Maryland Phase II WIP Strategies

CHARLES
Agriculture - Annual Practices

		2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	**Unit**			
Conservation Tillage	Acres/Year	7,633	6,991	6,991
Cover Crop	Acres/Year	3,821	6,575	6,687
Cropland Irrigation Management	Acres/Year	0	623	623
Dairy Manure Incorporation	Acres/Year	0	30	50
Nutrient Management (All forms)	Acres/Year	14,191	26,557	27,125
Poultry Litter Incorporation	Acres/Year	0	91	151
Soil Conservation and Water Quality Plans	Acres/Year	14,611	23,429	26,145

• 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)

CHARLES
Agriculture - Additional BMPs

		2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	**Unit**			
Barnyard Runoff Control	Acres	17	30	40
Forest Buffers	Acres	475	475	475
Grass Buffers / Vegetated Open Channel	Acres	495	514	527
Horse Pasture Management	Acres	0	69	115
Irrigation Water Capture Reuse	Acres	0	13	13
Land Retirement	Acres	708	722	888
Loafing Lot Management	Acres	0	2	3
Off Stream Watering Without Fencing	Acres	277	310	332
Prescribed Grazing	Acres	10	144	240
Stream Access Control with Fencing	Acres	11	11	11
Tree Planting / Vegetative Environmental Buffers	Acres	82	82	82
Wetland Restoration	Acres	82	88	92
Non Urban Stream Restoration / Shoreline Erosion Control	Linear Feet	0	1,320	2,200

• 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.

CHARLES
Forest BMPs

			2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	**Zone**	**Unit**			
Forest Harvesting Practices	harvested forest	Acres	1,735	1,710	1,710

• 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)

CHARLES
Developed Land BMPs

		2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	**Unit**			
Bioretention / Raingardens	Acres	0	4	4
Bioswale	Acres	0	18	47
Dry Detention Ponds and Hydrodynamic Structures	Acres	2,541	2,501	2,464
Dry Extended Detention Ponds	Acres	248	304	297
Impervious Urban Surface Reduction	Acres	0	466	1,608
MS4 Permit Stormwater Retrofit	Acres	475	567	585
Stormwater Management Generic BMP (1985 to 2002)	Acres	4,602	4,553	4,484
Stormwater Management Generic BMP (2002 to 2010)	Acres	2,731	2,674	2,633
Urban Filtering Practices	Acres	170	1,916	11,036
Urban Forest Buffers	Acres	27	630	1,122
Urban Infiltration Practices	Acres	479	494	498
Urban Tree Planting / Urban Tree Canopy	Acres	0	115	245
Vegetated Open Channels	Acres	0	277	262
Wet Ponds and Wetlands	Acres	3,813	3,707	3,653
Erosion and Sediment Control on Construction	Acres/Year	4,626	4,626	4,626
Erosion and Sediment Control on Extractive	Acres/Year	0	0	325
Forest Conservation	Acres/Year	6,357	6,262	6,456
Urban Nutrient Management	Acres/Year	7,399	18,771	18,004
Street Sweeping Pounds	Lbs/Year	0	221,002	221,002
Urban Stream Restoration / Shoreline Erosion Control	Linear Feet	0	1,389	2,327

• 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)

CHARLES
Septic System BMPs

			2010 Progress	2017 Interim Strategy	2025 Final Strategy
BMP Name	**Zone**	**Unit**			
Septic Denitrification	Critical Area	Systems	3	740	1,233
	Outside of the Critical Area, not within 1000 ft of a perennial stream	Systems	44	44	3,722
	Within 1000 ft of a perennial stream	Systems	26	26	9,441
	Septic DenitrificationTotal		***73***	***809***	***14,396***

• 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

CHARLES
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	0.005	0.001	0.001	0.003
	CAFO	0.000	0.000	0.000	0.000
	Crop	0.203	0.179	0.176	0.149
	Nursery	0.002	0.000	0.000	0.001
	Pasture	0.017	0.015	0.015	0.014
	Subtotal	***0.227***	***0.196***	***0.193***	***0.167***
Forest	Harvested	0.015	0.015	0.015	0.018
	Natural	0.317	0.323	0.324	0.319
	Subtotal	***0.332***	***0.338***	***0.339***	***0.337***
Non-Tidal Atm	Non-Tidal Atm	0.011	0.011	0.011	0.011
	Subtotal	***0.011***	***0.011***	***0.011***	***0.011***
Septic	Septic	0.184	0.177	0.123	0.124
	Subtotal	***0.184***	***0.177***	***0.123***	***0.124***
Stormwater	CSS	0.000	0.000	0.000	0
	Construction	0.044	0.044	0.044	0.049
	Extractive	0.004	0.004	0.004	0.004
	Regulated Developed	0.191	0.164	0.142	0.155
	Subtotal	***0.239***	***0.212***	***0.190***	***0.208***
Wastewater	CSO	0.000	0.000	0.000	0
	Industrial	0.168	0.135	0.107	0.107
	Municipal	0.136	0.167	0.240	0.240
	Subtotal	***0.304***	***0.302***	***0.347***	***0.347***
	Total	***1.298***	***1.236***	***1.203***	***1.194***

• 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.

CHARLES
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	0.018	0.016	0.016	0.014
	Nursery	0.001	0.000	0.000	0.001
	Pasture	0.003	0.002	0.002	0.002
	Subtotal	***0.023***	***0.019***	***0.019***	***0.018***
Forest	Harvested	0.000	0.001	0.001	0.001
	Natural	0.011	0.011	0.011	0.011
	Subtotal	***0.011***	***0.011***	***0.012***	***0.011***
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	0.000	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	0.012	0.012	0.012	0.014
	Extractive	0.001	0.001	0.001	0.001
	Regulated Developed	0.022	0.019	0.016	0.014
	Subtotal	***0.035***	***0.033***	***0.029***	***0.029***
Wastewater	CSO	0.000	0.000	0.000	0
	Industrial	0.015	0.008	0.007	0.007
	Municipal	0.004	0.009	0.013	0.013
	Subtotal	***0.019***	***0.017***	***0.020***	***0.020***
	Total	***0.089***	***0.081***	***0.080***	***0.079***

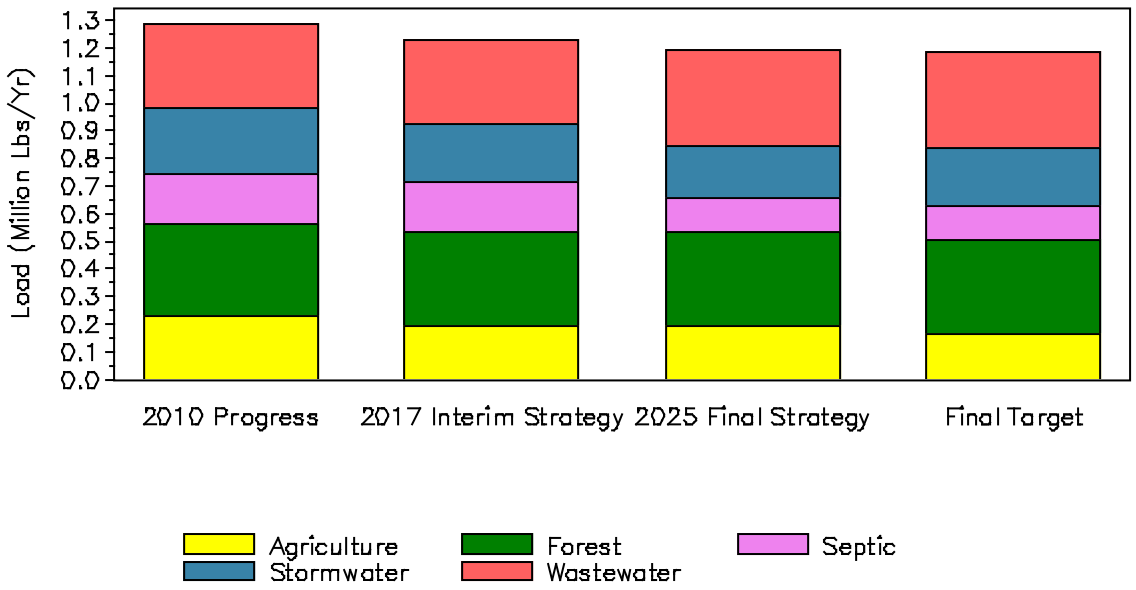
• The agricultural sector strategies were set to meet basin targets rather than county targets. Therefore, agricultural strategies are likely to overshoot or undershoot county targets, which can be reflected in the total countywide target results.
• Stormwater sector strategies may overshoot the county 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.

CHARLES
Total Sediment Loads

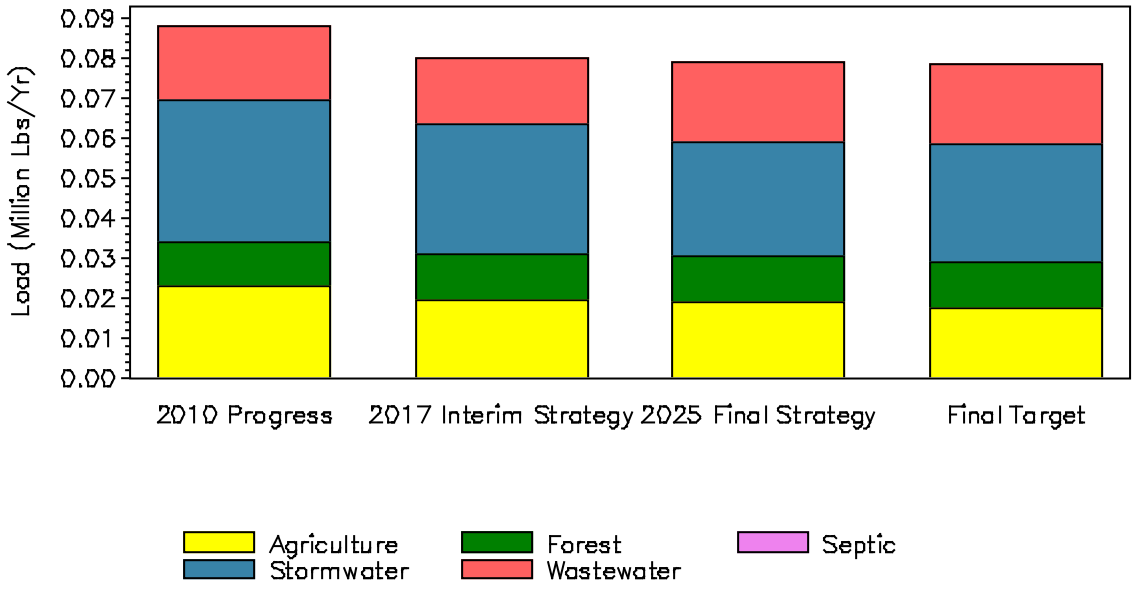
		2010 Progress	2017 Interim Strategy	2025 Final Strategy
Source Sector	**Landuse**	**Million Lbs/Yr**	**Million Lbs/Yr**	**Million Lbs/Yr**
Agriculture	AFO	0.031	0.029	0.027
	CAFO	0.000	0.000	0.000
	Crop	21.830	20.394	19.967
	Nursery	0.006	0.006	0.006
	Pasture	0.243	0.215	0.212
	Subtotal	***22.111***	***20.643***	***20.211***
Forest	Harvested	0.337	0.350	0.350
	Natural	7.651	7.786	7.814
	Subtotal	***7.988***	***8.136***	***8.164***
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	6.636	6.766	6.766
	Extractive	0.721	0.721	0.578
	Regulated Developed	6.871	5.911	4.400
	Subtotal	***14.227***	***13.397***	***11.744***
Wastewater	CSO	0.000	0.000	0.000
	Industrial	0.439	0.587	0.607
	Municipal	0.053	1.235	1.771
	Subtotal	***0.492***	***1.821***	***2.378***
	Total	***44.818***	***43.998***	***42.497***

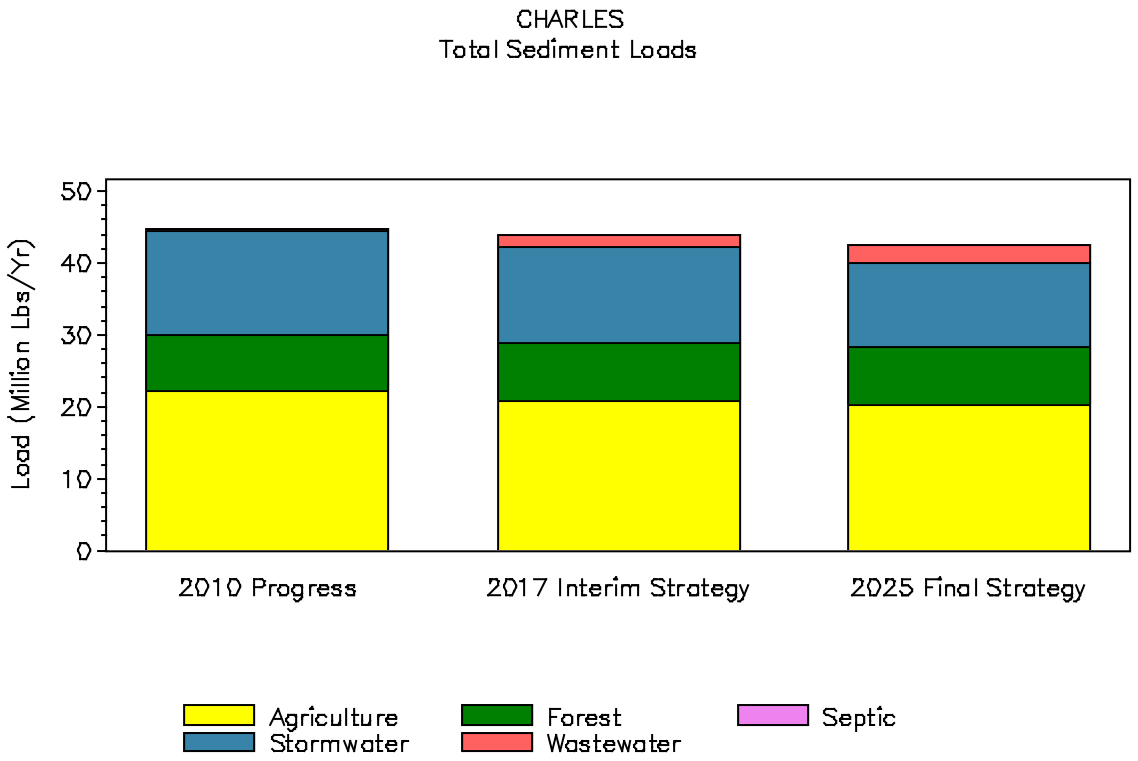
• The State did not distribute EPA's state and basin targets at the county or sector scale for sediment. Hence a Final Target column is not shown.

CHARLES
Total Nitrogen Loads



CHARLES
Total Phosphorus 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

CHARLES
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	4	4	3	4	0	0
Bioswale	Acres	0	18	18	47	47	0	-0
Dry Detention Ponds and Hydrodynamic Structures	Acres	2,541	2,537	2,501	2,529	2,464	-36	-65
Dry Extended Detention Ponds	Acres	248	307	304	303	297	-4	-6
Impervious Urban Surface Reduction	Acres	0	0	466	0	1,608	466	1,608
MS4 Permit Stormwater Retrofit	Acres	475	574	567	598	585	-7	-12
Stormwater Management Generic BMP (1985 to 2002)	Acres	4,602	4,618	4,553	4,602	4,484	-65	-118
Stormwater Management Generic BMP (2002 to 2010)	Acres	2,731	2,711	2,674	2,703	2,633	-37	-70
Urban Filtering Practices	Acres	170	185	1,916	190	11,036	1,731	10,846
Urban Forest Buffers	Acres	27	26	630	26	1,122	604	1,096
Urban Infiltration Practices	Acres	479	501	494	511	498	-7	-12
Urban Tree Planting / Urban Tree Canopy	Acres	0	115	115	245	245	0	0
Vegetated Open Channels	Acres	0	277	277	262	262	0	-0
Wet Ponds and Wetlands	Acres	3,813	3,761	3,707	3,751	3,653	-54	-98
Erosion and Sediment Control on Construction	Acres/Year	4,626	4,626	4,626	4,626	4,626	0	-0
Erosion and Sediment Control on Extractive	Acres/Year	0	0	0	0	325	0	325
Forest Conservation	Acres/Year	6,357	6,176	6,262	6,176	6,456	86	280
Urban Nutrient Management	Acres/Year	7,399	7,010	18,771	7,010	18,004	11,761	10,994
Street Sweeping Pounds	Lbs/Year	0	221,002	221,002	221,002	221,002	0	0
Urban Stream Restoration / Shoreline Erosion Control	Linear Feet	0	1,389	1,389	2,327	2,327	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 intedend 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 precedance 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.

CHARLES
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	3	3	740	3	1,233	736	1,229
	Outside of the Critical Area, not within 1000 ft of a perennial stream	Systems	44	44	44	44	3,722	0	3,679
	Within 1000 ft of a perennial stream	Systems	26	26	26	26	9,441	0	9,415
	Septic DenitrificationTotal		***73***	***73***	***809***	***73***	***14,396***	***736***	***14,324***

• 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

CHARLES
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	0.044	0.044	0.044	0.044	0.044	0.049
	Extractive	0.004	0.004	0.004	0.004	0.004	0.004
	Regulated Developed	0.191	0.189	0.164	0.188	0.142	0.155
	Subtotal	***0.239***	***0.238***	***0.212***	***0.236***	***0.190***	***0.208***
Septic	Septic	0.184	0.184	0.177	0.184	0.123	0.124
	Subtotal	***0.184***	***0.184***	***0.177***	***0.184***	***0.123***	***0.124***

• 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.

CHARLES
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	0.012	0.012	0.012	0.012	0.012	0.014
	Extractive	0.001	0.001	0.001	0.001	0.001	0.001
	Regulated Developed	0.022	0.022	0.019	0.022	0.016	0.014
	Subtotal	***0.035***	***0.035***	***0.033***	***0.035***	***0.029***	***0.029***
Septic	Septic	0.000	0	0.000	0	0.000	0.000
	Subtotal	***0.000***	***0***	***0.000***	***0***	***0.000***	***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.

CHARLES
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	6.636	6.636	6.766	6.636	6.766
	Extractive	0.721	0.721	0.721	0.721	0.578
	Regulated Developed	6.871	6.511	5.911	6.454	4.400
	Subtotal	***14.227***	***13.867***	***13.397***	***13.811***	***11.744***
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.