

Maryland Phase II WIP Strategies

HOWARD Agriculture - Annual Practices

		2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	Unit			
Conservation Tillage	Acres/Year	8,655	8,559	8,505
Cover Crop	Acres/Year	2,102	1,967	2,000
Cropland Irrigation Management	Acres/Year	0	160	160
Dairy Manure Incorporation	Acres/Year	0	240	400
Nutrient Management (All forms)	Acres/Year	9,018	16,779	17,043
Soil Conservation and Water Quality Plans	Acres/Year	5,493	14,518	16,200

- The BMP values are the amount credited in the Bay watershed model. It is the amount of BMP submitted minus the amount not given credit for (e.g., due to overlapping with other BMPs)

HOWARD Agriculture - Additional BMPs

		2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	Unit			
Barnyard Runoff Control	Acres	50	50	50
Forest Buffers	Acres	537	543	547
Grass Buffers / Vegetated Open Channel	Acres	221	296	345
Horse Pasture Management	Acres	0	660	1,100
Land Retirement	Acres	325	422	511
Loafing Lot Management	Acres	0	0	0
Off Stream Watering Without Fencing	Acres	2,720	2,840	2,919
Prescribed Grazing	Acres	0	158	264
Stream Access Control with Fencing	Acres	16	16	16
Tree Planting / Vegetative Environmental Buffers	Acres	1,035	1,035	1,035
Wetland Restoration	Acres	69	69	69

- The BMP values represent the total amount of implementation in place.
- The BMP values are the amount credited in the Bay watershed model. It is the amount of BMP submitted minus the amount not given credit for (e.g., due to overlapping with other BMPs)

Please note: The Agricultural BMP tables represent Land BMPs that can be shown as acres or feet and do not show those BMPs that are based on percentages such as Animal Waste Storage and Poultry Litter Treatment (Alum). Manure Transport is also not represented in these tables.

HOWARD Forest BMPs

			2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	Zone	Unit			
Forest Harvesting Practices	harvested forest	Acres	546	546	546

- The BMP values represent the total amount of implementation in place.
- The BMP values are the amount credited in the Bay watershed model. It is the amount of BMP submitted minus the amount not given credit for (e.g., due to overlapping with other BMPs)

HOWARD Developed Land BMPs

		2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	Unit			
Bioretention / Raingardens	Acres	0	2,093	2,090
Bioswale	Acres	0	2,068	2,124
Dry Detention Ponds and Hydrodynamic Structures	Acres	2,410	1,315	1,297
Dry Extended Detention Ponds	Acres	1,747	1,400	1,388
Impervious Urban Surface Reduction	Acres	0	0	108
MS4 Permit Stormwater Retrofit	Acres	1,319	9,158	15,516
Stormwater Management Generic BMP (1985 to 2002)	Acres	17,077	2,406	2,360
Stormwater Management Generic BMP (2002 to 2010)	Acres	4,114	4,094	4,071
Urban Filtering Practices	Acres	364	380	1,776
Urban Forest Buffers	Acres	38	37	170
Urban Infiltration Practices	Acres	478	370	386
Urban Tree Planting / Urban Tree Canopy	Acres	0	219	467
Vegetated Open Channels	Acres	0	546	517
Wet Ponds and Wetlands	Acres	4,292	8,281	8,253
Erosion and Sediment Control on Construction	Acres/Year	445	445	721
Erosion and Sediment Control on Extractive	Acres/Year	0	0	19
Forest Conservation	Acres/Year	4,214	4,217	4,224
Urban Nutrient Management	Acres/Year	11,453	28,169	30,077
Street Sweeping Pounds	Lbs/Year	0	470,699	470,699
Urban Stream Restoration / Shoreline Erosion Control	Linear Feet	0	102,951	184,386

- The BMP values represent the total amount of implementation in place.
- The BMP values are the amount credited in the Bay watershed model. It is the amount of BMP submitted minus the amount not given credit for (e.g., due to overlapping with other BMPs)

HOWARD Septic System BMPs

			2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	Zone	Unit			
Septic Connection	Outside of the Critical Area, not within 1000 ft of a perennial stream	Systems	0	67	67
	Within 1000 ft of a perennial stream	Systems	0	38	38
Septic ConnectionTotal			0	105	105
Septic Denitrification	Critical Area	Systems	0	0	0
	Outside of the Critical Area, not within 1000 ft of a perennial stream	Systems	36	36	36
	Within 1000 ft of a perennial stream	Systems	20	4,149	6,487
Septic DenitrificationTotal			57	4,185	6,523
Septic Pumping	Outside of the Critical Area, not within 1000 ft of a perennial stream	Systems	0	12,045	12,714
	Within 1000 ft of a perennial stream	Systems	0	6,789	7,166
	Septic PumpingTotal			0	18,834

- The BMP values represent the total amount of implementation in place.
- The BMP values are the amount credited in the Bay watershed model. It is the amount of BMP submitted minus the amount not given credit for (e.g., due to overlapping with other BMPs)

Maryland Phase II WIP Strategies

HOWARD Total Nitrogen Loads

		2010 Progress	2017 Interim Strategy	2025 Final Strategy	Final Target
Source Sector	Landuse	Million Lbs/Yr	Million Lbs/Yr	Million Lbs/Yr	Million Lbs/Yr
Agriculture	AFO	0.001	0.000	0.000	0.001
	CAFO	0.000	0.000	0.000	0.000
	Crop	0.070	0.061	0.059	0.069
	Nursery	0.021	0.020	0.020	0.021
	Pasture	0.014	0.012	0.012	0.013
	Subtotal		0.107	0.094	0.092
Forest	Harvested	0.003	0.003	0.003	0.004
	Natural	0.075	0.077	0.077	0.074
	Subtotal	0.078	0.080	0.080	0.078
Non-Tidal Atm	Non-Tidal Atm	0.001	0.001	0.001	0.001
	Subtotal	0.001	0.001	0.001	0.001
Septic	Septic	0.079	0.065	0.059	0.059
	Subtotal	0.079	0.065	0.059	0.059
Stormwater	CSS	0.000	0.000	0.000	0
	Construction	0.010	0.010	0.009	0.010
	Extractive	0.001	0.001	0.001	0.001
	Regulated Developed	0.387	0.349	0.332	0.349
	Subtotal	0.398	0.360	0.341	0.360
Wastewater	CSO	0.000	0.000	0.000	0
	Industrial	0.021	0.010	0.009	0.009
	Municipal	0.915	0.336	0.400	0.400
	Subtotal	0.936	0.346	0.409	0.409
	Total	1.599	0.945	0.983	1.011

- The agricultural sector strategies were set to meet basin targets rather than county targets. Therefore, agricultural strategies are likely to overshoot or undershoot county targets, which can be reflected in the total countywide target results.
- Stormwater sector strategies may overshoot the county target for nitrogen (N) to meet the phosphorus (P) target, or vice versa. This is because the N and P reduction targets differ and the same BMP has different effects on the reduction of N and P.

HOWARD Total Phosphorus Loads

		2010 Progress	2017 Interim Strategy	2025 Final Strategy	Final Target
Source Sector	Landuse	Million Lbs/Yr	Million Lbs/Yr	Million Lbs/Yr	Million Lbs/Yr
Agriculture	AFO	0.000	0.000	0.000	0.000
	CAFO	0.000	0.000	0.000	0.000
	Crop	0.005	0.005	0.005	0.005
	Nursery	0.007	0.007	0.007	0.007
	Pasture	0.001	0.001	0.001	0.001
	Subtotal		0.015	0.013	0.013
Forest	Harvested	0.000	0.000	0.000	0.000
	Natural	0.002	0.002	0.002	0.002
	Subtotal	0.002	0.002	0.002	0.002
Non-Tidal Atm	Non-Tidal Atm	0.000	0.000	0.000	0.000
	Subtotal	0.000	0.000	0.000	0.000
Septic	Septic	0.000	0.000	0.000	0.000
	Subtotal	0.000	0.000	0.000	0.000
Stormwater	CSS	0.000	0.000	0.000	0
	Construction	0.002	0.002	0.001	0.002
	Extractive	0.000	0.000	0.000	0.000
	Regulated Developed	0.022	0.020	0.019	0.018
	Subtotal	0.024	0.022	0.020	0.020
Wastewater	CSO	0.000	0.000	0.000	0
	Industrial	0.009	0.002	0.001	0.001
	Municipal	0.043	0.024	0.029	0.029
	Subtotal	0.052	0.026	0.030	0.030
Total		0.092	0.063	0.065	0.065

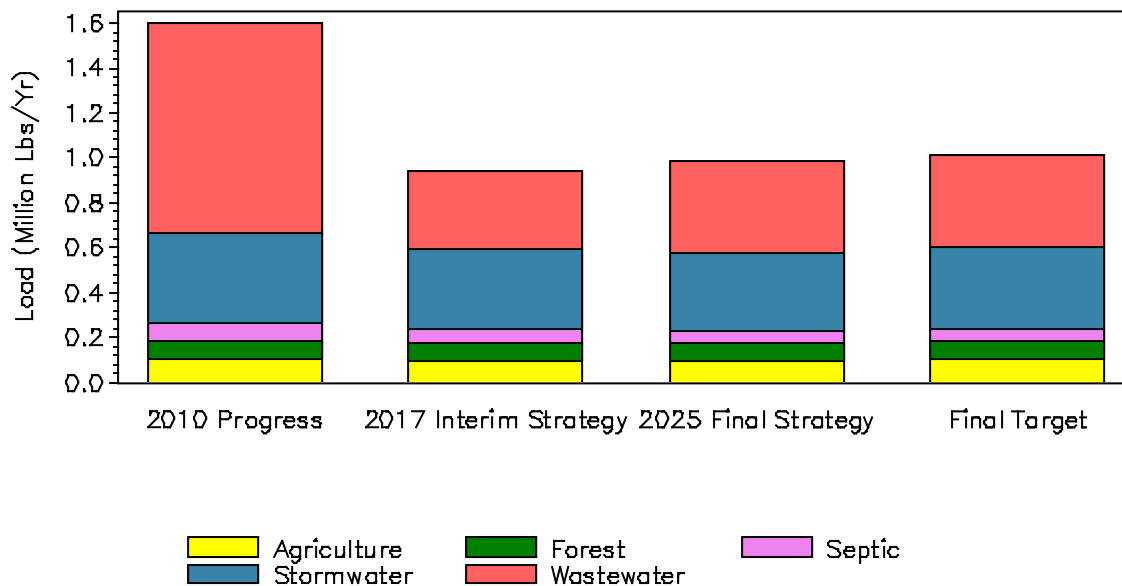
- The agricultural sector strategies were set to meet basin targets rather than county targets. Therefore, agricultural strategies are likely to overshoot or undershoot county targets, which can be reflected in the total countywide target results.
- Stormwater sector strategies may overshoot the county target for nitrogen (N) to meet the phosphorus (P) target, or vice versa. This is because the N and P reduction targets differ and the same BMP has different effects on the reduction of N and P.

HOWARD Total Sediment Loads

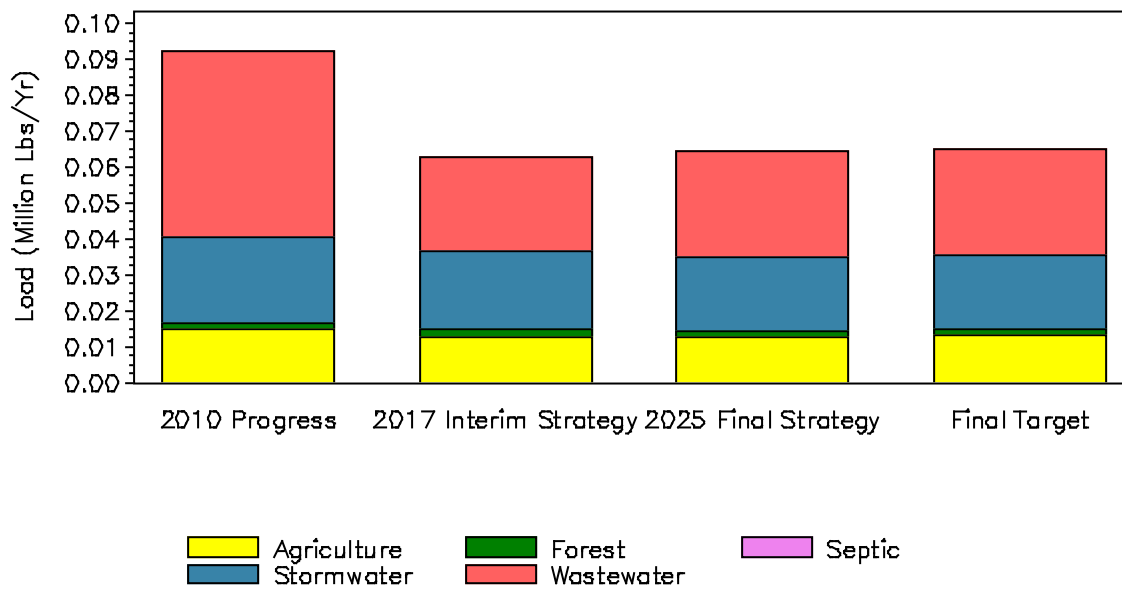
		2010 Progress	2017 Interim Strategy	2025 Final Strategy
Source Sector	Landuse	Million Lbs/Yr	Million Lbs/Yr	Million Lbs/Yr
Agriculture	AFO	0.185	0.185	0.185
	CAFO	0.000	0.000	0.000
	Crop	11.185	10.137	9.942
	Nursery	1.852	1.533	1.496
	Pasture	2.757	2.123	2.018
	Subtotal		15.979	13.978
Forest	Harvested	0.198	0.207	0.207
	Natural	8.256	8.475	8.536
	Subtotal	8.454	8.682	8.743
Non-Tidal Atm	Non-Tidal Atm	0.000	0.000	0.000
	Subtotal	0.000	0.000	0.000
Septic	Septic	0.000	0.000	0.000
	Subtotal	0.000	0.000	0.000
Stormwater	CSS	0.000	0.000	0.000
	Construction	3.588	3.620	2.911
	Extractive	0.101	0.101	0.094
	Regulated Developed	29.232	26.000	23.020
	Subtotal	32.921	29.721	26.025
Wastewater	CSO	0.000	0.000	0.000
	Industrial	0.037	0.051	0.044
	Municipal	0.407	3.020	3.618
	Subtotal	0.444	3.071	3.662
	Total	57.798	55.453	52.070

• The State did not distribute EPA's state and basin targets at the county or sector scale for sediment. Hence a Final Target column is not shown.

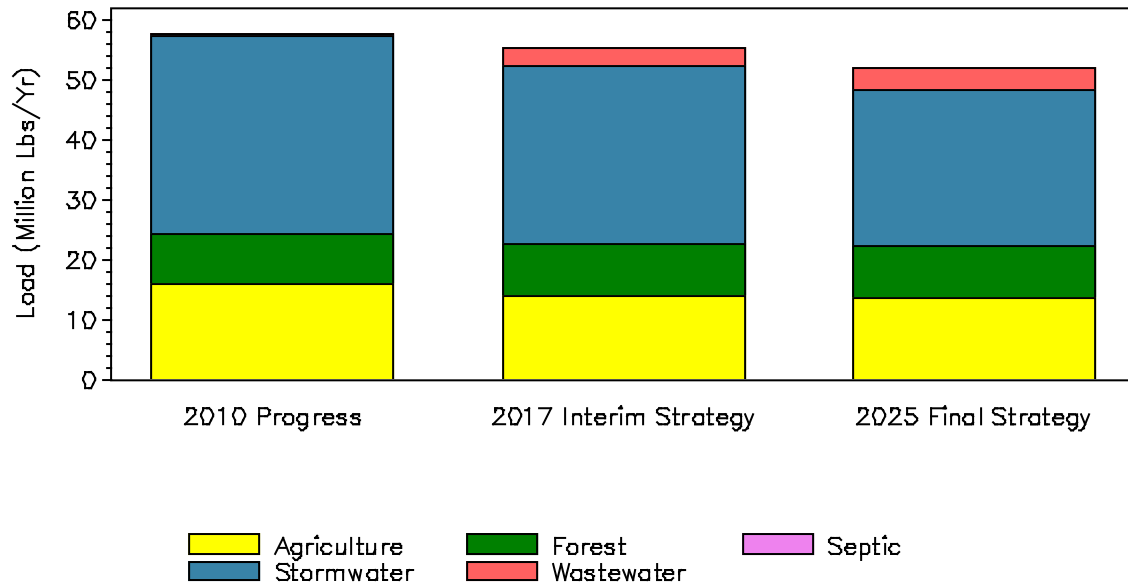
HOWARD
Total Nitrogen Loads



HOWARD
Total Phosphorus Loads



HOWARD
Total Sediment Loads



• The State did not distribute EPA's state and basin targets at the county or sector scale for sediment. Hence a Final Target bar is not shown.

Maryland Phase II WIP Team MAST Submittals

HOWARD Developed Land BMPs

		2010 Progress	2017 WIP Team	2017 Interim Strategy	2025 WIP Team	2025 Final Strategy	Change in 2017 Submittal	Change in 2025 Submittal
BMP Name	Unit							
Bioretention / Raingardens	Acres	0	2,093	2,093	2,092	2,090	0	-2
Bioswale	Acres	0	2,068	2,068	2,126	2,124	0	-2
Dry Detention Ponds and Hydrodynamic Structures	Acres	2,410	1,315	1,315	1,299	1,297	0	-2
Dry Extended Detention Ponds	Acres	1,747	1,400	1,400	1,390	1,388	0	-2
Impervious Urban Surface Reduction	Acres	0	0	0	0	108	0	108
MS4 Permit Stormwater Retrofit	Acres	1,319	9,158	9,158	15,531	15,516	0	-15
Stormwater Management Generic BMP (1985 to 2002)	Acres	17,077	2,406	2,406	2,376	2,360	0	-16
Stormwater Management Generic BMP (2002 to 2010)	Acres	4,114	4,094	4,094	4,078	4,071	0	-7
Urban Filtering Practices	Acres	364	380	380	393	1,776	0	1,383
Urban Forest Buffers	Acres	38	37	37	38	170	0	132
Urban Infiltration Practices	Acres	478	370	370	387	386	0	-0
Urban Tree Planting / Urban Tree Canopy	Acres	0	219	219	467	467	0	0
Vegetated Open Channels	Acres	0	546	546	517	517	0	0
Wet Ponds and Wetlands	Acres	4,292	8,281	8,281	8,263	8,253	0	-9
Erosion and Sediment Control on Construction	Acres/Year	445	721	445	721	721	-276	0
Erosion and Sediment Control on Extractive	Acres/Year	0	0	0	0	19	0	19
Forest Conservation	Acres/Year	4,214	4,217	4,217	4,217	4,224	0	7
Urban Nutrient Management	Acres/Year	11,453	28,169	28,169	28,169	30,077	0	1,907
Street Sweeping Pounds	Lbs/Year	0	470,699	470,699	470,699	470,699	0	0
Urban Stream Restoration / Shoreline Erosion Control	Linear Feet	0	102,951	102,951	184,386	184,386	0	0

- The BMP values represent the total amount of implementation in place.
- The BMP values are the amount credited in the Bay watershed model. It is the amount of BMP submitted minus the amount not given credit for (e.g., due to overlapping with other BMPs)
- Acres of BMPs might be observed to decrease in subsequent scenarios for several reasons:
 - To meet the countywide sector target, the State supplemented the Team scenarios with a generic set of BMPs.
 - Some aspects of the State strategies were automated, such that BMP levels were computed as a percentage of available acres. The application of some BMPs convert the acres of developed land to forest land, or impervious to pervious. This reduces/increases the available acres so that, if the same percentage level of other BMPs is applied to these lands, then a decrease/increase in BMP acreage might be observed even though the implementation level was intended to remain equal.
 - Because the Bay watershed model is not able to account for BMPs that treat overlapping areas (nested BMPs), the acreage available for BMPs can be used up before the Final Target is achieved. In such cases the State gave precedence to the more effective BMPs.
- The columns labeled Team include the State Highway Administration (SHA) strategies as well as 2010 Progress levels for other entities.
- The columns for Interim and Final strategies include numbers for SHA, federal facilities, State lands, industrial facilities, Phase I and II MS4 and non-regulated stormwater where applicable. They also reflect changes made by the State.

HOWARD Septic System BMPs

			2010 Progress	2017 WIP Team	2017 Interim Strategy	2025 WIP Team	2025 Final Strategy	Change in 2017 Submittal	Change in 2025 Submittal
BMP Name	Zone	Unit							
Septic Connection	Outside of the Critical Area, not within 1000 ft of a perennial stream	Systems	0	67	67	67	67	0	0
	Within 1000 ft of a perennial stream	Systems	0	38	38	38	38	0	0
Septic ConnectionTotal			0	105	105	105	105	0	0
Septic Denitrification	Critical Area	Systems	0	0	0	0	0	0	0
	Outside of the Critical Area, not within 1000 ft of a perennial stream	Systems	36	36	36	36	36	0	0
	Within 1000 ft of a perennial stream	Systems	20	4,149	4,149	6,412	6,487	0	75
Septic DenitrificationTotal			57	4,185	4,185	6,448	6,523	0	75
Septic Pumping	Outside of the Critical Area, not within 1000 ft of a perennial stream	Systems	0	12,045	12,045	12,714	12,714	0	0
	Within 1000 ft of a perennial stream	Systems	0	6,789	6,789	7,166	7,166	0	0
Septic PumpingTotal			0	18,834	18,834	19,880	19,880	0	0

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Maryland Phase II WIP Team MAST Submittals

HOWARD Total Nitrogen Loads

		2010 Progress	2017 WIP Team	2017 Interim Strategy	2025 WIP Team	2025 Final Strategy	Final Target
Source Sector	Landuse	Million Lbs/Yr	Million Lbs/Yr	Million Lbs/Yr	Million Lbs/Yr	Million Lbs/Yr	Million Lbs/Yr
Stormwater	CSS	0.000	0.000	0.000	0.000	0.000	0
	Construction	0.010	0.009	0.010	0.009	0.009	0.010
	Extractive	0.001	0.001	0.001	0.001	0.001	0.001
	Regulated Developed	0.387	0.351	0.349	0.338	0.332	0.349
	Subtotal	0.398	0.361	0.360	0.347	0.341	0.360
Septic	Septic	0.079	0.065	0.065	0.059	0.059	0.059
	Subtotal	0.079	0.065	0.065	0.059	0.059	0.059

- The columns labeled Team include the State Highway Administration (SHA) strategies as well as 2010 Progress levels for other entities.
- The columns for Interim and Final strategies include numbers for SHA, federal facilities, State lands, industrial facilities, Phase I and II MS4 and non-regulated stormwater where applicable. They also reflect changes made by the State.

HOWARD Total Phosphorus Loads

		2010 Progress	2017 WIP Team	2017 Interim Strategy	2025 WIP Team	2025 Final Strategy	Final Target
Source Sector	Landuse	Million Lbs/Yr	Million Lbs/Yr	Million Lbs/Yr	Million Lbs/Yr	Million Lbs/Yr	Million Lbs/Yr
Stormwater	CSS	0.000	0.000	0.000	0.000	0.000	0
	Construction	0.002	0.001	0.002	0.001	0.001	0.002
	Extractive	0.000	0.000	0.000	0.000	0.000	0.000
	Regulated Developed	0.022	0.020	0.020	0.019	0.019	0.018
	Subtotal	0.024	0.022	0.022	0.021	0.020	0.020
Septic	Septic	0.000	0	0.000	0	0.000	0.000
	Subtotal	0.000	0	0.000	0	0.000	0.000

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- The columns for Interim and Final strategies include numbers for SHA, federal facilities, State lands, industrial facilities, Phase I and II MS4 and non-regulated stormwater where applicable. They also reflect changes made by the State.

HOWARD Total Sediment Loads

		2010 Progress	2017 WIP Team	2017 Interim Strategy	2025 WIP Team	2025 Final Strategy
Source Sector	Landuse	Million Lbs/Yr	Million Lbs/Yr	Million Lbs/Yr	Million Lbs/Yr	Million Lbs/Yr
Stormwater	CSS	0.000	0.000	0.000	0.000	0.000
	Construction	3.588	2.859	3.620	2.859	2.911
	Extractive	0.101	0.101	0.101	0.101	0.094
	Regulated Developed	29.232	25.803	26.000	23.088	23.020
	Subtotal	32.921	28.762	29.721	26.047	26.025
Septic	Septic	0.000	0	0.000	0	0.000
	Subtotal	0.000	0	0.000	0	0.000

- The columns labeled Team include the State Highway Administration (SHA) strategies as well as 2010 Progress levels for other entities.
- The columns for Interim and Final strategies include numbers for SHA, federal facilities, State lands, industrial facilities, Phase I and II MS4 and non-regulated stormwater where applicable. They also reflect changes made by the State.