA0075191	69,823	80,929	34,622	21,639	12,983
POTOMAC RIVER	PILGRIMS PRIDE-HINT	VA0002313	88,471	88,229	44,115	17,646	4,932
POTOMAC RIVER	PURCELLVILLE	VA0022802	20,125	10,320	10,320	6,450	3,870
POTOMAC RIVER	QUANTICO-MAINSIDE	VA0028363	43,513	33,738	33,738	21,086	12,652
POTOMAC RIVER	ROUND HILL WWTP	VA0026212	7,153	8,573	3,668	2,292	1,375
POTOMAC RIVER	SIL MRRS	VA0090263		30,822	30,822	19,264	11,558
POTOMAC RIVER	STONY CREEK STP	VA0028380	13,896	15,067	6,446	4,029	2,417
POTOMAC RIVER	STRASBURG	VA0020311	40,582	44,002	18,825	11,765	7,059
POTOMAC RIVER	STUARTS DRAFT	VA0066877	45,608	36,547	36,547	22,842	13,705
POTOMAC RIVER	UPPER OCCOQUAN SI	VA0024988	1,425,687	1,981,956	828,392	517,745	310,647
POTOMAC RIVER	WAYNESBORO	VA0025151	161,369	168,996	68,586	42,866	25,720
POTOMAC RIVER	WEYERS CAVE STP	VA0022349	6,610	22,781	9,746	6,091	3,655
POTOMAC RIVER	WIDEWATER WWTP	VA0090387		2,436	2,436	1,523	914
POTOMAC RIVER	WOODSTOCK	VA0026468	21,975	23,827	10,194	6,371	3,823
POTOMAC RIVER	BERKELEY COUNTY P	WV0020061	8,186	9,619	14,657	9,161	5,496
POTOMAC RIVER	BERKELEY COUNTY P	WV0082759	12,385	14,554	22,580	14,112	8,467
POTOMAC RIVER	CHARLESTOWN	WV0022349	22,125	24,432	18,207	11,379	6,828
POTOMAC RIVER	FORT ASHBY PSD	WV0041521					
POTOMAC RIVER	FRANKLIN	WV0024970					
POTOMAC RIVER	HARPERS FERRY-BOL	WV0039136	10,485	10,456	10,456	10,456	4,647
POTOMAC RIVER	HESTER INDUSTRIES,	WV0047236	20,211	0	0	0	0
POTOMAC RIVER	HONEYWOOD HOMES	WV0080918					
POTOMAC RIVER	KEYSER	WV0024392	62,273	62,504	29,399	18,375	11,025
POTOMAC RIVER	MARTINSBURG	WV0023167	56,376	66,246	57,170	35,731	21,439
POTOMAC RIVER	MOOREFIELD	WV0020150	17,320	0	0	0	0
POTOMAC RIVER	MOUNTAIN TOP PSD	WV0101524	1,513	1,509	1,509	1,509	641
POTOMAC RIVER	PETERSBURG	WV0021792	13,805	13,767	17,928	11,205	6,723
POTOMAC RIVER	REPUBLIC PAPERBOA	WV0005517					
POTOMAC RIVER	RIVER BEND PARK	WV0105384	1,551	1,629	1,629	1,629	542
POTOMAC RIVER	ROMNEY	WV0020699	22,087	23,921	11,126	6,954	4,172
POTOMAC RIVER	SHEPHERDSTOWN	WV0024775					
POTOMAC RIVER	SPECRATECH INTERN	WV0005533	28,619	28,541	13,055	5,222	2,887
POTOMAC RIVER	VIRGINIA ELECTRIC &	WV0005525					
POTOMAC RIVER	WAMPLER-LONGACRE	WV0005495	248,846	0	0	0	0
POTOMAC RIVER Total			**23,815,593**	**18,694,524**	**17,106,000**	**11,234,067**	**6,671,469**
RAPPAHANNOCK RIV	CULPEPER	VA0061590	57,077	55,312	55,312	34,570	20,742
RAPPAHANNOCK RIV	FMC	VA0068110	60,984	80,180	80,180	50,113	30,068
RAPPAHANNOCK RIV	FORT A.P. HILL (WILC	VA0032034	7,291	2,842	2,842	1,776	1,066
RAPPAHANNOCK RIV	FREDERICKSBURG	VA0025127	57,378	54,323	54,323	33,952	20,371
RAPPAHANNOCK RIV	HAYMOUNT STP	VA0089125		23,146	23,146	14,466	8,680

TABLE IX-G: Discharged Nitrogen Loads (lbs/yr) for All Point Sources Sorted by Basin

BASIN	FACILITY	NPDES	2000	Tier 1	Tier 2	Tier 3	Tier 4
RAPPAHANNOCK RIV	KILMARNOCK	VA0020788	3,311	3,499	6,077	3,798	2,279
RAPPAHANNOCK RIV	LITTLE FALLS RUN	VA0076392	45,300	101,356	101,356	63,348	38,009
RAPPAHANNOCK RIV	MASSAPONAX	VA0025658	205,268	106,781	106,781	66,738	40,043
RAPPAHANNOCK RIV	ORANGE	VA0021385	35,684	16,847	16,847	10,530	6,318
RAPPAHANNOCK RIV	REEDVILLE	VA0060712	2,050	2,177	931	582	349
RAPPAHANNOCK RIV	REMINGTON REGIONA	VA0076805	10,725	13,966	13,966	8,729	5,237
RAPPAHANNOCK RIV	SOUTH WALES STP	VA0080527		20,856	20,856	13,035	7,821
RAPPAHANNOCK RIV	TAPPAHANNOCK	VA0071471	21,122	21,292	9,109	5,693	3,416
RAPPAHANNOCK RIV	URBANNA	VA0026263	3,191	6,436	2,753	1,721	1,032
RAPPAHANNOCK RIV	WARRENTON	VA0021172	44,185	51,092	28,752	17,970	10,782
RAPPAHANNOCK RIV	WARSAW	VA0026891	11,951	12,364	5,289	3,306	1,984
RAPPAHANNOCK RIV	WILDERNESS SHORES	VA0083411	28,195	31,116	13,312	8,320	4,992
RAPPAHANNOCK RIVER Total			**593,711**	**603,585**	**541,832**	**338,645**	**203,187**
VA EASTERN SHORE	CAPE CHARLES	VA0021288	8,696	8,672	3,710	2,319	1,391
VA EASTERN SHORE	ONANCOCK	VA0021253	13,295	13,329	5,702	3,564	2,138
VA EASTERN SHORE	TANGIER ISLAND	VA0067423	2,628	2,635	1,127	705	423
VA EASTERN SHORE	TYSON FOODS, INC.-T	VA0004049	255,318	191,421	181,706	72,683	9,571
VA EASTERN SHORE Total			**279,936**	**216,057**	**192,246**	**79,270**	**13,523**
YORK RIVER	AMOCO-YORKTOWN	VA0003018	166,665	166,210	166,210	166,210	166,210
YORK RIVER	ASHLAND	VA0024899	65,842	37,765	37,765	23,603	14,162
YORK RIVER	CAROLINE COUNTY R	VA0073504	10,584	11,172	4,780	2,987	1,792
YORK RIVER	DOSWELL	VA0029521	100,438	164,460	164,460	102,788	61,673
YORK RIVER	GORDONSVILLE	VA0021105	29,210	32,236	13,791	8,619	5,172
YORK RIVER	HRSD-YORK	VA0081311	522,303	309,429	309,429	193,393	116,036
YORK RIVER	MATHEWS COURTHOU	VA0028819	1,481	2,535	1,949	1,218	731
YORK RIVER	PARHAM LANDING WV	VA0088331	2,352	2,612	2,525	1,578	947
YORK RIVER	SMURFIT STONE	VA0003115	296,463	295,653	449,448	280,905	168,543
YORK RIVER	TOTOPOTOMOY	VA0089915		121,822	121,822	76,139	45,683
YORK RIVER	WEST POINT	VA0075434	35,580	34,171	14,619	9,137	5,482
YORK RIVER Total			**1,230,918**	**1,178,066**	**1,286,798**	**866,577**	**586,430**
JAMES RIVER	ALLEGHANY CO. LOW	VA0090671		42,714	18,273	11,421	6,853
JAMES RIVER	BROWN & WILLIAMSO	VA0002780	20,829	20,772	20,098	12,561	7,537
JAMES RIVER	BUENA VISTA	VA0020991	82,744	82,518	35,302	22,064	13,238
JAMES RIVER	BWXT	VA0003697	111,874	111,568	111,568	111,568	4,375
JAMES RIVER	CLIFTON FORGE	VA0022772	70,477	70,284	30,068	18,793	11,276
JAMES RIVER	COVINGTON	VA0025542	101,465	101,188	43,289	27,056	16,233
JAMES RIVER	CREWE STP	VA0020303	6,832	6,922	4,797	2,998	1,799
JAMES RIVER	DUPONT-SPRUANCE	VA0004669	201,414	200,864	200,864	200,864	200,864
JAMES RIVER	FALLING CREEK	VA0024996	202,791	200,744	200,744	125,465	75,279
JAMES RIVER	FARMVILLE	VA0083135	2,223	2,262	23,698	14,812	8,887
JAMES RIVER	GEORGIA PACIFIC CO	VA0003026	286,132	285,350	53,338	53,338	53,338
JAMES RIVER	HENRICO COUNTY	VA0063690	1,517,151	1,218,224	1,218,224	761,390	456,834
JAMES RIVER	HONEYWELL	VA0005291	800,548	798,361	798,361	798,361	798,361
JAMES RIVER	HOPEWELL	VA0066630	1,052,385	2,246,161	855,681	534,800	320,880
JAMES RIVER	HRSD-ARMY BASE	VA0081230	918,983	1,254,443	425,160	265,725	159,435
JAMES RIVER	HRSD-BOAT HARBOR	VA0081256	1,018,381	1,634,998	561,601	351,001	210,600
JAMES RIVER	HRSD-CHESAPEAKE/E	VA0081264	1,415,416	1,948,185	640,786	400,491	240,295
JAMES RIVER	HRSD-JAMES RIVER	VA0081272	895,610	1,234,762	487,290	304,556	182,734
JAMES RIVER	HRSD-NANSEMOND*	VA0081299	904,767	490,944	490,944	306,840	184,104
JAMES RIVER	HRSD-VIP*	VA0081281	884,709	874,685	874,685	546,678	328,007

TABLE IX-G: Discharged Nitrogen Loads (lbs/yr) for All Point Sources Sorted by Basin

BASIN	FACILITY	NPDES	2000	Tier 1	Tier 2	Tier 3	Tier 4
JAMES RIVER	HRSD-WILLIAMSBURG	VA0081302	382,014	394,768	387,395	242,122	145,273
JAMES RIVER	LAKE MONTICELLO ST	VA0024945	28,940	32,250	13,797	8,623	5,174
JAMES RIVER	LEES COMMERCIAL C.	VA0004677	81,059	80,837	27,557	16,167	7,329
JAMES RIVER	LEXINGTON-ROCKBRI	VA0088161	47,964	49,380	21,125	13,203	7,922
JAMES RIVER	LYNCHBURG	VA0024970	343,072	450,438	423,942	264,964	158,978
JAMES RIVER	MOORES CREEK-RIVA	VA0025518	425,208	487,381	289,645	181,028	108,617
JAMES RIVER	PHILLIP MORRIS-PARK	VA0026557	198,657	198,114	101,178	40,471	17,515
JAMES RIVER	PROCTORS CREEK	VA0060194	272,092	430,068	430,068	268,792	161,275
JAMES RIVER	RICHMOND	VA0063177	1,732,937	1,169,249	1,169,249	730,780	438,468
JAMES RIVER	SOUTH CENTRAL	VA0025437	276,307	315,033	315,033	196,895	118,137
JAMES RIVER	TYSON FOODS, INC.	VA0004031	21,382	17,353	17,353	17,353	8,676
JAMES RIVER	WESTVACO CORPORA	VA0003646	726,288	724,304	724,304	452,690	271,614
JAMES RIVER Total			**15,030,654**	**17,175,126**	**11,015,416**	**7,303,871**	**4,729,907**
Grand Total			**71,063,596**	**63,043,070**	**50,103,636**	**33,509,813**	**19,970,486**

Note:
* The load reductions listed in the Tables in this section reflecting implementation of NRT to TN = 8 mg/l occur in Tier 1 for the HRSD Nansemond and VIP facilities. However, HRSD requested, after the watershed model runs were conducted, that these load reductions should first appear in Tier 2. Because the model runs were already completed, these load reduction remain in Tier 1, but costs do not show up until Tier 2. Cumulative loads remain the same, as additional load reductions do not show up in Tier 2.

TABLE IX-H: Discharged Phosphorus Loads (lbs/yr) for All Point Sources Sorted by Basin

BASIN	FACILITY	NPDES	2000	Tier 1	Tier 2	Tier 3	Tier 4
SUSQUEHANNA RI	CAMP SHADOWBROOK	MD0053139	4	5	5	5	3
SUSQUEHANNA RI	NORTH HARFORD JR&SR	MD0023281	101	110	110	110	73
SUSQUEHANNA RI	PERRYVILLE	MD0020613	777	858	2,856	1,428	286
SUSQUEHANNA RI	ADDISON (V)	NY0020320	2,115	2,148	716	358	72
SUSQUEHANNA RI	BATH (V)	NY0021431	6,831	6,937	2,312	1,156	231
SUSQUEHANNA RI	BINGHAMTON-JOHNSON (	NY0024414	121,100	120,769	59,492	29,746	5,949
SUSQUEHANNA RI	COOPERSTOWN	NY0023591	5,847	5,915	1,972	986	197
SUSQUEHANNA RI	CORNING (C)	NY0025721	11,673	11,855	3,952	1,976	395
SUSQUEHANNA RI	CORTLAND (C)	NY0027561	32,683	33,839	25,954	12,977	2,595
SUSQUEHANNA RI	ELMIRA / CHEMUNG CO. S	NY0035742	65,358	65,684	21,895	10,947	2,189
SUSQUEHANNA RI	ENDICOTT (V)	NY0027669	69,406	69,216	23,072	11,536	2,307
SUSQUEHANNA RI	HAMILTON (V)	NY0020672	3,938	4,106	1,367	684	137
SUSQUEHANNA RI	HORNELL (C)	NY0023647	27,080	27,502	9,167	4,584	917
SUSQUEHANNA RI	LAKE STREET/CHEMUNG	NY0036986	64,698	65,021	21,674	10,837	2,167
SUSQUEHANNA RI	NORWICH	NY0021423	23,545	24,477	8,159	4,080	816
SUSQUEHANNA RI	ONEONTA (C)	NY0031151	27,157	27,476	9,159	4,579	916
SUSQUEHANNA RI	OWEGO #2	NY0025798	7,868	7,878	3,170	1,585	317
SUSQUEHANNA RI	OWEGO (V)	NY0029262	5,690	5,698	1,899	950	190
SUSQUEHANNA RI	RICHFIELD SPRINGS (V)	NY0031411	80	81	491	491	98
SUSQUEHANNA RI	SIDNEY (V)	NY0029271	6,081	6,077	2,026	1,013	203
SUSQUEHANNA RI	WAVERLY (V)	NY0031089	10,909	10,923	3,075	1,537	307
SUSQUEHANNA RI	ALTOONA CITY AUTHORIT	PA0027014	76,855	78,953	18,350	9,175	1,835
SUSQUEHANNA RI	ALTOONA CITY AUTHORIT	PA0027022	79,503	81,673	19,038	9,519	1,904
SUSQUEHANNA RI	ANNVILLE TOWNSHIP	PA0021806	2,102	2,151	1,447	724	145
SUSQUEHANNA RI	APPLETON PAPER SPRIN(	PA0008265	15,237	15,195	13,156	6,578	1,316
SUSQUEHANNA RI	ASHLAND MUNICIPAL AUT	PA0023558	7,117	7,097	2,201	1,100	220
SUSQUEHANNA RI	BEDFORD BOROUGH MUN	PA0022209	3,988	4,139	2,980	1,490	298
SUSQUEHANNA RI	BELLEFONTE BOROUGH	PA0020486	4,115	4,353	6,318	3,159	632
SUSQUEHANNA RI	BERWICK MUNICIPAL AUT	PA0023248	19,686	19,714	4,526	2,263	453
SUSQUEHANNA RI	BLOOMSBURG MUNICIPAL	PA0027171	11,413	11,429	8,105	4,053	811
SUSQUEHANNA RI	BLOSSBURG	PA0020036	800	830	634	317	63
SUSQUEHANNA RI	BROWN TOWNSHIP MUNI(	PA0028088	915	950	1,027	513	103
SUSQUEHANNA RI	BURNHAM BOROUGH	PA0038920	2,616	2,715	1,810	905	181
SUSQUEHANNA RI	CARLISLE BOROUGH	PA0026077	4,192	4,407	10,495	5,247	1,049
SUSQUEHANNA RI	CARLISLE SUBURBAN AU	PA0024384	1,320	1,388	2,144	1,072	214
SUSQUEHANNA RI	CHLOE TEXTILES INC.	PA0009172	670	668	668	412	82
SUSQUEHANNA RI	CLARKS SUMMIT-SOUTH /	PA0028576	21,689	21,629	6,932	3,466	693
SUSQUEHANNA RI	CLEARFIELD	PA0026310	6,231	6,214	7,992	3,996	799
SUSQUEHANNA RI	COLUMBIA	PA0026123	1,627	1,770	2,514	1,257	251
SUSQUEHANNA RI	CONSOLIDATED RAIL COF	PA0009229	106	105	105	105	49
SUSQUEHANNA RI	CURWENSVILLE MUNICIP/	PA0024759	2,545	2,538	1,363	681	136
SUSQUEHANNA RI	DANVILLE MUNICIPAL AUT	PA0023531	8,741	8,844	6,551	3,275	655
SUSQUEHANNA RI	DERRY TOWNSHIP MUNIC	PA0026484	13,996	14,056	10,582	5,291	1,058
SUSQUEHANNA RI	DILLSBURG BOROUGH AU	PA0024431	1,682	1,766	2,005	1,002	200
SUSQUEHANNA RI	DOVER TOWNSHIP SEWE	PA0020826	14,667	15,397	11,282	5,641	1,128
SUSQUEHANNA RI	DUNCANSVILLE	PA0032883	4,173	4,287	1,856	928	186
SUSQUEHANNA RI	EAST PENNSBORO SOUTI	PA0038415	24,507	25,759	7,384	3,692	738
SUSQUEHANNA RI	EASTERN SNYDER COUN	PA0110582	18,307	19,303	4,883	2,441	488
SUSQUEHANNA RI	ELIZABETHTOWN BOROU	PA0023108	5,716	6,218	7,137	3,569	714
SUSQUEHANNA RI	ELKLAND MUNICIPAL AUT	PA0113298	1,120	1,162	1,324	662	132

TABLE IX-H: Discharged Phosphorus Loads (lbs/yr) for All Point Sources Sorted by Basin

BASIN	FACILITY	NPDES	2000	Tier 1	Tier 2	Tier 3	Tier 4
SUSQUEHANNA RI	EMPIRE KOSHER POULTR	PA0007552	1,427	1,423	1,423	1,423	356
SUSQUEHANNA RI	EMPORIUM BOROUGH (MI	PA0028631	3,498	3,701	1,466	733	147
SUSQUEHANNA RI	EPHRATA BOROUGH WW	PA0027405	11,722	12,753	8,458	4,229	846
SUSQUEHANNA RI	FAIRVIEW TOWNSHIP	PA0081868	747	784	1,218	609	122
SUSQUEHANNA RI	FAIRVIEW TOWNSHIP	PA0082589					
SUSQUEHANNA RI	GOLD MILLS DYEHOUSE	PA0008231	317	316	316	316	208
SUSQUEHANNA RI	GREATER HAZELTON	PA0026921	19,112	19,059	20,348	10,174	2,035
SUSQUEHANNA RI	GREGG TOWNSHIP	PA0114821	2,544	2,696	2,024	1,012	202
SUSQUEHANNA RI	HAMPDEN TOWNSHIP	PA0028746	3,979	4,182	3,946	1,973	395
SUSQUEHANNA RI	HAMPDEN TOWNSHIP SE\	PA0080314	4,073	4,281	6,129	3,065	613
SUSQUEHANNA RI	HANOVER BOROUGH	PA0026875	10,622	11,536	11,702	5,851	1,170
SUSQUEHANNA RI	HARRISBURG SEWERAGE	PA0027197	109,743	110,217	79,913	39,956	7,991
SUSQUEHANNA RI	HEINZ PET FOODS	PA0009270	18,690	18,639	4,391	3,728	158
SUSQUEHANNA RI	HIGHSPIRE	PA0024040	5,174	5,197	3,192	1,596	319
SUSQUEHANNA RI	HOLLIDAYSBURG REGION	PA0043273	14,963	15,372	9,061	4,531	906
SUSQUEHANNA RI	HOUTZDALE BOROUGH M	PA0046159	263	263	370	185	37
SUSQUEHANNA RI	HUNTINGDON BOROUGH	PA0026191	8,335	8,513	6,499	3,249	650
SUSQUEHANNA RI	JERSEY SHORE BOROUG	PA0028665	12,798	13,293	2,184	1,092	218
SUSQUEHANNA RI	KELLY TOWNSHIP MUNICI	PA0028681	4,082	4,326	5,546	2,773	555
SUSQUEHANNA RI	LACKAWANNA RIVER BAS	PA0027081	1,685	1,681	1,498	749	150
SUSQUEHANNA RI	LACKAWANNA RIVER BAS	PA0027090	13,738	13,700	15,604	7,802	1,560
SUSQUEHANNA RI	LACKAWANNA RIVER BAS	PA0027073	905	903	1,040	520	104
SUSQUEHANNA RI	LACKAWANNA RIVER BAS	PA0027065	12,405	12,371	7,452	3,726	745
SUSQUEHANNA RI	LANCASTER AREA SEWEI	PA0042269	16,259	17,688	23,706	11,853	2,371
SUSQUEHANNA RI	LANCASTER CITY	PA0026743	46,904	51,025	63,086	31,543	6,309
SUSQUEHANNA RI	LEBANON CITY AUTHORIT	PA0027316	22,690	23,216	16,762	8,381	1,676
SUSQUEHANNA RI	LEMOYNE BOROUGH MUN	PA0026441	7,171	7,202	5,056	2,528	506
SUSQUEHANNA RI	LEWISBURG AREA JOINT	PA0044661	4,570	4,842	3,648	1,824	365
SUSQUEHANNA RI	LEWISTOWN BOROUGH	PA0026280	7,228	7,502	5,771	2,885	577
SUSQUEHANNA RI	LITITZ SEWAGE AUTHORI	PA0020320	13,274	14,441	9,212	4,606	921
SUSQUEHANNA RI	LOCK HAVEN	PA0025933	15,635	16,044	6,641	3,320	664
SUSQUEHANNA RI	LOGAN TOWNSHIP-GREEI	PA0032557	2,921	3,001	1,115	557	111
SUSQUEHANNA RI	LOWER ALLEN TOWNSHIF	PA0027189	14,264	14,993	10,366	5,183	1,037
SUSQUEHANNA RI	LOWER LACKAWANNA VA	PA0026361	16,824	16,778	10,659	5,329	1,066
SUSQUEHANNA RI	LYKENS BOROUGH	PA0043575	960	964	736	368	74
SUSQUEHANNA RI	MAHANOY CITY	PA0070041	4,655	4,643	1,741	870	174
SUSQUEHANNA RI	MANHEIM BOROUGH AUT	PA0020893	3,009	3,273	2,419	1,210	242
SUSQUEHANNA RI	MANSFIELD BOROUGH	PA0021814	3,790	3,934	1,754	877	175
SUSQUEHANNA RI	MARIETTA-DONEGAL JOIN	PA0021717	1,280	1,392	1,374	687	137
SUSQUEHANNA RI	MARTINSBURG	PA0028347	1,806	1,855	1,245	622	124
SUSQUEHANNA RI	MARYSVILLE MUNICIPAL A	PA0021571	366	398	3,362	1,681	336
SUSQUEHANNA RI	MECHANICSBURG BOROU	PA0020885	2,716	2,855	2,524	1,262	252
SUSQUEHANNA RI	MERCK & COMPANY	PA0008419	57,770	57,612	38,666	19,333	3,867
SUSQUEHANNA RI	MIDDLETOWN	PA0020664	2,559	2,570	3,610	1,805	361
SUSQUEHANNA RI	MIFFLINBURG BOROUGH	PA0028461	1,593	1,688	2,136	1,068	214
SUSQUEHANNA RI	MILLERSBURG BOROUGH	PA0022535	2,778	2,790	2,129	1,065	213
SUSQUEHANNA RI	MILLERSVILLE BOROUGH	PA0026620	2,516	2,737	2,100	1,050	210
SUSQUEHANNA RI	MILTON MUNICIPAL AUTH	PA0020273	2,223	2,217	5,216	2,608	522
SUSQUEHANNA RI	MONTGOMERY BOROUGH	PA0020699	3,530	3,667	1,574	787	157
SUSQUEHANNA RI	MOSHANNON VALLEY JOI	PA0037966	1,832	1,938	4,341	2,170	434

TABLE IX-H: Discharged Phosphorus Loads (lbs/yr) for All Point Sources Sorted by Basin

BASIN	FACILITY	NPDES	2000	Tier 1	Tier 2	Tier 3	Tier 4
SUSQUEHANNA RI	MOUNT JOY	PA0021067	662	720	2,275	1,138	228
SUSQUEHANNA RI	MOUNT UNION BOROUGH	PA0020214	1,320	1,348	1,029	515	103
SUSQUEHANNA RI	MOUNTAINTOP AREA	PA0045985	30,890	30,806	8,367	4,183	837
SUSQUEHANNA RI	MT. CARMEL MUNICIPAL S	PA0024406	7,943	7,921	2,880	1,440	288
SUSQUEHANNA RI	MT. HOLLY SPRINGS BOR	PA0023183	745	784	1,164	582	116
SUSQUEHANNA RI	MUNCY BOROUGH MUNIC	PA0024325	2,919	3,032	1,950	975	195
SUSQUEHANNA RI	NATIONAL GYPSUM COMF	PA0008591	1,212	1,208	944	472	94
SUSQUEHANNA RI	NEW CUMBERLAND BORO	PA0026654	724	727	1,501	751	150
SUSQUEHANNA RI	NEW FREEDOM WTP	PA0043257	5,266	5,529	3,501	1,750	350
SUSQUEHANNA RI	NEW HOLLAND BOROUGH	PA0021890	5,245	5,706	3,359	1,680	336
SUSQUEHANNA RI	NEW OXFORD MUNICIPAL	PA0020923	1,162	1,263	3,777	1,889	378
SUSQUEHANNA RI	NEWBERRY TOWNSHIP	PA0083011	1,867	1,875	1,260	630	126
SUSQUEHANNA RI	NORTHEASTERN YORK C	PA0023744	2,331	2,447	1,968	984	197
SUSQUEHANNA RI	NORTHUMBERLAND BOR	PA0020567	867	864	1,372	686	137
SUSQUEHANNA RI	OSRAM SYLVANIA PRODU	PA0009024	2,311	2,304	2,304	1,652	330
SUSQUEHANNA RI	P-H GLATFELTER COMPAI	PA0008869	2,679	2,672	2,672	2,672	2,672
SUSQUEHANNA RI	PALMYRA BOROUGH AUT	PA0024287	3,595	3,679	2,483	1,242	248
SUSQUEHANNA RI	PENN TOWNSHIP	PA0037150	5,263	5,525	5,067	2,534	507
SUSQUEHANNA RI	PENNSYLVANIA FISH & BO	PA0040835	1,954	1,949	1,949	1,949	1,949
SUSQUEHANNA RI	PENNSYLVANIA FISH & BO	PA0010553	2,748	2,741	2,741	2,741	1,827
SUSQUEHANNA RI	PENNSYLVANIA FISH & BO	PA0010561	1,935	1,930	1,930	1,930	1,484
SUSQUEHANNA RI	PENNSYLVANIA FISH & BO	PA0112127	1,191	1,188	1,188	1,188	1,188
SUSQUEHANNA RI	PENNSYLVANIA FISH & BO	PA0044032	61	61	61	61	61
SUSQUEHANNA RI	PINE CREEK MUNICIPAL A	PA0027553	2,950	3,027	1,953	977	195
SUSQUEHANNA RI	PINE GROVE BOROUGH A	PA0020915	3,723	3,713	1,371	686	137
SUSQUEHANNA RI	POPE & TALBOT WIS INC.	PA0007919	5,148	5,133	5,033	2,516	503
SUSQUEHANNA RI	PORTER TOWER JOINT M	PA0046272	2,233	2,227	1,713	857	171
SUSQUEHANNA RI	PROCTOR & GAMBLE PAP	PA0008885	36,395	36,295	14,875	7,438	1,488
SUSQUEHANNA RI	ROARING SPRING BOROU	PA0020249	3,110	3,195	2,075	1,037	207
SUSQUEHANNA RI	SAYRE	PA0043681	698	696	1,994	997	199
SUSQUEHANNA RI	SCRANTON SEWER AUTH	PA0026492	71,631	71,435	40,057	20,029	4,006
SUSQUEHANNA RI	SHAMOKIN-COAL TOWNSI	PA0027324	19,986	19,931	10,832	5,416	1,083
SUSQUEHANNA RI	SHENANDOAH MUNICIPAL	PA0070386	1,453	1,449	3,622	1,811	362
SUSQUEHANNA RI	SHIPPENSBURG BOROUG	PA0030643	3,330	3,452	3,477	3,477	695
SUSQUEHANNA RI	SILVER SPRING TOWNSHI	PA0083593	212	222	478	239	48
SUSQUEHANNA RI	SOUTH MIDDLETON TOWI	PA0044113	556	584	1,376	688	138
SUSQUEHANNA RI	SPRINGETTSBURY TOWN	PA0026808	43,170	45,319	34,383	17,192	3,438
SUSQUEHANNA RI	ST. JOHNS	PA0046388	1,046	1,043	975	487	97
SUSQUEHANNA RI	STEWARTSTOWN BOROU	PA0036269	1,168	1,226	828	414	83
SUSQUEHANNA RI	SUNBURY CITY MUNICIPA	PA0026557	22,163	22,103	9,181	4,590	918
SUSQUEHANNA RI	SWATARA TOWNSHIP	PA0026735	16,644	16,716	10,164	5,082	1,016
SUSQUEHANNA RI	TOWANDA MUNICIPAL AU	PA0034576	4,340	4,329	2,082	1,041	208
SUSQUEHANNA RI	TRI-BORO MUNICIPAL AUT	PA0023736	825	856	865	432	86
SUSQUEHANNA RI	TWIN BOROUGHS SANITA	PA0023264	1,320	1,377	1,051	526	105
SUSQUEHANNA RI	TYRONE BOROUGH SEWE	PA0026727	7,460	7,664	19,488	9,744	1,949
SUSQUEHANNA RI	TYSON FOODS	PA0035092	3,359	3,350	3,350	3,350	168
SUSQUEHANNA RI	UNIVERSITY AREA JOINT A	PA0026239	836	884	2,007	2,007	1,544
SUSQUEHANNA RI	UPPER ALLEN TOWNSHIP	PA0024902	2,417	2,541	1,688	844	169
SUSQUEHANNA RI	USFW-LAMAR NATIONAL F	PA0009857	403	402	402	402	402
SUSQUEHANNA RI	WELLSBORO MUNICIPAL A	PA0021687	6,261	6,498	3,598	1,799	360

TABLE IX-H: Discharged Phosphorus Loads (lbs/yr) for All Point Sources Sorted by Basin

BASIN	FACILITY	NPDES	2000	Tier 1	Tier 2	Tier 3	Tier 4
SUSQUEHANNA RI	WESTERN CLINTON COUN	PA0043893	943	967	1,075	537	107
SUSQUEHANNA RI	WHITE DEER TOWNSHIP	PA0020800	1,907	2,021	831	415	83
SUSQUEHANNA RI	WILLIAMSPORT SANITARY	PA0027057	72,931	75,750	22,279	11,140	2,228
SUSQUEHANNA RI	WILLIAMSPORT SANITARY	PA0027049	32,058	33,298	8,121	4,061	812
SUSQUEHANNA RI	WYOMING VALLEY	PA0026107	99,086	98,815	72,658	36,329	7,266
SUSQUEHANNA RI	YORK CITY	PA0026263	8,974	9,421	36,328	18,164	3,633
SUSQUEHANNA RIVER Total			1,934,145	1,969,969	1,168,012	597,230	127,191
MD EASTERN SHO	BRIDGEVILLE	DE0020249	3,272	3,647	675	338	68
MD EASTERN SHO	DUPONT-SEAFORD	DE0000035	13,864	13,826	13,826	13,826	11,522
MD EASTERN SHO	LAUREL	DE0020125	2,772	3,090	966	483	97
MD EASTERN SHO	SEAFORD	DE0020265	3,931	4,382	3,886	1,943	389
MD EASTERN SHO	ALLEN FAMILY FOODS	MD0067857	36	36	36	36	10
MD EASTERN SHO	BENJAMINS TRAILER PAR	MD0024961	157	174	174	174	116
MD EASTERN SHO	BETTERTON	MD0020575	189	194	194	194	129
MD EASTERN SHO	BOHEMIA MANOR HIGH	MD0023469	55	61	61	61	41
MD EASTERN SHO	BUDGET MOTEL	MD0023027	17	19	19	19	13
MD EASTERN SHO	CAMBRIDGE	MD0021636	41,284	42,372	15,562	7,781	1,556
MD EASTERN SHO	CECILTON	MD0020443	343	379	379	379	253
MD EASTERN SHO	CENTREVILLE	MD0020834	2,628	2,998	1,073	537	107
MD EASTERN SHO	CHERRY HILL	MD0052825	1,098	1,212	1,212	1,212	808
MD EASTERN SHO	CHESAPEAKE CITY NORT	MD0020401	955	1,055	1,055	1,055	581
MD EASTERN SHO	CHESAPEAKE CITY SOUTI	MD0020397	406	449	449	449	449
MD EASTERN SHO	CHESAPEAKE COLLEGE	MD0024384	125	143	143	143	95
MD EASTERN SHO	CHESTERTOWN	MD0020010	8,437	8,635	1,990	995	199
MD EASTERN SHO	CHURCH HILL	MD0050016	380	434	434	434	434
MD EASTERN SHO	COLONEL RICHARDSON M	MD0055522	54	58	58	58	39
MD EASTERN SHO	CRISFIELD	MD0020001	3,966	4,181	2,068	1,034	207
MD EASTERN SHO	DELMAR	MD0020532	558	613	1,759	879	176
MD EASTERN SHO	DENTON	MD0020494	1,596	1,711	1,244	622	124
MD EASTERN SHO	DONALDSON BROWN CEN	MD0054950	18	20	20	20	13
MD EASTERN SHO	EASTERN CORRECTIONAI	MD0023876	127	144	144	144	96
MD EASTERN SHO	EASTERN CORRECTIONAI	MD0066613	162	171	171	171	171
MD EASTERN SHO	EASTON	MD0020273	14,411	15,232	5,872	2,936	587
MD EASTERN SHO	ELK NECK STATE PARK	MD0023833	193	213	213	213	169
MD EASTERN SHO	ELKTON	MD0020681	5,185	5,727	5,266	2,633	527
MD EASTERN SHO	ENGLISH GRILL	MD0053104	4	4	4	4	2
MD EASTERN SHO	EWELL	MD0052230	194	204	204	204	136
MD EASTERN SHO	FAIRMOUNT	MD0052256	268	282	282	282	188
MD EASTERN SHO	FEDERALSBURG	MD0020249	913	979	1,003	501	100
MD EASTERN SHO	FOREST GREEN	MD0053279	410	453	453	453	61
MD EASTERN SHO	FRUITLAND	MD0052990	4,302	4,730	1,577	788	158
MD EASTERN SHO	GALENA	MD0020605	358	366	366	366	162
MD EASTERN SHO	GREAT OAKS LANDING	MD0024945	51	53	53	53	35
MD EASTERN SHO	GREENSBORO	MD0020290	1,678	1,799	1,799	1,799	1,034
MD EASTERN SHO	HARBOUR VIEW	MD0024023	64	71	71	71	47
MD EASTERN SHO	HEBRON	MD0059617	1,092	1,201	1,201	1,201	800
MD EASTERN SHO	HURLOCK	MD0022730	22,576	23,171	3,233	1,616	323
MD EASTERN SHO	KENNEDYVILLE	MD0052671	41	41	41	41	28
MD EASTERN SHO	KENT ISLAND	MD0023485	3,144	3,588	4,996	2,498	500
MD EASTERN SHO	MANCHESTER PARK	MD0023108	349	386	386	386	166

TABLE IX-H: Discharged Phosphorus Loads (lbs/yr) for All Point Sources Sorted by Basin

BASIN	FACILITY	NPDES	2000	Tier 1	Tier 2	Tier 3	Tier 4
MD EASTERN SHO	MAPLE HILL PARK	MD0053171	50	55	55	55	37
MD EASTERN SHO	MARDELA HIGH	MD0024279	20	22	22	22	15
MD EASTERN SHO	MILLINGTON	MD0020435	519	531	531	531	354
MD EASTERN SHO	MORNING CHEER	MD0052299	167	184	184	184	123
MD EASTERN SHO	NORTH CAROLINE HIGH	MD0023621	20	21	21	21	14
MD EASTERN SHO	NORTHEAST RIVER	MD0052027	1,632	1,802	1,913	957	191
MD EASTERN SHO	OXFORD	MD0022543	210	222	222	222	222
MD EASTERN SHO	PITTSVILLE	MD0060348	232	255	255	255	255
MD EASTERN SHO	POCOMOKE CITY	MD0022551	11,238	12,475	2,929	1,465	293
MD EASTERN SHO	POCOMOKE TRUCK STOP	MD0054330	19	21	21	21	14
MD EASTERN SHO	PORT DEPOSIT	MD0020796	1,243	1,373	1,373	1,373	915
MD EASTERN SHO	PRESTON	MD0020621	511	548	548	548	366
MD EASTERN SHO	PRINCESS ANNE	MD0020656	268	282	944	944	189
MD EASTERN SHO	QUEENSTOWN	MD0023370	514	586	586	586	480
MD EASTERN SHO	RISING SUN	MD0020265	2,112	2,332	2,332	2,332	1,555
MD EASTERN SHO	ROCK HALL	MD0020303	414	423	423	423	423
MD EASTERN SHO	SALISBURY	MD0021571	22,735	24,995	17,954	8,977	1,795
MD EASTERN SHO	SHARPTOWN	MD0052175	2,373	2,609	2,609	2,609	735
MD EASTERN SHO	SNOW HILL	MD0022764	4,791	5,318	1,416	708	142
MD EASTERN SHO	SPRING MEADOWS	MD0024953	89	97	97	97	65
MD EASTERN SHO	SUDLERSVILLE	MD0020559	398	454	454	454	303
MD EASTERN SHO	TALBOT COUNTY REGION	MD0023604	3,385	3,578	3,578	3,578	2,316
MD EASTERN SHO	TALBOT COUNTY REGION	MD0059463	663	701	701	701	467
MD EASTERN SHO	TAWES VOCATIONAL-TEC	MD0022993	1,498	1,579	1,579	1,579	1,053
MD EASTERN SHO	TOLCHESTER	MD0067202	805	823	823	823	549
MD EASTERN SHO	TRAPPE	MD0020486	1,025	1,083	1,083	1,083	828
MD EASTERN SHO	TRIUMPH INDUSTRIAL PAI	MD0024929	317	350	350	350	233
MD EASTERN SHO	TWIN CITIES	MD0055352	1,052	1,080	1,080	1,080	720
MD EASTERN SHO	TYLERTON	MD0052248	44	47	47	47	31
MD EASTERN SHO	U.S. ARMY-CHESAPEAKE	MD0020206	2	3	3	3	2
MD EASTERN SHO	VIENNA	MD0020664	500	514	514	514	342
MD EASTERN SHO	WALKERS TRAILER PARK	MD0057487	121	129	129	129	86
MD EASTERN SHO	WILLARDS	MD0051632	681	749	749	749	499
MD EASTERN SHO	WOODLAWN MOBILE HOM	MD0023337					
MD EASTERN SHO	WORTON-BUTLERTON	MD0060585	562	575	575	575	383
MD EASTERN SHORE Total			201,875	214,324	120,721	83,030	38,713
MD WESTERN SHO	ABERDEEN	MD0021563	584	634	3,414	2,626	525
MD WESTERN SHO	ABERDEEN PROVING GRO	MD0021237	1,064	1,154	2,785	1,392	278
MD WESTERN SHO	ABERDEEN PROVING GRO	MD0021229	1,323	1,436	2,925	1,462	292
MD WESTERN SHO	ANNAPOLIS	MD0021814	9,606	10,198	22,963	11,481	2,296
MD WESTERN SHO	BACK RIVER	MD0021555	42,546	43,357	53,436	53,436	26,718
MD WESTERN SHO	BALTIMORE YACHT CLUB	MD0054542	17	18	18	18	12
MD WESTERN SHO	BETHLEHEM STEEL CORF	MD0001201	81,163	80,941	80,941	80,941	26,876
MD WESTERN SHO	BOWLEYS QUARTERS	MD0058807	60	61	61	61	41
MD WESTERN SHO	BROADNECK	MD0021644	7,258	7,705	15,927	7,963	1,593
MD WESTERN SHO	BROADWATER	MD0024350	1,963	2,085	3,861	1,931	386
MD WESTERN SHO	CHEMETALS	MD0001775	11	11	12	12	12
MD WESTERN SHO	CHESAPEAKE BAY INSTIT	MD0022985					
MD WESTERN SHO	CHESAPEAKE BEACH	MD0020281	1,724	2,179	2,461	1,231	246
MD WESTERN SHO	CONGOLEUM	MD0001384	161	160	160	160	80

TABLE IX-H: Discharged Phosphorus Loads (lbs/yr) for All Point Sources Sorted by Basin

BASIN	FACILITY	NPDES	2000	Tier 1	Tier 2	Tier 3	Tier 4
MD WESTERN SHO	COX CREEK	MD0021661	45,048	47,825	37,447	18,724	3,745
MD WESTERN SHO	DREAMS LANDING	MD0052868	72	77	77	77	51
MD WESTERN SHO	FREEDOM DISTRICT	MD0021512	4,998	5,879	8,692	4,346	869
MD WESTERN SHO	GAITHER MANOR	MD0022845	232	273	273	273	138
MD WESTERN SHO	HAMPSTEAD	MD0022446	432	508	508	508	508
MD WESTERN SHO	HAVRE DE GRACE	MD0021750	3,500	3,799	4,252	2,126	425
MD WESTERN SHO	HOLIDAY MOBILE ESTATE	MD0053082	347	369	369	369	369
MD WESTERN SHO	JOPPATOWNE	MD0022535	1,921	2,085	2,614	1,307	261
MD WESTERN SHO	MANCHESTER	MD0022578	56	66	66	66	66
MD WESTERN SHO	MAYO LARGE COMMUNAL	MD0061794	1,281	1,360	1,360	1,360	1,360
MD WESTERN SHO	MOUNT AIRY	MD0022527	798	939	2,003	1,002	200
MD WESTERN SHO	NOTCHCLIFF	MD0022951	341	347	347	347	231
MD WESTERN SHO	PATAPSCO	MD0021601	144,631	173,933	222,326	111,163	22,233
MD WESTERN SHO	PHEASANT RIDGE	MD0024546	174	205	205	205	152
MD WESTERN SHO	RANDLE CLIFFS NAVAL	MD0020168	125	158	158	158	105
MD WESTERN SHO	RICHLYN MANOR	MD0022713	553	564	564	564	537
MD WESTERN SHO	RIVERBOAT MOTEL	MD0051535					
MD WESTERN SHO	ROSE HAVEN	MD0022756	168	178	178	178	178
MD WESTERN SHO	SOD RUN	MD0056545	41,334	44,860	38,354	19,177	3,835
MD WESTERN SHO	SOUTH CARROLL HIGH SC	MD0024589	2	3	3	3	3
MD WESTERN SHO	ST TIMOTHY SCHOOL	MD0056103	50	51	51	51	34
MD WESTERN SHO	SUMMER HILL TRAILER PA	MD0023272	43	45	45	45	45
MD WESTERN SHO	SWAN HARBOR PARK	MD0023043	103	112	112	112	75
MD WESTERN SHO	UNITED CONTAINER	MD0024635	68	69	69	69	46
MD WESTERN SHO	US GYPSUM CO	MD0001457					
MD WESTERN SHO	US NAVAL ACADEMY	MD0023523	63	67	67	67	67
MD WESTERN SHO	VILLA JULIE COLLEGE	MD0066001	3	3	3	3	3
MD WESTERN SHO	W R GRACE	MD0000311	1,814	1,809	1,809	1,809	1,238
MD WESTERN SHO	WOODSTOCK TRAINING C	MD0023906	78	80	80	80	53
MD WESTERN SHORE Total			395,719	435,606	510,996	326,904	96,185
PATUXENT RIVER	BOONES MOBILE	MD0050903	239	254	254	254	254
PATUXENT RIVER	BOWIE	MD0021628	992	1,085	6,354	3,177	635
PATUXENT RIVER	DORSEY RUN	MD0063207	945	1,003	4,466	2,233	447
PATUXENT RIVER	EDGEMEADE RESIDENTIA	MD0052680	27	29	29	29	13
PATUXENT RIVER	EMERGENCY MANAGEME	MD0025666	1	1	1	1	1
PATUXENT RIVER	FORT MEADE	MD0021717	1,198	1,272	6,615	3,308	662
PATUXENT RIVER	HARWOOD SOUTHERN HI	MD0023728	131	139	139	139	36
PATUXENT RIVER	LITTLE PATUXENT	MD0055174	18,767	22,000	47,126	31,418	6,284
PATUXENT RIVER	LYONS CREEK MOBILE	MD0053511	394	418	418	418	418
PATUXENT RIVER	MARLBORO MEADOWS	MD0022781	873	954	954	954	954
PATUXENT RIVER	MARYLAND CITY	MD0062596	1,479	1,570	3,242	1,621	324
PATUXENT RIVER	MARYLAND MANOR MOBI	MD0024333	287	304	304	304	304
PATUXENT RIVER	MD & VA MILK PRODUCER	MD0000469	14,068	14,030	1,086	543	109
PATUXENT RIVER	NATIONAL WILDLIFE VISIT	MD0065358	8	9	9	9	8
PATUXENT RIVER	NORTHERN HIGH SCHOO	MD0052167	114	145	145	145	96
PATUXENT RIVER	PARKWAY	MD0021725	5,304	5,501	18,882	9,441	1,888
PATUXENT RIVER	PARKWAY INN	MD0052329	133	141	141	141	141
PATUXENT RIVER	PATUXENT	MD0021652	4,683	4,972	14,756	7,378	1,476
PATUXENT RIVER	PATUXENT MOBILE	MD0024694	105	111	111	111	111
PATUXENT RIVER	PATUXENT WILDLIFE HQ	MD0025623	174	191	191	191	127

TABLE IX-H: Discharged Phosphorus Loads (lbs/yr) for All Point Sources Sorted by Basin

BASIN	FACILITY	NPDES	2000	Tier 1	Tier 2	Tier 3	Tier 4
PATUXENT RIVER	PINE HILL RUN	MD0021679	14,260	16,131	11,854	5,927	1,185
PATUXENT RIVER	PINEY ORCHARD	MD0059145	294	312	312	312	312
PATUXENT RIVER	POINT LOOKOUT STATE P	MD0023949	150	170	170	170	113
PATUXENT RIVER	USAF BRANDYWINE HOUS	MD0025640	14	15	15	15	8
PATUXENT RIVER	USAF TRANSMITTER STA	MD0025631					
PATUXENT RIVER	WAYSONS MOBILE	MD0023647	299	317	317	317	278
PATUXENT RIVER	WESTERN BRANCH	MD0021741	37,990	47,636	70,048	35,024	7,005
PATUXENT RIVER Total			102,930	118,710	187,940	103,579	23,190
POTOMAC RIVER	BLUE PLAINS	DC0021199	104,298	111,804	187,326	187,326	104,070
POTOMAC RIVER	WASHINGTON, D.C. COME	DC-CSO	46,480	46,353	46,353	46,353	0
POTOMAC RIVER	ANTIETAM	MD0062308	952	999	999	999	666
POTOMAC RIVER	BALLENGER CREEK	MD0021822	3,590	4,293	12,549	6,274	1,255
POTOMAC RIVER	BELTSVILLE USDA EAST	MD0020842	1,357	1,484	1,484	1,484	1,436
POTOMAC RIVER	BELTSVILLE USDA WEST	MD0020851	762	833	833	833	757
POTOMAC RIVER	BIERS LANE	MD0065749	28	28	28	28	18
POTOMAC RIVER	BLOOMINGTON	MD0060933	306	322	322	322	166
POTOMAC RIVER	BOONSBORO	MD0020231	2,821	2,963	2,963	2,963	2,457
POTOMAC RIVER	BOWLING BROOK PREPAF	MD0067571	46	54	54	54	36
POTOMAC RIVER	BRANDYWINE RECEIVING	MD0025658	10	11	11	11	7
POTOMAC RIVER	BRETTON WOODS	MD0064777	81	89	89	89	59
POTOMAC RIVER	BROADFORDING	MD0051373	10	10	10	10	7
POTOMAC RIVER	BROOK LANE	MD0053198	49	51	51	51	34
POTOMAC RIVER	BRUNSWICK	MD0020958	5,822	6,961	2,320	1,160	232
POTOMAC RIVER	CELANESE	MD0063878	7,763	7,792	3,094	1,547	309
POTOMAC RIVER	CHARLES COUNTY COMM	MD0052311	268	310	310	310	221
POTOMAC RIVER	CHELTENHAM BOYS VILLA	MD0023931	105	115	115	115	115
POTOMAC RIVER	CHOPTICAN HIGH	MD0051918	45	51	51	51	34
POTOMAC RIVER	CLEARSPRING	MD0053325	690	725	725	725	483
POTOMAC RIVER	CLIFFTON ON THE POTOM	MD0055557	406	469	469	469	313
POTOMAC RIVER	CONCORD TRAILER PARK	MD0023060	35	42	42	42	28
POTOMAC RIVER	CONOCOCHEAGUE	MD0063509	2,780	4,622	3,633	1,816	363
POTOMAC RIVER	CRESTVIEW	MD0022683	296	354	354	354	234
POTOMAC RIVER	CUMBERLAND	MD0021598	50,434	50,621	29,228	14,614	2,923
POTOMAC RIVER	DAMASCUS	MD0020982	3,005	2,925	2,619	1,310	262
POTOMAC RIVER	DAN-DEE INC.	MD0023710	18	22	22	22	15
POTOMAC RIVER	EMMITSBURG	MD0020257	2,912	3,481	1,761	880	176
POTOMAC RIVER	FAHRNEY-KEEDY MEMOR	MD0053066	165	173	173	173	116
POTOMAC RIVER	FLINTSTONE	MD0055620	534	536	536	536	358
POTOMAC RIVER	FORT DETRICK	MD0020877	3,308	3,955	3,375	1,688	338
POTOMAC RIVER	FOUNTAINDALE	MD0022721	2,460	2,942	2,942	2,942	1,540
POTOMAC RIVER	FOXVILLE US NAVAL SUPI	MD0025119	222	266	266	266	177
POTOMAC RIVER	FREDERICK	MD0021610	82,916	99,129	23,637	11,818	2,364
POTOMAC RIVER	FUNKSTOWN	MD0020362	1,030	1,082	1,082	1,082	391
POTOMAC RIVER	GARDEN STATE TANNING	MD0053431	64	64	64	13	13
POTOMAC RIVER	GEORGES CREEK	MD0060071	6,087	6,110	2,037	1,018	204
POTOMAC RIVER	GORMAN	MD0060950	41	43	43	43	29
POTOMAC RIVER	GREEN RIDGE FORESTRY	MD0024988	36	36	36	36	19
POTOMAC RIVER	GREENBRIAR STATE PARI	MD0023868	133	139	139	139	93
POTOMAC RIVER	HAGERSTOWN	MD0021776	56,857	59,720	25,786	12,893	2,579
POTOMAC RIVER	HANCOCK	MD0024562	1,578	1,657	1,657	1,657	1,364

TABLE IX-H: Discharged Phosphorus Loads (lbs/yr) for All Point Sources Sorted by Basin

BASIN	FACILITY	NPDES	2000	Tier 1	Tier 2	Tier 3	Tier 4
POTOMAC RIVER	HAPPY TRAILS CAMPGRO	MD0065757	31	32	32	32	21
POTOMAC RIVER	HIGHLAND VIEW	MD0024627	81	86	86	86	57
POTOMAC RIVER	HUNTER HILL APARTMEN	MD0022926	253	266	266	266	177
POTOMAC RIVER	I-70 REST AREA	MD0023680	262	313	313	313	209
POTOMAC RIVER	INDIAN HEAD	MD0020052	2,352	2,716	1,073	537	107
POTOMAC RIVER	JEFFERSON	MD0020737	1,341	1,603	1,603	1,603	1,069
POTOMAC RIVER	JUDE HOUSE	MD0057614					
POTOMAC RIVER	KEMPTOWN SCHOOL	MD0056481	42	50	50	50	33
POTOMAC RIVER	KITZMILLER	MD0060941	171	180	180	180	107
POTOMAC RIVER	KUNZANG ODSAL PALGUI	MD0067539	7	8	8	8	5
POTOMAC RIVER	LA PLATA	MD0020524	3,460	3,995	753	753	251
POTOMAC RIVER	LACKEY HIGH	MD0023159	84	97	97	97	65
POTOMAC RIVER	LAFAYETTE MOTEL	MD0053201	10	11	11	11	8
POTOMAC RIVER	LEONARDTOWN	MD0024767	3,853	4,359	1,466	733	147
POTOMAC RIVER	LEWISTOWN ELEMENTAR	MD0022900	23	27	27	27	18
POTOMAC RIVER	LIBERTYTOWN	MD0060577	221	264	264	264	183
POTOMAC RIVER	LUPPINO RESIDENCE	MD0063070					
POTOMAC RIVER	MAPLE RUN	MD0024970	28	28	28	28	19
POTOMAC RIVER	MARYLAND CORRECTION	MD0023957	957	1,005	2,874	1,437	287
POTOMAC RIVER	MATTAWOMAN	MD0021865	2,890	3,337	4,480	4,480	2,489
POTOMAC RIVER	METTIKI COAL D	MD0064149					
POTOMAC RIVER	MIDDLETOWN	MD0024406	1,633	1,953	1,953	1,953	1,594
POTOMAC RIVER	MILL BOTTOM	MD0065439	403	482	482	482	321
POTOMAC RIVER	MONROVIA WWTP	MD0059609	247	295	295	295	197
POTOMAC RIVER	MT CARMEL WOODS	MD0053228	44	51	51	51	51
POTOMAC RIVER	MT ST MARYS COLLEGE	MD0023230	854	1,021	1,021	1,021	323
POTOMAC RIVER	MYERSVILLE	MD0020699	2,056	2,458	2,458	2,458	1,138
POTOMAC RIVER	NAS-PATUXENT	MD0020095	274	310	310	310	207
POTOMAC RIVER	NATIONAL INSTITUTE OF I	MD0020931	470	518	518	518	346
POTOMAC RIVER	NEW GERMANY STATE PA	MD0023981	12	13	13	13	9
POTOMAC RIVER	NEW LIFE FOURSQUARE (	MD0057100	15	18	18	18	12
POTOMAC RIVER	NEW MARKET	MD0020729	1,477	1,766	1,766	1,766	736
POTOMAC RIVER	NEW WINDSOR	MD0022586	540	635	635	635	320
POTOMAC RIVER	NORBECK COUNTRY CLU	MD0024309					
POTOMAC RIVER	NORTH INDIAN HEAD EST	MD0024601					
POTOMAC RIVER	NSWC-INDIAN HEAD	MD0003158	4,451	4,438	1,479	740	148
POTOMAC RIVER	NSWC-INDIAN HEAD	MD0020885	1,949	2,251	2,251	2,251	2,114
POTOMAC RIVER	OLD SOUTH MOUNTAIN IN	MD0055425	19	23	23	23	15
POTOMAC RIVER	OLDTOWN	MD0024759	68	68	68	68	64
POTOMAC RIVER	PETER PAN INN	MD0024244	11	14	14	14	14
POTOMAC RIVER	PICCOWAXIN MIDDLE	MD0023451	21	25	25	25	16
POTOMAC RIVER	PINTO	MD0022748	2,266	2,274	2,274	2,274	1,642
POTOMAC RIVER	PISCATAWAY	MD0021539	7,517	9,009	13,869	13,869	7,705
POTOMAC RIVER	PLEASANT BRANCH	MD0065269	390	466	466	466	311
POTOMAC RIVER	PLESANT VALLEY	MD0066745	73	85	85	85	57
POTOMAC RIVER	POINT OF ROCKS	MD0020800	1,272	1,520	1,520	1,520	602
POTOMAC RIVER	POOLESVILLE	MD0023001	1,587	1,749	2,022	1,011	202
POTOMAC RIVER	RAWLINGS HEIGHTS	MD0023213	308	309	309	309	309
POTOMAC RIVER	ROCKY GAP STATE PARK	MD0051667	472	474	474	474	316
POTOMAC RIVER	RUNNYMEADE SCHOOL	MD0065927	24	29	29	29	19

TABLE IX-H: Discharged Phosphorus Loads (lbs/yr) for All Point Sources Sorted by Basin

BASIN	FACILITY	NPDES	2000	Tier 1	Tier 2	Tier 3	Tier 4
POTOMAC RIVER	SANDY HOOK	MD0064530	56	59	59	59	40
POTOMAC RIVER	SENECA CREEK	MD0021491	25,684	74,154	28,628	28,628	5,726
POTOMAC RIVER	SHAMROCK RESTAURANT	MD0058050	22	26	26	26	17
POTOMAC RIVER	SHEPPARD PRATT WESTE	MD0067521	27	32	32	32	21
POTOMAC RIVER	SIDELING HILL REST ARE/	MD0062821	61	64	64	64	43
POTOMAC RIVER	SMITHSBURG	MD0024317	1,216	1,278	1,278	1,278	1,278
POTOMAC RIVER	SOUTHERN CORRECTION	MD0023914	414	478	478	478	212
POTOMAC RIVER	SPRING MILLS	WV1031613					
POTOMAC RIVER	SPRINGVIEW ESTATES	MD0022870	51	61	61	61	41
POTOMAC RIVER	ST. JAMES SCHOOL	MD0065536	60	63	63	63	42
POTOMAC RIVER	SWAN POINT	MD0057525	290	335	335	335	223
POTOMAC RIVER	TANEYTOWN	MD0020672	4,156	4,888	2,773	1,387	277
POTOMAC RIVER	THUNDERBIRD APARTMEI	MD0050334	79	91	91	91	81
POTOMAC RIVER	THUNDERBIRD MOTEL	MD0053155	37	42	42	42	28
POTOMAC RIVER	THURMONT	MD0021121	1,787	2,136	3,056	1,528	306
POTOMAC RIVER	TRI-TOWN PLAZA	MD0024937	81	81	81	81	81
POTOMAC RIVER	UNION BRIDGE	MD0022454	874	1,028	1,028	1,028	629
POTOMAC RIVER	UPPER POTOMAC RIVER (	MD0021687	49,000	48,866	48,866	30,773	6,155
POTOMAC RIVER	URBANA HIGH SCHOOL	MD0066940	26	31	31	31	18
POTOMAC RIVER	VICTOR CULLEN CENTER	MD0023922	318	380	380	380	253
POTOMAC RIVER	WESTMINSTER	MD0021831	5,854	6,886	13,105	6,552	1,310
POTOMAC RIVER	WESTVACO CORPORATIC	MD0001422	598	597	597	597	597
POTOMAC RIVER	WHITE HOUSE MOTEL	MD0056553	12	14	14	14	10
POTOMAC RIVER	WHITE ROCK	MD0025089	130	156	156	156	104
POTOMAC RIVER	WINEBRENNER WWTP	MD0003221	1,136	1,193	672	336	67
POTOMAC RIVER	WINTERS APARTMENTS	MD0057606	2	2	2	2	1
POTOMAC RIVER	WOODSBORO	MD0058661	674	806	806	806	743
POTOMAC RIVER	ANTRIM TOWNSHIP	PA0080519	3,126	3,240	1,510	755	151
POTOMAC RIVER	CHAMBERSBURG BOROU	PA0026051	37,236	38,599	14,544	7,272	1,454
POTOMAC RIVER	FRANKLIN COUNTY AUTH(	PA0020834	2,113	2,191	3,294	1,647	329
POTOMAC RIVER	GETTYSBURG MUNICIPAL	PA0021563	2,327	2,528	4,927	2,463	493
POTOMAC RIVER	HYNDMAN BOROUGH	PA0020851	269	279	254	127	25
POTOMAC RIVER	LITTLESTOWN BOROUGH	PA0021229	2,448	2,659	1,546	773	155
POTOMAC RIVER	WASHINGTON TOWNSHIP	PA0080225	7,021	7,278	2,838	1,419	284
POTOMAC RIVER	WAYNESBORO BOROUGH	PA0020621	12,274	12,723	2,647	1,323	265
POTOMAC RIVER	ALEXANDRIA	VA0025160	6,005	6,170	20,800	20,800	11,556
POTOMAC RIVER	AQUIA	VA0060968	1,015	1,610	2,900	2,900	1,611
POTOMAC RIVER	ARLINGTON	VA0025143	5,360	6,868	19,346	19,346	10,748
POTOMAC RIVER	BROAD RUN WRF	VA_BROADR		731	7,309	3,655	731
POTOMAC RIVER	CHICKEN GEORGES	VA0077402	123,344	123,007	7,382	7,382	369
POTOMAC RIVER	COLONIAL BEACH	VA0026409	6,639	7,022	2,577	1,289	258
POTOMAC RIVER	DAHLGREN (DAHLGREN S	VA0026514	439	496	926	463	93
POTOMAC RIVER	DALE CITY #1	VA0024724	743	886	1,678	1,678	932
POTOMAC RIVER	DALE CITY #8	VA0024678	714	851	1,561	1,561	867
POTOMAC RIVER	DUPONT-WAYNESBORO	VA0002160	1,252	1,249	1,249	1,249	904
POTOMAC RIVER	FAIRVIEW BEACH	MD0056464	317	358	358	358	238
POTOMAC RIVER	FISHERSVILLE	VA0025291	6,510	13,917	5,208	2,604	521
POTOMAC RIVER	FRONT ROYAL	VA0062812	8,055	9,324	8,414	4,207	841
POTOMAC RIVER	FWSA OPEQUON	VA0065552	17,672	20,483	17,940	8,970	1,794
POTOMAC RIVER	H.L. MOONEY	VA0025101	2,953	4,473	8,020	8,020	4,456

TABLE IX-H: Discharged Phosphorus Loads (lbs/yr) for All Point Sources Sorted by Basin

BASIN	FACILITY	NPDES	2000	Tier 1	Tier 2	Tier 3	Tier 4
POTOMAC RIVER	HARRISONBURG-ROCKIN(	VA0060640	57,587	78,058	35,481	17,740	3,548
POTOMAC RIVER	LEESBURG	MD0066184	11,624	12,812	9,010	4,505	901
POTOMAC RIVER	LURAY	VA0062642	1,765	1,877	4,578	2,289	458
POTOMAC RIVER	MASSANUTTEN PUBLIC SI	VA0024732	2,766	2,888	1,155	578	116
POTOMAC RIVER	MERCK & COMPANY INC.-	VA0002178	80,398	80,179	30,720	15,360	3,072
POTOMAC RIVER	MIDDLE RIVER	VA0064793	22,566	35,349	17,207	8,604	1,721
POTOMAC RIVER	MONTROSS - WESTMORE	VA0072729		111	95	47	9
POTOMAC RIVER	NAVAL SURFACE WARFAI	VA0021067	3,387	3,823	1,322	661	132
POTOMAC RIVER	NEW MARKET STP	VA0022853	3,931	4,262	1,705	852	170
POTOMAC RIVER	NOMAN M. COLE JR. POLL	VA0025364	13,923	17,159	29,055	29,055	16,141
POTOMAC RIVER	PARKINS MILL	VA0075191	9,335	10,819	4,328	2,164	433
POTOMAC RIVER	PILGRIMS PRIDE-HINTON	VA0002313	54,403	54,255	3,288	3,288	164
POTOMAC RIVER	PURCELLVILLE	VA0022802	2,691	3,225	1,290	645	129
POTOMAC RIVER	QUANTICO-MAINSIDE	VA0028363	342	407	759	759	422
POTOMAC RIVER	ROUND HILL WWTP	VA0026212	1,148	1,375	458	229	46
POTOMAC RIVER	SIL MRRS	VA0090263		5,779	3,853	1,926	385
POTOMAC RIVER	STONY CREEK STP	VA0028380	1,858	2,014	806	403	81
POTOMAC RIVER	STRASBURG	VA0020311	5,425	5,883	2,353	1,177	235
POTOMAC RIVER	STUARTS DRAFT	VA0066877	4,920	6,853	4,568	2,284	457
POTOMAC RIVER	UPPER OCCOQUAN SEWA	VA0024988	3,173	4,411	10,355	10,355	10,355
POTOMAC RIVER	WAYNESBORO	VA0025151	35,879	37,575	8,573	4,287	857
POTOMAC RIVER	WEYERS CAVE STP	VA0022349	884	3,046	1,218	609	122
POTOMAC RIVER	WIDEWATER WWTP	VA0090387		609	305	152	30
POTOMAC RIVER	WOODSTOCK	VA0026468	2,938	3,185	1,274	637	127
POTOMAC RIVER	BERKELEY COUNTY PSSI	WV0020061	4,677	5,496	1,832	916	183
POTOMAC RIVER	BERKELEY COUNTY PSSI	WV0082759	7,206	8,467	2,822	1,411	282
POTOMAC RIVER	CHARLESTOWN	WV0022349	6,183	6,828	2,276	1,138	228
POTOMAC RIVER	FORT ASHBY PSD	WV0041521					
POTOMAC RIVER	FRANKLIN	WV0024970					
POTOMAC RIVER	HARPERS FERRY-BOLIVA	WV0039136	1,747	1,743	1,743	1,743	1,162
POTOMAC RIVER	HESTER INDUSTRIES, INC	WV0047236	1,513	0	0	0	0
POTOMAC RIVER	HONEYWOOD HOMES	WV0080918					
POTOMAC RIVER	KEYSER	WV0024392	3,826	3,840	3,675	1,837	367
POTOMAC RIVER	MARTINSBURG	WV0023167	18,245	21,439	7,146	3,573	715
POTOMAC RIVER	MOOREFIELD	WV0020150	2,887	0	0	0	0
POTOMAC RIVER	MOUNTAIN TOP PSD	WV0101524	241	240	240	240	160
POTOMAC RIVER	PETERSBURG	WV0021792	6,742	6,723	2,241	1,121	224
POTOMAC RIVER	REPUBLIC PAPERBOARD	WV0005517					
POTOMAC RIVER	RIVER BEND PARK	WV0105384	194	203	203	203	136
POTOMAC RIVER	ROMNEY	WV0020699	3,852	4,172	1,391	695	139
POTOMAC RIVER	SHEPHERDSTOWN	WV0024775					
POTOMAC RIVER	SPECRATECH INTERNATI(	WV0005533	2,895	2,887	962	481	96
POTOMAC RIVER	VIRGINIA ELECTRIC & PO\	WV0005525					
POTOMAC RIVER	WAMPLER-LONGACRE, IN	WV0005495	46,052	0	0	0	0
POTOMAC RIVER Total			1,202,995	1,322,949	845,869	645,156	251,482
RAPPAHANNOCK I	CULPEPER	VA0061590	9,348	10,371	6,914	3,457	691
RAPPAHANNOCK I	FMC	VA0068110	2,835	15,034	10,023	5,011	1,002
RAPPAHANNOCK I	FORT A.P. HILL (WILCOX (	VA0032034	1,365	1,441	355	178	36
RAPPAHANNOCK I	FREDERICKSBURG	VA0025127	7,927	8,934	6,790	3,395	679
RAPPAHANNOCK I	HAYMOUNT STP	VA0089125		4,340	2,893	1,447	289

TABLE IX-H: Discharged Phosphorus Loads (lbs/yr) for All Point Sources Sorted by Basin

BASIN	FACILITY	NPDES	2000	Tier 1	Tier 2	Tier 3	Tier 4
RAPPAHANNOCK I	KILMARNOCK	VA0020788	1,839	1,944	760	380	76
RAPPAHANNOCK I	LITTLE FALLS RUN	VA0076392	7,050	11,172	12,670	6,335	1,267
RAPPAHANNOCK I	MASSAPONAX	VA0025658	5,075	20,021	13,348	6,674	1,335
RAPPAHANNOCK I	ORANGE	VA0021385	4,771	3,159	2,106	1,053	211
RAPPAHANNOCK I	REEDVILLE	VA0060712	274	291	116	58	12
RAPPAHANNOCK I	REMINGTON REGIONAL	VA0076805	3,364	2,619	1,746	873	175
RAPPAHANNOCK I	SOUTH WALES STP	VA0080527		3,910	2,607	1,303	261
RAPPAHANNOCK I	TAPPAHANNOCK	VA0071471	2,824	2,846	1,139	569	114
RAPPAHANNOCK I	URBANNA	VA0026263	427	860	344	172	34
RAPPAHANNOCK I	WARRENTON	VA0021172	3,337	3,859	3,594	1,797	359
RAPPAHANNOCK I	WARSAW	VA0026891	1,598	1,653	661	331	66
RAPPAHANNOCK I	WILDERNESS SHORES	VA0083411	3,769	4,160	1,664	832	166
RAPPAHANNOCK RIVER Total			55,802	96,615	67,729	33,864	6,773
VA EASTERN SHO	CAPE CHARLES	VA0021288	1,163	1,159	464	232	46
VA EASTERN SHO	ONANCOCK	VA0021253	1,777	1,782	713	356	71
VA EASTERN SHO	TANGIER ISLAND	VA0067423	351	352	141	70	14
VA EASTERN SHO	TYSON FOODS, INC.-TEMP	VA0004049	46,067	45,941	6,381	6,381	319
VA EASTERN SHORE Total			49,358	49,235	7,698	7,039	451
YORK RIVER	AMOCO-YORKTOWN	VA0003018	22,058	21,998	21,998	21,998	18,507
YORK RIVER	ASHLAND	VA0024899	8,802	7,081	4,721	2,360	472
YORK RIVER	CAROLINE COUNTY REGI	VA0073504	2,564	2,706	597	299	60
YORK RIVER	DOSWELL	VA0029521	31,303	30,836	20,558	10,279	2,056
YORK RIVER	GORDONSVILLE	VA0021105	3,905	4,310	1,724	862	172
YORK RIVER	HRSD-YORK	VA0081311	45,959	58,018	38,679	19,339	3,868
YORK RIVER	MATHEWS COURTHOUSE	VA0028819	202	345	244	122	24
YORK RIVER	PARHAM LANDING WWTP	VA0088331	221	245	316	158	32
YORK RIVER	SMURFIT STONE	VA0003115	69,554	69,364	56,181	28,091	5,618
YORK RIVER	TOTOPOTOMOY	VA0089915		22,842	15,228	7,614	1,523
YORK RIVER	WEST POINT	VA0075434	4,757	4,568	1,827	914	183
YORK RIVER Total			189,324	222,313	162,071	92,034	32,514
JAMES RIVER	ALLEGHANY CO. LOWER J	VA0090671		4,568	2,284	1,142	228
JAMES RIVER	BROWN & WILLIAMSON	VA0002780	4,430	4,418	2,512	1,256	251
JAMES RIVER	BUENA VISTA	VA0020991	11,062	11,032	4,413	2,206	441
JAMES RIVER	BWXT	VA0003697	1,550	1,546	1,458	729	146
JAMES RIVER	CLIFTON FORGE	VA0022772	9,422	9,396	3,759	1,879	376
JAMES RIVER	COVINGTON	VA0025542	13,565	13,528	5,411	2,706	541
JAMES RIVER	CREWE STP	VA0020303	164	166	600	300	60
JAMES RIVER	DUPONT-SPRUANCE	VA0004669	7,882	7,860	7,860	7,860	7,104
JAMES RIVER	FALLING CREEK	VA0024996	26,704	31,618	25,093	12,547	2,509
JAMES RIVER	FARMVILLE	VA0083135	8,589	8,742	2,962	1,481	296
JAMES RIVER	GEORGIA PACIFIC CORPO	VA0003026	162,875	162,430	108,652	10,975	2,195
JAMES RIVER	HENRICO COUNTY	VA0063690	173,622	233,377	152,278	76,139	15,228
JAMES RIVER	HONEYWELL	VA0005291	52,110	51,968	51,968	51,968	40,244
JAMES RIVER	HOPEWELL	VA0066630	36,983	160,440	106,960	53,480	10,696
JAMES RIVER	HRSD-ARMY BASE	VA0081230	53,997	73,708	53,145	26,573	5,315
JAMES RIVER	HRSD-BOAT HARBOR	VA0081256	61,445	98,649	70,200	35,100	7,020
JAMES RIVER	HRSD-CHESAPEAKE/ELIZA	VA0081264	91,597	126,074	80,098	40,049	8,010
JAMES RIVER	HRSD-JAMES RIVER	VA0081272	58,254	80,313	60,911	30,456	6,091
JAMES RIVER	HRSD-NANSEMOND	VA0081299	72,341	76,721	61,368	30,684	6,137
JAMES RIVER	HRSD-VIP	VA0081281	96,305	109,336	109,336	54,668	10,934
JAMES RIVER	HRSD-WILLIAMSBURG	VA0081302	46,860	48,424	48,424	24,212	4,842

TABLE IX-H: Discharged Phosphorus Loads (lbs/yr) for All Point Sources Sorted by Basin

BASIN	FACILITY	NPDES	2000	Tier 1	Tier 2	Tier 3	Tier 4
JAMES RIVER	LAKE MONTICELLO STP	VA0024945	3,869	4,312	1,725	862	172
JAMES RIVER	LEES COMMERCIAL CARP	VA0004677	95,022	94,762	42,801	18,952	244
JAMES RIVER	LEXINGTON-ROCKBRIDGE	VA0088161	6,412	6,602	2,641	1,320	264
JAMES RIVER	LYNCHBURG	VA0024970	124,313	163,218	52,993	26,496	5,299
JAMES RIVER	MOORES CREEK-RIVANNA	VA0025518	100,164	114,810	36,206	18,103	3,621
JAMES RIVER	PHILLIP MORRIS-PARK 50	VA0026557	7,456	7,435	7,435	7,435	584
JAMES RIVER	PROCTORS CREEK	VA0060194	17,081	20,224	53,758	26,879	5,376
JAMES RIVER	RICHMOND	VA0063177	114,364	219,234	146,156	73,078	14,616
JAMES RIVER	SOUTH CENTRAL	VA0025437	27,446	59,069	39,379	19,690	3,938
JAMES RIVER	TYSON FOODS, INC.	VA0004031	791	789	868	868	289
JAMES RIVER	WESTVACO CORPORATIC	VA0003646	26,328	26,256	26,256	26,256	9,054
JAMES RIVER Total			1,513,003	2,031,025	1,369,910	686,350	172,121
Grand Total			5,645,151	6,460,745	4,440,946	2,575,186	748,618

X. COST RESULTS SUMMARIES

This section provides tables that summarize the costs which were either obtained directly from individual facilities, or calculated using the previously described methodologies.

Table X-A - provides the costs for TN removal by Tier for all of the significant municipal facilities.

Table X-B - provides the costs for TP removal by Tier for all of the significant municipal facilities.

Table VI-C in Section 6 provides the costs for the non-significant municipal facilities.

Table V-C - in Section 5 provides the costs for the industrial facilities.

Table VII - in Section 7 provides the costs for the Blue Plains CSO.

Table X-C - provides a summary of the costs in total for all point source categories arranged by state.

Table X-D - provides a summary of the costs by state arranged by point source category.

Table X-E - provides a summary of the costs for the significant municipal facilities only by state.

Table X-F and X-G provide information relating the amount of total design flow and number of the facilities being treated by each Tier to the total cost for each jurisdiction.

References noted in the Section X tables are included in the Part 3 of Appendix I.

Table X-A: NITROGEN INCREMENTAL COST FOR SIGNIFICANT MUNICIPAL FACILITIES IN THE BAY WATERSHED

				DESIGN	2010 DATA*			TIER 1 $) (TN=8 for NRT plants))			TIER 2 ($) (TN=8 for ALL)			TIER 3 ($) (TN=5 for ALL)			TIER 4 ($) (TN=3 for ALL)		
STA	FACILITY	NPDES	BNR STATUS	FLOW (MGD)	FLOW (MGD)	TN (mg/l)	TP (mg/l)	TN CC	TN O&M	TN NOTE	TN CC	TN O&M	TN NOTE	TN CC	TN O&M	TN NOTE	TN CC	TN O&M	TN NOTE
DC	BLUE PLAINS	DC0021199	CURRENT	370	341.71	7.50	0.11	0	0	14	33,000,000	5,541,509	14	225,000,000	13,400,000	14	365,000,000	17,501,280	14
DC Total				**370.00**	**341.71**			**0**	**0**		**33,000,000**	**5,541,509**		**225,000,000**	**13,400,000**		**365,000,000**	**17,501,280**	
DE	BRIDGEVILLE	DE0020249	BY 2010	0.8	0.22	8.00	5.40	3,187,400	63,244	12, M	0	0	N	918,088	6,734	1	1,055,210	16,495	1
DE	LAUREL	DE0020125		0.5	0.32	22.32	3.20			8	2,374,508	147,026	1	627,970	10,719	1	736,700	27,814	1
DE	SEAFORD	DE0020265	CURRENT	2	1.28	6.04	1.13	0	0	9	0	0	N	1,636,850	29,211	1	2,360,170	62,228	1
DE Total				**3.30**	**1.81**			**3,187,400**	**63,244**		**2,374,508**	**147,026**		**3,182,908**	**46,665**		**4,152,080**	**106,537**	
MD	ABERDEEN	MD0021563	CURRENT	4	1.72	8.00	0.12	0	0	2	0	0	N	2,408,870	31,281	1	4,093,150	64,967	1
MD	ABERDEEN PROVIN	MD0021237	BY 2005	2.8	0.91	8.00	0.41	8,000,000	159,146	2, M	0	0	N	1,945,658	18,448	1	3,053,362	38,794	1
MD	ABERDEEN PROVIN	MD0021229	CURRENT	3	0.96	8.00	0.49	0	0	2	0	0	N	2,022,860	18,942	1	3,226,660	39,733	1
MD	ANNAPOLIS	MD0021814	CURRENT	10	7.54	8.00	0.44	0	0	2	0	0	N	4,724,930	115,245	1	9,292,090	233,824	1
MD	BACK RIVER	MD0021555	CURRENT	180	87.73	10.00	0.16	0	0	2	10,000,000	141,129	19, M	70,346,630	1,183,324	1	156,595,390	2,352,813	1
MD	BALLENGER CREEI	MD0021822	CURRENT	6	4.12	8.00	0.34	0	0	2	0	0	N	3,180,890	68,203	1	5,826,130	139,973	1
MD	BOWIE	MD0021628	CURRENT	3.3	2.09	8.00	0.17	0	0	2	0	0	N	2,138,663	39,949	1	3,486,607	83,510	1
MD	BROADNECK	MD0021644	CURRENT	6	5.23	8.00	0.48	0	0	2	0	0	N	3,180,890	86,565	1	5,826,130	177,657	1
MD	BROADWATER	MD0024350	CURRENT	2	1.27	8.00	0.54	0	0	2	0	0	N	1,636,850	29,025	1	2,360,170	61,832	1
MD	BRUNSWICK	MD0020958	BY 2005	0.7	0.76	8.00	3.00	4,900,000	10,928	2, M	0	0	N	821,382	23,756	1	949,040	59,079	1
MD	CAMBRIDGE	MD0021636	BY 2005	8.1	5.11	8.00	2.72	9,934,376	198,241	2, M	0	0	N	3,991,511	80,382	1	7,645,759	163,783	1
MD	CELANESE	MD0063878	BY 2005	1.25	1.02	8.00	2.52	5,791,500	116,260	2, M	0	0	N	1,347,343	29,057	1	1,710,303	63,080	1
MD	CENTREVILLE	MD0020834	BY 2005	0.375	0.35	8.00	2.79	5,065,400	101,583	2, M	0	0	N	507,088	12,988	1	603,988	35,086	1
MD	CHESAPEAKE BEA	MD0020281	CURRENT	1.18	0.81	8.00	0.89	0	0	2	0	0	N	1,320,322	23,842	1	1,649,648	51,878	1
MD	CHESTERTOWN	MD0020010	BY 2005	0.9	0.65	8.00	4.34	2,600,000	51,782	2, M	0	0	N	1,014,794	19,420	1	1,161,380	46,971	1
MD	CONOCOCHEAGUE	MD0063509	BY 2005	4.1	1.19	8.00	1.27	5,555,439	111,577	2, M	0	0	N	2,447,471	21,498	1	4,179,799	44,613	1
MD	COX CREEK	MD0021661	BY 2005	15	12.30	8.00	1.28	9,476,780	198,973	2, M	0	0	N	6,654,980	180,144	1	13,624,540	363,121	1
MD	CRISFIELD	MD0020001	BY 2005	1	0.68	8.00	2.02	4,052,200	80,139	2, M	0	0	N	1,111,500	19,843	1	1,267,550	47,489	1
MD	CUMBERLAND	MD0021598	BY 2005	15	9.60	8.00	1.73	0	0	2	0	0	N	6,654,980	140,605	1	13,624,540	283,421	1
MD	DAMASCUS	MD0020982	CURRENT	1.5	0.86	8.00	1.12	0	0	2	0	0	N	1,443,845	22,415	1	1,926,925	48,305	1
MD	DELMAR	MD0020532	BY 2005	0.65	0.58	8.00	0.35	1,030,000	19,833	2, M	0	0	N	773,029	18,295	1	895,955	45,903	1
MD	DENTON	MD0020494	CURRENT	0.8	0.41	8.00	1.38	0	0	2	0	0	N	918,088	12,403	1	1,055,210	30,378	1
MD	DORSEY RUN	MD0063207	CURRENT	2	1.47	8.00	0.22	0	0	2	0	0	N	1,636,850	33,574	1	2,360,170	71,522	1
MD	EASTON	MD0020273	CURRENT	2.35	1.93	8.00	2.59	0	0	2	0	0	N	1,771,953	41,406	1	2,663,441	87,650	1
MD	ELKTON	MD0020681	BY 2005	2.7	1.73	8.00	1.09	6,360,000	128,234	2, M	0	0	N	1,907,057	35,319	1	2,966,713	74,371	1
MD	EMMITSBURG	MD0020257	CURRENT	0.75	0.58	8.00	1.98	0	0	2	0	0	N	869,735	17,775	1	1,002,125	43,854	1
MD	FEDERALSBURG	MD0020249	BY 2005	0.75	0.33	8.00	0.98	1,500,000	29,282	2, M	0	0	N	869,735	10,121	1	1,002,125	24,969	1
MD	FORT DETRICK	MD0020877	CURRENT	2	1.11	8.00	1.17	0	0	8	0	0	N	1,636,850	25,371	1	2,360,170	54,048	1
MD	FORT MEADE	MD0021717	CURRENT	4.5	2.17	8.00	0.19	0	0	8	0	0	N	2,601,875	38,252	1	4,526,395	79,150	1
MD	FREDERICK	MD0021610	BY 2005	8	7.76	8.00	4.19	8,816,824	153,316	2, M	0	0	N	3,952,910	122,320	1	7,559,110	249,304	1
MD	FREEDOM DISTRIC	MD0021512	CURRENT	3.5	2.85	8.00	0.68	0	0	2	0	0	N	2,215,865	53,705	1	3,659,905	112,037	1
MD	FRUITLAND	MD0052990	BY 2005	0.5	0.52	8.00	3.00	6,200,000	124,549	2, M	0	0	N	627,970	17,496	1	736,700	45,400	1
MD	GEORGES CREEK	MD0060071	BY 2005	0.6	0.67	8.00	3.00	2,000,000	40,709	2, M	0	0	N	724,676	21,582	1	842,870	54,688	1
MD	HAGERSTOWN	MD0021776	CURRENT	8	8.47	8.00	2.32	0	0	2	0	0	N	3,952,910	133,441	1	7,559,110	271,969	1
MD	HAVRE DE GRACE	MD0021750	BY 2005	1.89	1.40	8.00	0.89	6,278,550	125,354	2, M	0	0	N	1,594,389	32,739	1	2,264,856	69,900	1
MD	HURLOCK	MD0022730	CURRENT	2	1.06	8.00	7.17	5,200,000	103,378	2, M	0	0	N	1,636,850	24,302	1	2,360,170	51,769	1

Table X-A: NITROGEN INCREMENTAL COST FOR SIGNIFICANT MUNICIPAL FACILITIES IN THE BAY WATERSHED

				DESIGN	2010 DATA*			TIER 1 $) (TN=8 for NRT plants))			TIER 2 ($) (TN=8 for ALL)			TIER 3 ($) (TN=5 for ALL)			TIER 4 ($) (TN=3 for ALL)		
STA	FACILITY	NPDES	BNR STATUS	FLOW (MGD)	FLOW (MGD)	TN (mg/l)	TP (mg/l)	TN CC	TN O&M	TN NOTE	TN CC	TN O&M	TN NOTE	TN CC	TN O&M	TN NOTE	TN CC	TN O&M	TN NOTE
MD	INDIAN HEAD	MD0020052	BY 2005	0.5	0.35	8.00	2.53	656,000	12,603	2, M	0	0	N	627,970	11,912	1	736,700	30,909	1
MD	JOPPATOWNE	MD0022535	CURRENT	0.95	0.86	8.00	0.80	0	0	2	0	0	N	1,063,147	25,286	1	1,214,465	60,823	1
MD	KENT ISLAND	MD0023485	BY 2005	2.135	1.64	8.00	0.72	20,742,570	415,470	2, M	0	0	N	1,688,961	36,570	1	2,477,146	77,704	1
MD	LA PLATA	MD0020524	BY 2005	1	0.82	8.00	1.59	4,120,970	82,823	2, M	0	0	N	1,111,500	24,085	1	1,267,550	57,642	1
MD	LEONARDTOWN	MD0024767	BY 2005	0.68	0.48	8.00	2.97	1,840,000	37,068	2, M	0	0	N	802,041	15,105	1	927,806	37,695	1
MD	LITTLE PATUXENT	MD0055174	CURRENT	22.5	20.63	8.00	0.35	0	0	2	0	0	N	9,550,055	293,557	1	20,123,215	588,955	1
MD	MARYLAND CITY	MD0062596	CURRENT	2.5	1.06	8.00	0.48	0	0	2	0	0	N	1,829,855	22,344	1	2,793,415	47,187	1
MD	MARYLAND CORRE	MD0023957	CURRENT	1.23	0.94	8.00	0.35	0	0	2	0	0	N	1,339,622	27,220	1	1,692,973	59,129	1
MD	MATTAWOMAN	MD0021865	BY 2005	15	8.17	8.00	0.13	7,935,800	162,078	2, M	0	0	N	6,654,980	119,730	1	13,624,540	241,343	1
MD	MOUNT AIRY	MD0022527	CURRENT	1.2	0.66	8.00	0.47	0	0	2	0	0	N	1,328,042	19,228	1	1,666,978	41,811	1
MD	NORTHEAST RIVER	MD0052027	BY 2005	2	0.63	8.00	0.94	1,800,000	35,703	2, M	0	0	N	1,636,850	14,380	1	2,360,170	30,634	1
MD	PARKWAY	MD0021725	CURRENT	7.5	6.20	8.00	0.29	0	0	2	0	0	N	3,759,905	98,699	1	7,125,865	201,451	1
MD	PATAPSCO	MD0021601	BY 2010	73	73.00	8.00	0.78	200,000,000	4,067,523	2, M	0	0	N	29,043,560	995,980	1	63,880,960	1,984,222	1
MD	PATUXENT	MD0021652	CURRENT	7.5	4.85	8.00	0.34	0	0	2	0	0	N	3,759,905	77,129	1	7,125,865	157,426	1
MD	PERRYVILLE	MD0020613	CURRENT	1.65	0.94	8.00	0.30	0	0	2	0	0	N	1,501,746	23,358	1	2,056,898	50,144	1
MD	PINE HILL RUN	MD0021679	CURRENT	6	3.89	8.00	1.36	0	0	2	0	0	N	3,180,890	64,428	1	5,826,130	132,225	1
MD	PISCATAWAY	MD0021539	CURRENT	30	25.30	8.00	0.12	0	0	2	0	0	N	12,445,130	354,631	1	26,621,890	709,735	1
MD	POCOMOKE CITY	MD0022551	BY 2005	1.4	0.96	8.00	4.26	2,700,000	200,000	2, 2	0	0	N	1,405,244	25,940	1	1,840,276	56,059	1
MD	POOLESVILLE	MD0023001	BY 2005	0.625	0.66	8.00	0.87	1,658,000	33,147	2, M	0	0	N	748,853	21,222	1	869,413	53,504	1
MD	PRINCESS ANNE	MD0020656	CURRENT	1.26	0.62	8.00	0.15	3,563,500	70,685	2, M	0	0	N	1,351,203	17,650	1	1,718,967	38,304	1
MD	SALISBURY	MD0021571	BY 2005	6.8	5.90	8.00	1.39	15,000,000	303,495	2, M	0	0	N	3,489,698	95,384	1	6,519,322	195,136	1
MD	SENECA CREEK	MD0021491	BY 2005	5	18.80	8.00	1.30	29,520,000	566,020	2, M	0	0	N	2,794,880	323,119	1	4,959,640	666,490	1
MD	SNOW HILL	MD0022764	BY 2005	0.5	0.47	8.00	3.75	1,600,000	32,017	2, M	0	0	N	627,970	15,719	1	736,700	40,788	1
MD	SOD RUN	MD0056545	CURRENT	20	12.59	8.00	1.17	0	0	2	0	0	N	8,585,030	180,512	1	17,956,990	362,593	1
MD	TANEYTOWN	MD0020672	CURRENT	1.1	0.91	8.00	1.76	0	0	2	0	0	N	1,289,441	27,932	1	1,580,329	60,946	1
MD	THURMONT	MD0021121	CURRENT	1	1.00	8.00	0.70	0	0	2	0	0	N	1,111,500	29,319	1	1,267,550	70,168	1
MD	WESTERN BRANCH	MD0021741	CURRENT	30	23.00	8.00	0.68	0	0	2	0	0	N	0	0	18	0	0	18
MD	WESTMINSTER	MD0021831	CURRENT	5	4.30	8.00	0.53	0	0	2	0	0	N	2,794,880	73,955	1	4,959,640	152,545	1
MD	WINEBRENNER WW	MD0003221	BY 2005	1	0.22	8.00	1.77	852,000	16,578	2, M	0	0	N	1,111,500	6,450	1	1,267,550	15,436	1
MD Total				**556.23**	**397.79**			**384,749,909**	**7,788,496**		**10,000,000**	**141,129**		**253,226,556**	**5,843,881**		**491,117,129**	**11,987,846**	
NY	ADDISON (V)	NY0020320		0.42	0.24	17.73	3.00			8	2,318,600	46,669	1	550,605	8,357	1	651,764	22,213	1
NY	BATH (V)	NY0021431		1	0.76	17.61	3.00			8	2,722,193	53,890	1	1,111,500	22,184	1	1,267,550	53,091	1
NY	BINGHAMTON-JOHI	NY0024414	BY 2005	20	19.53	8.00	2.03	0	0	7	0	0	N	8,585,030	280,000	1	17,956,990	562,432	1
NY	COOPERSTOWN	NY0023591		0.52	0.65	18.95	3.00			8	2,388,473	46,400	1	647,311	21,655	1	757,934	55,897	1
NY	CORNING (C)	NY0025721		2.13	1.30	19.77	3.00			8	3,496,935	67,489	1	1,687,031	28,951	1	2,472,814	61,519	1
NY	CORTLAND (C)	NY0027561	BY 2005	10	8.52	8.00	1.30	0	0	7	0	0	N	4,724,930	130,259	1	9,292,090	264,286	1
NY	ELMIRA / CHEMUNG	NY0035742		12	7.19	15.00	3.00			8	9,613,949	181,374	1	5,496,950	107,607	1	11,025,070	217,631	1
NY	ENDICOTT (V)	NY0027669		10	7.58	23.47	3.00			8	6,656,000	133,689	7, M	0	0	3, M	0	0	A
NY	HAMILTON (V)	NY0020672		0.85	0.45	29.29	3.00			8	2,618,202	50,710	1	966,441	13,481	1	1,108,295	32,803	1
NY	HORNELL (C)	NY0023647		4	3.01	15.74	3.00			8	4,745,444	90,005	1	2,408,870	54,598	1	4,093,150	113,395	1
NY	LAKE STREET/CHEI	NY0036986		9.5	7.12	19.68	3.00			8	8,174,859	147,651	1	4,531,925	109,489	1	8,858,845	222,361	1
NY	NORWICH	NY0021423		2.2	2.68	30.04	3.00			8	3,544,425	60,713	1	1,714,052	59,015	1	2,533,468	125,247	1

Table X-A: NITROGEN INCREMENTAL COST FOR SIGNIFICANT MUNICIPAL FACILITIES IN THE BAY WATERSHED

				DESIGN	2010 DATA*			TIER 1 $) (TN=8 for NRT plants))			TIER 2 ($) (TN=8 for ALL)			TIER 3 ($) (TN=5 for ALL)			TIER 4 ($) (TN=3 for ALL)		
STA	FACILITY	NPDES	BNR STATUS	FLOW (MGD)	FLOW (MGD)	TN (mg/l)	TP (mg/l)	TN CC	TN O&M	TN NOTE	TN CC	TN O&M	TN NOTE	TN CC	TN O&M	TN NOTE	TN CC	TN O&M	TN NOTE
NY	ONEONTA (C)	NY0031151		4	3.01	17.76	3.00			8	4,745,444	63,867	1	2,408,870	54,545	1	4,093,150	113,284	1
NY	OWEGO #2	NY0025798	BY 2005	2	1.04	8.00	2.48	0	0	7	0	0	N	1,636,850	23,832	1	2,360,170	50,769	1
NY	OWEGO (V)	NY0029262		1	0.62	15.42	3.00			8	2,722,193	53,458	1	1,111,500	18,221	1	1,267,550	43,608	1
NY	RICHFIELD SPRING	NY0031411		0.6	0.32	16.58	0.08			8	2,444,284	48,320	1	724,676	10,399	1	842,870	26,351	1
NY	SIDNEY (V)	NY0029271		1.7	0.67	17.03	3.00			8	3,203,924	92,656	1	1,521,047	16,342	1	2,100,223	35,040	1
NY	WAVERLY (V)	NY0031089		0.65	1.01	27.70	3.55			8	2,479,128	46,106	1	773,029	31,990	1	895,955	80,263	1
NY Total				**82.57**	**65.68**			**0**	**0**		**61,874,054**	**1,182,996**		**40,600,618**	**990,925**		**71,577,888**	**2,080,192**	
PA	ALTOONA CITY AUT	PA0027014		5.5	6.03	14.15	4.30			8	1,200,000	15,637	3, M	8,330,000	282,903	3, M	0	0	A
PA	ALTOONA CITY AUT	PA0027022		9	6.25	16.80	4.29			8	1,200,000	12,811	3, M	11,530,000	257,415	3, M	0	0	A
PA	ANNVILLE TOWNSH	PA0021806		0.75	0.48	30.24	1.49			8	2,548,725	49,155	1	869,735	14,609	1	1,002,125	36,041	1
PA	ANTRIM TOWNSHIP	PA0080519	CURRENT	1.05	0.50	8.00	2.15	0	0	N	0	0	N	1,270,140	15,612	1	1,537,004	34,127	1
PA	ASHLAND MUNICIP	PA0023558		1.3	0.72	8.75	3.23			8	2,929,367	59,227	1	1,366,643	20,243	1	1,753,627	43,877	1
PA	BEDFORD BOROUG	PA0022209		1.2	0.98	13.56	1.39			8	2,860,429	58,274	1	1,328,042	28,601	1	1,666,978	62,191	1
PA	BELLEFONTE BOR	PA0020486		3.22	2.07	16.03	0.69			8	4,229,766	81,123	1	2,107,782	40,018	1	3,417,288	83,728	1
PA	BERWICK MUNICIP	PA0023248		3.65	1.49	22.99	4.36			8	4,514,951	92,508	1	2,273,767	27,630	1	3,789,879	57,560	1
PA	BLOOMSBURG MUN	PA0027171		4.29	2.66	9.53	1.41			8	4,935,313	101,150	1	2,520,813	47,417	1	4,344,432	98,261	1
PA	BLOSSBURG	PA0020036		0.6	0.21	11.07	1.31			8	2,444,284	49,090	1	724,676	6,718	1	842,870	17,022	1
PA	BROWN TOWNSHIP	PA0028088		0.6	0.34	27.44	0.93			8	2,444,284	49,450	1	724,676	10,882	1	842,870	27,576	1
PA	BURNHAM BOROUG	PA0038920		0.64	0.59	9.00	1.50			8	2,472,161	49,976	1	763,358	18,895	1	885,338	47,498	1
PA	CARLISLE BOROUG	PA0026077		7	3.45	19.85	0.42			8	6,660,935	136,597	1	3,566,900	55,481	1	6,692,620	113,423	1
PA	CARLISLE SUBURB	PA0024384	CURRENT	0.925	0.70	8.00	0.65	0	0	N	0	0	N	1,038,971	20,826	1	1,187,923	50,229	1
PA	CHAMBERSBURG B	PA0026051	BY 2005	5.2	4.78	8.00	2.65	6,400,000	124,868	3, M	0	0	N	0	0	3, M	0	0	A
PA	CLARKS SUMMIT-S	PA0028576		2	2.28	16.99	3.12			8	3,408,584	64,033	1	1,636,850	52,111	1	2,360,170	111,012	1
PA	CLEARFIELD	PA0026310		4.5	2.62	11.04	0.78			8	5,072,176	104,021	1	2,601,875	46,213	1	4,526,395	95,623	1
PA	COLUMBIA	PA0026123		2	0.83	17.50	0.70			8	3,408,584	69,207	1	1,636,850	18,896	1	2,360,170	40,254	1
PA	CURWENSVILLE MU	PA0024759		0.5	0.45	14.68	1.86			8	2,374,508	47,998	1	627,970	15,122	1	736,700	39,240	1
PA	DANVILLE MUNICIP	PA0023531		3.22	2.15	8.97	1.35			8	4,229,766	85,178	1	2,107,782	41,492	1	3,417,288	86,812	1
PA	DERRY TOWNSHIP	PA0026484		5	3.47	14.77	1.33			8	1,983,000	111,000	S	1,240,000	26,496	S, M	0	0	A
PA	DILLSBURG BOROU	PA0024431		1	0.66	11.07	0.88			8	2,722,193	55,091	1	1,111,500	19,232	1	1,267,550	46,027	1
PA	DOVER TOWNSHIP	PA0020826	CURRENT	4	3.70	7.53	1.36	0	0	N	0	0	N	2,408,870	67,193	1	4,093,150	139,553	1
PA	DUNCANSVILLE	PA0032883		1.217	0.61	8.00	2.31			8	2,872,157	55,995	1	1,334,604	17,684	1	1,681,708	38,431	1
PA	EAST PENNSBORO	PA0038415		3.7	2.42	17.43	3.49			8	4,547,969	86,388	1	2,293,067	44,910	1	3,833,203	93,514	1
PA	EASTERN SNYDER	PA0110582	BY 2005	2.8	1.60	8.00	3.95	3,000,000	61,856	10, M	0	0	N	0	0	10	0	0	10
PA	ELIZABETHTOWN B	PA0023108	BY 2005	3	2.34	8.00	0.87	4,083,001	86,431	1	0	0	N	2,022,860	46,220	1	3,226,660	96,949	1
PA	ELKLAND MUNICIP	PA0113298		0.55	0.43	22.82	0.88			8	2,409,411	47,203	1	676,323	14,331	1	789,785	36,722	1
PA	EMPORIUM BOROU	PA0028631		0.52	0.48	6.88	2.53			8	2,388,473	47,765	1	647,311	16,096	1	757,934	41,549	1
PA	EPHRATA BOROUG	PA0027405		3.8	2.78	1.98	1.51			8	4,613,914	93,551	1	2,331,668	51,068	1	3,919,852	106,241	1
PA	FAIRVIEW TOWNSH	PA0081868		0.5	0.40	11.07	0.64			8	2,374,508	47,883	1	627,970	13,512	1	736,700	35,061	1
PA	FRANKLIN COUNTY	PA0020834		0.4	1.08	1.05	0.67			8	2,304,611	46,741	1	531,264	39,036	1	630,530	104,476	1
PA	GETTYSBURG MUN	PA0021563	CURRENT	1.63	1.62	5.11	0.51	0	0	N	0	0	N	1,494,026	40,528	1	2,039,569	87,048	1
PA	GREATER HAZELTO	PA0026921		8.9	6.68	10.36	0.94			8	7,840,000	163,170	3, M	16,250,000	391,838	3, M	0	0	A
PA	GREGG TOWNSHIP	PA0114821	CURRENT	0.8	0.66	6.60	1.33	0	0	N	0	0	N	918,088	20,182	1	1,055,210	49,433	1

Table X-A: NITROGEN INCREMENTAL COST FOR SIGNIFICANT MUNICIPAL FACILITIES IN THE BAY WATERSHED

				DESIGN	2010 DATA*			TIER 1 $) (TN=8 for NRT plants))			TIER 2 ($) (TN=8 for ALL)			TIER 3 ($) (TN=5 for ALL)			TIER 4 ($) (TN=3 for ALL)		
STA	FACILITY	NPDES	BNR STATUS	FLOW (MGD)	FLOW (MGD)	TN (mg/l)	TP (mg/l)	TN CC	TN O&M	TN NOTE	TN CC	TN O&M	TN NOTE	TN CC	TN O&M	TN NOTE	TN CC	TN O&M	TN NOTE
PA	HAMPDEN TOWNSH	PA0028746	CURRENT	1.76	1.30	8.00	1.06	0	0	N	0	0	N	1,544,208	31,339	1	2,152,212	67,103	1
PA	HAMPDEN TOWNSH	PA0080314		2.5	2.01	9.35	0.70			8	3,747,289	73,618	1	1,829,855	42,247	1	2,793,415	89,217	1
PA	HANOVER BOROUG	PA0026875		3.65	3.84	23.73	0.99			8	60,000	0	3	5,130,000	161,192	3, M	0	0	A
PA	HARRISBURG SEWI	PA0027197	BY 2010	37.7	26.24	8.00	1.38	22,682,000	865,000	S	0	0	N	0	0	3, M	0	0	A
PA	HIGHSPIRE	PA0024040		2	1.05	14.97	1.63			8	3,408,584	69,030	1	1,636,850	23,992	1	2,360,170	51,110	1
PA	HOLLIDAYSBURG R	PA0043273		2	2.98	6.82	1.70			8	3,408,584	67,349	1	1,636,850	68,113	1	2,360,170	145,099	1
PA	HOUTZDALE BORO	PA0046159	CURRENT	0.3	0.12	6.89	0.71	0	0	N	0	0	N	434,558	4,849	1	524,360	13,536	1
PA	HUNTINGDON BOR	PA0026191		3.75	2.13	11.07	1.31			8	4,580,956	93,717	1	2,312,368	39,380	1	3,876,528	81,961	1
PA	HYNDMAN BOROUG	PA0020851		0.104	0.08	11.11	1.10			8	2,097,017	42,022	1	245,014	5,719	1	316,267	18,574	1
PA	JERSEY SHORE BO	PA0028665		0.8	0.72	21.08	6.09			8	2,583,478	52,678	1	918,088	21,779	1	1,055,210	53,344	1
PA	KELLY TOWNSHIP M	PA0028681	CURRENT	2.75	1.82	2.20	0.78	0	0	N	0	0	N	1,926,358	36,965	1	3,010,038	77,784	1
PA	LACKAWANNA RIVE	PA0027090		7	5.12	13.16	0.88			8	6,660,935	128,655	1	6,920,000	160,034	3, M	0	0	A
PA	LACKAWANNA RIVE	PA0027065		6	2.45	9.13	1.66			8	6,034,411	120,013	1	3,180,890	40,506	1	5,826,130	83,129	1
PA	LACKAWANNA RIVE	PA0027073		1	0.34	28.10	0.87			8	2,722,193	55,025	1	1,111,500	9,980	1	1,267,550	23,885	1
PA	LACKAWANNA RIVE	PA0027081	BY 2005	0.7	0.49	8.00	1.12	2,513,941	55,025	1	0	0	N	821,382	15,338	1	949,040	38,143	1
PA	LANCASTER AREA	PA0042269	BY 2005	15	7.78	8.00	0.75	4,249,333	93,253	S,	0	0	N	10,460,000	179,248	3, M	0	0	A
PA	LANCASTER CITY	PA0026743	BY 2010	29.73	20.71	8.00	0.81	1,077,000	8,461	3, M	0	0	N	23,080,000	543,241	3, M	0	0	A
PA	LEBANON CITY AUT	PA0027316		8	5.50	33.65	1.39			8	4,039,000	121,589	3, M	7,620,000	167,209	3, M	0	0	A
PA	LEMOYNE BOROUG	PA0026441		2.088	1.66	22.88	1.42			8	3,468,413	71,828	1	1,670,819	37,339	1	2,436,421	79,407	1
PA	LEWISBURG AREA	PA0044661	BY 2010	2.42	1.20	8.00	1.33	3,693,297	75,717	1	0	0	N	3,630,000	51,337	3, M	0	0	A
PA	LEWISTOWN BORO	PA0026280		2.4	1.89	14.00	1.30			8	3,679,787	75,693	1	1,791,254	40,374	1	2,706,766	85,397	1
PA	LITITZ SEWAGE AU	PA0020320		3.5	3.02	23.00	1.57			8	4,415,719	80,056	1	2,215,865	56,917	1	3,659,905	118,738	1
PA	LITTLESTOWN BOR	PA0021229		1	0.51	12.51	1.72			8	2,722,193	54,974	1	1,111,500	14,829	1	1,267,550	35,488	1
PA	LOCK HAVEN	PA0025933	BY 2010	3.75	2.18	8.00	2.42	4,580,956	94,176	1	0	0	N	4,590,000	79,880	3, M	0	0	A
PA	LOGAN TOWNSHIP-	PA0032557	BY 2005	0.6	0.37	8.00	2.69	2,444,284	49,316	1	0	0	N	724,676	11,810	1	842,870	29,927	1
PA	LOWER ALLEN TOW	PA0027189		5.95	3.40	13.63	1.45			8	6,002,771	123,770	1	3,161,589	56,433	1	5,782,805	115,843	1
PA	LOWER LACKAWAN	PA0026361		6	3.50	17.54	1.57			8	6,034,411	125,085	1	3,180,890	57,932	1	5,826,130	118,893	1
PA	LYKENS BOROUGH	PA0043575		0.41	0.24	11.07	1.31			8	2,311,606	46,470	1	540,935	8,656	1	641,147	23,085	1
PA	MAHANOY CITY	PA0070041	CURRENT	1.38	0.57	8.00	2.67	0	0	N	0	0	N	1,397,524	15,530	1	1,822,946	33,580	1
PA	MANHEIM BOROUG	PA0020893		1	0.79	8.82	1.35			8	2,722,193	55,150	1	1,111,500	23,209	1	1,267,550	55,545	1
PA	MANSFIELD BOROU	PA0021814		1	0.58	10.50	2.24			8	2,722,193	54,996	1	1,111,500	16,823	1	1,267,550	40,262	1
PA	MARIETTA-DONEGA	PA0021717		0.6	0.45	11.07	1.01			8	2,444,284	49,329	1	724,676	14,557	1	842,870	36,888	1
PA	MARTINSBURG	PA0028347		0.5	0.41	11.07	1.49			8	2,374,508	47,892	1	627,970	13,814	1	736,700	35,845	1
PA	MARYSVILLE MUNI	PA0021571		0.5	1.10	11.07	0.12			8	2,374,508	48,576	1	627,970	37,312	1	736,700	96,817	1
PA	MECHANICSBURG I	PA0020885		2.08	0.83	25.31	1.13			8	3,462,978	66,706	1	1,667,731	18,672	1	2,429,489	39,715	1
PA	MIDDLETOWN	PA0020664		2.2	1.19	20.08	0.71			8	3,544,425	72,505	1	1,714,052	26,114	1	2,533,468	55,422	1
PA	MIFFLINBURG BOR	PA0028461	CURRENT	0.512	0.70	6.18	0.79	0	0	N	0	0	N	639,575	23,560	1	749,440	60,939	1
PA	MILLERSBURG BOF	PA0022535		1	0.70	11.07	1.31			8	2,722,193	55,131	1	1,111,500	20,429	1	1,267,550	48,892	1
PA	MILLERSVILLE BOR	PA0026620		1	0.69	1.75	1.30			8	2,722,193	54,784	1	1,111,500	20,145	1	1,267,550	48,212	1
PA	MILTON MUNICIPAL	PA0020273		2.6	1.71	5.81	0.43			8	3,814,671	76,696	1	1,868,456	35,448	1	2,880,064	74,748	1
PA	MONTGOMERY BOI	PA0020699		0.6	0.52	32.35	2.33			8	2,444,284	49,858	1	724,676	16,676	1	842,870	42,257	1
PA	MOSHANNON VALL	PA0037966		1.5	1.43	14.07	0.45			8	3,066,885	62,920	1	1,443,845	37,147	1	1,926,925	80,054	1

Table X-A: NITROGEN INCREMENTAL COST FOR SIGNIFICANT MUNICIPAL FACILITIES IN THE BAY WATERSHED

				DESIGN	2010 DATA*			TIER 1 $) (TN=8 for NRT plants))			TIER 2 ($) (TN=8 for ALL)			TIER 3 ($) (TN=5 for ALL)			TIER 4 ($) (TN=3 for ALL)		
STA	FACILITY	NPDES	BNR STATUS	FLOW (MGD)	FLOW (MGD)	TN (mg/l)	TP (mg/l)	TN CC	TN O&M	TN NOTE	TN CC	TN O&M	TN NOTE	TN CC	TN O&M	TN NOTE	TN CC	TN O&M	TN NOTE
PA	MOUNT JOY	PA0021067		1.3	0.75	22.45	0.32			8	2,929,367	56,610	1	1,366,643	20,927	1	1,753,627	45,359	1
PA	MOUNT UNION BOI	PA0020214		0.63	0.34	11.07	1.31			8	2,465,194	49,636	1	753,688	10,785	1	874,721	27,163	1
PA	MOUNTAINTOP ARI	PA0045985	CURRENT	2.4	2.75	8.00	3.68	0	0	N	0	0	N	1,791,254	58,538	1	2,706,766	123,815	1
PA	MT. CARMEL MUNI	PA0024406		1.5	0.95	22.90	2.75			8	3,066,885	62,740	1	1,443,845	24,650	1	1,926,925	53,123	1
PA	MT. HOLLY SPRING	PA0023183		0.6	0.38	14.92	0.67			8	2,444,284	48,311	1	724,676	12,336	1	842,870	31,260	1
PA	MUNCY BOROUGH	PA0024325		1.4	0.64	8.35	1.55			8	2,998,186	59,638	1	1,405,244	17,270	1	1,840,276	37,322	1
PA	NEW CUMBERLANI	PA0026654		1.25	0.49	11.07	0.48			8	2,894,913	58,383	1	1,347,343	14,100	1	1,710,303	30,609	1
PA	NEW FREEDOM WT	PA0043257		1.3	1.15	19.60	1.58			8	2,929,367	56,042	1	1,366,643	32,203	1	1,753,627	69,800	1
PA	NEW HOLLAND BOI	PA0021890		1.14	1.10	28.90	1.70			8	2,819,009	52,382	1	1,304,881	33,165	1	1,614,989	72,262	1
PA	NEW OXFORD MUN	PA0020923	CURRENT	0.825	1.24	8.00	0.33	0	0	N	0	0	N	942,264	37,444	1	1,081,752	91,406	1
PA	NEWBERRY TOWN	PA0083011		0.4	0.41	20.16	1.49			8	2,304,611	46,658	1	531,264	14,926	1	630,530	39,949	1
PA	NORTHEASTERN Y	PA0023744		1.7	0.65	11.07	1.24			8	3,203,924	64,714	1	1,521,047	15,875	1	2,100,223	34,039	1
PA	NORTHUMBERLANI	PA0020567		0.75	0.45	19.07	0.63			8	2,548,725	51,570	1	869,735	13,850	1	1,002,125	34,169	1
PA	PALMYRA BOROUG	PA0024287		1.42	0.82	28.31	1.48			8	3,011,935	57,355	1	1,412,964	21,835	1	1,857,606	47,160	1
PA	PENN TOWNSHIP	PA0037150		4.2	1.66	9.34	1.09			8	4,876,496	96,435	1	2,486,072	29,801	1	4,266,448	61,797	1
PA	PINE CREEK MUNI	PA0027553		1.3	0.64	17.90	1.55			8	2,929,367	59,403	1	1,366,643	17,967	1	1,753,627	38,942	1
PA	PINE GROVE BORO	PA0020915		0.6	0.45	18.94	2.71			8	2,444,284	49,478	1	724,676	14,529	1	842,870	36,817	1
PA	PORTER TOWER JO	PA0046272	CURRENT	0.43	0.56	7.69	1.30	0	0	N	0	0	N	560,276	19,852	1	662,381	52,590	1
PA	ROARING SPRING I	PA0020249	CURRENT	0.7	0.68	5.61	1.54	0	0	N	0	0	N	821,382	21,241	1	949,040	52,825	1
PA	SAYRE	PA0043681		1.94	0.65	15.86	0.35			8	3,367,738	68,131	1	1,613,689	15,179	1	2,308,181	32,374	1
PA	SCRANTON SEWER	PA0026492	BY 2005	28	13.15	8.00	1.78	0	0	4	0	0	N	11,673,110	184,956	1	24,888,910	370,357	1
PA	SHAMOKIN-COAL T	PA0027324		7	3.56	25.26	1.84			8	6,660,935	138,847	1	3,566,900	57,265	1	6,692,620	117,070	1
PA	SHENANDOAH MUN	PA0070386		2	1.19	7.60	0.40			8	3,408,584	69,167	1	1,636,850	27,230	1	2,360,170	58,008	1
PA	SHIPPENSBURG BO	PA0030643		2.75	2.28	14.47	0.50			8	3,915,519	80,883	1	1,926,358	46,348	1	3,010,038	97,527	1
PA	SILVER SPRING TO	PA0083593		0.5	0.16	5.92	0.47			8	2,374,508	47,610	1	627,970	5,308	1	736,700	13,773	1
PA	SOUTH MIDDLETON	PA0044113		0.75	0.45	11.07	0.42			8	2,548,725	51,419	1	869,735	13,895	1	1,002,125	34,282	1
PA	SPRINGETTSBURY	PA0026808	CURRENT	15	11.29	8.00	1.32	0	0	N	0	0	N	6,654,980	165,406	1	13,624,540	333,413	1
PA	ST. JOHNS	PA0046388	CURRENT	0.6	0.32	5.88	1.07	0	0	N	0	0	N	724,676	10,327	1	842,870	26,169	1
PA	STEWARTSTOWN E	PA0036269		0.4	0.27	10.97	1.48			8	2,304,611	46,151	1	531,264	9,811	1	630,530	26,257	1
PA	SUNBURY CITY MU	PA0026557	BY 2005	3.5	3.01	8.00	2.41	3,000,000	63,044	15, M	0	0	N	2,500,000	63,999	S, M	0	0	A
PA	SWATARA TOWNSH	PA0026735	BY 2005	6.3	3.34	8.00	1.64	2,000,000	32,982	13, M	0	0	N	5,659,000	55,000	S	0	0	A
PA	TOWANDA MUNICIF	PA0034576	CURRENT	1	0.68	8.00	2.08	0	0	N	0	0	N	1,111,500	19,976	1	1,267,550	47,807	1
PA	TRI-BORO MUNICIP	PA0023736		0.5	0.28	10.21	0.99			8	2,374,508	47,736	1	627,970	9,595	1	736,700	24,896	1
PA	TWIN BOROUGHS S	PA0023264		0.6	0.35	11.07	1.31			8	2,444,284	49,225	1	724,676	11,139	1	842,870	28,226	1
PA	TYRONE BOROUGH	PA0026727	CURRENT	9	6.40	4.45	0.39	0	0	N	0	0	N	4,338,920	99,159	1	8,425,600	201,598	1
PA	UNIVERSITY AREA	PA0026239	BY 2005	3.84	5.07	8.00	0.06	780,000	6,986	3, M	0	0	N	520,000	20,598	3, M	0	0	A
PA	UPPER ALLEN TOW	PA0024902		0.48	0.55	11.07	1.51			8	2,360,538	47,756	1	608,629	18,945	1	715,466	49,431	1
PA	WASHINGTON TOW	PA0080225	CURRENT	1	0.93	7.79	2.57	0	0	N	0	0	N	1,111,500	27,222	1	1,267,550	65,149	1
PA	WAYNESBORO BOI	PA0020621		1.59	0.87	5.25	4.81			8	3,128,612	62,756	1	1,478,586	22,029	1	2,004,909	47,362	1
PA	WELLSBORO MUNI	PA0021687		2	1.18	19.89	1.81			8	3,408,584	65,503	1	1,636,850	27,046	1	2,360,170	57,615	1
PA	WESTERN CLINTON	PA0043893	CURRENT	0.9	0.35	2.58	0.90	0	0	N	0	0	N	1,014,794	10,492	1	1,161,380	25,377	1
PA	WHITE DEER TOWN	PA0020800		0.42	0.27	20.34	2.43			8	2,318,600	46,747	1	550,605	9,694	1	651,764	25,766	1

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				DESIGN	2010 DATA*			TIER 1 $) (TN=8 for NRT plants))			TIER 2 ($) (TN=8 for ALL)			TIER 3 ($) (TN=5 for ALL)			TIER 4 ($) (TN=3 for ALL)		
STA	FACILITY	NPDES	BNR STATUS	FLOW (MGD)	FLOW (MGD)	TN (mg/l)	TP (mg/l)	TN CC	TN O&M	TN NOTE	TN CC	TN O&M	TN NOTE	TN CC	TN O&M	TN NOTE	TN CC	TN O&M	TN NOTE
PA	WILLIAMSPORT SAI	PA0027057	BY 2005	10.5	7.32	8.00	3.40	6,330,000	137,056	3, M	0	0	N	9,610,000	217,201	3, M	0	0	A
PA	WILLIAMSPORT SAI	PA0027049	BY 2005	4.5	2.67	8.00	4.10	5,246,000	112,263	3, M	0	0	N	9,760,000	176,149	3, M	0	0	A
PA	WYOMING VALLEY	PA0026107	CURRENT	50	23.86	5.21	1.36	0	0	3	0	0	N	24,690,000	402,031	3, M	0	0	A
PA	YORK CITY	PA0026263	CURRENT	26	11.93	8.00	0.26	0	0	3	0	0	N	11,080,000	171,126	3, M	0	0	A
PA Total				**469.21**	**301.35**			**72,079,813**	**1,866,433**		**277,865,025**	**5,667,625**		**319,811,406**	**6,443,904**		**241,323,231**	**6,681,174**	
VA	ALEXANDRIA	VA0025160	BY 2005	54	37.94	8.00	0.05	0	0	5	0	0	N	20,000,000	592,000	S	55,000,000	800,000	S
VA	ALLEGHANY CO. LC	VA0090671		1.5	0.75	18.70	2.00			8	3,066,885	116,567	1	1,443,845	19,548	1	1,926,925	42,126	1
VA	AQUIA	VA0060968	CURRENT	6.5	5.29	8.00	0.10	8,000,000	160,000	C9, M	0	0	N	4,000,000	35,000	S	0	0	A
VA	ARLINGTON	VA0025143	BY 2005	40	35.29	8.00	0.06	0	0	5	0	0	N	16,305,230	489,067	1	35,286,790	976,927	1
VA	ASHLAND	VA0024899	BY 2010	2	1.55	8.00	1.50	2,415,700	45,093	S, M	0	0	N	0	0	S	0	0	S
VA	BROAD RUN WRF	VA_BROADR	BY 2010	15	2.40	8.00	0.10	13,500,000	268,466	17	0	0	N	6,654,980	35,163	1	11,025,070	72,654	1
VA	BUENA VISTA	VA0020991		2.25	1.45	18.70	2.50			8	3,578,310	68,555	1	1,733,353	31,639	1	2,576,793	67,089	1
VA	CAPE CHARLES	VA0021288		0.25	0.15	18.70	2.50			8	2,199,543	43,674	1	386,205	6,542	1	471,275	18,769	1
VA	CAROLINE COUNTY	VA0073504		0.5	0.20	18.70	4.53			8	2,374,508	47,083	1	627,970	6,631	1	736,700	17,205	1
VA	CLIFTON FORGE	VA0022772		2	1.23	18.70	2.50			8	3,408,584	66,802	1	1,636,850	28,253	1	2,360,170	60,186	1
VA	COLONIAL BEACH	VA0026409	BY 2010	2	0.85	13.26	2.72	90,000	740	3, M	0	0	N	3,360,000	39,766	3, M	0	0	A
VA	COVINGTON	VA0025542		3	1.78	18.70	2.50			8	4,083,001	77,968	1	2,022,860	35,043	1	3,226,660	73,504	1
VA	CREWE STP	VA0020303		0.5	0.20	11.54	0.28			8	2,374,508	47,295	1	627,970	6,654	1	736,700	17,267	1
VA	CULPEPER	VA0061590	BY 2005	4.5	2.27	8.00	1.50	4,200,000	82,381	6, M	0	0	N	2,601,875	39,978	1	4,526,395	82,721	1
VA	DAHLGREN (DAHLG	VA0026514		0.325	0.30	6.82	0.54			8	30,000	0	3	520,000	13,353	3, M	0	0	A
VA	DALE CITY #1	VA0024724	BY 2005	4	3.06	8.00	0.09	0	0	5	0	0	N	1,060,000	24,433	S, M	0	0	A
VA	DALE CITY #8	VA0024678	BY 2005	4	2.85	8.00	0.10	0	0	5	0	0	N	1,060,000	22,724	S, M	0	0	A
VA	DOSWELL	VA0029521	BY 2010	1	6.75	8.00	1.50	3,045,000	57,875	6, M	0	0	N	0	0	S	0	0	S
VA	FALLING CREEK	VA0024996	BY 2010	10.1	8.24	9.57	1.26	395,818	2,206	6, M	0	0	N	5,598,000	393,000	S	0	0	A
VA	FARMVILLE	VA0083135	CURRENT	2.4	0.97	0.76	2.95			8	0	0	N	1,791,254	20,726	1	2,706,766	43,838	1
VA	FISHERSVILLE	VA0025291		2	1.71	15.82	2.67			8	790,000	14,425	3, M	3,360,000	80,360	3, M	0	0	A
VA	FMC	VA0068110	BY 2005	5.4	3.29	8.00	1.50	0	0	21	0	0	N	2,949,284	55,633	1	5,306,236	114,502	1
VA	FORT A.P. HILL (WI	VA0032034	CURRENT	0.53	0.12	8.00	4.06	0	0	N	0	0	N	656,982	3,882	1	768,551	9,995	1
VA	FREDERICKSBURG	VA0025127	CURRENT	3.5	2.23	8.00	1.32	0	0	N	0	0	N	2,215,865	41,955	1	3,659,905	87,526	1
VA	FRONT ROYAL	VA0062812		4	2.76	11.21	1.11			8	50,000	0	3	4,790,000	99,650	3, M	0	0	A
VA	FWSA OPEQUON	VA0065552	CURRENT	8.4	5.89	8.00	1.14	0	0	5	0	0	N	6,390,000	238,000	S	0	0	A
VA	GORDONSVILLE	VA0021105		0.67	0.57	18.70	2.50			8	2,493,057	48,685	1	792,370	17,816	1	917,189	44,537	1
VA	H.L. MOONEY	VA0025101	BY 2005	18	14.63	8.00	0.10	0	0	5	0	0	N	8,011,100	267,500	S	0	424,845	S
VA	HARRISONBURG-R	VA0060640	CURRENT	16	11.65	8.00	2.20	0	0	5	0	0	N	7,040,990	169,762	1	14,491,030	341,899	1
VA	HAYMOUNT STP	VA0089125	BY 2010	0.95	0.95	8.00	1.50	2,687,559	53,319	1	0	0	N	1,063,147	27,986	1	1,214,465	67,319	1
VA	HENRICO COUNTY	VA0063690	BY 2010	75	50.00	8.00	1.53	0	0	6	0	0	N	25,000,000	4,000,000	S	0	0	A
VA	HOPEWELL	VA0066630	BY 2010	50	35.12	21.00	1.50	0	0	20	57,230,000	2,383,200	16	13,200,000	1,603,300	16	39,750,000	539,700	16
VA	HRSD-ARMY BASE	VA0081230		18	17.45	23.60	1.39			8	81,000,000	154,000	C14, C15	7,813,010	251,973	1	16,224,010	506,735	1
VA	HRSD-BOAT HARBO	VA0081256		25	23.05	23.29	1.41	0		8	112,000,000	151,900	C14, C15	10,515,080	326,016	1	22,289,440	653,438	1
VA	HRSD-CHESAPEAK	VA0081264		24	26.30	24.32	1.57			8	35,000,000	213,800	C14	10,129,070	372,817	1	21,422,950	747,517	1
VA	HRSD-JAMES RIVEI	VA0081272		20	20.00	20.27	1.32			8	27,300,000	132,100	C14	8,585,030	286,681	1	17,956,990	575,853	1
VA	HRSD-NANSEMONI	VA0081299	CURRENT	30	20.15	8.00	1.25	0	0	C14	13,100,000	0	C14	12,445,130	282,443	1	26,621,890	565,263	1

Table X-A: NITROGEN INCREMENTAL COST FOR SIGNIFICANT MUNICIPAL FACILITIES IN THE BAY WATERSHED

				DESIGN	2010 DATA*			TIER 1 $) (TN=8 for NRT plants))			TIER 2 ($) (TN=8 for ALL)			TIER 3 ($) (TN=5 for ALL)			TIER 4 ($) (TN=3 for ALL)		
STA	FACILITY	NPDES	BNR STATUS	FLOW (MGD)	FLOW (MGD)	TN (mg/l)	TP (mg/l)	TN CC	TN O&M	TN NOTE	TN CC	TN O&M	TN NOTE	TN CC	TN O&M	TN NOTE	TN CC	TN O&M	TN NOTE
VA	HRSD-VIP	VA0081281	CURRENT	40	35.90	8.00	1.00	0	0	C14	10,000,000	0	C14	16,305,230	497,521	1	35,286,790	993,813	1
VA	HRSD-WILLIAMSBU	VA0081302		22.5	15.90	8.15	1.00			8	15,800,000	0	C14	9,550,055	226,231	1	20,123,215	453,882	1
VA	HRSD-YORK	VA0081311	BY 2010	15	12.70	8.00	1.50	17,700,000	132,100	C14	0	0	N	6,654,980	186,069	1	13,624,540	375,063	1
VA	KILMARNOCK	VA0020788		0.2	0.25	4.61	2.56			8	2,164,460	43,304	1	337,852	11,859	1	418,190	35,177	1
VA	LAKE MONTICELLO	VA0024945		0.6	0.57	18.70	2.50			8	2,444,284	47,709	1	724,676	18,275	1	842,870	46,309	1
VA	LEESBURG	MD0066184	CURRENT	4.85	2.96	8.00	1.42	0	0	5	0	0	N	2,736,978	51,194	1	4,829,666	105,691	1
VA	LEXINGTON-ROCKE	VA0088161	CURRENT	4	0.87	18.70	2.50			8	0	0	N	2,408,870	15,727	1	4,093,150	32,663	1
VA	LITTLE FALLS RUN	VA0076392	CURRENT	4	4.16	8.00	0.88	0	0	5	0	0	N	4,000,000	25,000	S	0	0	A
VA	LURAY	VA0062642		1.6	1.50	1.50	0.41			8	0	0	3	3,360,000	86,100	3, M	0	0	A
VA	LYNCHBURG	VA0024970		22	17.40	8.50	3.08			8	54,000,000	620,000	C6	845,000	1,000,000	C6	0	0	A
VA	MASSANUTTEN PU	VA0024732		0.75	0.38	18.70	2.50			8	2,548,725	50,186	1	869,735	11,663	1	1,002,125	28,773	1
VA	MASSAPONAX	VA0025658	BY 2005	8	4.38	8.00	1.50	0	0	5	0	0	N	3,952,910	69,073	1	7,559,110	140,780	1
VA	MATHEWS COURTH	VA0028819		0.1	0.08	10.41	1.42			8	2,094,204	41,818	1	241,146	5,637	1	312,020	18,395	1
VA	MIDDLE RIVER	VA0064793	CURRENT	6.8	5.65	8.00	2.05	0	0	5	0	0	N	3,489,698	91,418	1	6,519,322	187,023	1
VA	MONTROSS - WEST	VA0072729		0.1	0.03	6.54	1.17	0	0	8	2,094,204	41,870	1	241,146	2,186	1	312,020	7,135	1
VA	MOORES CREEK-R	VA0025518		15	11.89	13.46	3.17			8	11,242,076	209,708	1	6,654,980	174,172	1	13,624,540	351,083	1
VA	NAVAL SURFACE W	VA0021067	CURRENT	0.4	0.43	8.00	2.89	0	0	N	0	0	N	531,264	15,661	1	630,530	41,914	1
VA	NEW MARKET STP	VA0022853		0.5	0.56	18.70	2.50			8	2,374,508	46,327	1	627,970	18,921	1	736,700	49,095	1
VA	NOMAN M. COLE JF	VA0025364	BY 2005	67	53.00	8.00	0.11	0	0	5	0	0	N	12,760,000	345,810	3, M	0	0	A
VA	ONANCOCK	VA0021253		0.25	0.23	18.70	2.50			8	2,199,543	43,505	1	386,205	10,055	1	471,275	28,848	1
VA	ORANGE	VA0021385	BY 2010	1.5	0.69	8.00	1.50	3,066,885	59,901	1	0	0	N	1,443,845	18,022	1	1,926,925	38,839	1
VA	PARHAM LANDING	VA0088331		0.57	0.10	8.27	0.78			8	2,423,364	48,416	1	695,664	3,386	1	811,019	8,637	1
VA	PARKINS MILL	VA0075191		2	1.42	18.70	2.50			8	97,000	922	3, M	3,360,000	66,779	3, M	0	0	A
VA	PROCTORS CREEK	VA0060194	CURRENT	21.5	17.65	8.00	0.38	0	0	5	0	0	N	1,500,000	526,000	S	0	0	A
VA	PURCELLVILLE	VA0022802	BY 2005	1	0.42	8.00	2.50	0	0	5	0	0	N	1,111,500	5,790	3, M	0	0	A
VA	QUANTICO-MAINSI	VA0028363	CURRENT	2.2	1.38	8.00	0.10	0	0	N	0	0	N	1,714,052	30,504	1	2,533,468	64,738	1
VA	REEDVILLE	VA0060712		0.2	0.04	18.70	2.50			8	2,164,460	43,210	1	337,852	1,817	1	418,190	5,391	1
VA	REMINGTON REGI	VA0076805	BY 2005	2	0.57	8.00	1.50	0	0	5	0	0	N	1,636,850	13,123	1	2,360,170	27,956	1
VA	RICHMOND	VA0063177	BY 2010	45	47.99	8.00	1.50	70,000,000	1,350,323	6, M	0	0	N	10,000,000	363,325	S, M	0	0	A
VA	ROUND HILL WWTF	VA0026212		0.5	0.15	18.70	3.00			8	2,374,508	47,177	1	627,970	5,088	1	736,700	13,203	1
VA	SIL MRRS	VA0090263	CURRENT	1.923	1.27	8.00	1.50	0	0	22	0	0	22	0	0	22	2,293,450	62,820	1
VA	SOUTH CENTRAL	VA0025437	BY 2010	23	12.93	8.00	1.50	7,800,000	338,000	S	0	0	N	4,300,000	217,000	S	0	0	A
VA	SOUTH WALES STP	VA0080527	BY 2010	0.856	0.86	8.00	1.50	2,622,367	52,058	1	0	0	N	972,243	25,671	1	1,114,665	62,417	1
VA	STONY CREEK STP	VA0028380		0.6	0.26	18.70	2.50			8	2,444,284	48,336	1	724,676	8,538	1	842,870	21,635	1
VA	STRASBURG	VA0020311		0.98	0.77	18.70	2.50			8	120,000	794	3, M	2,650,000	54,950	3, M	0	0	A
VA	STUARTS DRAFT	VA0066877	BY 2005	1.4	1.50	8.00	1.50	0	0	5	0	0	N	520,000	14,970	3, M	0	0	A
VA	TANGIER ISLAND	VA0067423		0.1	0.05	18.70	2.50			8	2,094,204	41,788	1	241,146	3,260	1	312,020	10,639	1
VA	TAPPAHANNOCK	VA0071471		0.8	0.37	18.70	2.50			8	2,583,478	50,893	1	918,088	11,352	1	1,055,210	27,804	1
VA	TOTOPOTOMOY	VA0089915	BY 2010	5	5.00	8.00	1.50	0	0	5	0	0	N	2,794,880	85,936	1	4,959,640	177,258	1
VA	UPPER OCCOQUAN	VA0024988		54	34.00	19.14	0.04			8	22,601,459	394,910	1	21,709,370	466,998	1	47,417,650	931,433	1
VA	URBANNA	VA0026263		0.1	0.11	18.70	2.50			8	2,094,204	41,649	1	241,146	7,962	1	312,020	25,983	1
VA	WARRENTON	VA0021172		2.5	1.18	14.22	1.07			8	3,747,289	73,296	1	1,829,855	24,771	1	2,793,415	52,313	1

Table X-A: NITROGEN INCREMENTAL COST FOR SIGNIFICANT MUNICIPAL FACILITIES IN THE BAY WATERSHED

				DESIGN	2010 DATA*			TIER 1 $) (TN=8 for NRT plants))			TIER 2 ($) (TN=8 for ALL)			TIER 3 ($) (TN=5 for ALL)			TIER 4 ($) (TN=3 for ALL)		
STA	FACILITY	NPDES	BNR STATUS	FLOW (MGD)	FLOW (MGD)	TN (mg/l)	TP (mg/l)	TN CC	TN O&M	TN NOTE	TN CC	TN O&M	TN NOTE	TN CC	TN O&M	TN NOTE	TN CC	TN O&M	TN NOTE
VA	WARSAW	VA0026891		0.3	0.22	18.70	2.50			8	2,234,595	44,241	1	434,558	8,664	1	524,360	24,187	1
VA	WAYNESBORO	VA0025151		4	2.81	19.71	4.38			8	3,500,000	44,309	3, M	0	0	3, M	0	0	A
VA	WEST POINT	VA0075434		0.6	0.60	18.70	2.50			8	2,444,284	47,444	1	724,676	19,364	1	842,870	49,067	1
VA	WEYERS CAVE STF	VA0022349		0.5	0.40	18.70	2.50			8	2,374,508	47,238	1	627,970	13,520	1	736,700	35,082	1
VA	WIDEWATER WWTF	VA0090387	BY 2010	0.5	0.10	8.00	2.00	2,374,508	47,445	1	0	0	N	627,970	3,380	1	736,700	8,771	1
VA	WILDERNESS SHOF	VA0083411		0.5	0.55	18.70	2.50			8	2,374,508	49,352	1	627,970	18,467	1	736,700	47,918	1
VA	WOODSTOCK	VA0026468		0.8	0.42	18.70	2.50			8	700,000	13,131	3, M	2,650,000	36,668	3, M	0	0	A
VA Total				**845.85**	**652.05**			**137,897,837**	**2,649,908**		**513,412,543**	**5,747,584**		**338,088,427**	**14,883,168**		**475,053,706**	**11,543,148**	
WV	BERKELEY COUNT	WV0082759		2.35	0.93	5.16	3.00			8	3,645,992	72,898	1	1,771,953	19,904	1	2,663,441	42,133	1
WV	BERKELEY COUNT	WV0020061		0.9	0.60	5.25	3.00			8	2,652,895	53,035	1	1,014,794	17,883	1	1,161,380	43,254	1
WV	CHARLESTOWN	WV0022349		1.2	0.75	10.74	3.00			8	2,860,429	56,745	1	1,328,042	21,846	1	1,666,978	47,502	1
WV	KEYSER	WV0024392		2.4	1.21	17.01	1.05			8	3,679,787	74,749	1	1,791,254	25,712	1	2,706,766	54,383	1
WV	MARTINSBURG	WV0023167		5	2.35	9.27	3.00			8	5,395,915	47,892	1	2,794,880	40,329	1	4,959,640	83,186	1
WV	MOOREFIELD	WV0020150	BY 2010	0.6	0.00	8.00	3.00	0	0	11	0	0	N	724,676	0	1	842,870	0	1
WV	PETERSBURG	WV0021792		0.8	0.74	6.14	3.00			8	2,583,478	51,542	1	918,088	22,343	1	1,055,210	54,725	1
WV	ROMNEY	WV0020699		0.5	0.46	17.20	3.00			8	2,374,508	46,645	1	627,970	15,435	1	736,700	40,050	1
WV Total				**13.75**	**7.02**						**23,193,004**	**403,506**		**10,971,658**	**163,451**		**15,792,986**	**365,233**	
Grand Total				2,341	1,767			597,914,959	12,368,080		921,719,133	18,831,375		1,190,881,573	41,771,993		1,664,017,020	50,265,410	

Source Notes

* 2010 Data are the projections based on 2000 data. 2010 flows are projected with 2000 flow and population increase factor, except where facility's own projection is provided. Concentrations are the same as 2000.

1 = Calculated from the methodologies provided from Thor Young, Stearn & Wheler, LLC and Tom Sadick, CH2M Hill.

2 = NRT eligible cost report from MDE,4/23/02, where cost=0, MDE has indicated funds already appropriated

2a= NRT Cost report, from MDE 3/6/2002

3 = Randall 51 Facility Report, 1999 for BNR @8 and additional 3/2001 report with 60 facilities.

4 = Paid for by Corp of Engineers

5 = From VA 2000 Annual Report and VA 2002 annual Report - Assumes that the cost share information equals 1/2 of total BNR cost to get 8, and that funds are already made available for these facilities to go to 8, except for FMC and Henrico where no funds have been spent as of 2002.

6 = Email from Bob Ehrhart to Allison Wiedeman, 3/7/02

7= BNR funded under federal funds.

8 = No cost is applied, because TN or TP =current level for Tier 1 for this facility

8a = The 2010 TP concentration of 1.5 mg/l shown for these facilities reflects the specific effluent concentration targeted by Virginia either under WQIF Grant program and/or the Tributary Strategy Plan for the Lower River Tributaries.

9 = Cost survey from Seaford WWTP, 3/22/02

10 = From 4/2/01 letters from Eastern Snyder County Regional Authority to Senator Specter. Also, costs not calculated to 8 because they are currently designing only to 3 (4/26/01 Telephone conversation between CBPO and Gannett Hemming)

11= Message from WVDEP, cost=0 due to irrigation.

12 = Email message from Paul Janiga, DE DNREC, 3/28/02.

13 = Cost survey from Mike Kyle, LASA, 3/6/02

14 = DC CSO & Blue Plains Cost Estimates- UAA cost analysis, from Tanya spano, WMCOG, 4/10/02

15 = Telephone conversation with Sunberry WWTP, 6/21/01

16 = Cost Summary: City of Hopewell, from Bob Steidel, Hopewell Regional Wastewater Treatment Facility. 8/7/2002.

17= Message from Tom Broderick, LCSA, concerning Broad Run, 3/11/02

18 = Message from Marya Levelev, 4/5/02, Western Branch already can achieve 3 mg/l.

Table X-A: NITROGEN INCREMENTAL COST FOR SIGNIFICANT MUNICIPAL FACILITIES IN THE BAY WATERSHED

				DESIGN	2010 DATA*			TIER 1 $) (TN=8 for NRT plants))			TIER 2 ($) (TN=8 for ALL)			TIER 3 ($) (TN=5 for ALL)			TIER 4 ($) (TN=3 for ALL)		
STA	FACILITY	NPDES	BNR STATUS	FLOW (MGD)	FLOW (MGD)	TN (mg/l)	TP (mg/l)	TN CC	TN O&M	TN NOTE	TN CC	TN O&M	TN NOTE	TN CC	TN O&M	TN NOTE	TN CC	TN O&M	TN NOTE

19 = Message from Marya Levelev, 8/12/02, to add $10 million TN cc in Tier 2 for Back River

20 = Message from Bob Steidel, 9/17/02, to remove the Tier 1 cost for Hopewell.

21 = Message from Bob Ehrhart, 9/4/02, to remove Tier 1 costs for FMC and Hopewell.

22 = Message from Bob Ehrhart, 9/19/02, to add SIL which replaced Broadway Lagoons, Timberville, Rocco Quality Foods and Wampler Foods-Timberville.

23 = Message from Bob Ehrhart, 11/14/02, No Tier 2 TP cost due to chemical feed facilities have been funded.

A = The capital costs at TN =3 from sources other than calculation are applied to Tier 3 for TN. And, in these cases, the Tier 4 TN capital costs are set to zero. Message from Allison Wiedeman, 5/3/02.

B = The value is set to zero, because this plant's TN or TP level have been lower than the defined level in this Tier for more than five years.

C14 = Message from W. Hunley, HRSD, 10/3/02

C15 = Cost shown represent an order of magnitude planning level estimate as transmitted by HRSD on October 3, 2002. A less costly alternative, which provides for only seasonal nitrification and/or an annual average TN concentration greater than 8.0 mg/l, does potentially exist as discussed in the September 1989 Technical Memoranda C.22 and C. 25 prepared by CH2M Hill. Message from Bob Ehrhart, 11/4/02

C6 = Letter from City of Lynchburg to Allison Wiedeman, 7/14/2001

C9 = Bos, Robert E, PE, Public Utility Administrator with County of Stafford, letter to Allison Wiedeman, EPA, re: Nitrogen Removal Costs, 7/31/01

M = For facilities with existing capital costs and no O&M costs available, the O&M costs are calculated from exiting capitlal costs adjusted by the cost ratio between calculated O&M and capital cost from the methodologies provided from Thor Young, Stearn & Wheler, LLC and Tom Sadick, CH2M Hill.

N = NRT facilities that currently have or will install NRT by 2010, It is assumed that no additional cost is needed.

S = From NRT cost survey results.

Table X-B: PHOSPHORUS INCREMENTAL COST FOR SIGNIFICANT MUNICIPAL FACILITIES IN THE BAY WATERSHED

				DESIGN	2010 DATA*			TIER 1 ($) (TP=Current)			TIER 2 $) (TP=1 for ALL)			TIER 3 ($) (TP=0.5 for ALL)			TIER 4 ($) (TP=0.1 for ALL)		
STAT	FACILITY	NPDES	BNR STATUS	FLOW (MGD)	FLOW (MGD)	TN (mg/l)	TP (mg/l)	TP CC	TP O&M	TP NOTE	TP CC	TP O&M	TP NOTE	TP CC	TP O&M	TP NOTE	TP CC	TP O&M	TP NOTE
DC	BLUE PLAINS	DC0021199	CURRENT	370	341.71	7.50	0.11	0	0	8	20,000,000	3,358,491	14	0	0	14	25,000,000	1,198,718	14
DC Total				**370.00**	**341.71**			**0**	**0**		**20,000,000**	**3,358,491**		**0**	**0**		**25,000,000**	**1,198,718**	
DE	BRIDGEVILLE	DE0020249	BY 2010	0.8	0.22	8.00	5.40	0	0	8	141,111	10,888	1	0	1,198	1	1,107,172	46,479	1
DE	LAUREL	DE0020125		0.5	0.32	22.32	3.20	0	0	8	112,778	8,023	1	0	1,714	1	874,978	82,429	1
DE	SEAFORD	DE0020265	CURRENT	2	1.28	6.04	1.13	0	0	8	0	1,346	1	0	6,895	1	2,275,679	209,272	1
DE Total				**3.30**	**1.81**			**0**	**0**		**253,889**	**20,257**		**0**	**9,807**		**4,257,828**	**338,180**	
MD	ABERDEEN	MD0021563	CURRENT	4	1.72	8.00	0.12	0	0	8	0	0	1	0	0	1	3,763,436	240,882	1
MD	ABERDEEN PROVING GR(	MD0021237	BY 2005	2.8	0.91	8.00	0.41	0	0	8	0	0	1	0	0	1	2,902,223	138,716	1
MD	ABERDEEN PROVING GR(	MD0021229	CURRENT	3	0.96	8.00	0.49	0	0	8	0	0	1	0	0	1	3,051,371	143,392	1
MD	ANNAPOLIS	MD0021814	CURRENT	10	7.54	8.00	0.44	0	0	8	0	0	1	0	0	1	6,701,258	823,833	1
MD	BACK RIVER	MD0021555	CURRENT	180	87.73	10.00	0.16	0	0	8	0	0	1	0	0	1	100,291,496	8,307,728	1
MD	BALLENGER CREEK	MD0021822	CURRENT	6	4.12	8.00	0.34	0	0	8	0	0	1	0	0	1	5,067,115	523,899	1
MD	BOWIE	MD0021628	CURRENT	3.3	2.09	8.00	0.17	0	0	8	0	0	1	0	0	1	3,270,506	304,707	1
MD	BROADNECK	MD0021644	CURRENT	6	5.23	8.00	0.48	0	0	8	0	0	1	0	0	1	5,067,115	664,944	1
MD	BROADWATER	MD0024350	CURRENT	2	1.27	8.00	0.54	0	0	8	0	0	1	0	546	1	2,275,679	207,940	1
MD	BRUNSWICK	MD0020958	BY 2005	0.7	0.76	8.00	3.00	0	0	8	131,667	15,230	1	0	4,117	1	1,035,087	169,733	1
MD	CAMBRIDGE	MD0021636	BY 2005	8.1	5.11	8.00	2.72	0	0	8	267,721	78,132	1	0	27,610	1	6,322,049	606,062	1
MD	CELANESE	MD0063878	BY 2005	1.25	1.02	8.00	2.52	0	0	8	163,793	16,028	1	0	5,490	1	1,626,795	185,802	1
MD	CENTREVILLE	MD0020834	BY 2005	0.375	0.35	8.00	2.79	0	0	8	100,973	7,245	1	0	1,904	1	759,286	104,508	1
MD	CHESAPEAKE BEACH	MD0020281	CURRENT	1.18	0.81	8.00	0.89	0	0	8	0	0	1	0	3,367	1	1,561,808	149,779	1
MD	CHESTERTOWN	MD0020010	BY 2005	0.9	0.65	8.00	4.34	0	0	8	150,556	21,050	1	0	3,530	1	1,175,260	129,708	1
MD	CONOCOCHEAGUE	MD0063509	BY 2005	4.1	1.19	8.00	1.27	0	0	8	0	1,696	1	0	4,073	1	3,832,009	165,660	1
MD	COX CREEK	MD0021661	BY 2005	15	12.30	8.00	1.28	0	0	8	0	28,172	1	0	66,439	1	9,760,640	1,316,794	1
MD	CRISFIELD	MD0020001	BY 2005	1	0.68	8.00	2.02	0	0	8	160,000	8,934	1	0	3,670	1	1,390,000	130,791	1
MD	CUMBERLAND	MD0021598	BY 2005	15	9.60	8.00	1.73	0	0	8	0	58,071	1	0	51,857	1	9,760,640	1,027,777	1
MD	DAMASCUS	MD0020982	CURRENT	1.5	0.86	8.00	1.12	0	0	8	0	830	1	0	4,647	1	1,851,848	150,771	1
MD	DELMAR	MD0020532	BY 2005	0.65	0.58	8.00	0.35	0	0	8	0	0	1	0	0	1	997,280	133,080	1
MD	DENTON	MD0020494	CURRENT	0.8	0.41	8.00	1.38	0	0	8	0	1,268	1	0	2,207	1	1,107,172	85,601	1
MD	DORSEY RUN	MD0063207	CURRENT	2	1.47	8.00	0.22	0	0	8	0	0	1	0	0	1	2,275,679	240,527	1
MD	EASTON	MD0020273	CURRENT	2.35	1.93	8.00	2.59	0	0	8	180,482	29,019	1	0	10,417	1	2,556,347	304,602	1
MD	ELKTON	MD0020681	BY 2005	2.7	1.73	8.00	1.09	0	0	8	0	1,252	1	0	9,342	1	2,826,651	264,521	1
MD	EMMITSBURG	MD0020257	CURRENT	0.75	0.58	8.00	1.98	0	0	8	0	4,669	1	0	3,124	1	1,071,677	124,794	1
MD	FEDERALSBURG	MD0020249	BY 2005	0.75	0.33	8.00	0.98	0	0	8	0	0	1	0	1,696	1	1,071,677	71,053	1
MD	FORT DETRICK	MD0020877	CURRENT	2	1.11	8.00	1.17	0	0	8	0	1,573	1	0	5,988	1	2,275,679	181,763	1
MD	FORT MEADE	MD0021717	CURRENT	4.5	2.17	8.00	0.19	0	0	8	0	0	1	0	0	1	4,102,241	295,232	1
MD	FREDERICK	MD0021610	BY 2005	8	7.76	8.00	4.19	0	0	8	266,204	210,251	1	0	41,937	1	6,264,304	923,206	1
MD	FREEDOM DISTRICT	MD0021512	CURRENT	3.5	2.85	8.00	0.68	0	0	8	0	0	1	0	5,439	1	3,413,810	411,157	1
MD	FRUITLAND	MD0052990	BY 2005	0.5	0.52	8.00	3.00	0	0	8	112,778	10,815	1	0	2,797	1	874,978	134,547	1
MD	GEORGES CREEK	MD0060071	BY 2005	0.6	0.67	8.00	3.00	0	0	8	122,222	13,502	1	0	3,613	1	958,115	159,887	1
MD	HAGERSTOWN	MD0021776	CURRENT	8	8.47	8.00	2.32	0	0	8	266,204	97,440	1	0	45,750	1	6,264,304	1,007,140	1
MD	HAVRE DE GRACE	MD0021750	BY 2005	1.89	1.40	8.00	0.89	0	0	8	0	0	1	0	5,935	1	2,184,979	232,027	1
MD	HURLOCK	MD0022730	CURRENT	2	1.06	8.00	7.17	0	0	8	175,172	57,625	1	0	5,736	1	2,275,679	174,099	1

Table X-B: PHOSPHORUS INCREMENTAL COST FOR SIGNIFICANT MUNICIPAL FACILITIES IN THE BAY WATERSHED

				DESIGN	2010 DATA*			TIER 1 ($) (TP=Current)			TIER 2 $) (TP=1 for ALL)			TIER 3 ($) (TP=0.5 for ALL)			TIER 4 ($) (TP=0.1 for ALL)		
STAT	FACILITY	NPDES	BNR STATUS	FLOW (MGD)	FLOW (MGD)	TN (mg/l)	TP (mg/l)	TP CC	TP O&M	TP NOTE	TP CC	TP O&M	TP NOTE	TP CC	TP O&M	TP NOTE	TP CC	TP O&M	TP NOTE
MD	INDIAN HEAD	MD0020052	BY 2005	0.5	0.35	8.00	2.53	0	0	8	112,778	6,714	1	0	1,904	1	874,978	91,602	1
MD	JOPPATOWNE	MD0022535	CURRENT	0.95	0.86	8.00	0.80	0	0	8	0	0	1	0	2,762	1	1,208,015	166,256	1
MD	KENT ISLAND	MD0023485	BY 2005	2.135	1.64	8.00	0.72	0	0	8	0	0	1	0	3,866	1	2,385,295	265,019	1
MD	LA PLATA	MD0020524	BY 2005	1	0.82	8.00	1.59	0	0	8	0	4,030	1	0	4,454	1	1,390,000	158,753	1
MD	LEONARDTOWN	MD0024767	BY 2005	0.68	0.48	8.00	2.97	0	0	8	129,778	10,448	1	0	2,602	1	1,020,117	108,696	1
MD	LITTLE PATUXENT	MD0055174	CURRENT	22.5	20.63	8.00	0.35	0	0	8	0	0	1	0	0	1	14,243,449	2,165,645	1
MD	MARYLAND CITY	MD0062596	CURRENT	2.5	1.06	8.00	0.48	0	0	8	0	0	1	0	0	1	2,673,351	165,782	1
MD	MARYLAND CORRECTION	MD0023957	CURRENT	1.23	0.94	8.00	0.35	0	0	8	0	0	1	0	0	1	1,608,323	173,208	1
MD	MATTAWOMAN	MD0021865	BY 2005	15	8.17	8.00	0.13	0	0	8	0	0	1	0	0	1	9,760,640	875,188	1
MD	MOUNT AIRY	MD0022527	CURRENT	1.2	0.66	8.00	0.47	0	0	8	0	0	1	0	0	1	1,580,472	121,430	1
MD	NORTHEAST RIVER	MD0052027	BY 2005	2	0.63	8.00	0.94	0	0	8	0	0	1	0	3,001	1	2,275,679	103,022	1
MD	PARKWAY	MD0021725	CURRENT	7.5	6.20	8.00	0.29	0	0	8	0	0	1	0	0	1	5,972,817	748,618	1
MD	PATAPSCO	MD0021601	BY 2010	73	73.00	8.00	0.78	0	0	8	0	0	1	0	184,707	1	42,919,870	7,228,896	1
MD	PATUXENT	MD0021652	CURRENT	7.5	4.85	8.00	0.34	0	0	8	0	0	1	0	0	1	5,972,817	585,016	1
MD	PERRYVILLE	MD0020613	CURRENT	1.65	0.94	8.00	0.30	0	0	8	0	0	1	0	0	1	1,982,292	160,794	1
MD	PINE HILL RUN	MD0021679	CURRENT	6	3.89	8.00	1.36	0	0	8	0	11,611	1	0	21,032	1	5,067,115	494,901	1
MD	PISCATAWAY	MD0021539	CURRENT	30	25.30	8.00	0.12	0	0	8	0	0	1	0	0	1	18,639,092	2,618,102	1
MD	POCOMOKE CITY	MD0022551	BY 2005	1.4	0.96	8.00	4.26	0	0	8	166,069	29,233	1	0	5,197	1	1,763,058	171,343	1
MD	POOLESVILLE	MD0023001	BY 2005	0.625	0.66	8.00	0.87	0	0	8	0	0	1	0	2,620	1	977,878	155,786	1
MD	PRINCESS ANNE	MD0020656	CURRENT	1.26	0.62	8.00	0.15	0	0	8	0	0	1	0	0	1	1,636,003	113,132	1
MD	SALISBURY	MD0021571	BY 2005	6.8	5.90	8.00	1.39	0	0	8	0	19,113	1	0	31,854	1	5,556,410	728,147	1
MD	SENECA CREEK	MD0021491	BY 2005	5	18.80	8.00	1.30	0	0	8	0	45,868	1	0	101,586	1	4,431,721	2,493,599	1
MD	SNOW HILL	MD0022764	BY 2005	0.5	0.47	8.00	3.75	0	0	8	112,778	12,847	1	0	2,513	1	874,978	120,880	1
MD	SOD RUN	MD0056545	CURRENT	20	12.59	8.00	1.17	0	0	8	0	17,662	1	0	68,048	1	12,760,503	1,329,599	1
MD	TANEYTOWN	MD0020672	CURRENT	1.1	0.91	8.00	1.76	0	0	8	0	5,741	1	0	4,920	1	1,486,331	171,535	1
MD	THURMONT	MD0021121	CURRENT	1	1.00	8.00	0.70	0	0	8	0	0	1	0	2,158	1	1,390,000	193,252	1
MD	WESTERN BRANCH	MD0021741	CURRENT	30	23.00	8.00	0.68	0	0	8	0	0	1	0	39,020	1	18,639,092	2,380,093	1
MD	WESTMINSTER	MD0021831	CURRENT	5	4.30	8.00	0.53	0	0	8	0	0	1	0	1,185	1	4,431,721	570,732	1
MD	WINEBRENNER WWTP	MD0003221	BY 2005	1	0.22	8.00	1.77	0	0	8	0	1,414	1	0	1,193	1	1,390,000	42,511	1
MD Total				**556.23**	**397.79**			**0**	**0**		**2,619,174**	**827,485**		**0**	**805,854**		**386,898,209**	**44,938,204**	
NY	ADDISON (V)	NY0020320		0.42	0.24	17.73	3.00	0	0	8	105,222	8,377	1	0	1,270	1	802,746	66,194	1
NY	BATH (V)	NY0021431		1	0.76	17.61	3.00	0	0	8	160,000	15,754	1	0	4,103	1	1,390,000	146,218	1
NY	BINGHAMTON-JOHNSON (	NY0024414	BY 2005	20	19.53	8.00	2.03	0	0	8	448,268	175,305	1	0	105,551	1	12,760,503	2,062,392	1
NY	COOPERSTOWN	NY0023591		0.52	0.65	18.95	3.00	0	0	8	114,667	12,998	1	0	3,498	1	892,180	165,283	1
NY	CORNING (C)	NY0025721		2.13	1.30	19.77	3.00	0	0	8	177,144	24,996	1	0	7,011	1	2,381,267	209,716	1
NY	CORTLAND (C)	NY0027561	BY 2005	10	8.52	8.00	1.30	0	0	8	0	21,404	1	0	46,048	1	6,701,258	931,158	1
NY	ELMIRA / CHEMUNG CO. S	NY0035742		12	7.19	15.00	3.00	0	0	8	326,892	125,406	1	0	38,846	1	7,933,681	778,464	1
NY	ENDICOTT (V)	NY0027669		10	7.58	23.47	3.00	0	0	8	296,548	131,191	1	0	40,935	1	6,701,258	827,759	1
NY	HAMILTON (V)	NY0020672		0.85	0.45	29.29	3.00	0	0	8	145,833	10,350	1	0	2,426	1	1,141,670	91,510	1
NY	HORNELL (C)	NY0023647		4	3.01	15.74	3.00	0	0	8	205,516	53,881	1	0	16,265	1	3,763,436	420,443	1
NY	LAKE STREET/CHEMUNG	NY0036986		9.5	7.12	19.68	3.00	0	0	8	288,962	123,447	1	0	38,454	1	7,112,961	813,481	1
NY	NORWICH	NY0021423		2.2	2.68	30.04	3.00	0	0	8	178,206	47,860	1	0	14,476	1	2,437,447	429,785	1

Table X-B: PHOSPHORUS INCREMENTAL COST FOR SIGNIFICANT MUNICIPAL FACILITIES IN THE BAY WATERSHED

				DESIGN	2010 DATA*			TIER 1 ($) (TP=Current)			TIER 2 $) (TP=1 for ALL)			TIER 3 ($) (TP=0.5 for ALL)			TIER 4 ($) (TP=0.1 for ALL)		
STAT	FACILITY	NPDES	BNR STATUS	FLOW (MGD)	FLOW (MGD)	TN (mg/l)	TP (mg/l)	TP CC	TP O&M	TP NOTE	TP CC	TP O&M	TP NOTE	TP CC	TP O&M	TP NOTE	TP CC	TP O&M	TP NOTE
NY	ONEONTA (C)	NY0031151		4	3.01	17.76	3.00	0	0	8	205,516	53,833	1	0	16,249	1	3,763,436	420,033	1
NY	OWEGO #2	NY0025798	BY 2005	2	1.04	8.00	2.48	0	0	8	175,172	16,282	1	0	5,625	1	2,275,679	170,734	1
NY	OWEGO (V)	NY0029262		1	0.62	15.42	3.00	0	0	8	160,000	13,511	1	0	3,370	1	1,390,000	120,101	1
NY	RICHFIELD SPRINGS (V)	NY0031411		0.6	0.32	16.58	0.08	0	0	8	0	0	1	0	0	1	958,115	77,042	1
NY	SIDNEY (V)	NY0029271		1.7	0.67	17.03	3.00	0	0	8	170,620	14,409	1	0	3,594	1	2,025,100	113,264	1
NY	WAVERLY (V)	NY0031089		0.65	1.01	27.70	3.55	0	0	8	126,945	23,843	1	0	5,455	1	997,280	232,696	1
NY Total				**82.57**	**65.68**			**0**	**0**		**3,285,513**	**872,847**		**0**	**353,177**		**65,428,020**	**8,076,273**	
PA	ALTOONA CITY AUTHORIT	PA0027014		5.5	6.03	14.15	4.30	0	0	8	228,274	169,072	1	0	32,558	1	4,753,037	781,731	1
PA	ALTOONA CITY AUTHORIT	PA0027022		9	6.25	16.80	4.29	0	0	8	281,376	175,652	1	0	33,778	1	6,834,065	723,562	1
PA	ANNVILLE TOWNSHIP	PA0021806		0.75	0.48	30.24	1.49	0	0	8	0	1,910	1	0	2,567	1	1,071,677	102,562	1
PA	ANTRIM TOWNSHIP	PA0080519	CURRENT	1.05	0.50	8.00	2.15	0	0	8	160,759	7,913	1	0	2,678	1	1,438,455	94,382	1
PA	ASHLAND MUNICIPAL AUT	PA0023558		1.3	0.72	8.75	3.23	0	0	8	164,552	16,583	1	0	3,905	1	1,672,652	130,953	1
PA	BEDFORD BOROUGH MUI	PA0022209		1.2	0.98	13.56	1.39	0	0	8	0	3,147	1	0	5,287	1	1,580,472	180,621	1
PA	BELLEFONTE BOROUGH	PA0020486		3.22	2.07	16.03	0.69	0	0	8	0	0	1	0	4,237	1	3,212,578	304,699	1
PA	BERWICK MUNICIPAL AUT	PA0023248		3.65	1.49	22.99	4.36	0	0	8	200,206	45,232	1	0	8,029	1	3,519,941	212,006	1
PA	BLOOMSBURG MUNICIPA	PA0027171		4.29	2.66	9.53	1.41	0	0	8	0	9,021	1	0	14,381	1	3,961,156	365,752	1
PA	BLOSSBURG	PA0020036		0.6	0.21	11.07	1.31	0	0	8	0	533	1	0	1,125	1	958,115	49,767	1
PA	BROWN TOWNSHIP MUNI	PA0028088		0.6	0.34	27.44	0.93	0	0	8	0	0	1	0	1,549	1	958,115	80,622	1
PA	BURNHAM BOROUGH	PA0038920		0.64	0.59	9.00	1.50	0	0	8	0	2,456	1	0	3,211	1	989,561	137,944	1
PA	CARLISLE BOROUGH	PA0026077		7	3.45	19.85	0.42	0	0	8	0	0	1	0	0	1	5,676,432	422,786	1
PA	CARLISLE SUBURBAN AU	PA0024384	CURRENT	0.925	0.70	8.00	0.65	0	0	8	0	0	1	0	1,122	1	1,191,737	138,001	1
PA	CHAMBERSBURG BOROU	PA0026051	BY 2005	5.2	4.78	8.00	2.65	0	0	8	223,722	69,774	1	0	25,804	1	4,561,171	627,679	1
PA	CLARKS SUMMIT-SOUTH .	PA0028576		2	2.28	16.99	3.12	0	0	8	175,172	43,398	1	0	12,300	1	2,275,679	373,330	1
PA	CLEARFIELD	PA0026310		4.5	2.62	11.04	0.78	0	0	8	0	0	1	0	7,870	1	4,102,241	356,678	1
PA	COLUMBIA	PA0026123		2	0.83	17.50	0.70	0	0	8	0	0	1	0	1,821	1	2,275,679	135,371	1
PA	CURWENSVILLE MUNICIP	PA0024759		0.5	0.45	14.68	1.86	0	0	8	0	3,190	1	0	2,418	1	874,978	116,290	1
PA	DANVILLE MUNICIPAL AU	PA0023531		3.22	2.15	8.97	1.35	0	0	8	0	6,224	1	0	11,623	1	3,212,578	315,923	1
PA	DERRY TOWNSHIP MUNIC	PA0026484		5	3.47	14.77	1.33	0	0	8	0	9,430	1	0	18,776	1	4,431,721	460,880	1
PA	DILLSBURG BOROUGH AU	PA0024431		1	0.66	11.07	0.88	0	0	8	0	0	1	0	2,709	1	1,390,000	126,762	1
PA	DOVER TOWNSHIP SEWE	PA0020826	CURRENT	4	3.70	7.53	1.36	0	0	8	0	11,171	1	0	20,017	1	3,763,436	517,431	1
PA	DUNCANSVILLE	PA0032883		1.217	0.61	8.00	2.31	0	0	8	163,292	9,864	1	0	3,294	1	1,596,276	112,163	1
PA	EAST PENNSBORO SOUT	PA0038415		3.7	2.42	17.43	3.49	0	0	8	200,964	53,899	1	0	13,101	1	3,555,073	344,813	1
PA	EASTERN SNYDER COUN	PA0110582	BY 2005	2.8	1.60	8.00	3.95	0	0	8	187,310	42,890	1	0	8,663	1	2,902,223	243,221	1
PA	ELIZABETHTOWN BOROU	PA0023108	BY 2005	3	2.34	8.00	0.87	0	0	8	0	0	1	0	9,402	1	3,051,371	349,882	1
PA	ELKLAND MUNICIPAL AUT	PA0113298		0.55	0.43	22.82	0.88	0	0	8	0	0	1	0	1,776	1	917,419	108,165	1
PA	EMPORIUM BOROUGH (M	PA0028631		0.52	0.48	6.88	2.53	0	0	8	114,667	8,361	1	0	2,600	1	892,180	122,856	1
PA	EPHRATA BOROUGH WW	PA0027405		3.8	2.78	1.98	1.51	0	0	8	0	11,658	1	0	15,006	1	3,624,983	392,539	1
PA	FAIRVIEW TOWNSHIP	PA0081868		0.5	0.40	11.07	0.64	0	0	8	0	0	1	0	621	1	874,978	103,908	1
PA	FRANKLIN COUNTY AUTH	PA0020834		0.4	1.08	1.05	0.67	0	0	8	0	0	1	0	1,929	1	783,713	311,394	1
PA	GETTYSBURG MUNICIPAL	PA0021563	CURRENT	1.63	1.62	5.11	0.51	0	0	8	0	0	1	0	228	1	1,965,078	278,207	1
PA	GREATER HAZELTON	PA0026921		8.9	6.68	10.36	0.94	0	0	8	0	0	1	0	31,529	1	6,777,827	775,360	1
PA	GREGG TOWNSHIP	PA0114821	CURRENT	0.8	0.66	6.60	1.33	0	0	8	0	1,822	1	0	3,592	1	1,107,172	139,294	1

Table X-B: PHOSPHORUS INCREMENTAL COST FOR SIGNIFICANT MUNICIPAL FACILITIES IN THE BAY WATERSHED

				DESIGN	2010 DATA*			TIER 1 ($) (TP=Current)			TIER 2 $) (TP=1 for ALL)			TIER 3 ($) (TP=0.5 for ALL)			TIER 4 ($) (TP=0.1 for ALL)		
STAT	FACILITY	NPDES	BNR STATUS	FLOW (MGD)	FLOW (MGD)	TN (mg/l)	TP (mg/l)	TP CC	TP O&M	TP NOTE	TP CC	TP O&M	TP NOTE	TP CC	TP O&M	TP NOTE	TP CC	TP O&M	TP NOTE
PA	HAMPDEN TOWNSHIP	PA0028746	CURRENT	1.76	1.30	8.00	1.06	0	0	8	0	641	1	0	7,000	1	2,076,053	218,866	1
PA	HAMPDEN TOWNSHIP SE	PA0080314		2.5	2.01	9.35	0.70	0	0	8	0	0	1	0	4,316	1	2,673,351	313,449	1
PA	HANOVER BOROUGH	PA0026875		3.65	3.84	23.73	0.99	0	0	8	0	0	1	0	20,173	1	3,519,941	548,189	1
PA	HARRISBURG SEWERAGE	PA0027197	BY 2010	37.7	26.24	8.00	1.38	0	0	8	0	82,263	1	0	141,782	1	23,085,846	2,684,742	1
PA	HIGHSPIRE	PA0024040		2	1.05	14.97	1.63	0	0	8	0	5,442	1	0	5,663	1	2,275,679	171,883	1
PA	HOLLIDAYSBURG REGION	PA0043273		2	2.98	6.82	1.70	0	0	8	0	17,130	1	0	16,076	1	2,275,679	487,964	1
PA	HOUTZDALE BOROUGH M	PA0046159	CURRENT	0.3	0.12	6.89	0.71	0	0	8	0	0	1	0	276	1	681,020	39,909	1
PA	HUNTINGDON BOROUGH	PA0026191		3.75	2.13	11.07	1.31	0	0	8	0	5,292	1	0	11,530	1	3,590,086	302,530	1
PA	HYNDMAN BOROUGH	PA0020851		0.104	0.08	11.11	1.10	0	0	8	0	69	1	0	450	1	412,902	44,435	1
PA	JERSEY SHORE BOROUG	PA0028665		0.8	0.72	21.08	6.09	0	0	8	141,111	32,976	1	0	3,876	1	1,107,172	150,314	1
PA	KELLY TOWNSHIP MUNIC	PA0028681	CURRENT	2.75	1.82	2.20	0.78	0	0	8	0	0	1	0	5,510	1	2,864,524	277,412	1
PA	LACKAWANNA RIVER BAS	PA0027090		7	5.12	13.16	0.88	0	0	8	0	0	1	0	20,930	1	5,676,432	628,601	1
PA	LACKAWANNA RIVER BAS	PA0027065		6	2.45	9.13	1.66	0	0	8	0	13,352	1	0	13,222	1	5,067,115	311,140	1
PA	LACKAWANNA RIVER BAS	PA0027073		1	0.34	28.10	0.87	0	0	8	0	0	1	0	1,358	1	1,390,000	65,783	1
PA	LACKAWANNA RIVER BAS	PA0027081	BY 2005	0.7	0.49	8.00	1.12	0	0	8	0	496	1	0	2,658	1	1,035,087	109,583	1
PA	LANCASTER AREA SEWEI	PA0042269	BY 2005	15	7.78	8.00	0.75	0	0	8	0	0	1	0	20,704	1	9,760,640	833,618	1
PA	LANCASTER CITY	PA0026743	BY 2010	29.73	20.71	8.00	0.81	0	0	8	0	0	1	0	69,130	1	18,482,056	2,144,517	1
PA	LEBANON CITY AUTHORIT	PA0027316		8	5.50	33.65	1.39	0	0	8	0	17,519	1	0	29,739	1	6,264,304	654,670	1
PA	LEMOYNE BOROUGH MUI	PA0026441		2.088	1.66	22.88	1.42	0	0	8	0	5,826	1	0	8,970	1	2,347,336	269,562	1
PA	LEWISBURG AREA JOINT	PA0044661	BY 2010	2.42	1.20	8.00	1.33	0	0	8	0	3,243	1	0	6,472	1	2,611,175	187,943	1
PA	LEWISTOWN BOROUGH	PA0026280		2.4	1.89	14.00	1.30	0	0	8	0	4,699	1	0	10,238	1	2,595,551	297,906	1
PA	LITITZ SEWAGE AUTHORI	PA0020320		3.5	3.02	23.00	1.57	0	0	8	0	14,194	1	0	16,344	1	3,413,810	435,750	1
PA	LITTLESTOWN BOROUGH	PA0021229		1	0.51	12.51	1.72	0	0	8	0	3,021	1	0	2,742	1	1,390,000	97,739	1
PA	LOCK HAVEN	PA0025933	BY 2010	3.75	2.18	8.00	2.42	0	0	8	201,723	29,561	1	0	11,782	1	3,590,086	309,155	1
PA	LOGAN TOWNSHIP-GREE	PA0032557	BY 2005	0.6	0.37	8.00	2.69	0	0	8	122,222	7,565	1	0	1,977	1	958,115	87,495	1
PA	LOWER ALLEN TOWNSHIF	PA0027189		5.95	3.40	13.63	1.45	0	0	8	0	12,559	1	0	18,392	1	5,036,010	433,631	1
PA	LOWER LACKAWANNA VA	PA0026361		6	3.50	17.54	1.57	0	0	8	0	16,610	1	0	18,911	1	5,067,115	444,999	1
PA	LYKENS BOROUGH	PA0043575		0.41	0.24	11.07	1.31	0	0	8	0	619	1	0	1,306	1	793,284	68,803	1
PA	MAHANOY CITY	PA0070041	CURRENT	1.38	0.57	8.00	2.67	0	0	8	165,765	11,192	1	0	3,089	1	1,745,110	102,173	1
PA	MANHEIM BOROUGH AUT	PA0020893		1	0.79	8.82	1.35	0	0	8	0	2,318	1	0	4,292	1	1,390,000	152,977	1
PA	MANSFIELD BOROUGH	PA0021814		1	0.58	10.50	2.24	0	0	8	160,000	9,118	1	0	3,111	1	1,390,000	110,887	1
PA	MARIETTA-DONEGAL JOI	PA0021717		0.6	0.45	11.07	1.01	0	0	8	0	49	1	0	2,437	1	958,115	107,846	1
PA	MARTINSBURG	PA0028347		0.5	0.41	11.07	1.49	0	0	8	0	1,657	1	0	2,208	1	874,978	106,229	1
PA	MARYSVILLE MUNICIPAL /	PA0021571		0.5	1.10	11.07	0.12	0	0	8	0	0	1	0	0	1	874,978	286,926	1
PA	MECHANICSBURG BOROU	PA0020885		2.08	0.83	25.31	1.13	0	0	8	0	897	1	0	4,479	1	2,340,853	134,712	1
PA	MIDDLETOWN	PA0020664		2.2	1.19	20.08	0.71	0	0	8	0	0	1	0	2,713	1	2,437,447	190,181	1
PA	MIFFLINBURG BOROUGH	PA0028461	CURRENT	0.512	0.70	6.18	0.79	0	0	8	0	0	1	0	2,198	1	885,336	180,361	1
PA	MILLERSBURG BOROUGH	PA0022535		1	0.70	11.07	1.31	0	0	8	0	1,792	1	0	3,778	1	1,390,000	134,655	1
PA	MILLERSVILLE BOROUGH	PA0026620		1	0.69	1.75	1.30	0	0	8	0	1,730	1	0	3,726	1	1,390,000	132,781	1
PA	MILTON MUNICIPAL AUTH	PA0020273		2.6	1.71	5.81	0.43	0	0	8	0	0	1	0	0	1	2,750,372	264,311	1
PA	MONTGOMERY BOROUGH	PA0020699		0.6	0.52	32.35	2.33	0	0	8	122,222	8,126	1	0	2,792	1	958,115	123,545	1
PA	MOSHANNON VALLEY JOI	PA0037966		1.5	1.43	14.07	0.45	0	0	8	0	0	1	0	0	1	1,851,848	249,869	1

Table X-B: PHOSPHORUS INCREMENTAL COST FOR SIGNIFICANT MUNICIPAL FACILITIES IN THE BAY WATERSHED

				DESIGN	2010 DATA*			TIER 1 ($) (TP=Current)			TIER 2 $) (TP=1 for ALL)			TIER 3 ($) (TP=0.5 for ALL)			TIER 4 ($) (TP=0.1 for ALL)		
STAT	FACILITY	NPDES	BNR STATUS	FLOW (MGD)	FLOW (MGD)	TN (mg/l)	TP (mg/l)	TP CC	TP O&M	TP NOTE	TP CC	TP O&M	TP NOTE	TP CC	TP O&M	TP NOTE	TP CC	TP O&M	TP NOTE
PA	MOUNT JOY	PA0021067		1.3	0.75	22.45	0.32	0	0	8	0	0	1	0	0	1	1,672,652	135,374	1
PA	MOUNT UNION BOROUGH	PA0020214		0.63	0.34	11.07	1.31	0	0	8	0	866	1	0	1,826	1	981,786	79,021	1
PA	MOUNTAINTOP AREA	PA0045985	CURRENT	2.4	2.75	8.00	3.68	0	0	8	181,241	64,537	1	0	14,844	1	2,595,551	431,926	1
PA	MT. CARMEL MUNICIPAL S	PA0024406		1.5	0.95	22.90	2.75	0	0	8	167,586	17,038	1	0	5,112	1	1,851,848	165,809	1
PA	MT. HOLLY SPRINGS BOR	PA0023183		0.6	0.38	14.92	0.67	0	0	8	0	0	1	0	715	1	958,115	91,392	1
PA	MUNCY BOROUGH MUNIC	PA0024325		1.4	0.64	8.35	1.55	0	0	8	0	2,937	1	0	3,460	1	1,763,058	114,074	1
PA	NEW CUMBERLAND BOR	PA0026654		1.25	0.49	11.07	0.48	0	0	8	0	0	1	0	0	1	1,626,795	90,161	1
PA	NEW FREEDOM WTP	PA0043257		1.3	1.15	19.60	1.58	0	0	8	0	5,504	1	0	6,211	1	1,672,652	208,320	1
PA	NEW HOLLAND BOROUGH	PA0021890		1.14	1.10	28.90	1.70	0	0	8	0	6,369	1	0	5,960	1	1,524,237	206,067	1
PA	NEW OXFORD MUNICIPAL	PA0020923	CURRENT	0.825	1.24	8.00	0.33	0	0	8	0	0	1	0	0	1	1,124,540	256,280	1
PA	NEWBERRY TOWNSHIP	PA0083011		0.4	0.41	20.16	1.49	0	0	8	0	1,670	1	0	2,235	1	783,713	119,069	1
PA	NORTHEASTERN YORK C	PA0023744		1.7	0.65	11.07	1.24	0	0	8	0	1,300	1	0	3,491	1	2,025,100	110,027	1
PA	NORTHUMBERLAND BOR	PA0020567		0.75	0.45	19.07	0.63	0	0	8	0	0	1	0	633	1	1,071,677	97,234	1
PA	PALMYRA BOROUGH AUT	PA0024287		1.42	0.82	28.31	1.48	0	0	8	0	3,244	1	0	4,406	1	1,780,940	144,781	1
PA	PENN TOWNSHIP	PA0037150		4.2	1.66	9.34	1.09	0	0	8	0	1,242	1	0	8,990	1	3,900,164	229,776	1
PA	PINE CREEK MUNICIPAL A	PA0027553		1.3	0.64	17.90	1.55	0	0	8	0	2,916	1	0	3,465	1	1,672,652	116,225	1
PA	PINE GROVE BOROUGH A	PA0020915		0.6	0.45	18.94	2.71	0	0	8	122,222	8,801	1	0	2,433	1	958,115	107,639	1
PA	PORTER TOWER JOINT M	PA0046272	CURRENT	0.43	0.56	7.69	1.30	0	0	8	0	1,395	1	0	3,039	1	812,105	156,668	1
PA	ROARING SPRING BOROU	PA0020249	CURRENT	0.7	0.68	5.61	1.54	0	0	8	0	3,041	1	0	3,681	1	1,035,087	151,765	1
PA	SAYRE	PA0043681		1.94	0.65	15.86	0.35	0	0	8	0	0	1	0	0	1	2,226,366	108,121	1
PA	SCRANTON SEWER AUTH	PA0026492	BY 2005	28	13.15	8.00	1.78	0	0	8	0	85,177	1	0	71,070	1	17,473,874	1,365,717	1
PA	SHAMOKIN-COAL TOWNS	PA0027324		7	3.56	25.26	1.84	0	0	8	0	24,700	1	0	19,219	1	5,676,432	436,379	1
PA	SHENANDOAH MUNICIPAL	PA0070386		2	1.19	7.60	0.40	0	0	8	0	0	1	0	0	1	2,275,679	195,078	1
PA	SHIPPENSBURG BOROUG	PA0030643		2.75	2.28	14.47	0.50	0	0	8	0	0	1	0	0	1	2,864,524	347,827	1
PA	SILVER SPRING TOWNSH	PA0083593		0.5	0.16	5.92	0.47	0	0	8	0	0	1	0	0	1	874,978	40,819	1
PA	SOUTH MIDDLETON TOWI	PA0044113		0.75	0.45	11.07	0.42	0	0	8	0	0	1	0	0	1	1,071,677	97,555	1
PA	SPRINGETTSBURY TOWN	PA0026808	CURRENT	15	11.29	8.00	1.32	0	0	8	0	29,686	1	0	61,004	1	9,760,640	1,209,063	1
PA	ST. JOHNS	PA0046388	CURRENT	0.6	0.32	5.88	1.07	0	0	8	0	185	1	0	1,729	1	958,115	76,509	1
PA	STEWARTSTOWN BOROU	PA0036269		0.4	0.27	10.97	1.48	0	0	8	0	1,081	1	0	1,469	1	783,713	78,260	1
PA	SUNBURY CITY MUNICIPA	PA0026557	BY 2005	3.5	3.01	8.00	2.41	0	0	8	197,930	39,036	1	0	16,289	1	3,413,810	434,282	1
PA	SWATARA TOWNSHIP	PA0026735	BY 2005	6.3	3.34	8.00	1.64	0	0	8	0	17,786	1	0	18,033	1	5,252,406	419,567	1
PA	TOWANDA MUNICIPAL AU	PA0034576	CURRENT	1	0.68	8.00	2.08	0	0	8	160,000	9,298	1	0	3,694	1	1,390,000	131,666	1
PA	TRI-BORO MUNICIPAL AU	PA0023736		0.5	0.28	10.21	0.99	0	0	8	0	0	1	0	1,503	1	874,978	73,782	1
PA	TWIN BOROUGHS SANITA	PA0023264		0.6	0.35	11.07	1.31	0	0	8	0	885	1	0	1,865	1	958,115	82,522	1
PA	TYRONE BOROUGH SEWE	PA0026727	CURRENT	9	6.40	4.45	0.39	0	0	8	0	0	1	0	0	1	6,834,065	740,666	1
PA	UNIVERSITY AREA JOINT	PA0026239	BY 2005	3.84	5.07	8.00	0.06	0	0	8	0	0	1	0	0	1	3,652,817	714,940	1
PA	UPPER ALLEN TOWNSHIP	PA0024902		0.48	0.55	11.07	1.51	0	0	8	0	2,314	1	0	2,995	1	857,455	146,780	1
PA	WASHINGTON TOWNSHIP	PA0080225	CURRENT	1	0.93	7.79	2.57	0	0	8	160,000	15,254	1	0	5,034	1	1,390,000	179,428	1
PA	WAYNESBORO BOROUGH	PA0020621		1.59	0.87	5.25	4.81	0	0	8	168,951	57,274	1	0	9,254	1	1,930,489	150,328	1
PA	WELLSBORO MUNICIPAL	PA0021687		2	1.18	19.89	1.81	0	0	8	0	7,872	1	0	6,384	1	2,275,679	193,758	1
PA	WESTERN CLINTON COUI	PA0043893	CURRENT	0.9	0.35	2.58	0.90	0	0	8	0	0	1	0	1,526	1	1,175,260	70,078	1
PA	WHITE DEER TOWNSHIP	PA0020800		0.42	0.27	20.34	2.43	0	0	8	105,222	5,336	1	0	1,474	1	802,746	76,780	1

Table X-B: PHOSPHORUS INCREMENTAL COST FOR SIGNIFICANT MUNICIPAL FACILITIES IN THE BAY WATERSHED

				DESIGN	2010 DATA*			TIER 1 ($) (TP=Current)			TIER 2 $) (TP=1 for ALL)			TIER 3 ($) (TP=0.5 for ALL)			TIER 4 ($) (TP=0.1 for ALL)		
STAT	FACILITY	NPDES	BNR STATUS	FLOW (MGD)	FLOW (MGD)	TN (mg/l)	TP (mg/l)	TP CC	TP O&M	TP NOTE	TP CC	TP O&M	TP NOTE	TP CC	TP O&M	TP NOTE	TP CC	TP O&M	TP NOTE
PA	WILLIAMSPORT SANITARY	PA0027057	BY 2005	10.5	7.32	8.00	3.40	0	0	8	304,134	151,230	1	0	39,528	1	7,010,600	797,388	1
PA	WILLIAMSPORT SANITARY	PA0027049	BY 2005	4.5	2.67	8.00	4.10	0	0	8	213,102	72,604	1	0	14,409	1	4,102,241	362,436	1
PA	WYOMING VALLEY	PA0026107	CURRENT	50	23.86	5.21	1.36	0	0	8	0	71,004	1	0	128,912	1	30,084,265	2,407,145	1
PA	YORK CITY	PA0026263	CURRENT	26	11.93	8.00	0.26	0	0	8	0	0	1	0	0	1	16,303,836	1,243,143	1
PA Total				**469.21**	**301.35**			**0**	**0**		**4,793,727**	**1,724,742**		**0**	**1,291,747**		**396,116,842**	**40,127,199**	
VA	ALEXANDRIA	VA0025160	BY 2005	54	37.94	8.00	0.05	0	0	8	0	0	1	0	0	1	0	0	B
VA	ALLEGHANY CO. LOWER .	VA0090671		1.5	0.75	18.70	2.00	0	0	8	167,586	9,552	1	0	4,053	1	1,851,848	131,486	1
VA	AQUIA	VA0060968	CURRENT	6.5	5.29	8.00	0.10	0	0	8	0	0	1	0	0	1	5,374,706	660,273	1
VA	ARLINGTON	VA0025143	BY 2005	40	35.29	8.00	0.06	0	0	8	0	0	1	0	0	1	0	0	B
VA	ASHLAND	VA0024899	BY 2010	2	1.55	8.00	1.50	0	0	8a	175,172	22,725	1	0	8,375	1	2,275,679	254,216	1
VA	BROAD RUN WRF	VA_BROADR	BY 2010	15	2.40	8.00	0.10	0	0	8	0	0	1	0	0	1	0	0	17
VA	BUENA VISTA	VA0020991		2.25	1.45	18.70	2.50	0	0	8	178,965	21,547	1	0	7,829	1	2,477,301	231,238	1
VA	CAPE CHARLES	VA0021288		0.25	0.15	18.70	2.50	0	0	8	89,167	4,826	1	0	821	1	623,612	54,373	1
VA	CAROLINE COUNTY REGI	VA0073504		0.5	0.20	18.70	4.53	0	0	8	112,778	7,980	1	0	1,060	1	874,978	50,988	1
VA	CLIFTON FORGE	VA0022772		2	1.23	18.70	2.50	0	0	8	175,172	18,807	1	0	6,668	1	2,275,679	202,405	1
VA	COLONIAL BEACH	VA0026409	BY 2010	2	0.85	13.26	2.72	0	0	8	175,172	15,570	1	0	4,572	1	2,275,679	138,784	1
VA	COVINGTON	VA0025542		3	1.78	18.70	2.50	0	0	8	190,344	52,922	1	0	9,602	1	3,051,371	265,271	1
VA	CREWE STP	VA0020303		0.5	0.20	11.54	0.28	0	0	8	0	0	1	0	0	1	874,978	51,172	1
VA	CULPEPER	VA0061590	BY 2005	4.5	2.27	8.00	1.50	0	0	8a	0	11,052	1	0	12,267	1	4,102,241	308,555	1
VA	DAHLGREN (DAHLGREN S	VA0026514		0.325	0.30	6.82	0.54	0	0	8	0	0	1	0	116	1	708,032	96,298	1
VA	DALE CITY #1	VA0024724	BY 2005	4	3.06	8.00	0.09	0	0	8	0	0	1	0	0	1	3,763,436	427,580	1
VA	DALE CITY #8	VA0024678	BY 2005	4	2.85	8.00	0.10	0	0	8	0	0	1	0	0	1	3,763,436	397,670	1
VA	DOSWELL	VA0029521	BY 2010	1	6.75	8.00	1.50	0	0	8a	160,000	85,740	1	0	5,403	1	1,390,000	1,299,942	1
VA	FALLING CREEK	VA0024996	BY 2010	10.1	8.24	9.57	1.26	0	0	8	0	17,712	1	0	44,521	1	6,763,197	899,819	1
VA	FARMVILLE	VA0083135	CURRENT	2.4	0.97	0.76	2.95	0	0	8	181,241	19,315	1	0	5,256	1	2,595,551	152,928	1
VA	FISHERSVILLE	VA0025291		2	1.71	15.82	2.67	0	0	8	175,172	27,144	1	0	9,240	1	2,275,679	280,458	1
VA	FMC	VA0068110	BY 2005	5.4	3.29	8.00	1.50	0	0	8a	0	13,603	1	0	17,782	1	4,689,380	428,780	1
VA	FORT A.P. HILL (WILCOX (	VA0032034	CURRENT	0.53	0.12	8.00	4.06	0	0	8	115,611	5,259	1	0	630	1	900,666	29,518	1
VA	FREDERICKSBURG	VA0025127	CURRENT	3.5	2.23	8.00	1.32	0	0	8	0	5,819	1	0	12,048	1	3,413,810	321,206	1
VA	FRONT ROYAL	VA0062812		4	2.76	11.21	1.11	0	0	8	0	2,469	1	0	14,929	1	3,763,436	385,908	1
VA	FWSA OPEQUON	VA0065552	CURRENT	8.4	5.89	8.00	1.14	0	0	8	0	6,903	1	0	31,830	1	6,494,226	692,822	1
VA	GORDONSVILLE	VA0021105		0.67	0.57	18.70	2.50	0	0	8	128,833	9,596	1	0	3,059	1	1,012,557	128,660	1
VA	H.L. MOONEY	VA0025101	BY 2005	18	14.63	8.00	0.10	0	0	8	0	0	1	0	0	S	0	759,796	S
VA	HARRISONBURG-ROCKIN	VA0060640	CURRENT	16	11.65	8.00	2.20	0	0	8	0	0	23	0	62,951	1	10,364,714	1,243,671	1
VA	HAYMOUNT STP	VA0089125	BY 2010	0.95	0.95	8.00	1.50	0	0	8	0	3,927	1	0	5,133	1	1,208,015	184,010	1
VA	HENRICO COUNTY	VA0063690	BY 2010	75	50.00	8.00	1.53	0	0	8	300,000	500,000	S	0	270,175	1	300,000	580,000	S
VA	HOPEWELL	VA0066630	BY 2010	50	35.12	21.00	1.50	0	0	8a	1,070,000	365,000	16	0	0	16	26,550,000	1,461,300	16
VA	HRSD-ARMY BASE	VA0081230		18	17.45	23.60	1.39	0	0	8	0	55,819	1	0	94,291	1	11,566,461	1,852,009	1
VA	HRSD-BOAT HARBOR	VA0081256		25	23.05	23.29	1.41	0	0	8	0	77,225	1	0	124,551	1	15,716,889	2,406,892	1
VA	HRSD-CHESAPEAKE/ELIZ	VA0081264		24	26.30	24.32	1.57	0	0	8	0	124,804	1	0	142,112	1	15,128,584	2,751,813	1
VA	HRSD-JAMES RIVER	VA0081272		20	20.00	20.27	1.32	0	0	8	0	52,667	1	0	108,070	1	12,760,503	2,111,605	1
VA	HRSD-NANSEMOND	VA0081299	CURRENT	30	20.15	8.00	1.25	0	0	8	0	43,772	1	0	114,358	1	18,639,092	2,085,169	1

Table X-B: PHOSPHORUS INCREMENTAL COST FOR SIGNIFICANT MUNICIPAL FACILITIES IN THE BAY WATERSHED

				DESIGN	2010 DATA*			TIER 1 ($) (TP=Current)			TIER 2 $) (TP=1 for ALL)			TIER 3 ($) (TP=0.5 for ALL)			TIER 4 ($) (TP=0.1 for ALL)		
STAT	FACILITY	NPDES	BNR STATUS	FLOW (MGD)	FLOW (MGD)	TN (mg/l)	TP (mg/l)	TP CC	TP O&M	TP NOTE	TP CC	TP O&M	TP NOTE	TP CC	TP O&M	TP NOTE	TP CC	TP O&M	TP NOTE
VA	HRSD-VIP	VA0081281	CURRENT	40	35.90	8.00	1.00	0	0	8	0	0	1	0	190,325	1	24,403,414	3,662,487	1
VA	HRSD-WILLIAMSBURG	VA0081302		22.5	15.90	8.15	1.00	0	0	8	0	0	1	0	85,916	1	14,243,449	1,668,967	1
VA	HRSD-YORK	VA0081311	BY 2010	15	12.70	8.00	1.50	0	0	8a	0	34,796	1	0	69,265	1	9,760,640	1,360,100	1
VA	KILMARNOCK	VA0020788		0.2	0.25	4.61	2.56	0	0	8	84,445	22,658	1	0	1,345	1	560,479	98,650	1
VA	LAKE MONTICELLO STP	VA0024945		0.6	0.57	18.70	2.50	0	0	8	122,222	9,467	1	0	3,060	1	958,115	135,391	1
VA	LEESBURG	MD0066184	CURRENT	4.85	2.96	8.00	1.42	0	0	8	0	10,322	1	0	15,985	1	4,333,782	395,171	1
VA	LEXINGTON-ROCKBRIDGE	VA0088161	CURRENT	4	0.87	18.70	2.50	0	0	8	205,516	14,863	1	0	4,685	1	3,763,436	121,106	1
VA	LITTLE FALLS RUN	VA0076392	CURRENT	4	4.16	8.00	0.88	0	0	8	0	0	1	0	12,207	1	3,763,436	581,054	1
VA	LURAY	VA0062642		1.6	1.50	1.50	0.41	0	0	8	0	0	1	0	0	1	1,939,157	259,622	1
VA	LYNCHBURG	VA0024970		22	17.40	8.50	3.08	0	0	8	478,612	308,781	1	0	94,021	1	13,947,657	1,828,449	1
VA	MASSANUTTEN PUBLIC S	VA0024732		0.75	0.38	18.70	2.50	0	0	8	136,389	7,432	1	0	2,050	1	1,071,677	81,879	1
VA	MASSAPONAX	VA0025658	BY 2005	8	4.38	8.00	1.50	0	0	8a	0	0	1	0	23,682	1	6,264,304	521,326	1
VA	MATHEWS COURTHOUSE	VA0028819		0.1	0.08	10.41	1.42	0	0	8	0	275	1	0	432	1	405,553	43,471	1
VA	MIDDLE RIVER	VA0064793	CURRENT	6.8	5.65	8.00	2.05	0	0	8	247,998	54,207	1	0	30,530	1	5,556,410	697,873	1
VA	MONTROSS - WESTMORE	VA0072729		0.1	0.03	6.54	1.17	0	0	8	0	44	1	0	168	1	405,553	16,863	1
VA	MOORES CREEK-RIVANN	VA0025518		15	11.89	13.46	3.17	0	0	8	372,408	219,075	1	0	63,711	1	9,760,640	1,273,139	1
VA	NAVAL SURFACE WARFAI	VA0021067	CURRENT	0.4	0.43	8.00	2.89	0	0	8	103,334	50,513	1	0	2,345	1	783,713	124,927	1
VA	NEW MARKET STP	VA0022853		0.5	0.56	18.70	2.50	0	0	8	112,778	9,197	1	0	3,025	1	874,978	145,499	1
VA	NOMAN M. COLE JR. POLL	VA0025364	BY 2005	67	53.00	8.00	0.11	0	0	8	0	0	1	0	0	1	39,597,492	5,270,706	1
VA	ONANCOCK	VA0021253		0.25	0.23	18.70	2.50	0	0	8	89,167	10,034	1	0	1,264	1	623,612	83,572	1
VA	ORANGE	VA0021385	BY 2010	1.5	0.69	8.00	1.50	0	0	8a	167,586	11,927	1	0	3,736	1	1,851,848	121,225	1
VA	PARHAM LANDING WWTP	VA0088331		0.57	0.10	8.27	0.78	0	0	8	0	0	1	0	310	1	933,894	25,369	1
VA	PARKINS MILL	VA0075191		2	1.42	18.70	2.50	0	0	8	175,172	21,125	1	0	7,678	1	2,275,679	233,060	1
VA	PROCTORS CREEK	VA0060194	CURRENT	21.5	17.65	8.00	0.38	0	0	8	0	0	1	0	0	1	13,651,476	1,856,981	1
VA	PURCELLVILLE	VA0022802	BY 2005	1	0.42	8.00	2.50	0	0	8	160,000	8,452	1	0	2,289	1	1,390,000	81,569	1
VA	QUANTICO-MAINSIDE	VA0028363	CURRENT	2.2	1.38	8.00	0.10	0	0	8	0	0	1	0	0	1	2,437,447	222,149	1
VA	REEDVILLE	VA0060712		0.2	0.04	18.70	2.50	0	0	8	84,445	3,318	1	0	205	1	560,479	15,117	1
VA	REMINGTON REGIONAL	VA0076805	BY 2005	2	0.57	8.00	1.50	0	0	8a	0	0	23	0	3,097	1	2,275,679	94,014	1
VA	RICHMOND	VA0063177	BY 2010	45	47.99	8.00	1.50	0	0	8a	0	198,373	1	0	145,391	1	27,252,964	4,867,426	1
VA	ROUND HILL WWTP	VA0026212		0.5	0.15	18.70	3.00	0	0	8	112,778	4,745	1	0	813	1	874,978	39,128	1
VA	SIL MRRS	VA0090263	CURRENT	1.923	1.27	8.00	1.50	0	0	22	0	0	22	0	0	22	2,212,325	209,375	1
VA	SOUTH CENTRAL	VA0025437	BY 2010	23	12.93	8.00	1.50	0	0	8a	0	53,448	1	0	100,000	S	7,420,000	200,000	S
VA	SOUTH WALES STP	VA0080527	BY 2010	0.856	0.86	8.00	1.50	0	0	8	0	3,538	1	0	4,625	1	1,145,747	173,911	1
VA	STONY CREEK STP	VA0028380		0.6	0.26	18.70	2.50	0	0	8	122,222	5,725	1	0	1,430	1	958,115	63,253	1
VA	STRASBURG	VA0020311		0.98	0.77	18.70	2.50	0	0	8	158,111	12,743	1	0	4,175	1	1,227,295	147,537	1
VA	STUARTS DRAFT	VA0066877	BY 2005	1.4	1.50	8.00	1.50	0	0	8a	0	11,513	1	0	8,105	1	1,763,058	267,211	1
VA	TANGIER ISLAND	VA0067423		0.1	0.05	18.70	2.50	0	0	8	75,000	3,823	1	0	249	1	405,553	25,142	1
VA	TAPPAHANNOCK	VA0071471		0.8	0.37	18.70	2.50	0	0	8	0	0	23	0	2,020	1	1,107,172	78,346	1
VA	TOTOPOTOMOY	VA0089915	BY 2010	5	5.00	8.00	1.50	0	0	8a	0	20,668	1	0	27,017	1	4,431,721	663,191	1
VA	UPPER OCCOQUAN SEW	VA0024988		54	34.00	19.14	0.04	0	0	8	0	0	1	0	0	1	0	0	B
VA	URBANNA	VA0026263		0.1	0.11	18.70	2.50	0	0	8	75,000	8,928	1	0	611	1	405,553	61,403	1
VA	WARRENTON	VA0021172		2.5	1.18	14.22	1.07	0	0	8	0	719	1	0	6,376	1	2,673,351	183,791	1

Table X-B: PHOSPHORUS INCREMENTAL COST FOR SIGNIFICANT MUNICIPAL FACILITIES IN THE BAY WATERSHED

				DESIGN	2010 DATA*			TIER 1 ($) (TP=Current)			TIER 2 $) (TP=1 for ALL)			TIER 3 ($) (TP=0.5 for ALL)			TIER 4 ($) (TP=0.1 for ALL)		
STAT	FACILITY	NPDES	BNR STATUS	FLOW (MGD)	FLOW (MGD)	TN (mg/l)	TP (mg/l)	TP CC	TP O&M	TP NOTE	TP CC	TP O&M	TP NOTE	TP CC	TP O&M	TP NOTE	TP CC	TP O&M	TP NOTE
VA	WARSAW	VA0026891		0.3	0.22	18.70	2.50	0	0	8	93,889	17,796	1	0	1,173	1	681,020	71,309	1
VA	WAYNESBORO	VA0025151		4	2.81	19.71	4.38	0	0	8	205,516	82,836	1	0	15,211	1	3,763,436	393,188	1
VA	WEST POINT	VA0075434		0.6	0.60	18.70	2.50	0	0	8	122,222	11,048	1	0	3,749	1	958,115	143,455	1
VA	WEYERS CAVE STP	VA0022349		0.5	0.40	18.70	2.50	0	0	8	112,778	7,216	1	0	2,161	1	874,978	103,969	1
VA	WIDEWATER WWTP	VA0090387	BY 2010	0.5	0.10	8.00	2.00	0	0	8	112,778	3,082	1	0	540	1	874,978	25,992	1
VA	WILDERNESS SHORES	VA0083411		0.5	0.55	18.70	2.50	0	0	8	112,778	9,031	1	0	2,952	1	874,978	142,010	1
VA	WOODSTOCK	VA0026468		0.8	0.42	18.70	2.50	0	0	8	141,111	8,010	1	0	2,261	1	1,107,172	87,677	1
VA Total				**845.85**	**652.05**			**0**	**0**		**7,379,470**	**2,841,483**		**0**	**2,071,890**		**409,232,246**	**52,293,664**	
WV	BERKELEY COUNTY PSSD	WV0082759		2.35	0.93	5.16	3.00	0	0	8	180,482	18,933	1	0	5,008	1	2,556,347	146,420	1
WV	BERKELEY COUNTY PSSD	WV0020061		0.9	0.60	5.25	3.00	0	0	8	150,556	12,958	1	0	3,251	1	1,175,260	119,444	1
WV	CHARLESTOWN	WV0022349		1.2	0.75	10.74	3.00	0	0	8	163,034	15,617	1	0	4,038	1	1,580,472	137,960	1
WV	KEYSER	WV0024392		2.4	1.21	17.01	1.05	0	0	8	0	449	1	0	6,520	1	2,595,551	189,716	1
WV	MARTINSBURG	WV0023167		5	2.35	9.27	3.00	0	0	8	220,688	43,211	1	0	12,679	1	4,431,721	311,230	1
WV	MOOREFIELD	WV0020150	BY 2010	0.6	0.00	8.00	3.00	0	0	8	122,222	3,779	1	0	540	1	958,115	0	1
WV	PETERSBURG	WV0021792		0.8	0.74	6.14	3.00	0	0	8	141,111	14,989	1	0	3,976	1	1,107,172	154,205	1
WV	ROMNEY	WV0020699		0.5	0.46	17.20	3.00	0	0	8	112,778	9,806	1	0	2,467	1	874,978	118,693	1
WV Total				**13.75**	**7.02**			**0**	**0**		**1,090,872**	**119,742**		**0**	**38,479**		**15,279,616**	**1,177,669**	
Grand Total				**2,341**	**1,767**			**0**	**0**		**39,422,645**	**9,765,046**		**0**	**4,570,953**		**########**	**148,149,906**	

Source Notes

* 2010 Data are the projections based on 2000 data. 2010 flows are projected with 2000 flow and population increase factor, except where facility's own projection is provided. Concentrations are the same as 2000.

1 = Calculated from the methodologies provided from Thor Young, Stearn & Wheler, LLC and Tom Sadick, CH2M Hill.

2 = NRT eligible cost report from MDE,4/23/02, where cost=0, MDE has indicated funds already appropriated

2a= NRT Cost report, from MDE 3/6/2002

3 = Randall 51 Facility Report, 1999 for BNR @8 and additional 3/2001 report with 60 facilities.

4 = Paid for by Corp of Engineers

5 = From VA 2000 Annual Report and VA 2002 annual Report - Assumes that the cost share information equals 1/2 of total BNR cost to get 8, and that funds are already made available for these facilities to go to 8, except for FMC and Henrico where no funds have been spent as of 2002.

6 = Email from Bob Ehrhart to Allison Wiedeman, 3/7/02

7= BNR funded under federal funds.

8 = No cost is applied, because TN or TP =current level for Tier 1 for this facility

8a = The 2010 TP concentration of 1.5 mg/l shown for these facilities reflects the specific effluent concentration targeted by Virginia either under WQIF Grant program and/or the Tributary Strategy Plan for the Lower River Tributaries.

9 = Cost survey from Seaford WWTP, 3/22/02

10 = From 4/2/01 letters from Eastern Snyder County Regional Authority to Senator Specter. Also, costs not calculated to 8 because they are currently designing only to 3 (4/26/01 Telephone conversation between CBPO and Gannett Hemming)

11= Message from WVDEP, cost=0 due to irrigation.

12 = Email message from Paul Janiga, DE DNREC, 3/28/02.

13 = Cost survey from Mike Kyle, LASA, 3/6/02

14 = DC CSO & Blue Plains Cost Estimates- UAA cost analysis, from Tanya spano, WMCOG, 4/10/02

15 = Telephone conversation with Sunberry WWTP, 6/21/01

16 = Cost Summary: City of Hopewell, from Bob Steidel, Hopewell Regional Wastewater Treatment Facility. 8/7/2002.

17= Message from Tom Broderick, LCSA, concerning Broad Run, 3/11/02

18 = Message from Marya Levelev, 4/5/02, Western Branch already can achieve 3 mg/l.

Table X-B: PHOSPHORUS INCREMENTAL COST FOR SIGNIFICANT MUNICIPAL FACILITIES IN THE BAY WATERSHED

				DESIGN	2010 DATA*			TIER 1 ($) (TP=Current)			TIER 2 $) (TP=1 for ALL)			TIER 3 ($) (TP=0.5 for ALL)			TIER 4 ($) (TP=0.1 for ALL)		
STAT	FACILITY	NPDES	BNR STATUS	FLOW (MGD)	FLOW (MGD)	TN (mg/l)	TP (mg/l)	TP CC	TP O&M	TP NOTE	TP CC	TP O&M	TP NOTE	TP CC	TP O&M	TP NOTE	TP CC	TP O&M	TP NOTE

19 = Message from Marya Levelev, 8/12/02, to add $10 million TN cc in Tier 2 for Back River

20 = Message from Bob Steidel, 9/17/02, to remove the Tier 1 cost for Hopewell.

21 = Message from Bob Ehrhart, 9/4/02, to remove Tier 1 costs for FMC and Hopewell.

22 = Message from Bob Ehrhart, 9/19/02, to add SIL which replaced Broadway Lagoons, Timberville, Rocco Quality Foods and Wampler Foods-Timberville.

23 = Message from Bob Ehrhart, 11/14/02, No Tier 2 TP cost due to chemical feed facilities have been funded.

A = The capital costs at TN =3 from sources other than calculation are applied to Tier 3 for TN. And, in these cases, the Tier 4 TN capital costs are set to zero. Message from Allison Wiedeman, 5/3/02.

B = The value is set to zero, because this plant's TN or TP level have been lower than the defined level in this Tier for more than five years.

C14 = Message from W. Hunley, HRSD, 10/3/02

C15 = Cost shown represent an order of magnitude planning level estimate as transmitted by HRSD on October 3, 2002. A less costly alternative, which provides for only seasonal nitrification and/or an annual average TN concentration greater than 8.0 mg/l, does potentially exist as discussed in the September 1989 Technical Memoranda C.22 and C. 25 prepared by CH2M Hill. Message from Bob Ehrhart, 11/4/02

C6 = Letter from City of Lynchburg to Allison Wiedeman, 7/14/2001

C9 = Bos, Robert E, PE, Public Utility Administrator with County of Stafford, letter to Allison Wiedeman, EPA, re: Nitrogen Removal Costs, 7/31/01

M = For facilities with existing capital costs and no O&M costs available, the O&M costs are calculated from exiting capitlal costs adjusted by the cost ratio between calculated O&M and capital cost from the methodologies provided from Thor Young, Stearn & Wheler, LLC and Tom Sadick, CH2M Hill.

N = NRT facilities that currently have or will install NRT by 2010, It is assumed that no additional cost is needed.

S = From NRT cost survey results.

Table X-C: NRT CAPITAL COST SUMMARY FOR POINT SOURCES BY STATE AND CATEGORY

		DESIGN	TIER 1 COSTS ($MIL)		TIER 2 COST ($MIL)				TIER 3 COST ($MIL)				TIER 4 COST ($MIL)			
	# OF	FLOW	INCREMENTAL		INCREMENTAL		CUMULATIVE		INCREMENTAL		CUMULATIVE		INCREMENTAL		CUMULATIVE	
	PLANTS	(MGD)	TN CC	TP CC	TN CC	TP CC	TN CC	TP CC	TN CC	TP CC	TN CC	TP CC	TN CC	TP CC	TN CC	TP CC
WATERSHED TOTAL																
SIGNIFICANT	304	2,336.01	597.91	0	921.44	40.09	1,519.36	40.09	1,190.49	0	2,709.85	40.09	1,663.59	1,301.89	4,373.44	1,341.98
NON-SIGNIFICANT	185	21.17	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	83.09	11.30	83.09	11.30
INDUSTRIAL	49	459.51	0.00	0	48.57	2.36	48.57	2.36	46.02	0.8	94.58	3.16	112.58	83.91	207.17	87.07
DC-CSO	1	7.61	130.00	0	0	0	130.00	0	0	0	130.00	0	3,500.00	0	3,630.00	0
TOTAL	**539**	**2,824.30**	**727.91**	**0**	**970.01**	**42.45**	**1,697.92**	**42.45**	**1,236.51**	**0.8**	**2,934.43**	**43.25**	**5,359.27**	**1,397.11**	**8,293.70**	**1,440.35**
TOTAL BY STATE																
DC																
SIGNIFICANT	1	169.40	0.00	0	15.11	9.16	15.11	9.16	103.01	0	118.12	9.16	167.11	11.45	285.23	20.60
CSO	1	7.61	130.00	0	0.00	0.00	130.00	0.00	0.00	0	130.00	0.00	3,500.00	0.00	3,630.00	0.00
DC TOTAL	**2**	**177.01**	**130.00**	**0**	**15.11**	**9.16**	**145.11**	**9.16**	**103.01**	**0**	**248.12**	**9.16**	**3,667.11**	**11.45**	**3,915.23**	**20.60**
DE																
SIGNIFICANT	3	3.30	3.19	0	2.37	0.25	5.56	0.25	3.18	0	8.74	0.25	4.15	4.26	12.90	4.51
INDUSTRIAL	1	37.83	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
DE TOTAL	**4**	**41.13**	**3.19**	**0**	**2.37**	**0.25**	**5.56**	**0.25**	**3.18**	**0**	**8.74**	**0.25**	**4.15**	**4.26**	**12.90**	**4.51**
MD																
SIGNIFICANT	65	725.82	384.75	0	25.13	11.79	409.88	11.79	356.36	0	766.24	11.79	658.43	398.36	1,424.66	410.14
NON-SIGNIFICANT	181	20.59	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	80.97	10.99	80.97	10.99
INDUSTRIAL	10	53.30	0.00	0	12.25	0.21	12.25	0.21	5.89	0	18.14	0.21	5.70	15.76	23.84	15.97
MD TOTAL	**256**	**799.71**	**384.75**	**0**	**37.38**	**12.00**	**422.13**	**12.00**	**362.25**	**0**	**784.38**	**12.00**	**745.09**	**425.10**	**1,529.47**	**437.10**
NY																
SIGNIFICANT	18	82.57	0.00	0	61.87	3.29	61.87	3.29	40.60	0	102.47	3.29	71.58	65.43	174.05	68.71
NY TOTAL	**18**	**82.57**	**0.00**	**0**	**61.87**	**3.29**	**61.87**	**3.29**	**40.60**	**0**	**102.47**	**3.29**	**71.58**	**65.43**	**174.05**	**68.71**
PA																
SIGNIFICANT	123	469.21	72.08	0	277.87	4.79	349.94	4.79	319.81	0	669.76	4.79	241.32	396.12	911.08	400.91
INDUSTRIAL	19	75.62	0.00	0	17.34	0.79	17.34	0.79	16.95	0	34.29	0.79	47.98	23.89	82.27	24.67
PA TOTAL	**142**	**544.84**	**72.08**	**0**	**295.20**	**5.58**	**367.28**	**5.58**	**336.77**	**0**	**704.05**	**5.58**	**289.30**	**420.00**	**993.35**	**425.58**
VA																
SIGNIFICANT	86	871.95	137.90	0	515.90	9.72	653.80	9.72	356.55	0	1,010.35	9.72	505.21	411.00	1,515.56	420.72
NON-SIGNIFICANT	1	0.05	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.40	0.07	0.40	0.07
INDUSTRIAL	16	292.44	0.00	0	13.79	1.27	13.79	1.27	22.72	0.8	36.51	2.07	58.37	44.27	94.88	46.34
VA TOTAL	**103**	**1,164.44**	**137.90**	**0**	**529.68**	**10.99**	**667.58**	**10.99**	**379.28**	**0.8**	**1,046.86**	**11.79**	**563.98**	**455.35**	**1,610.84**	**467.13**
WV																
SIGNIFICANT	8	13.75	0.00	0	23.19	1.09	23.19	1.09	10.97	0	34.16	1.09	15.79	15.28	49.96	16.37
NON-SIGNIFICANT	3	0.53	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	1.71	0.25	1.71	0.25
INDUSTRIAL	3	0.32	0.00	0	5.19	0.10	5.19	0.10	0.45	0	5.64	0.10	0.54	0.00	6.18	0.10
WV TOTAL	**14**	**14.60**	**0.00**	**0**	**28.38**	**1.19**	**28.38**	**1.19**	**11.42**	**0**	**39.81**	**1.19**	**18.05**	**15.53**	**57.85**	**16.71**

NOTE: Blue Plains costs are allocated among DC, MD and VA according to the Blue Plains cost allocation methodology by MWCOG.

Non-significant category covers only plants with existing data in the database, which are mainly MD facilities. Most VA non-significant plants are not yet included due to no loading data.

Many industrial facilities do not have design flow data available. 2010 flows were used for industrial design flows. Actual design flows were used for several MD plants that have the data.

TN CC = Total Nitrogen Capital Costs; TP CC = Total Phosphorus Capital Costs

Table X-D: NRT INCREMENTAL COST SUMMARY FOR POINT SOURCES BY CATEGORY AND STATE

Significant Plants Summary

			TIER 1 COSTS ($)		TIER 2 COST ($)				TIER 3 COSTS ($)				TIER 4 COSTS ($)			
STATE	# PLANTS	DESIGN FLOW	TN CC	TN O&M	TN CC	TN O&M	TP CC	TP O&M	TN CC	TN O&M	TP CC	TP O&M	TN CC	TN O&M	TP CC	TP O&M
DC Total	1	153	0	0	15,108,649	2,537,112	9,156,757	1,537,644	103,013,514	6,135,027	0	0	167,110,811	8,012,748	11,445,946	548,818
DE Total	3	3.3	3,187,400	63,244	2,374,508	147,026	253,889	20,257	3,182,908	46,665	0	9,807	4,152,080	106,537	4,257,828	338,180
MD Total	65	726	384,749,909	7,788,496	25,126,486	2,681,237	11,786,742	2,366,944	356,361,691	11,986,151	0	805,854	658,425,237	20,010,054	398,357,668	45,487,670
NY Total	18	82.57	0	0	61,874,054	1,182,996	3,285,513	872,847	40,600,618	990,925	0	353,177	71,577,888	2,080,192	65,428,020	8,076,273
PA Total	123	469.21	72,079,813	1,866,433	277,865,025	5,667,625	4,793,727	1,724,742	319,811,406	6,443,904	0	1,291,747	241,323,231	6,681,174	396,116,842	40,127,199
VA Total	86	888	137,897,837	2,649,908	515,898,541	6,206,296	9,721,232	3,261,645	356,552,954	16,008,012	0	2,071,890	505,210,107	13,017,780	411,003,381	52,423,385
WV Total	8	13.75	0	0	23,193,004	403,506	1,090,872	119,742	10,971,658	163,451	0	38,479	15,792,986	365,233	15,279,616	1,177,669
Grand To	**304**	**2,336**	**597,914,959**	**12,368,080**	**921,440,267**	**18,825,798**	**40,088,731**	**9,903,821**	**1,190,494,749**	**41,774,135**	**0**	**4,570,953**	**1,663,592,340**	**50,273,719**	**1,301,889,303**	**148,179,194**

Insignificant Plants Summary

			TIER 1 COSTS ($)		TIER 2 COST ($)				TIER 3 COSTS ($)				TIER 4 COSTS ($)			
STATE	# PLAN	DESIG N	TN CC	TN O&M	TN CC	TN O&M	TP CC	TP O&M	TN CC	TN O&M	TP CC	TP O&M	TN CC	TN O&M	TP CC	TP O&M
MD	181	20.59	0	0	0	0	0	0	0	0	0	0	80,973,919	612,243	10,986,221	287,877
VA	1	0.05	0	0	0	0	0	0	0	0	0	0	403,080	2,342	70,278	1,729
WV	3	0.53	0	0	0	0	0	0	0	0	0	0	1,712,349	9,949	246,761	6,914
GRAND T	**185**	**21.17**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**83,089,348**	**624,534**	**11,303,260**	**296,520**

Industrial Plants Summary

			TIER 1 COSTS ($)		TIER 2 COST ($)				TIER 3 COSTS ($)				TIER 4 COSTS ($)			
STATE	# PLANTS	DESIGN FLOW	TN CC	TN O&M	TN CC	TN O&M	TP CC	TP O&M	TN CC	TN O&M	TP CC	TP O&M	TN CC	TN O&M	TP CC	TP O&M
DE Total	1	37.83	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MD Total	10	53.30	0	0	12,251,672	544,428	210,673	47,381	5,888,095	424,429	0	113,749	5,695,679	251,363	15,756,779	2,550,713
PA Total	19	75.62	0	0	17,337,769	321,654	785,589	172,314	16,954,957	504,830	0	138,513	47,981,091	1,733,061	23,885,080	3,648,345
VA Total	16	292.44	0	0	13,786,149	1,402,538	1,265,216	722,524	22,723,729	2,297,555	800,000	203,087	58,365,921	2,556,857	44,272,979	6,519,313
WV Total	3	0.32	0	0	5,190,884	102,636	95,395	4,520	449,977	12,366	0	1,707	541,288	34,255	0	0
GRAND T	**49**	**459.51**	**0**	**0**	**48,566,474**	**2,371,256**	**2,356,873**	**946,739**	**46,016,759**	**3,239,180**	**800,000**	**457,056**	**112,583,979**	**4,575,535**	**83,914,838**	**12,718,371**

CSO SUMMARY

			TIER 1 COSTS ($)		TIER 2 COST ($)				TIER 3 COSTS ($)				TIER 4 COSTS ($)			
STATE	# PLANTS	DESIGN FLOW	TN CC	TN O&M	TN CC	TN O&M	TP CC	TP O&M	TN CC	TN O&M	TP CC	TP O&M	TN CC	TN O&M	TP CC	TP O&M
DC	**1**	7.61	**130,000,000**	**6,500,000**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3,500,000,000**	**175,000,000**		

GRAND TOTAL

W/O CSO	**538**	**2,817**	**597,914,959**	**12,368,080**	**970,006,741**	**21,197,054**	**42,445,603**	**10,850,560**	**1,236,511,508**	**45,013,315**	**800,000**	**5,028,009**	**1,859,265,666**	**55,473,788**	**1,397,107,401**	**161,194,086**
W CSO	**539**	**2,824**	**727,914,959**	**18,868,080**	**970,006,741**	**21,197,054**	**42,445,603**	**10,850,560**	**1,236,511,508**	**45,013,315**	**800,000**	**5,028,009**	**5,359,265,666**	**230,473,788**	**1,397,107,401**	**161,194,086**

NOTE: Blue Plains costs are allocated among DC, MD and VA according to the flow allocation projected by MWCOG. Most VA insignificant plants are not yet included.

Table X-E: NRT INCREMENTAL COST SUMMARY FOR SIGNIFICANT MUNICIPAL FACILITIES

	TIER 1 COSTS ($)		TIER 2 COST ($)				TIER 3 COSTS ($)				TIER 4 COSTS ($)			
STATE	TN CC	TN O&M	TN CC	TN O&M	TP CC	TP O&M	TN CC	TN O&M	TP CC	TP O&M	TN CC	TN O&M	TP CC	TP O&M
DC Total	0	0	33,000,000	5,541,509	20,000,000	3,358,491	225,000,000	13,400,000	0	0	365,000,000	17,501,280	25,000,000	1,198,718
DE Total	3,187,400	63,244	2,374,508	147,026	253,889	20,257	3,182,908	46,665	0	9,807	4,152,080	106,537	4,257,828	338,180
MD Total	384,749,909	7,788,496	10,000,000	141,129	2,619,174	827,485	253,226,556	5,843,881	0	805,854	491,117,129	11,987,846	386,898,209	44,938,204
NY Total	0	0	61,874,054	1,182,996	3,285,513	872,847	40,600,618	990,925	0	353,177	71,577,888	2,080,192	65,428,020	8,076,273
PA Total	72,079,813	1,866,433	277,865,025	5,667,625	4,793,727	1,724,742	319,811,406	6,443,904	0	1,291,747	241,323,231	6,681,174	396,116,842	40,127,199
VA Total	137,897,837	2,649,908	513,133,676	5,742,007	8,045,556	2,980,258	337,701,603	14,885,310	0	2,071,890	474,629,026	11,551,456	408,908,787	52,322,951
WV Total	0	0	23,193,004	403,506	1,090,872	119,742	10,971,658	163,451	0	38,479	15,792,986	365,233	15,279,616	1,177,669
Grand Total	597,914,959	12,368,080	921,440,267	18,825,798	40,088,731	9,903,821	1,190,494,749	41,774,135	0	4,570,953	1,663,592,340	50,273,719	1,301,889,303	148,179,194

Note: The costs listed are incremental.

Table X-F: Total Design Flow and TN Capital Cost Summary for Significant Municipals by State

			Tier 1 Facilities with Costs				Tier 2 Facilities with Costs				Tier 3 Facilities with Costs				Tier 4 Facilities with Costs			
	# of	Design	# of	Design Flow		Capital Cost	# of	Design Flow		Capital Cost	# of	Design Flow		Capital Cost	# of	Design Flow		Capital Cost
State	Plants	Flow (MGD)	Plants	MGD	%	$million	Plants	MGD	%	$million	Plants	MGD	%	$million	Plants	MGD	%	$million
DC	**1**	**169.4**	**0**	**0.0**	**0%**	**0.00**	**1**	**169.4**	**100%**	**15.11**	**1**	**169.4**	**100%**	**103.01**	**1**	**169.4**	**100%**	**167.11**
DE	**3**	**3.3**	**1**	**0.8**	**24%**	**3.19**	**1**	**0.5**	**15%**	**2.37**	**3**	**3.3**	**100%**	**3.18**	**3**	**3.3**	**100%**	**4.15**
MD	**65**	**725.8**	**31**	**162.2**	**22%**	**384.75**	**1**	**349.6**	**48%**	**25.13**	**64**	**695.8**	**96%**	**356.36**	**64**	**695.8**	**96%**	**658.43**
NY	**18**	**82.6**	**0**	**0.0**	**0%**	**0.00**	**15**	**50.6**	**61%**	**61.87**	**17**	**72.6**	**88%**	**40.60**	**17**	**72.6**	**88%**	**71.58**
PA	**123**	**469.2**	**15**	**129.5**	**28%**	**72.08**	**85**	**188.7**	**40%**	**277.87**	**120**	**423.5**	**90%**	**319.81**	**102**	**220.9**	**47%**	**241.32**
VA	**86**	**876.7**	**14**	**127.9**	**15%**	**137.90**	**45**	**385.9**	**44%**	**515.90**	**82**	**867.7**	**99%**	**356.55**	**60**	**545.1**	**62%**	**505.21**
WV	**8**	**13.8**	**0**	**0.0**	**0%**	**0.00**	**7**	**13.2**	**96%**	**23.19**	**8**	**13.8**	**100%**	**10.97**	**8**	**13.8**	**100%**	**15.79**
Total	**304**	**2,341**	**61**	**420**		**598**	**155**	**1,158**		**921**	**295**	**2,246**		**1,190**	**255**	**1,721**		**1,664**

TN Cost Notes: (detailed notes were listed in Table X-A)

Tier 1: MD All costs for 31 plants were provided from MDE, $200 million is due to Potapsco alone.
PA 5 plants used calculated costs; Costs for another 5 plants were from the Randall report; The remaining 5 plants used costs from survey or facility contacts.
VA 4 plants used calculated costs; 1 plant used the Randall report cost; 4 plants used the grant agreement costs; the remaining 5 plants used costs from survey or facility contacts.

Tier 2: MD Back River ($ 10 million) and Blue Plains ($ 15Million)
PA 79 plants used calculated costs; Cost for 5 plant were from the Randall report; The remaining 1 plant used costs from survey or facility contacts.
VA 29 plants used calculated costs; 7 plants used the Randall report cost; the remaining 9 plants used costs from survey or facility contacts.

Table X-G: Total Design Flow and TP Capital Cost Summary for Significant Municipals by State

			Tier 1 Facilities with Costs				Tier 2 Facilities with Costs				Tier 3 Facilities with Costs				Tier 4 Facilities with Costs			
	# of	Design	# of	Design Flow		Capital Cost	# of	Design Flow		Capital Cost	# of	Design Flow		Capital Cost	# of	Design Flow		Capital Cost
State	Plants	Flow (MGD)	Plants	MGD	%	$million	Plants	MGD	%	$million	Plants	MGD	%	$million	Plants	MGD	%	$million
DC	**1**	**169.4**	**0**	**0.0**	**0%**	**0.00**	**1**	**169.4**	**100%**	**9.16**	**0**	**0.0**	**0%**	**0.00**	**1**	**169.4**	**100%**	**11.45**
DE	**3**	**3.3**	**0**	**0.0**	**0%**	**0.00**	**2**	**1.3**	**39%**	**0.25**	**0**	**0.0**	**0%**	**0.00**	**3**	**3.3**	**100%**	**4.26**
MD	**65**	**725.8**	**0**	**0.0**	**0%**	**0.00**	**16**	**206.5**	**28%**	**11.79**	**0**	**0.0**	**0%**	**0.00**	**65**	**725.8**	**100%**	**398.36**
NY	**18**	**82.6**	**0**	**0.0**	**0%**	**0.00**	**16**	**72.0**	**87%**	**3.29**	**0**	**0.0**	**0%**	**0.00**	**18**	**82.6**	**100%**	**65.43**
PA	**123**	**469.2**	**0**	**0.0**	**0%**	**0.00**	**27**	**71.1**	**15%**	**4.79**	**0**	**0.0**	**0%**	**0.00**	**123**	**469.2**	**100%**	**396.12**
VA	**86**	**876.7**	**0**	**0.0**	**0%**	**0.00**	**44**	**259.4**	**30%**	**9.72**	**0**	**0.0**	**0%**	**0.00**	**81**	**695.7**	**79%**	**411.00**
WV	**8**	**13.8**	**0**	**0.0**	**0%**	**0.00**	**7**	**11.3**	**83%**	**1.09**	**0**	**0.0**	**0%**	**0.00**	**8**	**13.8**	**100%**	**15.28**
Total	**304**	**2,341**	**0**	**0**		**0**	**113**	**791**		**40**	**0**	**0**		**0**	**299**	**2,160**		**1,302**

Note: Blue Plains design flow and costs were allocated among DC, MD and VA based on the ratios provided by MWCOG for UAA.
But Blue Plains is counted only once in the "# of Plants" columns as a DC plant.
The "%" columns list the percentage of the design flow costed over the total design flow in each state.