

APPENDIX F ADDITIONAL RESULTS

This appendix contains summary results tables for the 16 scenarios highlighted in the report, as well as 12 others with a 1.1 to 1 trading ratio for agricultural nonpoint sources. For each scenario, we disaggregated and present the results in two ways: (1) by basin and (2) by nutrient reduction technology/BMP.

For the three short-term scenarios—SigPS-Only, SigPS-AgrNPS, and SigPS-AgrNPS-Urban—all values are expressed *relative to a “No Trading” scenario*. The values in the “change in BMP area” columns represent the total change (positive or negative) in acres converted or treated by agricultural or urban stormwater BMPs, compared with the TMDL baseline (same as the No-Trading scenario).

In the basin-level summary tables, the net nutrient reduction are sometimes positive even if trades are not allowed between basins (i.e., the In-Basin-State and In-Basin scenarios). This result implies that total nutrient reductions are greater with trading than without trading; however, these excess reductions are always a very small percentage of the total target reductions (see Table 7-1). They occur when achieving the least-cost solution requires a point source upgrade that exceeds the target reduction. In scenarios that allow trading across basins, nutrient reductions are often negative, implying that the basin is purchasing credits from other basins.

For the technology and BMP summary tables, positive net nutrient reductions imply that the technology or BMP is being used in place of other technologies or BMPs with negative net nutrient reductions. For the individual BMPs involving land conversion (buffers, wetland restoration, tree planting, land retirement, and livestock exclusion, all urban stormwater BMPs except street sweeping and urban nutrient management), the “change in BMP area” only refers to the acres converted by the BMP. For all the other BMPs, it refers to the area treated by the BMP. In contrast, the sector subtotals and totals for “change in BMP area” represent the total area converted or treated by BMPs. For this reason, as well as because some acres are treated by multiple BMPs, the sector subtotal and total acres are often not equal to the sum of the change in BMP area for the individual BMPs.

Because there is no “No Trading” scenario for the long-term scenario, the summary tables for the Offset-Only scenario show the actual cost and nutrient reductions for these scenarios. In addition, because the Offset-Only scenarios do not include urban stormwater BMPs, these BMPs are omitted from the Offset-Only technology and BMP summary tables.

Table F-1. Summary Results for SigPS-Only and In-Basin-State Trading Scenario

Basin	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
Eastern Shore of Chesapeake Bay	\$2,247,399	1,459	280	0
James River Basin	\$28,521,001	18,030	124	0
Patuxent River Basin	\$0	0	0	0
Potomac River Basin	\$5,563,543	963	253	0
Rappahannock River Basin	\$877,437	24	13	0
Susquehanna River Basin	\$26,235,198	72	25	0
Western Shore of Chesapeake Bay	\$3,732,629	4,540	337	0
York River Basin	\$10,775,883	451	96	0
Total	\$77,953,091	25,539	1,129	0

Technology/BMP	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
TN<3	-\$2,588,881	71,950	0	0
TN<3-TP<0.1	\$9,247,360	-245,411	-74,643	0
TN<3-TP<1	\$19,549,782	-394,397	-4,157	0
TN<5	\$3,196,305	-60,204	0	0
TN<5-TP<0.1	-\$29,371,137	1,572,637	202,836	0
TN<5-TP<0.5	\$26,916,043	-532,596	-134,069	0
TN<5-TP<1	\$0	0	0	0
TN<8	\$155,077	731,565	0	0
TN<8-TP<0.5	\$22,376,122	-1,143,417	-96,457	0
TN<8-TP<1	\$5,611,377	25,411	-5,173	0
TP<0.1	\$1,548,455	0	111,836	0
TP<0.5	\$23,996,347	0	-115,292	0
TP<1	-\$2,683,760	0	116,248	0
Point Source Subtotal	\$77,953,091	25,539	1,129	0
Dry Ponds	\$0	0	0	0
Dry Extended Detention Ponds	\$0	0	0	0
Urban Forest Buffers	\$0	0	0	0
Urban Filtering Practices	\$0	0	0	0
Urban Infiltration Practices	\$0	0	0	0
Urban Infiltration Practices with Sand/Vegetation	\$0	0	0	0
Street Sweeping	\$0	0	0	0
Urban Nutrient Management	\$0	0	0	0
Wet Ponds and Wetlands	\$0	0	0	0
Urban Stormwater Subtotal	\$0	0	0	0
Forest Buffers	\$0	0	0	0
Grass Buffers	\$0	0	0	0
Wetland Restoration	\$0	0	0	0
Tree Planting	\$0	0	0	0
Land Retirement	\$0	0	0	0
Continuous No-Till	\$0	0	0	0
Enhanced Nutrient Management	\$0	0	0	0
Decision Agriculture	\$0	0	0	0
Cover Crop Early Drilled Rye	\$0	0	0	0
Livestock Exclusion	\$0	0	0	0
Off Stream Watering	\$0	0	0	0
Upland Prescribed Grazing	\$0	0	0	0
Upland Precision Intensive Rotational Grazing	\$0	0	0	0
Agriculture Subtotal	\$0	0	0	0
Total	\$77,953,091	25,539	1,129	0

Table F-2. Summary Results for SigPS-Only and In-State Trading Scenario

Basin	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
Eastern Shore of Chesapeake Bay	\$5,049,615	-103,910	-2,387	0
James River Basin	\$23,382,512	365,723	-3,637	0
Patuxent River Basin	\$115,244	0	-74	0
Potomac River Basin	\$20,798,395	-240,559	-22,452	0
Rappahannock River Basin	\$3,970,872	-38,261	-9,427	0
Susquehanna River Basin	\$26,046,558	12,347	-214	0
Western Shore of Chesapeake Bay	\$3,148,308	140,209	2,161	0
York River Basin	\$11,133,552	-127,830	36,252	0
Total	\$93,645,055	7,719	222	0

Technology/BMP	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
TN<3	\$9,463,306	-385,823	0	0
TN<3-TP<0.1	\$23,580,347	-894,086	-117,041	0
TN<3-TP<1	\$19,948,049	-407,116	-8,971	0
TN<5	-\$15,558,503	1,813,282	0	0
TN<5-TP<0.1	-\$31,232,967	1,421,305	198,083	0
TN<5-TP<0.5	\$30,960,505	-516,194	-145,073	0
TN<5-TP<1	\$0	0	0	0
TN<8	\$7,454,756	-285,394	0	0
TN<8-TP<0.5	\$21,265,297	-799,006	-91,448	0
TN<8-TP<1	\$4,984,425	60,752	11,894	0
TP<0.1	\$505,147	0	134,313	0
TP<0.5	\$25,480,063	0	-131,103	0
TP<1	-\$3,205,368	0	149,569	0
Point Source Subtotal	\$93,645,055	7,719	222	0
Dry Ponds	\$0	0	0	0
Dry Extended Detention Ponds	\$0	0	0	0
Urban Forest Buffers	\$0	0	0	0
Urban Filtering Practices	\$0	0	0	0
Urban Infiltration Practices	\$0	0	0	0
Urban Infiltration Practices with Sand/Vegetation	\$0	0	0	0
Street Sweeping	\$0	0	0	0
Urban Nutrient Management	\$0	0	0	0
Wet Ponds and Wetlands	\$0	0	0	0
Urban Stormwater Subtotal	\$0	0	0	0
Forest Buffers	\$0	0	0	0
Grass Buffers	\$0	0	0	0
Wetland Restoration	\$0	0	0	0
Tree Planting	\$0	0	0	0
Land Retirement	\$0	0	0	0
Continuous No-Till	\$0	0	0	0
Enhanced Nutrient Management	\$0	0	0	0
Decision Agriculture	\$0	0	0	0
Cover Crop Early Drilled Rye	\$0	0	0	0
Livestock Exclusion	\$0	0	0	0
Off Stream Watering	\$0	0	0	0
Upland Prescribed Grazing	\$0	0	0	0
Upland Precision Intensive Rotational Grazing	\$0	0	0	0
Agriculture Subtotal	\$0	0	0	0
Total	\$93,645,055	7,719	222	0

Table F-3. Summary Results for SigPS-Only and In-Basin Trading Scenario

Basin	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
Eastern Shore of Chesapeake Bay	\$2,554,410	176	64	0
James River Basin	\$28,521,001	18,030	124	0
Patuxent River Basin	\$0	0	0	0
Potomac River Basin	\$7,754,943	465	24	0
Rappahannock River Basin	\$877,437	24	13	0
Susquehanna River Basin	\$26,758,674	282	9	0
Western Shore of Chesapeake Bay	\$3,732,629	4,540	337	0
York River Basin	\$10,775,883	451	96	0
Total	\$80,974,977	23,967	667	0

Technology/BMP	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
TN<3	-\$2,137,508	242,101	0	0
TN<3-TP<0.1	\$12,505,955	-308,746	-103,732	0
TN<3-TP<1	\$19,549,782	-394,397	-4,158	0
TN<5	\$2,849,691	-54,781	0	0
TN<5-TP<0.1	-\$34,868,510	1,498,798	267,154	0
TN<5-TP<0.5	\$26,689,464	-506,136	-137,104	0
TN<5-TP<1	\$0	0	0	0
TN<8	\$191,851	729,146	0	0
TN<8-TP<0.5	\$22,376,122	-1,143,417	-96,457	0
TN<8-TP<1	\$6,061,465	-38,600	-23,937	0
TP<0.1	\$6,744,746	0	98,977	0
TP<0.5	\$23,996,347	0	-115,293	0
TP<1	-\$2,984,428	0	115,215	0
Point Source Subtotal	\$80,974,977	23,967	667	0
Dry Ponds	\$0	0	0	0
Dry Extended Detention Ponds	\$0	0	0	0
Urban Forest Buffers	\$0	0	0	0
Urban Filtering Practices	\$0	0	0	0
Urban Infiltration Practices	\$0	0	0	0
Urban Infiltration Practices with Sand/Vegetation	\$0	0	0	0
Street Sweeping	\$0	0	0	0
Urban Nutrient Management	\$0	0	0	0
Wet Ponds and Wetlands	\$0	0	0	0
Urban Stormwater Subtotal	\$0	0	0	0
Forest Buffers	\$0	0	0	0
Grass Buffers	\$0	0	0	0
Wetland Restoration	\$0	0	0	0
Tree Planting	\$0	0	0	0
Land Retirement	\$0	0	0	0
Continuous No-Till	\$0	0	0	0
Enhanced Nutrient Management	\$0	0	0	0
Decision Agriculture	\$0	0	0	0
Cover Crop Early Drilled Rye	\$0	0	0	0
Livestock Exclusion	\$0	0	0	0
Off Stream Watering	\$0	0	0	0
Upland Prescribed Grazing	\$0	0	0	0
Upland Precision Intensive Rotational Grazing	\$0	0	0	0
Agriculture Subtotal	\$0	0	0	0
Total	\$80,974,977	23,967	667	0

Table F-4. Summary Results for SigPS-Only and Watershed-Wide Trading Scenario

Basin	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
Eastern Shore of Chesapeake Bay	\$2,016,709	2,142	4,908	0
James River Basin	-\$5,485,724	1,139,933	37,226	0
Patuxent River Basin	\$115,244	0	-74	0
Potomac River Basin	\$64,172,161	-1,580,140	-20,768	0
Rappahannock River Basin	\$2,694,400	-24,771	-2,709	0
Susquehanna River Basin	\$23,827,365	227,409	-13,970	0
Western Shore of Chesapeake Bay	\$900,124	359,241	-2,549	0
York River Basin	\$18,663,873	-123,788	-2,060	0
Total	\$106,904,151	27	3	0

Technology/BMP	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
TN<3	-\$4,994,005	1,272,588	0	0
TN<3-TP<0.1	-\$12,590,708	1,058,979	-45,239	0
TN<3-TP<1	\$19,490,392	-389,043	-4,034	0
TN<5	\$35,720,445	-75,423	0	0
TN<5-TP<0.1	-\$21,864,349	1,069,922	172,444	0
TN<5-TP<0.5	\$23,582,779	-321,905	-126,444	0
TN<5-TP<1	\$0	0	0	0
TN<8	\$8,663,308	-1,208,853	0	0
TN<8-TP<0.5	\$25,107,218	-1,683,996	-108,140	0
TN<8-TP<1	-\$1,564,549	277,757	54,668	0
TP<0.1	\$13,629,179	0	56,947	0
TP<0.5	\$24,779,442	0	-125,861	0
TP<1	-\$3,055,000	0	125,663	0
Point Source Subtotal	\$106,904,151	27	3	0
Dry Ponds	\$0	0	0	0
Dry Extended Detention Ponds	\$0	0	0	0
Urban Forest Buffers	\$0	0	0	0
Urban Filtering Practices	\$0	0	0	0
Urban Infiltration Practices	\$0	0	0	0
Urban Infiltration Practices with Sand/Vegetation	\$0	0	0	0
Street Sweeping	\$0	0	0	0
Urban Nutrient Management	\$0	0	0	0
Wet Ponds and Wetlands	\$0	0	0	0
Urban Stormwater Subtotal	\$0	0	0	0
Forest Buffers	\$0	0	0	0
Grass Buffers	\$0	0	0	0
Wetland Restoration	\$0	0	0	0
Tree Planting	\$0	0	0	0
Land Retirement	\$0	0	0	0
Continuous No-Till	\$0	0	0	0
Enhanced Nutrient Management	\$0	0	0	0
Decision Agriculture	\$0	0	0	0
Cover Crop Early Drilled Rye	\$0	0	0	0
Livestock Exclusion	\$0	0	0	0
Off Stream Watering	\$0	0	0	0
Upland Prescribed Grazing	\$0	0	0	0
Upland Precision Intensive Rotational Grazing	\$0	0	0	0
Agriculture Subtotal	\$0	0	0	0
Total	\$106,904,151	27	3	0

Table F-5. Summary Results for SigPS-AgrNPS and In-Basin-State Trading Scenario (2 to 1 Trading Ratio)

Basin	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
Eastern Shore of Chesapeake Bay	\$4,937,215	0	151	78,305
James River Basin	\$39,977,863	0	0	135,818
Patuxent River Basin	\$103,649	401	0	202
Potomac River Basin	\$28,292,477	0	0	172,892
Rappahannock River Basin	\$3,808,069	0	0	19,541
Susquehanna River Basin	\$39,749,767	0	0	255,324
Western Shore of Chesapeake Bay	\$4,352,573	70,392	0	2,141
York River Basin	\$17,641,976	0	0	48,214
Total	\$138,863,589	70,793	151	712,436

Technology/BMP	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
TN<3	\$9,514,748	-391,176	0	0
TN<3-TP<0.1	\$40,093,074	-1,877,492	-192,673	0
TN<3-TP<1	\$19,948,049	-407,115	-8,971	0
TN<5	\$3,778,664	44,546	0	0
TN<5-TP<0.1	-\$3,992,482	134,995	25,400	0
TN<5-TP<0.5	\$24,530,185	-99,326	-175,572	0
TN<5-TP<1	\$0	0	0	0
TN<8	\$5,358,492	912,821	0	0
TN<8-TP<0.5	\$21,265,297	-799,005	-91,447	0
TN<8-TP<1	\$15,588,368	-603,754	-3,758	0
TP<0.1	\$14,424,536	0	24,580	0
TP<0.5	\$24,064,068	0	-115,190	0
TP<1	-\$3,909,253	0	322,462	0
Point Source Subtotal	\$170,663,745	-3,085,507	-215,170	0
Dry Ponds	\$0	0	0	0
Dry Extended Detention Ponds	\$0	0	0	0
Urban Forest Buffers	\$0	0	0	0
Urban Filtering Practices	\$0	0	0	0
Urban Infiltration Practices	\$0	0	0	0
Urban Infiltration Practices with Sand/Vegetation	\$0	0	0	0
Street Sweeping	\$0	0	0	0
Urban Nutrient Management	\$0	0	0	0
Wet Ponds and Wetlands	\$0	0	0	0
Urban Stormwater Subtotal	\$0	0	0	0
Forest Buffers	-\$943,839	142,959	11,474	4,521
Grass Buffers	-\$7,022,711	683,056	51,988	46,342
Wetland Restoration	-\$987,397	55,791	4,323	1,373
Tree Planting	-\$1,095,773	99,186	17,190	4,730
Land Retirement	-\$1,900,618	116,398	27,140	23,262
Continuous No-Till	-\$2,784,713	80,615	48,765	91,123
Enhanced Nutrient Management	-\$201,180	20,944	0	7,545
Decision Agriculture	\$0	0	0	0
Cover Crop Early Drilled Rye	-\$14,945,387	1,661,707	16,286	312,770
Livestock Exclusion	-\$1,886,895	294,564	37,917	9,150
Off Stream Watering	\$0	0	0	0
Upland Prescribed Grazing	-\$31,645	1,079	239	1,375
Upland Precision Intensive Rotational Grazing	\$0	0	0	0
Agriculture Subtotal	-\$31,800,156	3,156,300	215,321	712,436
Total	\$138,863,589	70,793	151	712,436

Table F-6. Summary Results for SigPS-AgrNPS and In-State Trading Scenario (2 to 1 Trading Ratio)

Basin	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
Eastern Shore of Chesapeake Bay	\$7,340,455	-128,402	-7,901	37,421
James River Basin	\$44,866,147	-200,321	-18,579	84,163
Patuxent River Basin	\$114,618	41	-70	15
Potomac River Basin	\$27,529,284	47,886	12,412	164,669
Rappahannock River Basin	\$2,024,971	114,439	11,725	58,204
Susquehanna River Basin	\$39,228,688	-12,835	-414	157,300
Western Shore of Chesapeake Bay	\$2,342,869	214,546	10,035	819
York River Basin	\$18,644,557	-35,354	-7,177	26,763
Total	\$142,091,589	0	31	529,354

Technology/BMP	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
TN<3	\$9,514,748	-391,176	0	0
TN<3-TP<0.1	\$40,093,074	-1,877,493	-192,674	0
TN<3-TP<1	\$19,948,049	-407,116	-8,971	0
TN<5	\$3,329,635	534,563	0	0
TN<5-TP<0.1	-\$6,356,526	189,345	36,108	0
TN<5-TP<0.5	\$24,530,304	-98,716	-173,996	0
TN<5-TP<1	\$0	0	0	0
TN<8	\$4,582,578	642,527	0	0
TN<8-TP<0.5	\$21,265,297	-799,006	-91,448	0
TN<8-TP<1	\$13,284,425	-302,378	-19,752	0
TP<0.1	\$11,792,325	0	47,253	0
TP<0.5	\$25,480,063	0	-131,103	0
TP<1	-\$3,769,392	0	343,952	0
Point Source Subtotal	\$163,694,581	-2,509,450	-190,631	0
Dry Ponds	\$0	0	0	0
Dry Extended Detention Ponds	\$0	0	0	0
Urban Forest Buffers	\$0	0	0	0
Urban Filtering Practices	\$0	0	0	0
Urban Infiltration Practices	\$0	0	0	0
Urban Infiltration Practices with Sand/Vegetation	\$0	0	0	0
Street Sweeping	\$0	0	0	0
Urban Nutrient Management	\$0	0	0	0
Wet Ponds and Wetlands	\$0	0	0	0
Urban Stormwater Subtotal	\$0	0	0	0
Forest Buffers	-\$1,343,628	207,073	14,739	6,275
Grass Buffers	-\$5,245,398	545,594	48,353	37,600
Wetland Restoration	-\$4,103	331	57	8
Tree Planting	-\$567,315	88,919	11,137	2,672
Land Retirement	-\$1,342,257	91,722	25,254	18,642
Continuous No-Till	-\$2,230,357	105,249	46,269	73,514
Enhanced Nutrient Management	-\$59,789	13,996	0	2,242
Decision Agriculture	\$0	0	0	0
Cover Crop Early Drilled Rye	-\$8,962,195	1,166,427	6,512	187,557
Livestock Exclusion	-\$1,830,715	289,308	38,185	9,078
Off Stream Watering	\$0	0	0	0
Upland Prescribed Grazing	-\$17,236	830	157	670
Upland Precision Intensive Rotational Grazing	\$0	0	0	0
Agriculture Subtotal	-\$21,602,992	2,509,450	190,662	529,354
Total	\$142,091,589	0	31	529,354

Table F-7. Summary Results for SigPS-AgrNPS and In-Basin Trading Scenario (2 to 1 Trading Ratio)

Basin	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
Eastern Shore of Chesapeake Bay	\$6,201,740	0	0	52,970
James River Basin	\$39,651,317	0	0	104,067
Patuxent River Basin	\$103,649	401	0	202
Potomac River Basin	\$53,748,391	0	0	362,203
Rappahannock River Basin	\$3,805,241	0	0	18,251
Susquehanna River Basin	\$42,244,480	0	0	175,725
Western Shore of Chesapeake Bay	\$4,352,595	70,386	0	2,134
York River Basin	\$17,613,112	0	0	46,059
Total	\$167,720,527	70,787	0	761,611

Technology/BMP	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
TN<3	\$587,067	-187	0	0
TN<3-TP<0.1	\$36,935,137	-1,792,424	-174,462	0
TN<3-TP<1	\$19,948,049	-407,116	-8,971	0
TN<5	\$50,929,691	-1,479,148	0	0
TN<5-TP<0.1	-\$575,443	20,372	3,058	0
TN<5-TP<0.5	\$24,638,389	5,384	-160,106	0
TN<5-TP<1	\$0	0	0	0
TN<8	\$6,269,651	866,007	0	0
TN<8-TP<0.5	\$21,265,297	-799,006	-91,448	0
TN<8-TP<1	\$8,580,856	-116,455	44,562	0
TP<0.1	\$15,073,754	0	20,516	0
TP<0.5	\$24,118,841	0	-115,638	0
TP<1	-\$3,861,599	0	267,767	0
Point Source Subtotal	\$203,909,689	-3,702,572	-214,722	0
Dry Ponds	\$0	0	0	0
Dry Extended Detention Ponds	\$0	0	0	0
Urban Forest Buffers	\$0	0	0	0
Urban Filtering Practices	\$0	0	0	0
Urban Infiltration Practices	\$0	0	0	0
Urban Infiltration Practices with Sand/Vegetation	\$0	0	0	0
Street Sweeping	\$0	0	0	0
Urban Nutrient Management	\$0	0	0	0
Wet Ponds and Wetlands	\$0	0	0	0
Urban Stormwater Subtotal	\$0	0	0	0
Forest Buffers	-\$1,010,539	159,966	11,726	4,795
Grass Buffers	-\$10,073,973	1,006,110	61,179	57,807
Wetland Restoration	-\$4,503	382	58	9
Tree Planting	-\$1,099,910	126,786	12,438	6,376
Land Retirement	-\$2,697,357	199,888	27,871	28,220
Continuous No-Till	-\$1,102,335	33,520	36,420	33,724
Enhanced Nutrient Management	-\$593,911	38,564	0	22,273
Decision Agriculture	\$0	0	0	0
Cover Crop Early Drilled Rye	-\$16,982,187	1,873,745	9,795	355,395
Livestock Exclusion	-\$2,614,064	333,720	55,134	14,102
Off Stream Watering	\$0	0	0	0
Upland Prescribed Grazing	-\$10,383	678	102	331
Upland Precision Intensive Rotational Grazing	\$0	0	0	0
Agriculture Subtotal	-\$36,189,162	3,773,360	214,722	761,611
Total	\$167,720,527	70,787	0	761,611

Table F-8. Summary Results for SigPS-AgrNPS and Watershed-Wide Trading Scenario (2 to 1 Trading Ratio)

Basin	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
Eastern Shore of Chesapeake Bay	\$2,345,772	398,834	-7,905	112,113
James River Basin	\$51,507,892	-655,454	-5,540	98,621
Patuxent River Basin	\$104,348	919	-37	219
Potomac River Basin	\$69,182,353	-876,408	63,489	300,641
Rappahannock River Basin	\$2,570,066	75,242	12,755	49,281
Susquehanna River Basin	\$34,752,462	863,589	-17,399	304,612
Western Shore of Chesapeake Bay	\$7,765,709	265,655	-39,226	2,354
York River Basin	\$19,179,932	-72,378	-6,136	18,595
Total	\$187,408,535	0	0	886,436

Technology/BMP	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
TN<3	\$9,514,748	-391,176	0	0
TN<3-TP<0.1	\$47,514,912	-2,262,551	-216,406	0
TN<3-TP<1	\$19,948,049	-407,115	-8,971	0
TN<5	\$51,669,431	-1,230,928	0	0
TN<5-TP<0.1	\$0	0	0	0
TN<5-TP<0.5	\$24,958,077	-124,955	-180,392	0
TN<5-TP<1	-\$232,409	37,249	4,951	0
TN<8	\$1,678,018	1,067,253	0	0
TN<8-TP<0.5	\$21,265,297	-799,005	-91,447	0
TN<8-TP<1	\$12,930,428	-269,403	-24,418	0
TP<0.1	\$17,690,018	0	-3,328	0
TP<0.5	\$25,480,063	0	-131,103	0
TP<1	-\$3,567,765	0	367,294	0
Point Source Subtotal	\$228,848,868	-4,380,631	-283,820	0
Dry Ponds	\$0	0	0	0
Dry Extended Detention Ponds	\$0	0	0	0
Urban Forest Buffers	\$0	0	0	0
Urban Filtering Practices	\$0	0	0	0
Urban Infiltration Practices	\$0	0	0	0
Urban Infiltration Practices with Sand/Vegetation	\$0	0	0	0
Street Sweeping	\$0	0	0	0
Urban Nutrient Management	\$0	0	0	0
Wet Ponds and Wetlands	\$0	0	0	0
Urban Stormwater Subtotal	\$0	0	0	0
Forest Buffers	-\$967,924	169,559	11,258	4,509
Grass Buffers	-\$10,150,151	1,029,630	66,523	56,289
Wetland Restoration	-\$22,664	1,794	102	37
Tree Planting	-\$1,538,858	109,501	32,181	7,338
Land Retirement	-\$2,651,543	203,462	31,217	27,915
Continuous No-Till	-\$1,553,691	35,319	50,013	45,528
Enhanced Nutrient Management	-\$454,759	53,998	0	17,054
Decision Agriculture	\$0	0	0	0
Cover Crop Early Drilled Rye	-\$20,584,182	2,420,916	16,993	430,776
Livestock Exclusion	-\$3,508,029	355,811	75,449	20,047
Off Stream Watering	\$0	0	0	0
Upland Prescribed Grazing	-\$8,532	639	85	240
Upland Precision Intensive Rotational Grazing	\$0	0	0	0
Agriculture Subtotal	-\$41,440,333	4,380,630	283,820	886,436
Total	\$187,408,535	0	0	886,436

Table F-9. Summary Results for SigPS-AgrNPS-Urban and In-Basin-State Trading Scenario (2 to 1 Trading Ratio)

Basin	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
Eastern Shore of Chesapeake Bay	\$13,477,250	0	145	82,314
James River Basin	\$136,933,337	0	0	59,088
Patuxent River Basin	\$20,606,492	0	0	-3,420
Potomac River Basin	\$148,442,959	0	0	152,239
Rappahannock River Basin	\$9,196,252	0	0	20,166
Susquehanna River Basin	\$760,673,350	0	0	151,459
Western Shore of Chesapeake Bay	\$45,402,881	0	0	-65,615
York River Basin	\$28,271,580	0	0	52,596
Total	\$1,163,004,101	0	145	448,827

Technology/BMP	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
TN<3	\$9,463,306	-385,822	0	0
TN<3-TP<0.1	\$40,093,074	-1,877,492	-192,673	0
TN<3-TP<1	\$19,948,049	-407,115	-8,971	0
TN<5	-\$10,505,458	1,815,781	0	0
TN<5-TP<0.1	-\$16,601,642	1,104,198	80,727	0
TN<5-TP<0.5	\$23,995,149	-53,391	-175,248	0
TN<5-TP<1	\$0	0	0	0
TN<8	\$6,337,515	-372,236	0	0
TN<8-TP<0.5	\$21,265,297	-799,005	-91,447	0
TN<8-TP<1	\$7,738,430	-241,573	-8,142	0
TP<0.1	\$7,296,848	0	64,027	0
TP<0.5	\$25,425,290	0	-130,655	0
TP<1	-\$3,736,286	0	315,274	0
Point Source Subtotal	\$130,719,571	-1,216,656	-147,109	0
Dry Ponds	\$30,477,677	-7,131	-1,013	-1,894
Dry Extended Detention Ponds	\$29,020,961	-62,446	-5,170	-4,399
Urban Forest Buffers	\$2,538,761	-10,635	-305	-1,548
Urban Filtering Practices	\$540,266,020	-929,588	-42,592	-9,614
Urban Infiltration Practices	\$404,792,258	-1,958,280	-68,659	-21,229
Urban Infiltration Practices with Sand/Vegetation	\$2,879,311	-5,455	-337	-142
Street Sweeping	\$40,256,533	-12,627	-1,022	-40,189
Urban Nutrient Management	\$2,895,250	-110,305	-5,188	-144,725
Wet Ponds and Wetlands	\$34,930,008	-89,537	-11,125	-2,179
Urban Stormwater Subtotal	\$1,088,056,781	-3,186,004	-135,411	-677,680
Forest Buffers	-\$1,180,217	166,734	13,534	5,777
Grass Buffers	-\$10,922,219	927,450	60,155	60,472
Wetland Restoration	-\$1,829,893	82,421	5,623	2,530
Tree Planting	-\$2,464,904	131,931	36,743	10,372
Land Retirement	-\$5,434,135	291,041	33,771	40,654
Continuous No-Till	-\$6,918,290	200,031	72,580	214,678
Enhanced Nutrient Management	-\$759,182	60,474	0	28,471
Decision Agriculture	\$0	0	0	0
Cover Crop Early Drilled Rye	-\$24,267,855	2,243,944	20,913	507,867
Livestock Exclusion	-\$1,962,920	297,555	39,102	9,519
Off Stream Watering	\$0	0	0	0
Upland Prescribed Grazing	-\$32,636	1,079	243	1,438
Upland Precision Intensive Rotational Grazing	\$0	0	0	0
Agriculture Subtotal	-\$55,772,251	4,402,661	282,665	1,126,507
Total	\$1,163,004,101	0	145	448,827

**Table F-10. Summary Results for SigPS-AgrNPS-Urban and In-State Trading Scenario
(2 to 1 Trading Ratio)**

Basin	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
Eastern Shore of Chesapeake Bay	\$13,195,470	15,186	5,098	29,987
James River Basin	\$136,590,598	18,067	-8,337	27,651
Patuxent River Basin	\$23,623,933	-53,357	-5,884	-33,619
Potomac River Basin	\$147,911,295	-58,611	14,151	144,071
Rappahannock River Basin	\$7,573,310	99,714	11,270	53,543
Susquehanna River Basin	\$765,318,258	-110,252	-11,146	41,244
Western Shore of Chesapeake Bay	\$44,119,579	150,888	4,692	-62,001
York River Basin	\$30,031,730	-61,634	-9,820	18,085
Total	\$1,168,364,173	0	24	218,960

Technology/BMP	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
TN<3	\$9,514,748	-391,176	0	0
TN<3-TP<0.1	\$36,667,362	-1,747,685	-176,003	0
TN<3-TP<1	\$19,948,049	-407,116	-8,971	0
TN<5	-\$12,802,711	2,041,737	0	0
TN<5-TP<0.1	-\$20,670,915	1,245,299	100,264	0
TN<5-TP<0.5	\$23,757,199	-38,638	-170,672	0
TN<5-TP<1	\$0	0	0	0
TN<8	\$7,155,441	-393,773	0	0
TN<8-TP<0.5	\$21,265,297	-799,006	-91,448	0
TN<8-TP<1	\$5,710,409	-166,743	17,053	0
TP<0.1	\$9,312,288	0	57,416	0
TP<0.5	\$25,480,063	0	-131,103	0
TP<1	-\$3,561,340	0	294,145	0
Point Source Subtotal	\$121,775,889	-657,102	-109,319	0
Dry Ponds	\$30,477,677	-7,084	-1,010	-1,894
Dry Extended Detention Ponds	\$29,020,961	-62,450	-5,174	-4,399
Urban Forest Buffers	\$2,538,761	-10,635	-305	-1,548
Urban Filtering Practices	\$540,266,020	-929,549	-42,590	-9,614
Urban Infiltration Practices	\$404,792,258	-1,958,412	-68,674	-21,229
Urban Infiltration Practices with Sand/Vegetation	\$2,879,311	-5,455	-337	-142
Street Sweeping	\$40,256,533	-12,627	-1,022	-40,189
Urban Nutrient Management	\$2,888,696	-96,689	-4,758	-144,397
Wet Ponds and Wetlands	\$34,930,008	-89,569	-11,150	-2,179
Urban Stormwater Subtotal	\$1,088,050,227	-3,172,470	-135,020	-675,280
Forest Buffers	-\$1,302,121	202,983	14,422	6,081
Grass Buffers	-\$10,004,786	880,383	58,670	54,105
Wetland Restoration	-\$66,050	4,063	91	111
Tree Planting	-\$1,215,628	99,640	25,946	5,650
Land Retirement	-\$3,290,470	216,760	28,594	28,361
Continuous No-Till	-\$5,996,940	187,399	67,932	181,860
Enhanced Nutrient Management	-\$458,016	49,045	0	17,177
Decision Agriculture	\$0	0	0	0
Cover Crop Early Drilled Rye	-\$17,152,070	1,890,915	9,667	358,951
Livestock Exclusion	-\$1,953,732	297,444	38,849	9,452
Off Stream Watering	\$0	0	0	0
Upland Prescribed Grazing	-\$22,130	938	192	911
Upland Precision Intensive Rotational Grazing	\$0	0	0	0
Agriculture Subtotal	-\$41,461,944	3,829,571	244,363	894,241
Total	\$1,168,364,173	0	24	218,960

**Table F-11. Summary Results for SigPS-AgrNPS-Urban and In-Basin Trading Scenario
(2 to 1 Trading Ratio)**

Basin	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
Eastern Shore of Chesapeake Bay	\$15,205,343	0	0	48,168
James River Basin	\$136,467,662	0	0	22,989
Patuxent River Basin	\$20,487,597	0	0	-6,432
Potomac River Basin	\$172,881,644	0	0	341,725
Rappahannock River Basin	\$9,182,733	0	0	17,242
Susquehanna River Basin	\$761,556,095	0	0	64,632
Western Shore of Chesapeake Bay	\$45,393,933	0	0	-66,667
York River Basin	\$28,265,329	0	0	50,824
Total	\$1,189,440,336	0	0	472,482

Technology/BMP	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
TN<3	-\$39,483	13,914	0	0
TN<3-TP<0.1	\$36,614,468	-1,779,346	-173,097	0
TN<3-TP<1	\$19,549,782	-394,397	-4,158	0
TN<5	\$36,781,602	285,162	0	0
TN<5-TP<0.1	-\$21,181,448	886,998	111,956	0
TN<5-TP<0.5	\$23,960,031	-51,216	-175,115	0
TN<5-TP<1	\$0	0	0	0
TN<8	\$5,567,072	32,656	0	0
TN<8-TP<0.5	\$21,265,297	-799,006	-91,448	0
TN<8-TP<1	\$5,666,088	-158,379	21,661	0
TP<0.1	\$8,748,553	0	56,680	0
TP<0.5	\$25,480,063	0	-131,103	0
TP<1	-\$3,331,413	0	253,667	0
Point Source Subtotal	\$159,080,614	-1,963,614	-130,956	0
Dry Ponds	\$30,477,677	-6,977	-998	-1,894
Dry Extended Detention Ponds	\$29,031,224	-62,153	-5,156	-4,400
Urban Forest Buffers	\$2,538,761	-10,635	-305	-1,548
Urban Filtering Practices	\$540,266,020	-929,455	-42,582	-9,614
Urban Infiltration Practices	\$404,792,258	-1,957,693	-68,628	-21,229
Urban Infiltration Practices with Sand/Vegetation	\$2,879,311	-5,455	-337	-142
Street Sweeping	\$40,350,611	-12,641	-1,023	-40,283
Urban Nutrient Management	\$2,056,670	-56,230	-2,709	-102,807
Wet Ponds and Wetlands	\$34,930,008	-88,415	-10,987	-2,179
Urban Stormwater Subtotal	\$1,087,322,541	-3,129,654	-132,725	-644,620
Forest Buffers	-\$1,035,481	166,605	11,568	4,921
Grass Buffers	-\$13,682,018	1,244,154	69,240	70,752
Wetland Restoration	-\$44,473	1,752	125	75
Tree Planting	-\$2,093,660	154,128	30,140	11,144
Land Retirement	-\$5,272,126	352,714	33,293	43,554
Continuous No-Till	-\$2,752,649	50,620	45,412	79,682
Enhanced Nutrient Management	-\$1,259,528	88,357	0	47,235
Decision Agriculture	\$0	0	0	0
Cover Crop Early Drilled Rye	-\$27,903,270	2,688,679	12,826	583,947
Livestock Exclusion	-\$2,889,629	344,662	60,906	16,057
Off Stream Watering	\$0	0	0	0
Upland Prescribed Grazing	-\$29,986	1,599	170	1,898
Upland Precision Intensive Rotational Grazing	\$0	0	0	0
Agriculture Subtotal	-\$56,962,819	5,093,269	263,681	1,117,102
Total	\$1,189,440,336	0	0	472,482

Table F-12. Summary Results for SigPS-AgrNPS-Urban and Watershed-Wide Trading Scenario (2 to 1 Trading Ratio)

Basin	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
Eastern Shore of Chesapeake Bay	\$5,478,666	715,377	1,986	189,030
James River Basin	\$143,152,873	-316,048	1,619	66,137
Patuxent River Basin	\$23,437,397	-41,242	-5,445	-28,758
Potomac River Basin	\$187,699,833	-715,664	45,063	274,856
Rappahannock River Basin	\$6,918,782	129,791	15,048	68,626
Susquehanna River Basin	\$768,821,967	-35,605	-20,938	119,481
Western Shore of Chesapeake Bay	\$46,871,376	309,707	-29,040	-48,391
York River Basin	\$29,744,046	-46,317	-8,293	26,355
Total	\$1,212,124,941	0	0	667,335

Technology/BMP	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
TN<3	\$9,514,748	-391,176	0	0
TN<3-TP<0.1	\$39,748,285	-1,827,646	-191,830	0
TN<3-TP<1	\$19,948,049	-407,115	-8,971	0
TN<5	\$50,960,131	-1,187,479	0	0
TN<5-TP<0.1	-\$12,598,749	676,855	77,832	0
TN<5-TP<0.5	\$20,572,558	87,581	-153,937	0
TN<5-TP<1	\$0	0	0	0
TN<8	-\$4,514,046	1,392,570	0	0
TN<8-TP<0.5	\$21,265,297	-799,005	-91,447	0
TN<8-TP<1	\$6,998,262	-162,876	-2,217	0
TP<0.1	\$17,323,907	0	-1,300	0
TP<0.5	\$25,480,063	0	-131,103	0
TP<1	-\$3,547,251	0	308,155	0
Point Source Subtotal	\$191,151,256	-2,618,291	-194,817	0
Dry Ponds	\$30,477,677	-6,962	-1,000	-1,894
Dry Extended Detention Ponds	\$29,020,961	-62,146	-5,161	-4,399
Urban Forest Buffers	\$2,538,761	-10,635	-305	-1,548
Urban Filtering Practices	\$540,266,020	-929,665	-42,601	-9,614
Urban Infiltration Practices	\$404,792,258	-1,957,962	-68,656	-21,229
Urban Infiltration Practices with Sand/Vegetation	\$2,879,311	-5,455	-337	-142
Street Sweeping	\$40,256,533	-12,627	-1,022	-40,189
Urban Nutrient Management	\$2,267,741	-52,601	-3,012	-113,358
Wet Ponds and Wetlands	\$34,930,008	-88,723	-11,060	-2,179
Urban Stormwater Subtotal	\$1,087,429,272	-3,126,775	-133,153	-649,553
Forest Buffers	-\$1,674,752	241,159	16,894	7,642
Grass Buffers	-\$14,620,886	1,258,760	75,209	76,937
Wetland Restoration	-\$677,546	34,303	1,940	987
Tree Planting	-\$2,816,630	181,203	39,372	14,681
Land Retirement	-\$5,649,410	371,726	37,087	45,650
Continuous No-Till	-\$3,239,737	56,760	57,240	91,115
Enhanced Nutrient Management	-\$1,115,977	96,268	0	41,851
Decision Agriculture	\$0	0	0	0
Cover Crop Early Drilled Rye	-\$33,107,234	3,147,232	24,414	692,853
Livestock Exclusion	-\$3,544,248	356,993	75,725	20,246
Off Stream Watering	\$0	0	0	0
Upland Prescribed Grazing	-\$9,166	663	90	257
Upland Precision Intensive Rotational Grazing	\$0	0	0	0
Agriculture Subtotal	-\$66,455,587	5,745,067	327,970	1,316,887
Total	\$1,212,124,941	0	0	667,335

Table F-13. Summary Results for Offset-Only and In-Basin-State Trading Scenario (2 to 1 Trading Ratio)

Basin	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
Eastern Shore of Chesapeake Bay	\$20,125	2,478	247	622
James River Basin	\$147,764	204,439	19,589	393
Patuxent River Basin	\$1,770,792	29,249	2,695	19,134
Potomac River Basin	\$3,640,240	262,649	26,672	121,031
Rappahannock River Basin	\$51,208	10,838	1,777	1,847
Susquehanna River Basin	\$386,861	35,830	2,806	9,360
Western Shore of Chesapeake Bay	\$9,014,544	277,905	26,568	6,846
York River Basin	\$669,574	46,588	4,658	13,792
Total	\$15,701,106	869,976	85,012	173,025

Technology/BMP	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
TN<3	\$0	0	0	0
TN<3-TP<0.1	\$0	0	0	0
TN<3-TP<1	\$0	0	0	0
TN<5	\$0	0	0	0
TN<5-TP<0.1	\$0	0	0	0
TN<5-TP<0.5	\$0	0	0	0
TN<5-TP<1	\$0	0	0	0
TN<8	\$694,035	294,927	0	0
TN<8-TP<0.5	\$0	0	0	0
TN<8-TP<1	\$50,916	115,281	18,100	0
TP<0.1	\$8,560,032	0	23,047	0
TP<0.5	\$0	0	0	0
TP<1	\$4,229	0	372	0
Point Source Subtotal	\$9,309,212	410,208	41,519	0
Forest Buffers	\$3,837	533	23	17
Grass Buffers	\$500,548	61,709	3,850	2,903
Wetland Restoration	\$33,188	377	47	53
Tree Planting	\$514,259	59,773	3,067	1,418
Land Retirement	\$714,007	40,657	6,274	6,569
Continuous No-Till	\$3,534,483	180,708	22,964	126,991
Enhanced Nutrient Management	\$55,484	1,291	0	2,081
Decision Agriculture	\$0	0	0	0
Cover Crop Early Drilled Rye	\$840,022	75,267	826	17,580
Livestock Exclusion	\$192,227	39,441	6,437	1,212
Off Stream Watering	\$0	0	0	0
Upland Prescribed Grazing	\$3,839	11	5	190
Upland Precision Intensive Rotational Grazing	\$0	0	0	0
Agriculture Subtotal	\$6,391,894	459,768	43,493	173,025
Total	\$15,701,106	869,976	85,012	173,025

Table F-14. Summary Results for Offset-Only and In-State Trading Scenario (2 to 1 Trading Ratio)

Basin	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
Eastern Shore of Chesapeake Bay	\$1,129,928	43,617	8,430	622
James River Basin	\$252,812	224,003	23,688	3,919
Patuxent River Basin	\$5,308,058	522	20,189	501
Potomac River Basin	\$2,956,501	221,214	23,257	103,810
Rappahannock River Basin	\$64,666	12,213	2,603	2,315
Susquehanna River Basin	\$395,056	34,545	2,763	9,709
Western Shore of Chesapeake Bay	\$708,547	312,676	3,324	2,781
York River Basin	\$3,968	704	76	135
Total	\$10,819,535	849,494	84,330	161,931

Technology/BMP	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
TN<3	\$0	0	0	0
TN<3-TP<0.1	\$0	0	0	0
TN<3-TP<1	\$0	0	0	0
TN<5	\$0	0	0	0
TN<5-TP<0.1	\$0	0	0	0
TN<5-TP<0.5	\$0	0	0	0
TN<5-TP<1	\$0	0	0	0
TN<8	\$708,460	302,207	0	0
TN<8-TP<0.5	\$0	0	0	0
TN<8-TP<1	\$50,916	115,281	18,100	0
TP<0.1	\$5,288,218	0	20,066	0
TP<0.5	\$0	0	0	0
TP<1	\$4,229	0	372	0
Point Source Subtotal	\$6,051,823	417,488	38,538	0
Forest Buffers	\$828	280	23	4
Grass Buffers	\$315,605	46,072	3,740	2,197
Wetland Restoration	\$13,564	719	76	19
Tree Planting	\$11,341	55,350	2,413	28
Land Retirement	\$219,331	25,942	2,863	2,056
Continuous No-Till	\$3,818,052	182,069	26,896	137,439
Enhanced Nutrient Management	\$485	6,513	0	18
Decision Agriculture	\$0	0	0	0
Cover Crop Early Drilled Rye	\$145,675	66,543	494	3,049
Livestock Exclusion	\$220,522	48,084	9,126	1,491
Off Stream Watering	\$0	0	0	0
Upland Prescribed Grazing	\$22,310	433	162	1,102
Upland Precision Intensive Rotational Grazing	\$0	0	0	0
Agriculture Subtotal	\$4,767,713	432,006	45,792	161,931
Total	\$10,819,535	849,494	84,330	161,931

Table F-15. Summary Results for Offset-Only and In-Basin Trading Scenario (2 to 1 Trading Ratio)

Basin	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
Eastern Shore of Chesapeake Bay	\$19,770	2,478	247	622
James River Basin	\$145,684	210,063	19,589	309
Patuxent River Basin	\$1,366,664	29,249	3,280	10,070
Potomac River Basin	\$1,595,754	262,651	26,673	41,738
Rappahannock River Basin	\$51,208	10,838	1,777	1,847
Susquehanna River Basin	\$133,857	35,830	2,807	2,730
Western Shore of Chesapeake Bay	\$4,901,992	324,609	26,568	1,236
York River Basin	\$669,574	46,588	4,658	13,792
Total	\$8,884,503	922,306	85,598	72,368

Technology/BMP	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
TN<3	\$995,899	357,771	0	0
TN<3-TP<0.1	\$0	0	0	0
TN<3-TP<1	\$0	0	0	0
TN<5	\$0	0	0	0
TN<5-TP<0.1	\$55,016	116,677	18,519	0
TN<5-TP<0.5	\$0	0	0	0
TN<5-TP<1	\$0	0	0	0
TN<8	\$0	0	0	0
TN<8-TP<0.5	\$0	0	0	0
TN<8-TP<1	\$0	0	0	0
TP<0.1	\$4,812,810	0	26,231	0
TP<0.5	\$0	0	0	0
TP<1	\$16,126	0	932	0
Point Source Subtotal	\$5,879,850	474,448	45,682	0
Forest Buffers	\$6,849	1,542	108	33
Grass Buffers	\$258,944	39,225	3,900	1,733
Wetland Restoration	\$0	0	0	0
Tree Planting	\$51,923	61,937	2,926	232
Land Retirement	\$370,556	33,014	5,944	4,905
Continuous No-Till	\$156,233	17,361	4,876	4,573
Enhanced Nutrient Management	\$1,694	99	0	64
Decision Agriculture	\$0	0	0	0
Cover Crop Early Drilled Rye	\$1,301,246	143,212	1,035	27,232
Livestock Exclusion	\$857,208	151,469	21,127	5,400
Off Stream Watering	\$0	0	0	0
Upland Prescribed Grazing	\$0	0	0	0
Upland Precision Intensive Rotational Grazing	\$0	0	0	0
Agriculture Subtotal	\$3,004,653	447,858	39,916	72,368
Total	\$8,884,503	922,306	85,598	72,368

Table F-16. Summary Results for Offset-Only and Watershed-Wide Trading Scenario (2 to 1 Trading Ratio)

Basin	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
Eastern Shore of Chesapeake Bay	\$0	0	0	622
James River Basin	\$855,558	233,584	61,533	20,148
Patuxent River Basin	\$0	0	0	0
Potomac River Basin	\$490,328	101,260	13,235	14,649
Rappahannock River Basin	\$73,099	12,067	3,275	2,670
Susquehanna River Basin	\$424,079	299,536	3,645	4,710
Western Shore of Chesapeake Bay	\$173,777	202,534	2,558	41
York River Basin	\$3,065	509	80	105
Total	\$2,019,905	849,490	84,326	42,322

Technology/BMP	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
TN<3	\$0	0	0	0
TN<3-TP<0.1	\$0	0	0	0
TN<3-TP<1	\$0	0	0	0
TN<5	\$0	0	0	0
TN<5-TP<0.1	\$0	0	0	0
TN<5-TP<0.5	\$0	0	0	0
TN<5-TP<1	\$0	0	0	0
TN<8	\$423,756	413,970	0	0
TN<8-TP<0.5	\$0	0	0	0
TN<8-TP<1	\$50,916	115,281	18,100	0
TP<0.1	\$0	0	0	0
TP<0.5	\$0	0	0	0
TP<1	\$9,555	0	684	0
Point Source Subtotal	\$484,227	529,251	18,785	0
Forest Buffers	\$0	0	0	0
Grass Buffers	\$95,701	20,446	3,375	887
Wetland Restoration	\$0	0	0	0
Tree Planting	\$5,874	55,187	2,245	14
Land Retirement	\$207,761	15,504	12,075	3,499
Continuous No-Till	\$474,779	9,886	27,604	13,663
Enhanced Nutrient Management	\$686	9,157	0	26
Decision Agriculture	\$0	0	0	0
Cover Crop Early Drilled Rye	\$63,963	64,751	405	1,339
Livestock Exclusion	\$686,914	145,308	19,838	3,978
Off Stream Watering	\$0	0	0	0
Upland Prescribed Grazing	\$0	0	0	0
Upland Precision Intensive Rotational Grazing	\$0	0	0	0
Agriculture Subtotal	\$1,535,678	320,239	65,541	42,322
Total	\$2,019,905	849,490	84,326	42,322

**Table F-17. Summary Results for SigPS-AgrNPS and In-Basin-State Trading Scenario
(1.1 to 1 Trading Ratio)**

Basin	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
Eastern Shore of Chesapeake Bay	\$7,170,688	1,241	155	38,834
James River Basin	\$45,025,728	0	0	87,912
Patuxent River Basin	\$109,102	483	0	61
Potomac River Basin	\$34,065,468	0	0	120,168
Rappahannock River Basin	\$4,080,426	0	0	8,117
Susquehanna River Basin	\$54,024,701	0	0	252,546
Western Shore of Chesapeake Bay	\$4,437,031	84,051	0	34
York River Basin	\$18,999,307	0	0	25,487
Total	\$167,912,451	85,776	155	533,161

Technology/BMP	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
TN<3	\$10,962,930	-529,949	0	0
TN<3-TP<0.1	\$40,093,074	-1,877,492	-192,673	0
TN<3-TP<1	\$19,948,049	-407,115	-8,971	0
TN<5	\$4,409,430	6,728	0	0
TN<5-TP<0.1	\$0	0	0	0
TN<5-TP<0.5	\$25,749,772	-217,875	-184,927	0
TN<5-TP<1	\$0	0	0	0
TN<8	\$8,964,599	422,761	0	0
TN<8-TP<0.5	\$21,265,297	-799,005	-91,447	0
TN<8-TP<1	\$25,614,147	-1,460,214	-125,745	0
TP<0.1	\$15,073,754	0	20,516	0
TP<0.5	\$24,118,841	0	-115,638	0
TP<1	-\$4,019,656	0	422,346	0
Point Source Subtotal	\$192,180,237	-4,862,162	-276,539	0
Dry Ponds	\$0	0	0	0
Dry Extended Detention Ponds	\$0	0	0	0
Urban Forest Buffers	\$0	0	0	0
Urban Filtering Practices	\$0	0	0	0
Urban Infiltration Practices	\$0	0	0	0
Urban Infiltration Practices with Sand/Vegetation	\$0	0	0	0
Street Sweeping	\$0	0	0	0
Urban Nutrient Management	\$0	0	0	0
Wet Ponds and Wetlands	\$0	0	0	0
Urban Stormwater Subtotal	\$0	0	0	0
Forest Buffers	-\$739,102	223,524	18,250	3,547
Grass Buffers	-\$6,017,833	1,173,092	74,882	36,995
Wetland Restoration	-\$587,433	59,911	4,860	833
Tree Planting	-\$939,562	128,249	10,506	3,214
Land Retirement	-\$1,453,376	170,140	37,215	16,980
Continuous No-Till	-\$1,873,920	150,260	64,321	59,783
Enhanced Nutrient Management	-\$155,619	31,291	0	5,836
Decision Agriculture	\$0	0	0	0
Cover Crop Early Drilled Rye	-\$10,878,614	2,525,694	9,832	227,663
Livestock Exclusion	-\$1,602,163	484,159	56,524	7,341
Off Stream Watering	\$0	0	0	0
Upland Prescribed Grazing	-\$20,165	1,619	304	822
Upland Precision Intensive Rotational Grazing	\$0	0	0	0
Agriculture Subtotal	-\$24,267,787	4,947,938	276,694	533,161
Total	\$167,912,451	85,776	155	533,161

Table F-18. Summary Results for SigPS-AgrNPS and In-State Trading Scenario (1.1 to 1 Trading Ratio)

Basin	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
Eastern Shore of Chesapeake Bay	\$7,551,734	-18,137	917	42,907
James River Basin	\$53,622,494	-523,029	-22,275	64,141
Patuxent River Basin	\$108,668	515	5	65
Potomac River Basin	\$30,477,754	369,120	34,104	182,053
Rappahannock River Basin	\$2,892,015	173,363	14,330	40,941
Susquehanna River Basin	\$53,966,463	-35,647	-2,356	214,914
Western Shore of Chesapeake Bay	\$6,694,962	25,937	-14,779	2,803
York River Basin	\$19,099,467	7,877	-9,792	20,775
Total	\$174,413,556	0	155	568,598

Technology/BMP	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
TN<3	\$9,514,748	-391,176	0	0
TN<3-TP<0.1	\$47,859,708	-2,312,397	-217,249	0
TN<3-TP<1	\$19,948,049	-407,116	-8,971	0
TN<5	\$4,382,370	299,690	0	0
TN<5-TP<0.1	-\$575,443	20,372	3,058	0
TN<5-TP<0.5	\$27,909,402	-340,835	-200,469	0
TN<5-TP<1	\$0	0	0	0
TN<8	\$7,402,851	383,137	0	0
TN<8-TP<0.5	\$21,265,297	-799,006	-91,448	0
TN<8-TP<1	\$25,040,489	-1,378,231	-118,734	0
TP<0.1	\$15,073,754	0	20,515	0
TP<0.5	\$24,118,841	0	-115,638	0
TP<1	-\$4,144,358	0	434,606	0
Point Source Subtotal	\$197,795,708	-4,925,562	-294,331	0
Dry Ponds	\$0	0	0	0
Dry Extended Detention Ponds	\$0	0	0	0
Urban Forest Buffers	\$0	0	0	0
Urban Filtering Practices	\$0	0	0	0
Urban Infiltration Practices	\$0	0	0	0
Urban Infiltration Practices with Sand/Vegetation	\$0	0	0	0
Street Sweeping	\$0	0	0	0
Urban Nutrient Management	\$0	0	0	0
Wet Ponds and Wetlands	\$0	0	0	0
Urban Stormwater Subtotal	\$0	0	0	0
Forest Buffers	-\$1,184,940	346,826	24,392	5,519
Grass Buffers	-\$5,366,992	1,073,530	77,986	35,478
Wetland Restoration	-\$13,918	1,117	144	25
Tree Planting	-\$628,405	153,622	10,861	2,257
Land Retirement	-\$1,044,385	136,641	30,284	12,774
Continuous No-Till	-\$3,547,777	302,232	83,173	121,239
Enhanced Nutrient Management	-\$96,198	34,734	0	3,608
Decision Agriculture	\$0	0	0	0
Cover Crop Early Drilled Rye	-\$9,859,913	2,387,100	10,246	206,344
Livestock Exclusion	-\$1,616,150	488,061	57,055	7,349
Off Stream Watering	\$0	0	0	0
Upland Prescribed Grazing	-\$23,474	1,699	346	1,020
Upland Precision Intensive Rotational Grazing	\$0	0	0	0
Agriculture Subtotal	-\$23,382,152	4,925,562	294,486	568,598
Total	\$174,413,556	0	155	568,598

Table F-19. Summary Results for SigPS-AgrNPS and In-Basin Trading Scenario (1.1 to 1 Trading Ratio)

Basin	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
Eastern Shore of Chesapeake Bay	\$7,918,914	0	0	32,703
James River Basin	\$45,022,810	0	0	85,521
Patuxent River Basin	\$109,102	483	0	61
Potomac River Basin	\$73,644,146	0	0	237,920
Rappahannock River Basin	\$4,080,426	0	0	8,117
Susquehanna River Basin	\$54,623,408	0	0	202,121
Western Shore of Chesapeake Bay	\$4,437,031	84,051	0	34
York River Basin	\$18,999,307	0	0	25,487
Total	\$208,835,142	84,535	0	591,965

Technology/BMP	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
TN<3	\$9,514,748	-391,176	0	0
TN<3-TP<0.1	\$40,093,074	-1,877,492	-192,673	0
TN<3-TP<1	\$19,948,049	-407,116	-8,971	0
TN<5	\$51,696,491	-1,523,891	0	0
TN<5-TP<0.1	\$0	0	0	0
TN<5-TP<0.5	\$26,271,504	-204,532	-202,403	0
TN<5-TP<1	\$0	0	0	0
TN<8	\$7,464,932	663,845	0	0
TN<8-TP<0.5	\$21,265,297	-799,006	-91,448	0
TN<8-TP<1	\$25,040,489	-1,378,230	-118,734	0
TP<0.1	\$15,073,754	0	20,516	0
TP<0.5	\$24,118,841	0	-115,638	0
TP<1	-\$4,781,936	0	435,567	0
Point Source Subtotal	\$235,705,243	-5,917,598	-273,785	0
Dry Ponds	\$0	0	0	0
Dry Extended Detention Ponds	\$0	0	0	0
Urban Forest Buffers	\$0	0	0	0
Urban Filtering Practices	\$0	0	0	0
Urban Infiltration Practices	\$0	0	0	0
Urban Infiltration Practices with Sand/Vegetation	\$0	0	0	0
Street Sweeping	\$0	0	0	0
Urban Nutrient Management	\$0	0	0	0
Wet Ponds and Wetlands	\$0	0	0	0
Urban Stormwater Subtotal	\$0	0	0	0
Forest Buffers	-\$690,455	212,700	17,411	3,311
Grass Buffers	-\$7,721,965	1,600,802	90,622	43,857
Wetland Restoration	-\$5,550	936	102	11
Tree Planting	-\$200,502	99,478	7,000	960
Land Retirement	-\$1,572,396	243,213	36,353	18,264
Continuous No-Till	-\$482,254	42,885	35,456	14,755
Enhanced Nutrient Management	-\$144,664	27,383	0	5,425
Decision Agriculture	\$0	0	0	0
Cover Crop Early Drilled Rye	-\$13,959,359	3,212,101	9,725	292,135
Livestock Exclusion	-\$2,084,424	561,472	76,962	10,542
Off Stream Watering	\$0	0	0	0
Upland Prescribed Grazing	-\$8,532	1,162	154	240
Upland Precision Intensive Rotational Grazing	\$0	0	0	0
Agriculture Subtotal	-\$26,870,101	6,002,133	273,785	591,965
Total	\$208,835,142	84,535	0	591,965

**Table F-20. Summary Results for SigPS-AgrNPS and Watershed-Wide Trading Scenario
(1.1 to 1 Trading Ratio)**

Basin	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
Eastern Shore of Chesapeake Bay	\$5,305,686	524,985	-3,862	87,685
James River Basin	\$59,346,109	-1,127,955	-44,557	75,126
Patuxent River Basin	\$114,603	1,313	-297	167
Potomac River Basin	\$74,677,934	-270,009	105,119	258,302
Rappahannock River Basin	\$3,102,746	130,228	23,986	42,473
Susquehanna River Basin	\$52,084,593	658,781	-17,625	285,283
Western Shore of Chesapeake Bay	\$10,500,259	138,644	-55,480	1,971
York River Basin	\$19,592,272	-55,987	-7,283	13,107
Total	\$224,724,201	0	0	764,115

Technology/BMP	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
TN<3	\$10,962,930	-529,949	0	0
TN<3-TP<0.1	\$54,423,879	-2,845,621	-316,473	0
TN<3-TP<1	\$19,948,049	-407,115	-8,971	0
TN<5	\$51,669,431	-1,230,928	0	0
TN<5-TP<0.1	\$0	0	0	0
TN<5-TP<0.5	\$28,648,918	-387,401	-219,397	0
TN<5-TP<1	\$0	0	0	0
TN<8	\$7,955,865	381,562	0	0
TN<8-TP<0.5	\$21,265,297	-799,005	-91,447	0
TN<8-TP<1	\$25,400,633	-1,426,928	-124,238	0
TP<0.1	\$17,690,018	0	-3,328	0
TP<0.5	\$25,480,063	0	-131,103	0
TP<1	-\$3,644,888	0	441,252	0
Point Source Subtotal	\$259,800,194	-7,245,385	-453,705	0
Dry Ponds	\$0	0	0	0
Dry Extended Detention Ponds	\$0	0	0	0
Urban Forest Buffers	\$0	0	0	0
Urban Filtering Practices	\$0	0	0	0
Urban Infiltration Practices	\$0	0	0	0
Urban Infiltration Practices with Sand/Vegetation	\$0	0	0	0
Street Sweeping	\$0	0	0	0
Urban Nutrient Management	\$0	0	0	0
Wet Ponds and Wetlands	\$0	0	0	0
Urban Stormwater Subtotal	\$0	0	0	0
Forest Buffers	-\$795,146	270,136	17,311	3,708
Grass Buffers	-\$9,062,440	1,772,364	111,015	49,861
Wetland Restoration	-\$8,830	1,472	108	17
Tree Planting	-\$1,136,659	175,121	46,019	5,561
Land Retirement	-\$2,040,112	305,674	47,332	21,776
Continuous No-Till	-\$1,374,394	49,360	88,629	39,402
Enhanced Nutrient Management	-\$352,791	83,425	0	13,230
Decision Agriculture	\$0	0	0	0
Cover Crop Early Drilled Rye	-\$16,950,335	3,942,000	13,128	354,729
Livestock Exclusion	-\$3,348,602	644,845	130,038	18,993
Off Stream Watering	\$0	0	0	0
Upland Prescribed Grazing	-\$6,685	988	125	188
Upland Precision Intensive Rotational Grazing	\$0	0	0	0
Agriculture Subtotal	-\$35,075,994	7,245,385	453,705	764,115
Total	\$224,724,201	0	0	764,115

Table F-21. Summary Results for SigPS-AgrNPS-Urban and In-Basin-State Trading Scenario (1.1 to 1 Trading Ratio)

Basin	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
Eastern Shore of Chesapeake Bay	\$16,219,740	1,241	148	33,964
James River Basin	\$143,375,260	0	0	81,017
Patuxent River Basin	\$21,886,092	2,905	0	-4,123
Potomac River Basin	\$157,213,737	0	0	43,308
Rappahannock River Basin	\$9,531,876	0	0	5,948
Susquehanna River Basin	\$796,524,429	0	0	104,323
Western Shore of Chesapeake Bay	\$46,037,263	11,945	0	-63,241
York River Basin	\$30,045,892	0	0	23,684
Total	\$1,220,834,287	16,091	148	224,881

Technology/BMP	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
TN<3	\$10,962,930	-529,949	0	0
TN<3-TP<0.1	\$40,093,074	-1,877,492	-192,673	0
TN<3-TP<1	\$19,948,049	-407,115	-8,971	0
TN<5	\$4,409,430	6,728	0	0
TN<5-TP<0.1	-\$1,972,062	80,319	8,954	0
TN<5-TP<0.5	\$24,758,883	-97,887	-180,150	0
TN<5-TP<1	\$0	0	0	0
TN<8	\$6,959,216	715,314	0	0
TN<8-TP<0.5	\$21,265,297	-799,005	-91,447	0
TN<8-TP<1	\$19,941,670	-828,483	-84,852	0
TP<0.1	\$12,574,208	0	42,699	0
TP<0.5	\$25,480,063	0	-131,103	0
TP<1	-\$4,998,947	0	410,742	0
Point Source Subtotal	\$179,421,811	-3,737,570	-226,801	0
Dry Ponds	\$30,477,677	-7,155	-1,015	-1,894
Dry Extended Detention Ponds	\$29,020,961	-62,550	-5,176	-4,399
Urban Forest Buffers	\$2,538,761	-10,635	-305	-1,548
Urban Filtering Practices	\$540,266,020	-933,215	-42,743	-9,614
Urban Infiltration Practices	\$404,792,258	-1,965,840	-68,884	-21,229
Urban Infiltration Practices with Sand/Vegetation	\$2,879,311	-5,455	-337	-142
Street Sweeping	\$40,256,533	-12,627	-1,022	-40,189
Urban Nutrient Management	\$3,585,553	-145,074	-6,576	-179,231
Wet Ponds and Wetlands	\$34,930,008	-89,852	-11,149	-2,179
Urban Stormwater Subtotal	\$1,088,747,083	-3,232,402	-137,208	-696,367
Forest Buffers	-\$1,029,173	268,414	21,845	4,937
Grass Buffers	-\$9,835,959	1,553,258	89,213	54,783
Wetland Restoration	-\$1,669,343	106,724	8,458	2,245
Tree Planting	-\$2,822,436	242,572	20,440	7,277
Land Retirement	-\$5,016,048	470,050	49,348	34,308
Continuous No-Till	-\$5,488,131	296,443	95,282	165,978
Enhanced Nutrient Management	-\$398,961	64,537	0	14,962
Decision Agriculture	\$0	0	0	0
Cover Crop Early Drilled Rye	-\$19,383,289	3,492,094	21,403	405,645
Livestock Exclusion	-\$1,653,865	490,224	57,819	7,539
Off Stream Watering	\$0	0	0	0
Upland Prescribed Grazing	-\$37,401	1,746	349	1,670
Upland Precision Intensive Rotational Grazing	\$0	0	0	0
Agriculture Subtotal	-\$47,334,606	6,986,064	364,157	921,248
Total	\$1,220,834,287	16,091	148	224,881

**Table F-22. Summary Results for SigPS-AgrNPS-Urban and In-State Trading Scenario
(1.1 to 1 Trading Ratio)**

Basin	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
Eastern Shore of Chesapeake Bay	\$16,298,320	-2,826	3,862	48,663
James River Basin	\$153,761,385	-639,873	-32,051	11,458
Patuxent River Basin	\$23,678,501	-57,341	-6,131	-35,144
Potomac River Basin	\$151,395,877	409,437	49,549	155,728
Rappahannock River Basin	\$7,497,936	249,734	20,687	55,487
Susquehanna River Basin	\$801,032,917	-148,552	-17,583	-9,535
Western Shore of Chesapeake Bay	\$47,226,795	157,326	-8,915	-70,765
York River Basin	\$29,961,639	32,094	-9,269	21,840
Total	\$1,230,853,370	0	148	177,731

Technology/BMP	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
TN<3	\$9,514,748	-391,176	0	0
TN<3-TP<0.1	\$47,859,708	-2,312,397	-217,249	0
TN<3-TP<1	\$19,948,049	-407,116	-8,971	0
TN<5	\$4,382,370	299,690	0	0
TN<5-TP<0.1	-\$2,347,649	90,552	11,446	0
TN<5-TP<0.5	\$25,531,988	-157,966	-183,475	0
TN<5-TP<1	\$0	0	0	0
TN<8	\$6,074,566	595,209	0	0
TN<8-TP<0.5	\$21,265,297	-799,006	-91,448	0
TN<8-TP<1	\$14,697,772	-341,168	-44,713	0
TP<0.1	\$15,073,754	0	20,515	0
TP<0.5	\$24,118,841	0	-115,638	0
TP<1	-\$4,582,793	0	388,208	0
Point Source Subtotal	\$181,536,651	-3,423,379	-241,326	0
Dry Ponds	\$30,477,677	-7,242	-1,028	-1,894
Dry Extended Detention Ponds	\$29,020,961	-62,958	-5,207	-4,399
Urban Forest Buffers	\$2,538,761	-10,635	-305	-1,548
Urban Filtering Practices	\$540,266,020	-930,896	-42,675	-9,614
Urban Infiltration Practices	\$404,792,258	-1,962,398	-68,896	-21,229
Urban Infiltration Practices with Sand/Vegetation	\$2,879,311	-5,455	-337	-142
Street Sweeping	\$40,256,533	-12,627	-1,022	-40,189
Urban Nutrient Management	\$3,889,475	-160,511	-8,108	-194,423
Wet Ponds and Wetlands	\$34,930,008	-90,657	-11,293	-2,179
Urban Stormwater Subtotal	\$1,089,051,006	-3,243,379	-138,872	-709,994
Forest Buffers	-\$1,479,890	400,194	28,469	6,888
Grass Buffers	-\$9,229,330	1,506,803	97,303	50,855
Wetland Restoration	-\$48,792	2,918	286	85
Tree Planting	-\$834,798	174,876	13,487	3,037
Land Retirement	-\$2,696,161	325,153	42,664	23,341
Continuous No-Till	-\$7,217,447	419,250	124,298	225,992
Enhanced Nutrient Management	-\$259,481	60,125	0	9,731
Decision Agriculture	\$0	0	0	0
Cover Crop Early Drilled Rye	-\$16,249,939	3,282,559	13,915	340,071
Livestock Exclusion	-\$1,691,710	492,983	59,532	7,739
Off Stream Watering	\$0	0	0	0
Upland Prescribed Grazing	-\$26,740	1,895	391	1,147
Upland Precision Intensive Rotational Grazing	\$0	0	0	0
Agriculture Subtotal	-\$39,734,288	6,666,758	380,345	887,724
Total	\$1,230,853,370	0	148	177,731

**Table F-23. Summary Results for SigPS-AgrNPS-Urban and In-Basin Trading Scenario
(1.1 to 1 Trading Ratio)**

Basin	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
Eastern Shore of Chesapeake Bay	\$17,117,886	0	0	25,632
James River Basin	\$143,380,347	0	0	81,677
Patuxent River Basin	\$21,810,672	0	0	-6,540
Potomac River Basin	\$196,792,503	0	0	157,242
Rappahannock River Basin	\$9,531,444	0	0	5,951
Susquehanna River Basin	\$796,504,496	0	0	34,216
Western Shore of Chesapeake Bay	\$46,034,950	12,631	0	-62,877
York River Basin	\$30,014,654	0	0	22,531
Total	\$1,261,186,951	12,631	0	257,831

Technology/BMP	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
TN<3	\$9,514,748	-391,176	0	0
TN<3-TP<0.1	\$40,093,088	-1,877,494	-192,673	0
TN<3-TP<1	\$19,948,049	-407,116	-8,971	0
TN<5	\$51,696,491	-1,523,891	0	0
TN<5-TP<0.1	-\$2,832,457	113,485	12,868	0
TN<5-TP<0.5	\$25,498,399	-144,454	-199,079	0
TN<5-TP<1	\$0	0	0	0
TN<8	\$6,403,224	777,756	0	0
TN<8-TP<0.5	\$21,265,297	-799,006	-91,448	0
TN<8-TP<1	\$14,728,425	-363,357	-43,387	0
TP<0.1	\$11,371,465	0	46,302	0
TP<0.5	\$25,480,063	0	-131,103	0
TP<1	-\$4,476,609	0	370,191	0
Point Source Subtotal	\$218,690,183	-4,615,253	-237,300	0
Dry Ponds	\$30,477,677	-7,076	-1,011	-1,894
Dry Extended Detention Ponds	\$29,031,224	-62,344	-5,168	-4,400
Urban Forest Buffers	\$2,538,761	-10,635	-305	-1,548
Urban Filtering Practices	\$540,266,020	-931,089	-42,687	-9,614
Urban Infiltration Practices	\$404,792,258	-1,961,261	-68,796	-21,229
Urban Infiltration Practices with Sand/Vegetation	\$2,879,311	-5,455	-337	-142
Street Sweeping	\$40,350,611	-12,641	-1,023	-40,283
Urban Nutrient Management	\$3,095,785	-106,323	-5,320	-154,749
Wet Ponds and Wetlands	\$34,930,008	-89,328	-11,122	-2,179
Urban Stormwater Subtotal	\$1,088,361,656	-3,186,151	-135,770	-680,798
Forest Buffers	-\$945,879	251,182	20,674	4,499
Grass Buffers	-\$11,899,858	2,064,827	109,568	63,419
Wetland Restoration	-\$441,561	14,277	1,936	527
Tree Planting	-\$1,146,394	176,199	13,834	3,972
Land Retirement	-\$4,529,893	523,803	48,044	34,566
Continuous No-Till	-\$3,890,344	143,741	68,827	111,835
Enhanced Nutrient Management	-\$356,814	58,558	0	13,381
Decision Agriculture	\$0	0	0	0
Cover Crop Early Drilled Rye	-\$20,190,686	3,986,725	17,854	422,541
Livestock Exclusion	-\$2,445,912	593,433	92,147	13,024
Off Stream Watering	\$0	0	0	0
Upland Prescribed Grazing	-\$17,547	1,289	186	678
Upland Precision Intensive Rotational Grazing	\$0	0	0	0
Agriculture Subtotal	-\$45,864,888	7,814,035	373,070	938,629
Total	\$1,261,186,951	12,631	0	257,831

Table F-24. Summary Results for SigPS-AgrNPS-Urban and Watershed-Wide Trading Scenario (1.1 to 1 Trading Ratio)

Basin	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
Eastern Shore of Chesapeake Bay	\$11,274,138	920,565	1,870	142,037
James River Basin	\$156,974,081	-918,283	-42,517	11,289
Patuxent River Basin	\$23,606,542	-47,552	-6,247	-33,417
Potomac River Basin	\$195,642,273	-12,826	110,590	196,669
Rappahannock River Basin	\$8,120,600	175,886	25,831	48,212
Susquehanna River Basin	\$802,844,902	-191,516	-17,785	80,523
Western Shore of Chesapeake Bay	\$51,476,486	103,471	-63,017	-59,030
York River Basin	\$30,522,177	-29,745	-8,725	12,939
Total	\$1,280,461,199	0	0	399,222

Technology/BMP	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
TN<3	\$10,962,930	-529,949	0	0
TN<3-TP<0.1	\$51,328,086	-2,512,558	-277,388	0
TN<3-TP<1	\$19,948,049	-407,115	-8,971	0
TN<5	\$51,669,431	-1,230,928	0	0
TN<5-TP<0.1	-\$1,845,708	414,591	1,725	0
TN<5-TP<0.5	\$27,909,402	-340,834	-200,468	0
TN<5-TP<1	\$0	0	0	0
TN<8	\$7,112,490	171,510	0	0
TN<8-TP<0.5	\$21,265,297	-799,005	-91,447	0
TN<8-TP<1	\$20,035,265	-836,810	-87,310	0
TP<0.1	\$17,495,162	0	-3,066	0
TP<0.5	\$25,480,063	0	-131,103	0
TP<1	-\$4,965,692	0	432,840	0
Point Source Subtotal	\$246,394,775	-6,071,099	-365,188	0
Dry Ponds	\$30,477,677	-7,167	-1,023	-1,894
Dry Extended Detention Ponds	\$29,020,961	-62,898	-5,208	-4,399
Urban Forest Buffers	\$2,538,761	-10,635	-305	-1,548
Urban Filtering Practices	\$540,266,020	-934,111	-42,803	-9,614
Urban Infiltration Practices	\$404,792,258	-1,968,433	-69,048	-21,229
Urban Infiltration Practices with Sand/Vegetation	\$2,879,311	-5,455	-337	-142
Street Sweeping	\$40,256,533	-12,627	-1,022	-40,189
Urban Nutrient Management	\$3,975,537	-159,063	-8,102	-198,725
Wet Ponds and Wetlands	\$34,930,008	-90,380	-11,271	-2,179
Urban Stormwater Subtotal	\$1,089,137,068	-3,250,769	-139,119	-705,927
Forest Buffers	-\$1,242,409	360,865	24,875	5,708
Grass Buffers	-\$12,508,305	2,108,478	121,507	64,525
Wetland Restoration	-\$420,504	20,366	2,104	483
Tree Planting	-\$1,618,404	213,441	49,077	7,302
Land Retirement	-\$5,079,405	600,352	58,315	37,670
Continuous No-Till	-\$3,303,665	108,243	93,226	91,324
Enhanced Nutrient Management	-\$800,261	142,379	0	30,011
Decision Agriculture	\$0	0	0	0
Cover Crop Early Drilled Rye	-\$26,722,256	5,121,113	24,454	559,231
Livestock Exclusion	-\$3,365,317	645,406	130,588	19,089
Off Stream Watering	\$0	0	0	0
Upland Prescribed Grazing	-\$10,119	1,224	161	326
Upland Precision Intensive Rotational Grazing	\$0	0	0	0
Agriculture Subtotal	-\$55,070,644	9,321,867	504,306	1,105,149
Total	\$1,280,461,199	0	0	399,222

Table F-25. Summary Results for Offset-Only and In-Basin-State Trading Scenario (1.1 to 1 Trading Ratio)

Basin	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
Eastern Shore of Chesapeake Bay	\$10,955	2,478	247	338
James River Basin	\$141,044	204,924	19,589	259
Patuxent River Basin	\$546,721	29,249	2,695	12,276
Potomac River Basin	\$1,758,584	262,649	26,672	62,258
Rappahannock River Basin	\$23,687	10,838	1,861	947
Susquehanna River Basin	\$162,536	35,830	2,806	4,501
Western Shore of Chesapeake Bay	\$7,193,263	265,686	26,568	15,980
York River Basin	\$318,090	46,588	4,658	6,853
Total	\$10,154,879	858,242	85,096	103,413

Technology/BMP	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
TN<3	\$0	0	0	0
TN<3-TP<0.1	\$0	0	0	0
TN<3-TP<1	\$0	0	0	0
TN<5	\$0	0	0	0
TN<5-TP<0.1	\$0	0	0	0
TN<5-TP<0.5	\$0	0	0	0
TN<5-TP<1	\$0	0	0	0
TN<8	\$234,536	174,109	0	0
TN<8-TP<0.5	\$0	0	0	0
TN<8-TP<1	\$50,916	115,281	18,100	0
TP<0.1	\$6,519,198	0	18,401	0
TP<0.5	\$0	0	0	0
TP<1	\$4,229	0	372	0
Point Source Subtotal	\$6,808,879	289,390	36,873	0
Forest Buffers	\$1,256	369	12	6
Grass Buffers	\$266,319	66,385	4,484	1,578
Wetland Restoration	\$2,459	70	21	4
Tree Planting	\$12,349	100,638	4,389	30
Land Retirement	\$361,308	27,902	6,051	3,230
Continuous No-Till	\$2,283,974	217,676	25,350	82,432
Enhanced Nutrient Management	\$529	9,438	0	20
Decision Agriculture	\$0	0	0	0
Cover Crop Early Drilled Rye	\$306,588	99,203	1,095	6,416
Livestock Exclusion	\$110,394	47,168	6,819	724
Off Stream Watering	\$0	0	0	0
Upland Prescribed Grazing	\$826	3	2	41
Upland Precision Intensive Rotational Grazing	\$0	0	0	0
Agriculture Subtotal	\$3,346,000	568,852	48,222	103,413
Total	\$10,154,879	858,242	85,096	103,413

Table F-26. Summary Results for Offset-Only and In-State Trading Scenario (1.1 to 1 Trading Ratio)

Basin	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
Eastern Shore of Chesapeake Bay	\$864,772	58,545	12,410	30,376
James River Basin	\$187,372	223,689	23,636	2,076
Patuxent River Basin	\$7,722	547	92	64
Potomac River Basin	\$2,668,687	334,539	36,614	95,238
Rappahannock River Basin	\$31,732	13,330	2,778	1,198
Susquehanna River Basin	\$169,419	33,603	2,727	4,803
Western Shore of Chesapeake Bay	\$95,106	185,028	6,053	2,700
York River Basin	\$462	213	20	16
Total	\$4,025,272	849,494	84,330	136,470

Technology/BMP	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
TN<3	\$0	0	0	0
TN<3-TP<0.1	\$0	0	0	0
TN<3-TP<1	\$0	0	0	0
TN<5	\$0	0	0	0
TN<5-TP<0.1	\$0	0	0	0
TN<5-TP<0.5	\$0	0	0	0
TN<5-TP<1	\$0	0	0	0
TN<8	\$97,281	95,565	0	0
TN<8-TP<0.5	\$0	0	0	0
TN<8-TP<1	\$50,916	115,281	18,100	0
TP<0.1	\$0	0	0	0
TP<0.5	\$0	0	0	0
TP<1	\$4,229	0	372	0
Point Source Subtotal	\$152,426	210,846	18,472	0
Forest Buffers	\$0	0	0	0
Grass Buffers	\$161,599	51,102	3,975	1,136
Wetland Restoration	\$197	9	10	0
Tree Planting	\$11,341	100,637	4,387	28
Land Retirement	\$70,126	20,369	2,234	611
Continuous No-Till	\$3,434,068	313,247	44,683	124,102
Enhanced Nutrient Management	\$472	11,516	0	18
Decision Agriculture	\$0	0	0	0
Cover Crop Early Drilled Rye	\$61,680	86,249	811	1,291
Livestock Exclusion	\$116,904	54,854	9,530	808
Off Stream Watering	\$0	0	0	0
Upland Prescribed Grazing	\$16,460	666	228	813
Upland Precision Intensive Rotational Grazing	\$0	0	0	0
Agriculture Subtotal	\$3,872,847	638,648	65,858	136,470
Total	\$4,025,272	849,494	84,330	136,470

Table F-27. Summary Results for Offset-Only and In-Basin Trading Scenario (1.1 to 1 Trading Ratio)

Basin	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
Eastern Shore of Chesapeake Bay	\$10,749	2,478	247	357
James River Basin	\$139,068	209,230	19,589	259
Patuxent River Basin	\$546,721	29,249	2,695	12,276
Potomac River Basin	\$689,745	262,651	26,673	20,264
Rappahannock River Basin	\$23,687	10,838	1,861	947
Susquehanna River Basin	\$70,502	35,830	2,807	1,231
Western Shore of Chesapeake Bay	\$3,834,484	265,686	26,568	5,652
York River Basin	\$318,090	46,588	4,658	6,853
Total	\$5,633,045	862,550	85,098	47,839

Technology/BMP	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
TN<3	\$227,892	189,083	0	0
TN<3-TP<0.1	\$0	0	0	0
TN<3-TP<1	\$0	0	0	0
TN<5	\$0	0	0	0
TN<5-TP<0.1	\$0	0	0	0
TN<5-TP<0.5	\$0	0	0	0
TN<5-TP<1	\$0	0	0	0
TN<8	\$0	0	0	0
TN<8-TP<0.5	\$0	0	0	0
TN<8-TP<1	\$50,916	115,281	18,100	0
TP<0.1	\$3,523,646	0	19,610	0
TP<0.5	\$0	0	0	0
TP<1	\$9,555	0	684	0
Point Source Subtotal	\$3,812,009	304,364	38,395	0
Forest Buffers	\$1,256	369	12	6
Grass Buffers	\$149,720	44,037	4,817	1,045
Wetland Restoration	\$2,101	57	10	3
Tree Planting	\$5,832	100,319	4,082	14
Land Retirement	\$320,201	33,849	6,897	3,240
Continuous No-Till	\$417,153	30,305	5,430	14,904
Enhanced Nutrient Management	\$511	9,023	0	19
Decision Agriculture	\$0	0	0	0
Cover Crop Early Drilled Rye	\$410,554	145,027	1,286	8,592
Livestock Exclusion	\$513,708	195,199	24,168	3,257
Off Stream Watering	\$0	0	0	0
Upland Prescribed Grazing	\$0	0	0	0
Upland Precision Intensive Rotational Grazing	\$0	0	0	0
Agriculture Subtotal	\$1,821,036	558,187	46,702	47,839
Total	\$5,633,045	862,550	85,098	47,839

Table F-28. Summary Results for Offset-Only and Watershed-Wide Trading Scenario (1.1 to 1 Trading Ratio)

Basin	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
Eastern Shore of Chesapeake Bay	\$0	0	0	0
James River Basin	\$492,738	237,007	62,280	10,411
Patuxent River Basin	\$0	0	0	0
Potomac River Basin	\$238,801	116,702	11,407	6,894
Rappahannock River Basin	\$43,862	15,101	4,181	1,621
Susquehanna River Basin	\$251,106	281,503	1,787	1,762
Western Shore of Chesapeake Bay	\$7,672	198,964	4,652	41
York River Basin	\$462	213	20	16
Total	\$1,034,641	849,490	84,326	20,745

Technology/BMP	Annual Cost Reduction (\$/yr)	Net N Reduction (lbs/yr)	Net P Reduction (lbs/yr)	Change in BMP Area (Acres)
TN<3	\$0	0	0	0
TN<3-TP<0.1	\$0	0	0	0
TN<3-TP<1	\$0	0	0	0
TN<5	\$0	0	0	0
TN<5-TP<0.1	\$0	0	0	0
TN<5-TP<0.5	\$0	0	0	0
TN<5-TP<1	\$0	0	0	0
TN<8	\$257,652	320,865	0	0
TN<8-TP<0.5	\$0	0	0	0
TN<8-TP<1	\$50,916	115,281	18,100	0
TP<0.1	\$0	0	0	0
TP<0.5	\$0	0	0	0
TP<1	\$0	0	0	0
Point Source Subtotal	\$308,568	436,146	18,100	0
Forest Buffers	\$0	0	0	0
Grass Buffers	\$53,540	24,444	4,040	481
Wetland Restoration	\$0	0	0	0
Tree Planting	\$5,824	100,318	4,081	14
Land Retirement	\$100,089	15,926	13,865	1,711
Continuous No-Till	\$193,603	3,853	22,562	5,621
Enhanced Nutrient Management	\$686	16,648	0	26
Decision Agriculture	\$0	0	0	0
Cover Crop Early Drilled Rye	\$40,144	105,772	577	840
Livestock Exclusion	\$332,188	146,383	21,099	2,036
Off Stream Watering	\$0	0	0	0
Upland Prescribed Grazing	\$0	0	0	0
Upland Precision Intensive Rotational Grazing	\$0	0	0	0
Agriculture Subtotal	\$726,073	413,344	66,226	20,745
Total	\$1,034,641	849,490	84,326	20,745