

## Maryland Phase II WIP Strategies

### HARFORD Agriculture - Annual Practices

		2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	Unit			
Conservation Tillage	Acres/Year	29,872	26,525	26,502
Cover Crop	Acres/Year	5,380	11,799	12,000
Cropland Irrigation Management	Acres/Year	0	423	423
Dairy Manure Incorporation	Acres/Year	0	1,200	2,000
Nutrient Management (All forms)	Acres/Year	33,611	49,712	48,585
Soil Conservation and Water Quality Plans	Acres/Year	32,191	45,261	50,505

- 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)

### HARFORD Agriculture - Additional BMPs

		2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	Unit			
Barnyard Runoff Control	Acres	130	130	130
Forest Buffers	Acres	871	895	911
Grass Buffers / Vegetated Open Channel	Acres	165	186	199
Horse Pasture Management	Acres	0	33	55
Irrigation Water Capture Reuse	Acres	0	45	75
Land Retirement	Acres	565	3,563	5,597
Loafing Lot Management	Acres	0	0	0
Off Stream Watering Without Fencing	Acres	7,453	7,963	8,303
Precision Intensive Rotational Grazing	Acres	0	91	151
Prescribed Grazing	Acres	69	601	1,000
Stream Access Control with Fencing	Acres	31	47	47
Tree Planting / Vegetative Environmental Buffers	Acres	745	745	745
Water Control Structures	Acres	4	3	3
Wetland Restoration	Acres	105	111	115
Non Urban Stream Restoration / Shoreline Erosion Control	Linear Feet	0	1,200	2,000

- 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.

## HARFORD Forest BMPs

			2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	Zone	Unit			
Forest Harvesting Practices	harvested forest	Acres	1,160	1,160	1,160

- 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)

## HARFORD Developed Land BMPs

		2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	Unit			
Bioretention / Raingardens	Acres	0	6	6
Bioswale	Acres	0	30	82
Dry Detention Ponds and Hydrodynamic Structures	Acres	7,401	6,980	6,803
Dry Extended Detention Ponds	Acres	2,938	2,797	2,725
Impervious Urban Surface Reduction	Acres	0	732	2,973
MS4 Permit Stormwater Retrofit	Acres	1,325	1,425	1,436
Stormwater Management Generic BMP (1985 to 2002)	Acres	4,451	4,544	4,419
Stormwater Management Generic BMP (2002 to 2010)	Acres	5,882	5,593	5,448
Urban Filtering Practices	Acres	155	7,414	38,609
Urban Forest Buffers	Acres	6	2,209	3,949
Urban Infiltration Practices	Acres	962	961	956
Urban Tree Planting / Urban Tree Canopy	Acres	0	190	405
Vegetated Open Channels	Acres	0	477	451
Wet Ponds and Wetlands	Acres	3,042	3,064	2,981
Erosion and Sediment Control on Construction	Acres/Year	1,648	1,648	2,471
Erosion and Sediment Control on Extractive	Acres/Year	0	0	269
Forest Conservation	Acres/Year	5,592	5,629	5,818
Urban Nutrient Management	Acres/Year	11,750	32,529	48,165
Street Sweeping Pounds	Lbs/Year	0	415,820	415,820
Urban Stream Restoration / Shoreline Erosion Control	Linear Feet	0	2,614	4,378

- 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)

## HARFORD Septic System BMPs

			2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	Zone	Unit			
Septic Denitrification	Critical Area	Systems	1	162	270
	Outside of the Critical Area, not within 1000 ft of a perennial stream	Systems	80	80	12,710
	Within 1000 ft of a perennial stream	Systems	43	43	9,964
	<b><i>Septic Denitrification Total</i></b>		<b>124</b>	<b>285</b>	<b>22,944</b>

- 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

### HARFORD 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	0.007	0.003	0.003	0.003
	CAFO	0.000	0.000	0.000	0.000
	Crop	0.720	0.579	0.533	0.440
	Nursery	0.035	0.027	0.022	0.032
	Pasture	0.113	0.109	0.111	0.086
	<b>Subtotal</b>		<b>0.875</b>	<b>0.718</b>	<b>0.668</b>
Forest	Harvested	0.017	0.018	0.018	0.018
	Natural	0.413	0.424	0.430	0.412
	<b>Subtotal</b>	<b>0.430</b>	<b>0.442</b>	<b>0.448</b>	<b>0.429</b>
Non-Tidal Atm	Non-Tidal Atm	0.035	0.035	0.035	0.035
	<b>Subtotal</b>	<b>0.035</b>	<b>0.035</b>	<b>0.035</b>	<b>0.035</b>
Septic	Septic	0.177	0.175	0.103	0.104
	<b>Subtotal</b>	<b>0.177</b>	<b>0.175</b>	<b>0.103</b>	<b>0.104</b>
Stormwater	CSS	0.000	0.000	0.000	0
	Construction	0.051	0.051	0.046	0.048
	Extractive	0.004	0.004	0.003	0.003
	Regulated Developed	0.704	0.610	0.444	0.493
	<b>Subtotal</b>	<b>0.759</b>	<b>0.665</b>	<b>0.493</b>	<b>0.544</b>
Wastewater	CSO	0.000	0.000	0.000	0
	Industrial	0.041	0.024	0.015	0.015
	Municipal	0.473	0.245	0.401	0.400
	<b>Subtotal</b>	<b>0.514</b>	<b>0.269</b>	<b>0.416</b>	<b>0.416</b>
<b>Total</b>		<b>2.789</b>	<b>2.303</b>	<b>2.163</b>	<b>2.089</b>

- 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.

## HARFORD 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	0.001	0.000	0.000	0.000
	CAFO	0.000	0.000	0.000	0.000
	Crop	0.033	0.029	0.028	0.024
	Nursery	0.008	0.006	0.005	0.007
	Pasture	0.007	0.007	0.008	0.005
	<b>Subtotal</b>		<b>0.050</b>	<b>0.043</b>	<b>0.041</b>
Forest	Harvested	0.000	0.000	0.000	0.000
	Natural	0.009	0.009	0.009	0.009
	<b>Subtotal</b>	<b>0.009</b>	<b>0.009</b>	<b>0.009</b>	<b>0.009</b>
Non-Tidal Atm	Non-Tidal Atm	0.002	0.002	0.002	0.002
	<b>Subtotal</b>	<b>0.002</b>	<b>0.002</b>	<b>0.002</b>	<b>0.002</b>
Septic	Septic	0.000	0.000	0.000	0.000
	<b>Subtotal</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
Stormwater	CSS	0.000	0.000	0.000	0
	Construction	0.008	0.008	0.007	0.007
	Extractive	0.001	0.001	0.000	0.001
	Regulated Developed	0.036	0.031	0.020	0.019
	<b>Subtotal</b>	<b>0.045</b>	<b>0.039</b>	<b>0.027</b>	<b>0.026</b>
Wastewater	CSO	0.000	0.000	0.000	0
	Industrial	0.007	0.002	0.001	0.001
	Municipal	0.037	0.019	0.030	0.030
	<b>Subtotal</b>	<b>0.045</b>	<b>0.020</b>	<b>0.031</b>	<b>0.031</b>
<b>Total</b>		<b>0.150</b>	<b>0.114</b>	<b>0.111</b>	<b>0.106</b>

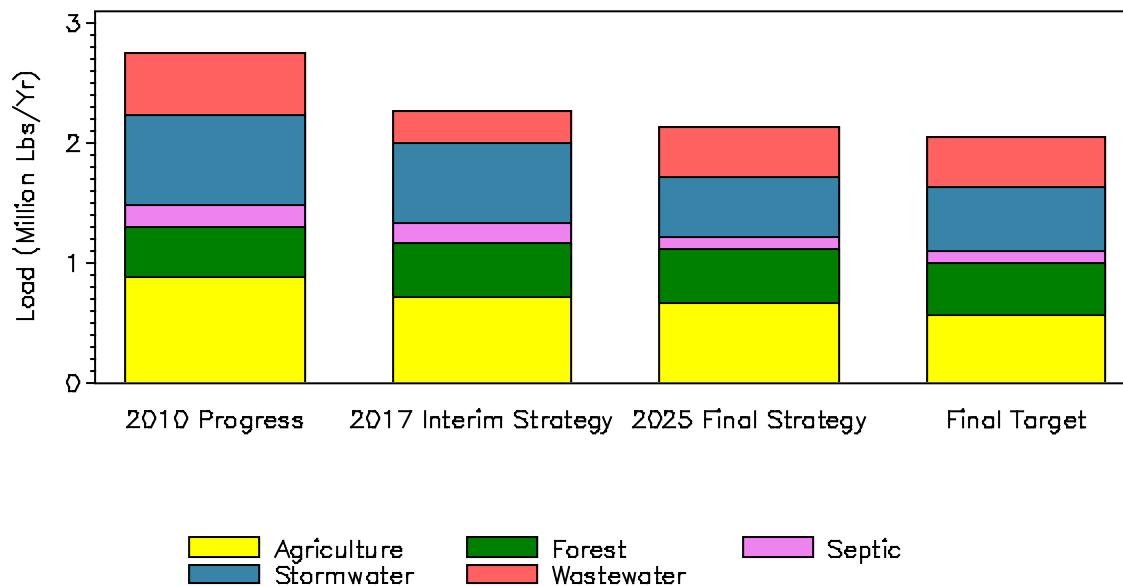
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## HARFORD Total Sediment Loads

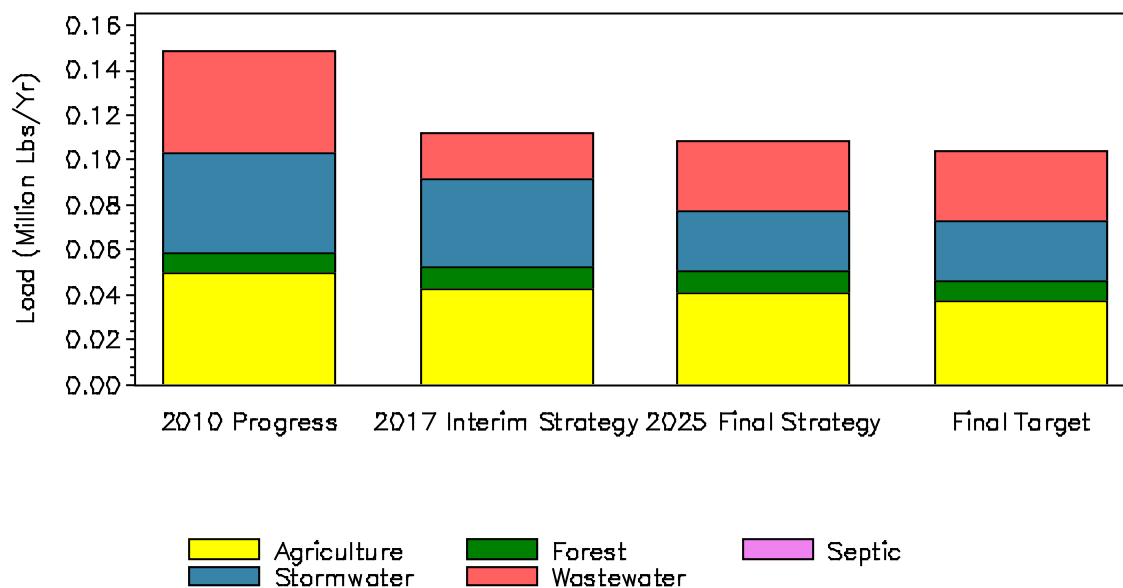
		2010 Progress	2017 Interim Strategy	2025 Final Strategy
Source Sector	Landuse	Million Lbs/Yr	Million Lbs/Yr	Million Lbs/Yr
Agriculture	AFO	0.087	0.088	0.088
	CAFO	0.000	0.000	0.000
	Crop	47.655	42.752	40.167
	Nursery	0.202	0.178	0.175
	Pasture	1.790	2.013	2.216
	<b>Subtotal</b>		<b>49.735</b>	<b>45.031</b>
Forest	Harvested	0.644	0.760	0.760
	Natural	15.361	15.870	16.112
	<b>Subtotal</b>	<b>16.005</b>	<b>16.631</b>	<b>16.872</b>
Non-Tidal Atm	Non-Tidal Atm	0.000	0.000	0.000
	<b>Subtotal</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
Septic	Septic	0.000	0.000	0.000
	<b>Subtotal</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
Stormwater	CSS	0.000	0.000	0.000
	Construction	14.206	14.429	11.960
	Extractive	0.555	0.555	0.370
	Regulated Developed	27.832	23.282	12.335
	<b>Subtotal</b>	<b>42.593</b>	<b>38.265</b>	<b>24.665</b>
Wastewater	CSO	0.000	0.000	0.000
	Industrial	0.051	0.063	0.063
	Municipal	0.336	1.848	3.032
	<b>Subtotal</b>	<b>0.387</b>	<b>1.910</b>	<b>3.095</b>
	<b>Total</b>	<b>108.720</b>	<b>101.837</b>	<b>87.278</b>

• 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.

HARFORD  
Total Nitrogen Loads

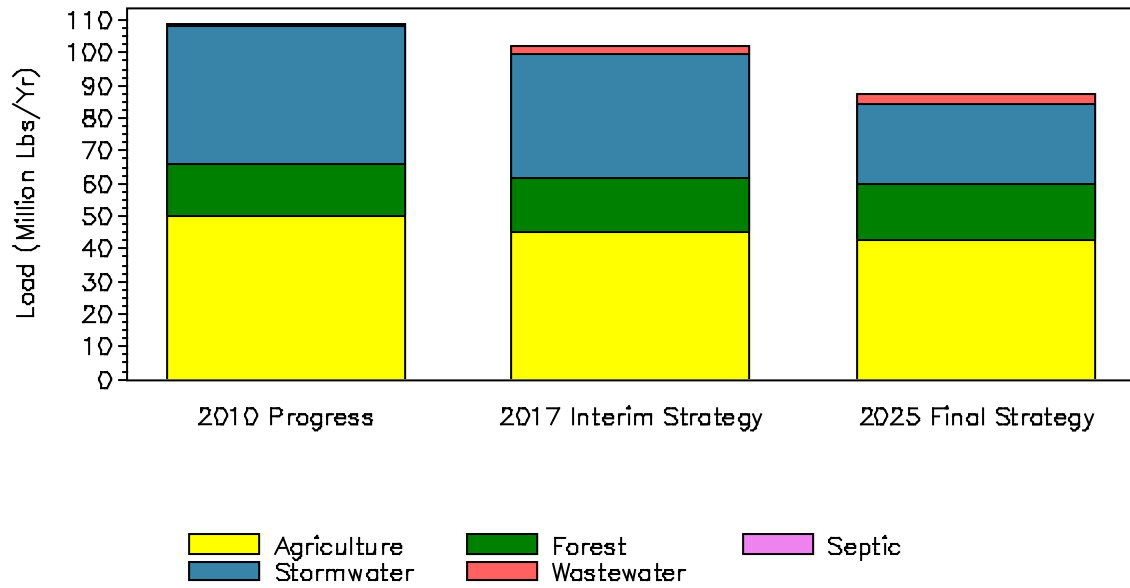


HARFORD  
Total Phosphorus Loads





HARFORD  
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

### HARFORD 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	6	6	6	6	0	0
Bioswale	Acres	0	30	30	82	82	0	0
Dry Detention Ponds and Hydrodynamic Structures	Acres	7,401	7,202	6,980	7,188	6,803	-222	-385
Dry Extended Detention Ponds	Acres	2,938	2,885	2,797	2,878	2,725	-88	-153
Impervious Urban Surface Reduction	Acres	0	0	732	0	2,973	732	2,973
MS4 Permit Stormwater Retrofit	Acres	1,325	1,464	1,425	1,505	1,436	-40	-69
Stormwater Management Generic BMP (1985 to 2002)	Acres	4,451	4,677	4,544	4,651	4,419	-133	-232
Stormwater Management Generic BMP (2002 to 2010)	Acres	5,882	5,768	5,593	5,754	5,448	-175	-306
Urban Filtering Practices	Acres	155	189	7,414	198	38,609	7,225	38,411
Urban Forest Buffers	Acres	6	7	2,209	7	3,949	2,202	3,942
Urban Infiltration Practices	Acres	962	990	961	1,006	956	-29	-50
Urban Tree Planting / Urban Tree Canopy	Acres	0	190	190	405	405	0	0
Vegetated Open Channels	Acres	0	477	477	451	451	0	0
Wet Ponds and Wetlands	Acres	3,042	3,155	3,064	3,140	2,981	-91	-158
Erosion and Sediment Control on Construction	Acres/Year	1,648	1,648	1,648	1,648	2,471	0	823
Erosion and Sediment Control on Extractive	Acres/Year	0	0	0	0	269	0	269
Forest Conservation	Acres/Year	5,592	5,561	5,629	5,561	5,818	69	258
Urban Nutrient Management	Acres/Year	11,750	11,162	32,529	11,162	48,165	21,367	37,003
Street Sweeping Pounds	Lbs/Year	0	415,820	415,820	415,820	415,820	0	0
Urban Stream Restoration / Shoreline Erosion Control	Linear Feet	0	2,614	2,614	4,378	4,378	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.

## HARFORD 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 Denitrification	Critical Area	Systems	1	1	162	1	270	161	269
	Outside of the Critical Area, not within 1000 ft of a perennial stream	Systems	80	80	80	80	12,710	0	12,629
	Within 1000 ft of a perennial stream	Systems	43	43	43	43	9,964	0	9,921
<b>Septic Denitrification Total</b>			<b>124</b>	<b>124</b>	<b>285</b>	<b>124</b>	<b>22,944</b>	<b>161</b>	<b>22,820</b>

- 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 Team MAST Submittals

### HARFORD 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	0.051	0.051	0.051	0.051	0.046	0.048
	Extractive	0.004	0.004	0.004	0.004	0.003	0.003
	Regulated Developed	0.704	0.701	0.610	0.696	0.444	0.493
	<b>Subtotal</b>	<b>0.759</b>	<b>0.756</b>	<b>0.665</b>	<b>0.751</b>	<b>0.493</b>	<b>0.544</b>
Septic	Septic	0.177	0.177	0.175	0.177	0.103	0.104
	<b>Subtotal</b>	<b>0.177</b>	<b>0.177</b>	<b>0.175</b>	<b>0.177</b>	<b>0.103</b>	<b>0.104</b>

- 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.

### HARFORD 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	0.008	0.008	0.008	0.008	0.007	0.007
	Extractive	0.001	0.001	0.001	0.001	0.000	0.001
	Regulated Developed	0.036	0.036	0.031	0.036	0.020	0.019
	<b>Subtotal</b>	<b>0.045</b>	<b>0.044</b>	<b>0.039</b>	<b>0.044</b>	<b>0.027</b>	<b>0.026</b>
Septic	Septic	0.000	0	0.000	0	0.000	0.000
	<b>Subtotal</b>	<b>0.000</b>	<b>0</b>	<b>0.000</b>	<b>0</b>	<b>0.000</b>	<b>0.000</b>

- 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.

## HARFORD 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	14.206	14.206	14.429	14.206	11.960
	Extractive	0.555	0.555	0.555	0.555	0.370
	Regulated Developed	27.832	27.056	23.282	26.762	12.335
	<b>Subtotal</b>	<b>42.593</b>	<b>41.817</b>	<b>38.265</b>	<b>41.523</b>	<b>24.665</b>
Septic	Septic	0.000	0	0.000	0	0.000
	<b>Subtotal</b>	<b>0.000</b>	<b>0</b>	<b>0.000</b>	<b>0</b>	<b>0.000</b>

- 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.