

Executive Summary

The *Sugarland Run and Horsepen Creek Watershed Management Plan* presents a strategy for preserving healthy ecosystems and improving the streams and natural environment within the watersheds. This plan was initiated by Fairfax County and developed with input from residents of these watersheds as part of a county-wide planning effort.

Background

The Sugarland Run and Horsepen Creek watersheds are located in northern Virginia, straddling the Fairfax and Loudoun County boundary. Both watersheds are located within the larger Chesapeake Bay watershed. Sugarland Run drains directly into the Potomac River and Horsepen Creek drains into Broad Run in Loudoun County, which drains into the Potomac River just upstream of the Sugarland Run outlet.

In 1900 Fairfax County was largely agricultural, with dairy farming being the most important single industry. The population was just over 12,000. Beginning in the early 1940s, the County's economy shifted from agriculture to largely commercial. After World War II the population grew rapidly from roughly 50,000 to 500,000. In the 1970s the population of Fairfax grew to almost 900,000 residents, driven by technology-based businesses which were less dependent on urban centers than conventional industry, resulting in suburban expansion (Fairfax County, 2001). Today, Fairfax County is the most populous jurisdiction in Virginia as well as the Washington D.C. metropolitan area. The 2005 population was estimated at 1,047,500 and included 387,700 households (Fairfax County, 2006a). Most of the population expansion and associated development in Fairfax County occurred prior to the development and implementation of stormwater regulations that were promulgated to prevent flooding and protect water quality.



Figure ES.1 Sugarland Run & Horsepen Creek

Today, Fairfax County is the most populous jurisdiction in Virginia as well as the Washington D.C. metropolitan area. The 2005 population was estimated at 1,047,500 and included 387,700 households (Fairfax County, 2006a). Most of the population expansion and associated development in Fairfax County occurred prior to the development and implementation of stormwater regulations that were promulgated to prevent flooding and protect water quality.

The Sugarland Run and Horsepen Creek Watershed Management Plan was developed in response to the watersheds' rapid growth and need for updated stormwater and overall watershed management. This plan presents issues affecting the quality of the watersheds, builds on previous management efforts and presents a comprehensive strategy for mitigating and reducing the impacts of development.

Purpose

Fairfax County has developed three primary goals to guide the progress of all county watershed management plans in the second phase of plan development. These goals were drafted by Fairfax County staff based on the goals and visions conceived by the watershed steering committees and watershed planning teams during the completion of the initial phase of watershed management plans. The countywide watershed planning goals are to:

- 1) Improve and maintain watershed functions in Fairfax County, including water quality, habitat and hydrology.
- 2) Protect human health, safety and property by reducing stormwater impacts.
- 3) Involve stakeholders in the protection, maintenance and restoration of county watersheds.

The *Sugarland Run and Horsepen Creek Watershed Management Plan* provides a plan of action to meet these goals by identifying watershed impairments, evaluating solutions for watershed restoration and preservation and involving a Watershed Advisory Group in plan development and project selection and prioritization.

Existing Watershed Conditions

The Sugarland Run watershed was divided into seven watershed management areas for watershed assessment purposes. Watershed management areas, or WMAs, are smaller subdivisions of a watershed used for planning and management purposes and typically range from two to five square miles in size. The Sugarland Run watershed was further broken down into 78 subwatersheds for more detailed analysis. Subwatersheds are the smallest watershed division used in this watershed management plan and range in size from 100 to 300 acres. The Horsepen Creek watershed was divided into nine WMAs and 77 subwatersheds for watershed management purposes.

Land use within Sugarland Run and Horsepen Creek watersheds is primarily residential in nature with commercial and industrial centers straddling the Dulles Toll Road (Route 267). Much of the open space within the Fairfax County portion of the watersheds is found along the Resource Protection Areas (RPAs) that border major streams. Resource Protection Areas are protected buffer areas established along the perennial streams in Fairfax County under the County's Chesapeake Bay Preservation Ordinance to improve the quality of streams and waterways draining to the Chesapeake Bay. However, many natural stream channels were replaced with concrete ditches or pipes prior to the establishment of RPAs and smaller headwater streams continue to be altered as watershed development continues.

The Fairfax County Stream Protection Strategy (SPS) program was completed in 2001 and included detailed biological and habitat data for five locations within Sugarland Run and Horsepen Creek watersheds. The data indicate that both watersheds are substantially degraded and are among the most negatively impacted in Fairfax County.

Fairfax County conducted a stream physical assessment (SPA) in 2005 to obtain baseline data for the County's streams (CH2MHill, 2005). The streams were evaluated based on habitat

conditions, impacts to the stream from infrastructure and problem areas, general stream characteristics and geomorphic classification. The overall goal of the stream assessment program was to provide a consistent basis for protecting and restoring the receiving water systems and other natural resources in Fairfax County. Approximately 26 miles of stream were assessed in Sugarland Run watershed and approximately 17 miles of stream were assessed in the Horsepen Creek watershed. Both Sugarland Run and Horsepen Creek watersheds were given fair overall ratings. Most of the streams in both Sugarland Run watershed and Horsepen Creek watershed are classified as Stage 3 for stream morphology and show signs of active erosion. Stage 3 streams are the most unstable and typically exhibit steep banks, bank failures, channel widening and deepening.

Planning Process

Additional field reconnaissance was conducted to update and supplement existing Fairfax County GIS data so current field conditions were accurately represented. The reconnaissance effort included the identification of pollution sources, current stormwater management practices and potential restoration opportunities across the various watersheds. There are 157 existing stormwater management facilities in the Sugarland Run watershed within Fairfax County; however, nearly three-quarters of this area is untreated by any stormwater facilities. Correspondingly, there are 147 existing stormwater management facilities in the Horsepen Creek watershed within Fairfax County, yet more than two-thirds of this area is without stormwater controls.

Successful management of a watershed requires the assessment of the interactions between pollutant sources, watershed stressors and conditions within streams and other waterbodies. In addition to field reconnaissance and previous watershed assessments, water quality and water quantity modeling was conducted for existing and forecasted future conditions. The goal of watershed characterization is to identify existing and potential problem areas and evaluate subwatershed restoration opportunities.

A standardized method of subwatershed ranking was conducted as a means to provide a systematic method of compiling available water quality and natural resources information. Ranking subwatersheds based on watershed characterization and modeling results provides a tool for planners and managers to set priorities and identify candidate restoration and preservation areas.

Subwatershed ranking indicators were developed to assess the condition of the environment, as early-warning signals of changes in the environment, and to diagnose causes of ecological problems. The indicators used by Fairfax County may be grouped into the following categories:

- **Watershed Impact Indicators** – Measure the extent that reversal or prevention of a particular watershed impact, sought by the goals and objectives, has been achieved (“What’s there now, and how is it doing?”).
- **Source Indicators** – Quantify the presence of a potential stressor or pollutant source (“Is there a problem, and what’s causing it?”).

- **Programmatic Indicators** –After the plans are adopted, these will assess outcomes of resource protection and restoration activities (“What’s the County doing about the problem, and how is it doing?”).

Watershed impact indicators and source indicators were evaluated based on existing conditions. Future condition metrics and scores were also evaluated for a sub-set of predictive indicators and reflect the simulated conditions at ultimate build-out based on the County’s Comprehensive Plan. The resulting scores from the existing condition and future without projects condition were used to rank subwatersheds according to their problems and needs and to assist with candidate project identification.

Watershed Restoration Strategies

Priority subwatersheds were identified based on the results of final subwatershed ranking, priority restoration elements from the SPA, problem areas identified during subwatershed characterization and field reconnaissance and input from the Watershed Advisory Group (WAG). General subwatershed characteristics and impairments were recorded for each priority subwatershed. Sources of subwatershed impairments were identified where evident and improvement goals/strategies were developed for each priority subwatershed.

All subwatersheds draining to a planned, un-built regional pond were evaluated for potential restoration alternatives, and the alternatives were categorized as **regional pond alternative strategies**. **Subwatershed improvement strategies** are intended to reduce stormwater impacts for subwatersheds that do not drain to a planned, un-built regional pond. Regional pond alternative strategies and subwatershed improvement strategies may include a variety of project types including new stormwater ponds, stormwater pond retrofits, low impact development retrofits, culvert retrofits, outfall improvements and area-wide drainage improvements. **Stream restoration strategies** are targeted to improve habitat, to promote stable stream geomorphology and to reduce in-stream pollutants due to erosion. **Non-structural measures and preservation strategies** can provide significant benefits by improving the water quality of stormwater runoff, by reducing the quantity of stormwater runoff, by improving stream and riparian habitat and by mitigating the potential impacts of future development.

A universe of potential projects was compiled as a result of these efforts. Additionally, potential alternatives were identified for each of the seven planned, un-built regional ponds within the watersheds. Watershed advisory group (WAG) members reviewed proposed candidate projects and discussed overall project selection methods and the location and scope of individual proposed projects. Field visits to candidate sites were conducted for all potential candidate structural projects to determine feasibility and modify project scopes based on site conditions.

An initial feasibility analysis was conducted to reduce the initial list of candidate structural projects. Factors considered during the initial feasibility analysis included constraints identified during field reconnaissance, the size and scale of the projects, the location and distribution of projects within a subwatershed, existing stormwater treatment in the subwatershed, project drainage area and specific WAG member comments. Candidate projects deemed viable were

those which had few, if any, site constraints, would provide significant additional stormwater treatment to a subwatershed and were considered to be of significant size and scope.

Project Prioritization

Viable structural projects were prioritized and ranked according to a standardized method developed by Fairfax County in order to ensure that all projects across the County could be compared and ranked in a County-wide fashion. Structural projects were scored based on five factors:

1. Effect on watershed impact indicators
2. Effect on source indicators
3. Location within priority subwatersheds
4. Sequencing
5. Implementability

An initial ranking composite score was calculated for each project based on the weighted average of the five project scores described above. This score was used to determine the overall initial rank of each project.

In addition to the quantitative project prioritization method developed by the County, WAG member comments, evaluation of projects in water quality modeling, cost benefit analysis and best professional judgment were integrated into the final project scoring and ranking. The final ranking scores were used to determine the priority of each project for the implementation process.

The 70 projects ranked most beneficial comprise the 10-year “Priority” Implementation Plan. The remaining 50 projects make up the 11-25 year “Long-Term” Implementation Plan. The 10-year projects were further analyzed with water quality modeling and a detailed cost benefit analysis to refine the priority ranking within the 10-year implementation plan.

Project fact sheets were created for each of the 10-year projects and include basic information about the project location, a description of the project scope, project benefits, design considerations, itemized cost estimates and detailed project maps. Some projects contain multiple parts or sub-projects; these project “suites” are summarized and contained on a single project fact sheet.

Plan Costs and Benefits

An integral element to evaluating the benefits of restoration strategies and projects is associated costs. Detailed cost estimates, as shown on the project fact sheets, were determined for structural projects in the 0-10 year implementation phase. The total cost of the 10-year implementation plan is \$30 million. Associated costs for structural projects in the 11-25 year implementation phase were roughly approximated based on the overall costs associated with similar projects in the 10 year implementation plan and are estimated at approximately \$13 million. Cost estimates were not calculated for non-structural projects, as they do not require traditional construction measures to be implemented and may be programmatic in nature. The 10-year implementation

plan consists of 70 total structural projects. The 11-25 year implementation plan consists of 50 additional structural projects. There are 19 non-structural projects identified in the plan. The total cost for all structural projects in the plan is \$43 million.

Implementation of all projects and restoration strategies in the 10-year priority list will result in significant overall reductions in stormwater flows and pollutant loads with associated improvements to habitat and stream quality. Stormwater runoff volume from the 2-year storm event would decrease by 1 percent or 0.03 inches and 2 percent or 0.09 inches for the 10-year storm event. The peak flow rate would also decrease by 2 percent, resulting in a reduction of 0.005 CFS per acre for the 2-year storm event and 0.010 CFS per acre for the 10-year storm event. Total suspended solids would be reduced by 7 percent overall or 420,419 pounds per year. Total nitrogen would be reduced by 2 percent or 3,551 pounds per year and total phosphorus would be reduced by 3 percent or 625 pounds per year.

Implementation of all projects within the plan, including projects in the 25-year implementation plan will result in additional reductions in stormwater flows and pollutant loads. Total suspended solids would be reduced by 9 percent overall or 550,887 pounds per year. Total nitrogen would be reduced by 3 percent or 4,747 pounds per year and total phosphorus would be reduced by 4 percent or 850 pounds per year.

The following provisions address the funding and implementation of projects and programs in Fairfax County watershed plans. These provisions as recommended by the Board were developed for the Popes Head Creek Watershed Management Plan in February 2006 and have been applied to the Sugarland Run and Horsepen Creek Watershed Management Plan:

- i. Projects and programs (both structural and non-structural) will first undergo appropriate review by County staff and the Board (please see iii below) prior to implementation. Board adoption of the Watershed Management Plan will not set into motion automatic implementation of projects, programs or initiatives that have not first been subject to sufficient scrutiny to ensure that the projects that are funded give the County the greatest environmental benefit for the cost.
- ii. Road projects not related to protection of streambeds or banks or water quality will not be funded out of the stormwater and watershed budget.
- iii. The Watershed Management Plan provides a conceptual master-list of structural capital projects and a list of potential non-structural projects for the watershed. Staff will, on a fiscal year basis, prepare and submit to the Board a detailed work plan to include a description of proposed projects and an explanation of their ranking, based on specific criteria. Criteria used to assemble this list will include, but are not limited to, cost-effectiveness as compared to alternative projects, a clear public benefit, a need to protect public or private lands from erosion or flooding, a need to meet a specific watershed or water quality goal and ability to be implemented within the same fiscal year that funding is provided. Staff also intends to track the progress of implementation and report back to the Board periodically.
- iv. Each project on the annual list of structural projects will be evaluated using basic value-engineering cost effectiveness principles before implementation and the

consideration of alternative structural and non-structural means for accomplishing the purposes of the project will be considered before implementation. This process will ensure the County's commitment to being a fiscally responsible public entity.

- v. Obstruction removal projects on private lands will be evaluated on a case-by-case basis for referral to the Zoning Administrator and/or County Attorney for action as public nuisances; and otherwise to determine appropriate cost-sharing by any parties responsible for the obstructions.
- vi. Stream restoration projects on private lands will be evaluated to determine means for cost-sharing by land owners directly responsible for degradation due to their land uses.

Table ES.1 provides a list of all projects in the 10-year implementation plan, the 25-year implementation plan and the non-structural projects.

| Table ES.1 Master Project List | | | | |
|---|-----------------------------------|-----------------------|--|-------------|
| Priority Structural Projects (10 Year Implementation Plan) | | | | |
| Project # | Project Type | WMA | Location | Cost |
| HC9007 | Regional Pond Alternative Suite | Horsepen - Cedar | Between Ladybank Lane & Mother Well Court | \$790,000 |
| HC9013 | Regional Pond Alternative Suite | Horsepen - Cedar | Between Franklin Farm Rd, West Ox Rd & Ashburton Ave | \$1,970,000 |
| HC9102 | New Stormwater Pond | Horsepen - Middle | Legacy Circle & Sunrise Valley Drive | \$150,000 |
| HC9106 | Stormwater Pond Retrofit | Horsepen - Frying Pan | Frying Pan Road & Centreville Road | \$310,000 |
| HC9107 | New Stormwater Pond | Horsepen - Merrybrook | Palmer Drive & Dogwood Court | \$210,000 |
| HC9108 | Stormwater Pond Retrofit | Horsepen - Middle | Near Copper Creek Road & Copper Creek Court | \$190,000 |
| HC9109 | Stormwater Pond Retrofit | Horsepen - Frying Pan | Between Coppermine Rd, Thomas Jefferson Dr & Masons Ferry Dr | \$400,000 |
| HC9110 | New Stormwater Pond | Horsepen - Merrybrook | Herndon Parkway & Campbell Way | \$160,000 |
| HC9114 | Stormwater Pond Retrofit | Horsepen - Frying Pan | Fox Mill Road & Cabin Creek Road | \$340,000 |
| HC9116 | New Stormwater Pond | Horsepen - Frying Pan | Near Halterbreak Court & Curved Iron Road culs-de sac | \$220,000 |
| HC9118 | Stormwater Pond Retrofit | Horsepen - Upper | Between Floris Lane & Merricourt Lane culs-de-sac | \$120,000 |
| HC9119 | Stormwater Pond Retrofit | Horsepen - Frying Pan | Colts Brook Drive & Fox Mill Road | \$450,000 |
| HC9121 | Stormwater Pond Retrofit, BMP/LID | Horsepen - Upper | Centreville Road & Lake Shore Drive | \$590,000 |
| HC9122 | Stormwater Pond Retrofit | Horsepen - Upper | Lake Shore Drive & Running Pump Lane | \$70,000 |
| HC9123 | Stormwater Pond Retrofit | Horsepen - Upper | Near Point Rider Lane & Equus Court | \$150,000 |
| HC9126 | Stormwater Pond Retrofit | Horsepen - Upper | Monterey Estates Drive & West Ox Road | \$180,000 |
| HC9127 | Stormwater Pond Retrofit | Horsepen - Frying Pan | Near Meadow Hall Drive & New Carson Drive | \$180,000 |

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|---|---|--------------------------|--|-------------|
| Priority Structural Projects (10 Year Implementation Plan) | | | | |
| Project # | Project Type | WMA | Location | Cost |
| HC9128 | Stormwater Pond Retrofit | Horsepen - Upper | Korean Orthodox Presbyterian Church, McLearen Road & Centreville Road | \$430,000 |
| HC9129 | Stormwater Pond Retrofit, BMP/LID | Horsepen - Upper | West Ox Road & New Parkland Drive | \$490,000 |
| HC9132 | Stormwater Pond Retrofit | Horsepen - Upper | Highland Mews Subdivision, Hutumn Court & Highland Mews Court | \$210,000 |
| HC9133 | Stormwater Pond Retrofit, BMP/LID, Stream Restoration | Horsepen - Cedar | Near Glen Taylor Lane & Mother Well Court | \$310,000 |
| HC9134 | Stormwater Pond Retrofit, BMP/LID | Horsepen - Upper | Kinross Circle & Scotsmore Way | \$310,000 |
| HC9136 | Stormwater Pond Retrofit | Horsepen - Upper | Near Viking Drive & Pinecrest Road | \$150,000 |
| HC9137 | Stream Restoration, New Stormwater Pond | Horsepen - Upper | Between Tewksbury Drive & Kettering Drive | \$430,000 |
| HC9140 | Stormwater Pond Retrofit | Horsepen - Upper | Huntington Drive cul-de-sac | \$370,000 |
| HC9142 | Stormwater Pond Retrofit, New Stormwater Pond | Horsepen - Upper | Quincy Adams Drive & Quincy Adams Court | \$220,000 |
| HC9143 | Stormwater Pond Retrofit | Horsepen - Cedar | Off of Ashburton Avenue, near Thistlethorn Drive & Saffron Drive | \$310,000 |
| HC9149 | New Stormwater Pond | Horsepen - Upper | Chasbarb Terrace & Chasbarb Court | \$270,000 |
| HC9200 | Culvert Retrofit, Stream Restoration | Horsepen - Lower Middle | Near Parcher Avenue & Monaghan Drive, next to the Reflection Lake pool | \$1,070,000 |
| HC9201 | Stream Restoration | Horsepen - Upper | Between Claxton Drive & Conquest Place culs-de-sac | \$230,000 |
| HC9202 | Stream Restoration | Horsepen - Upper | Between Quincy Adams Court, Viking Court & Prince Harold Court culs-de-sac | \$950,000 |
| HC9500 | BMP/LID | Horsepen - Middle | Wellesley Subdivision, Stratford Glen Place | \$250,000 |
| HC9503 | BMP/LID | Horsepen - Frying Pan | Frying Pan Park/Kidwell Farm | \$90,000 |
| SU9002 | Regional Pond Alternative Suite | Sugarland - Upper Middle | Near Wheile Ave, between Pellow Circle Terrace & Reston Ave | \$860,000 |
| SU9005 | Regional Pond Alternative Suite | Sugarland - Lower Middle | Near Leesburg Pike, between Rolling Holly Drive & Sugarland Road | \$780,000 |
| SU9007 | Regional Pond Alternative Suite | Sugarland - Lower Middle | Between Leesburg Pike, Fairfax County Parkway & Wiehle Avenue | \$1,010,000 |
| SU9100 | Stormwater Pond Retrofit | Sugarland - Lower | Jackson Tavern Way cul-de-sac | \$170,000 |
| SU9101 | Stormwater Pond Retrofit | Sugarland - Lower | Near Great Falls Way & Jackson Tavern Way | \$390,000 |

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|---|---|--------------------------|---|-------------|
| Priority Structural Projects (10 Year Implementation Plan) | | | | |
| Project # | Project Type | WMA | Location | Cost |
| SU9103 | Stormwater Pond Retrofit | Sugarland - Lower | Thomas Run Drive | \$210,000 |
| SU9106 | Stormwater Pond Retrofit, BMP/LID | Sugarland - Lower Middle | Near Tralee Drive & Old Holly Drive | \$400,000 |
| SU9108 | Stormwater Pond Retrofit | Sugarland - Lower Middle | Dranesville Road & Woodson Drive | \$210,000 |
| SU9110 | Stormwater Pond Retrofit | Sugarland - Lower Middle | Methven Court cul-de-sac | \$130,000 |
| SU9117 | Stormwater Pond Retrofit | Sugarland - Folly Lick | Dranesville Road & Hiddenbrook Drive | \$500,000 |
| SU9123 | Stormwater Pond Retrofit | Sugarland - Folly Lick | Near Philmont Drive & Judd Court | \$310,000 |
| SU9129 | Stormwater Pond Retrofit | Sugarland - Upper Middle | Near Quail Ridge Court cul-de-sac | \$190,000 |
| SU9130 | New Stormwater Pond | Sugarland - Upper Middle | Near Jenny Ann Court cul-de-sac | \$150,000 |
| SU9135 | Stormwater Pond Retrofit, BMP/LID | Sugarland - Upper Middle | Trinity Presbyterian Church | \$320,000 |
| SU9136 | New Stormwater Pond | Sugarland - Upper Middle | Near Queens Row Street & Herndon Parkway | \$110,000 |
| SU9139 | Stormwater Pond Retrofit | Sugarland - Upper | Towns at Stuart Pointe Subdivision, Stuart Pointe Lane | \$70,000 |
| SU9143 | Stormwater Pond Retrofit | Sugarland - Upper | Near Grove Street & Herndon Parkway | \$140,000 |
| SU9144 | New Stormwater Pond, BMP/LID | Sugarland - Upper Middle | Bowman Towne Drive & Fountain Drive | \$200,000 |
| SU9146 | Stormwater Pond Retrofit, New Stormwater Pond | Sugarland - Upper | Next to St. Timothy's Episcopal Church, Spring Street | \$130,000 |
| SU9147 | Stormwater Pond Retrofit | Sugarland - Upper | Near Edmund Halley Drive & Sunrise Valley Drive | \$140,000 |
| SU9149 | New Stormwater Pond, Stream Restoration, Stormwater Pond Retrofit | Sugarland - Headwaters | Polo Fields Subdivision | \$1,930,000 |
| SU9150 | New Stormwater Pond | Sugarland - Headwaters | Near Nutmeg Lane cul-de-sac | \$250,000 |
| SU9201 | New Stormwater Pond, Stream Restoration | Sugarland - Folly Lick | Folly Lick stream corridor between Fantasia Drive & Monroe Street | \$910,000 |
| SU9203 | Stream Restoration | Sugarland - Upper Middle | Hunters Creek HOA and Runnymede Park | \$290,000 |
| SU9204 | Stream Restoration | Sugarland - Folly Lick | Herndon Centennial Park golf course | \$1,880,000 |
| SU9205 | Stream Restoration | Sugarland - Upper Middle | Fairfax County Parkway & Walnut Branch Road | \$810,000 |
| SU9208 | Stream Restoration | Sugarland - Headwaters | Near Sanibel Drive & Tigers Eye Court culs-de-sac | \$1,170,000 |
| SU9209 | Stream Restoration | Sugarland - Headwaters | Pinecrest Road & Glade Drive | \$290,000 |
| SU9210 | Stream Restoration | Sugarland - Headwaters | Fox Mill Road & Keele Drive | \$80,000 |
| SU9500 | BMP/LID | Sugarland - Upper Middle | Herndon High School | \$850,000 |

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| Priority Structural Projects (10 Year Implementation Plan) | | | | |
|---|---------------------|--------------------------|--|---------------------|
| Project # | Project Type | WMA | Location | Cost |
| SU9502 | BMP/LID | Sugarland - Upper Middle | Herndon Elementary School | \$580,000 |
| SU9504 | BMP/LID | Sugarland - Upper Middle | Reston North Park | \$130,000 |
| SU9505 | BMP/LID | Sugarland - Upper | Near Elden Street & Van Buren Street | \$380,000 |
| SU9509 | BMP/LID | Sugarland - Upper Middle | Trader Joe's | \$330,000 |
| SU9512 | BMP/LID | Sugarland - Upper Middle | Reston Hospital | \$200,000 |
| SU9514 | BMP/LID | Sugarland - Upper | Sunset Hills Road & Fairfax County Parkway | \$290,000 |
| SU9515 | BMP/LID | Sugarland - Upper | Sunset Hills Road & Town Center Parkway | \$200,000 |
| | | | Total Cost: | \$29,560,000 |

| Long-term Structural Projects (25 Year Implementation Plan) | | | | |
|--|---|-------------------------|--|--|
| Project # | Project Type | WMA | Location | |
| HC9100 | Stormwater Pond Retrofit | Horsepen - Lower Middle | Rock Hill Road & Turquoise Lane | |
| HC9101 | Stormwater Pond Retrofit | Horsepen - Lower Middle | Near Spring Knoll Drive & Summerset Place | |
| HC9103 | Stormwater Pond Retrofit | Horsepen - Middle | Dulles Int'l Airport, near Sully Rd & electric substation | |
| HC9104 | New Stormwater Pond | Horsepen - Merrybrook | Centreville Road & McNair Farms Drive | |
| HC9111 | Stormwater Pond Retrofit | Horsepen - Frying Pan | Near Frying Pan Road & Coppermine Road | |
| HC9113 | Stormwater Pond Retrofit | Horsepen - Middle | Towerview Road cul-de-sac | |
| HC9115 | Stormwater Pond Retrofit, New Stormwater Pond | Horsepen - Middle | Near Mustang Drive & Maverick Lane | |
| HC9117 | Stormwater Pond Retrofit | Horsepen - Frying Pan | Monroe Manor Drive cul-de-sac | |
| HC9124 | Stormwater Pond Retrofit | Horsepen - Frying Pan | Near Locksley Court cul-de-sac | |
| HC9125 | New Stormwater Pond | Horsepen - Upper | Near Spring Chapel Court cul-de-sac | |
| HC9130 | Stormwater Pond Retrofit | Horsepen - Upper | Middleton Farm Subdivision, between Middleton Farm Lane & Blue Holly Lane cul-de-sac | |
| HC9131 | Stormwater Pond Retrofit, Culvert Retrofit | Horsepen - Upper | Near West Ox Road & McLearn Road | |
| HC9135 | Stormwater Pond Retrofit | Horsepen - Cedar | Near Emerald Chase Drive & Rover Glen Court | |
| HC9138 | New Stormwater Pond | Horsepen - Cedar | Near Emerald Chase Drive & Ruby Lace Court | |
| HC9139 | New Stormwater Pond | Horsepen - Upper | Near Bradwell Road & Litchfield Drive | |
| HC9146 | Stormwater Pond Retrofit, BMP/LID | Horsepen - Cedar | Near Ashburton Avenue & Wheeler Way | |

| Table ES.1 Master Project List | | | |
|--|---|--------------------------|--|
| Long-term Structural Projects (25 Year Implementation Plan) | | | |
| Project # | Project Type | WMA | Location |
| HC9148 | Stormwater Pond Retrofit, New Stormwater Pond | Horsepen - Upper | Near Glenbrooke Woods Drive cul-de-sac |
| HC9302 | Area-wide Drainage Improvement | Horsepen - Cedar | Burchlawn Street cul-de-sac |
| HC9400 | Culvert Retrofit | Horsepen - Lower Middle | Near Rock Hill Road & Innovation Avenue |
| HC9401 | Culvert Retrofit | Horsepen - Lower Middle | Near Rock Hill Road & Innovation Avenue |
| HC9501 | BMP/LID | Horsepen - Middle | Along stream corridor between Floris Street & Mountainview Court |
| HC9502 | BMP/LID | Horsepen - Middle | Floris Elementary School |
| HC9505 | BMP/LID | Horsepen - Upper | Near Emerald Chase Drive & Lazy Glen Court |
| SU9001 | Regional Pond Alternative Suite | Sugarland - Lower Middle | Near Rowland Drive & Heather Way |
| SU9105 | Stormwater Pond Retrofit | Sugarland - Lower | Air View Lane |
| SU9107 | Stormwater Pond Retrofit | Sugarland - Lower Middle | Near Leesburg Pike & Fairfax County Parkway |
| SU9111 | Stormwater Pond Retrofit | Sugarland - Lower Middle | Dranesville Road & Woodson Drive |
| SU9112 | Stormwater Pond Retrofit | Sugarland - Lower Middle | East of Dranesville Road & Butter Churn Drive |
| SU9115 | Stormwater Pond Retrofit | Sugarland - Lower Middle | Hastings Hunt Section 6 and Jenkins Ridge Subdivisions |
| SU9118 | Stormwater Pond Retrofit | Sugarland - Folly Lick | Near stream corridor in Dranesville Estate Section 1 and 2 |
| SU9120 | Stormwater Pond Retrofit | Sugarland - Upper Middle | Near Eddyspark Drive & Kingsvale Circle |
| SU9121 | Stormwater Pond Retrofit, New Stormwater Pond | Sugarland - Folly Lick | East of Millikens Bend Road near Millbank Way & Westlodge Court |
| SU9122 | Stormwater Pond Retrofit | Sugarland - Folly Lick | Baptist Temple of Herndon |
| SU9124 | Stormwater Pond Retrofit | Sugarland - Upper Middle | Near Rosiers Branch Drive & Heather Down Drive |
| SU9127 | Stormwater Pond Retrofit | Sugarland - Folly Lick | Herndon United Methodist Church |
| SU9128 | Stormwater Pond Retrofit | Sugarland - Upper Middle | Between the Fawn Ridge Lane culs-de-sac |
| SU9133 | New Stormwater Pond, BMP/LID | Sugarland - Folly Lick | Near Crestview Drive & Bond Street |
| SU9137 | New Stormwater Pond | Sugarland - Upper Middle | Walnut Branch Road & Purple Sage Court |
| SU9140 | New Stormwater Pond, Stormwater Pond Retrofit | Sugarland - Upper | Safeway; corner of Post Drive & Grove Street |
| SU9141 | Stormwater Pond Retrofit | Sugarland - Upper | Substation near Grove Street & Grant Street |

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| Long-term Structural Projects (25 Year Implementation Plan) | | | |
|--|--------------------------|--------------------------|--|
| Project # | Project Type | WMA | Location |
| SU9142 | Stormwater Pond Retrofit | Sugarland - Folly Lick | Near Spring Street & Wood Street |
| SU9200 | Stream Restoration | Sugarland - Lower Middle | Near Dranesville Road & Woodson Drive |
| SU9202 | Stream Restoration | Sugarland - Folly Lick | Near Herndon Parkway & Stevenson Court |
| SU9206 | Stream Restoration | Sugarland - Upper | Near Herndon Parkway & Tamarack Way |
| SU9207 | Stream Restoration | Sugarland - Upper | Near Fairfax County Parkway & New Dominion Parkway |
| SU9400 | Culvert Retrofit | Sugarland - Lower | Near Kentland Drive & Parrish Farm Lane |
| SU9501 | BMP/LID | Sugarland - Upper Middle | Lake Newport Road & North Point Drive |
| SU9510 | BMP/LID | Sugarland - Upper | Near Elden Street & Fairfax County Parkway |
| SU9511 | BMP/LID | Sugarland - Folly Lick | Dulles Park Court & Alabama Drive |
| SU9513 | BMP/LID | Sugarland - Upper | Near Old Dominion Avenue & Aspen Drive |

| Non-Structural Projects | | | |
|--------------------------------|---|--------------------------|---|
| Project # | Project Type | WMA | Location |
| HC9901 | Buffer Restoration, Rain Barrel Programs | Horsepen - Cedar | Near Ashburton Avenue & Thistlethorn Drive |
| HC9902 | Buffer Restoration | Horsepen - Frying Pan | Stream corridors near Copper Bed Road & Copper Hill Road |
| HC9903 | Buffer Restoration, Rain Barrel Programs | Horsepen - Lower Middle | Reflection Lake HOA & Four Season HOA (Herndon) |
| HC9904 | Conservation Acquisition Project/ Land Conservation Coordination Project | Horsepen - Middle | Stream corridors near Sully Road & Park Center Road |
| HC9905 | Conservation Acquisition Project/ Land Conservation Coordination Project, Dumpsite/ Obstruction Removal, Buffer Restoration | Horsepen - Upper | Stream corridors near McLearn Road & Cobra Drive |
| HC9906 | Rain Barrel Programs | Horsepen - Upper | Chantilly Highlands |
| HC9907 | Conservation Acquisition Project/ Land Conservation Coordination Project, Buffer Restoration | Horsepen - Merrybrook | Centreville Road & Woodland Park Road |
| SU9900 | Rain Barrel Programs | Sugarland - Folly Lick | Westfield, Fortnightly Square, Haloyon of Herndon Sect 5, Van Vlecks, Ballou, Saubers, Herndon Station, Herndon Park Station and Chandon Subdivisions |
| SU9901 | Buffer Restoration | Sugarland - Lower Middle | Near Leesburg Pike & Rolling Holly Drive |
| SU9902 | Rain Barrel Programs | Sugarland - Lower Middle | Sugar Creek Sec. 1, Stuart Hills, Cedar Chase, Oak Creek Estates, Forest Heights Estates, Stoney Creek Woods, Hastings Hunt sec. 6, portion of Jenkins Ridge, Holly Knoll and Crestbrook Subdivisions |

Table ES.1 Master Project List

| Non-Structural Projects | | | |
|--------------------------------|--|--------------------------|---|
| Project # | Project Type | WMA | Location |
| SU9903 | Conservation Acquisition Project/ Land Conservation Coordination Project | Sugarland - Lower Middle | Stream corridor near Leesburg Pike & Holly Knoll Drive |
| SU9904 | Community Outreach/ Public Education | Sugarland - Lower Middle | Near Heather Way cul-de-sac |
| SU9905 | Rain Barrel Programs | Sugarland - Upper | Crestview Sec. 1, Runnymede Manor, Stuart Woods, Reston Sec. 49 and Towns at Stuart Pointe Subdivisions |
| SU9906 | Buffer Restoration | Sugarland - Upper | Near Fairfax County Parkway & Sunset Hills Road |
| SU9907 | Conservation Acquisition Project/ Land Conservation Coordination Project, Buffer Restoration | Sugarland - Upper | Stream corridors near Herndon Parkway & Fairbrook Drive |
| SU9908 | Rain Barrel Programs | Sugarland - Upper Middle | Stuart Ridge, Shaker Woods, Shaker Grove, Kingstream, Hunters Creek, Potomac Fairways, Iron Ridge Sec. 2, Graymoor, Chestnut Grove, Old Drainsville Hunt Club, Jeneba Woods, Reston Sec. 49 and Sugar Land Heights Subdivisions |
| SU9909 | Rain Barrel Programs | Sugarland - Headwaters | Polo Fields Subdivision |
| SU9910 | Buffer Restoration | Sugarland - Headwaters | Fairfax County Parkway & Dulles Access Road |
| SU9911 | Conservation Acquisition Project/ Land Conservation Coordination Project | Sugarland - Headwaters | Sunrise Valley Wetland Park |

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