

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

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 Chesapeake Bay 2000 agreement 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 25-year 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 \$31 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.

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 and 10-year storm events would decrease by 2 percent, or 40 inches per year and 83 inches per year, respectively. 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 4 percent overall or 118 tons per year. Total nitrogen would be reduced by 2 percent or 3,447 pounds per year, and total phosphorus would be reduced by 3 percent or 568 pounds per year.

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	\$820,000.00
HC9013	Regional Pond Alternative Suite	Horsepen - Cedar	Between Franklin Farm Road, West Ox Road & Ashburton Avenue	\$2,140,000.00
HC9102	New Stormwater Pond	Horsepen - Middle	Legacy Circle & Sunrise Valley Drive	\$150,000.00
HC9106	Stormwater Pond Retrofit	Horsepen - Frying Pan	Frying Pan Road & Centreville Road	\$310,000.00
HC9107	New Stormwater Pond	Horsepen - Merrybrook	Palmer Drive & Dogwood Court	\$210,000.00
HC9109	Stormwater Pond Retrofit	Horsepen - Frying Pan	Between Coppermine Road, Thomas Jefferson Drive & Masons Ferry Drive	\$400,000.00
HC9110	New Stormwater Pond	Horsepen - Merrybrook	Herndon Parkway & Campbell Way	\$160,000.00
HC9114	Stormwater Pond Retrofit	Horsepen - Frying Pan	Fox Mill Road & Cabin Creek Road	\$340,000.00
HC9116	New Stormwater Pond	Horsepen - Frying Pan	Near Halterbreak Court & Curved Iron Road culs-de-sac	\$220,000.00
HC9118	Stormwater Pond Retrofit	Horsepen - Upper	Between Floris Lane & Merricourt Lane culs-de-sac	\$120,000.00
HC9119	Stormwater Pond Retrofit	Horsepen - Frying Pan	Colts Brook Drive & Fox Mill Road	\$450,000.00
HC9121	Stormwater Pond Retrofit, BMP/LID	Horsepen - Upper	Centreville Road & Lake Shore Drive	\$590,000.00
HC9122	Stormwater Pond Retrofit	Horsepen - Upper	Lake Shore Drive & Running Pump Lane	\$70,000.00
HC9123	Stormwater Pond Retrofit	Horsepen - Upper	Near Point Rider Lane & Equus Court	\$150,000.00
HC9126	Stormwater Pond Retrofit	Horsepen - Upper	Monterey Estates Drive & West Ox Road	\$180,000.00

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Priority Structural Projects (10 Year Implementation Plan)				
Project #	Project Type	WMA	Location	Cost
HC9127	Stormwater Pond Retrofit	Horsepen - Frying Pan	Near Medow Hall Drive & New Carson Drive	\$180,000.00
HC9128	Stormwater Pond Retrofit	Horsepen - Upper	Korean Orthodox Presbyterian Church, Mcclareen Road & Centreville Road	\$430,000.00
HC9129	Stormwater Pond Retrofit, BMP/LID	Horsepen - Upper	West Ox Road & New Parkland Drive	\$490,000.00
HC9130	Stormwater Pond Retrofit	Horsepen - Upper	Middleton Farm Subdivision, between Middleton Farm Lane & Blue Holly Lane culs-de-sac	\$160,000.00
HC9132	Stormwater Pond Retrofit	Horsepen - Upper	Highland Mews Subdivision, Hutumn Court & Highland Mews Court	\$210,000.00
HC9134	Stormwater Pond Retrofit, BMP/LID	Horsepen - Upper	Kinross Circle & Scotsmore Way	\$310,000.00
HC9136	Stormwater Pond Retrofit	Horsepen - Upper	Near Viking Drive & Pinecrest Road	\$150,000.00
HC9137	Stream Restoration, New Stormwater Pond	Horsepen - Upper	Between Tewksbury Drive & Kettering Drive	\$430,000.00
HC9140	Stormwater Pond Retrofit	Horsepen - Upper	Huntington Drive cul-de-sac	\$370,000.00
HC9142	Stormwater Pond Retrofit, New Stormwater Pond	Horsepen - Upper	Quincy Adams Drive & Quincy Adams Court	\$220,000.00
HC9149	New Stormwater Pond	Horsepen - Upper	Chasbarb Terrace & Chasbarb Court	\$270,000.00
HC9200	Culvert Retrofit, Stream Restoration	Horsepen - Lower Middle	Near Parcher Avenue & Monaghan Drive, next to the Reflection Lake pool	\$1,070,000.00
HC9201	Stream Restoration	Horsepen - Upper	Between Claxton Drive & Conquest Place culs-de-sac	\$230,000.00
HC9202	Stream Restoration	Horsepen - Upper	Between Quincy Adams Court, Viking Court, and Prince Harold Court culs-de-sac	\$950,000.00
HC9500	BMP/LID	Horsepen - Middle	Wellesley Subdivision, Stratford Glen Place	\$250,000.00
HC9503	BMP/LID	Horsepen - Frying Pan	Frying Pan Park/Kidwell Farm	\$90,000.00
SU9002	Regional Pond Alternative Suite	Sugarland - Upper Middle	Near Wheile Avenue, between Pellow Circle Terrace & Reston Avenue	\$860,000.00
SU9007	Regional Pond Alternative Suite	Sugarland - Lower Middle	Between Leesburg Pike, Fairfax County Parkway & Wiehle Avenue	\$730,000.00

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Priority Structural Projects (10 Year Implementation Plan)				
Project #	Project Type	WMA	Location	Cost
SU9100	Stormwater Pond Retrofit	Sugarland - Lower	Jackson Tavern Way cul-de-sac	\$170,000.00
SU9101	Stormwater Pond Retrofit	Sugarland - Lower	Near Great Falls Way & Jackson Tavern Way	\$390,000.00
SU9103	Stormwater Pond Retrofit	Sugarland - Lower	Thomas Run Drive	\$210,000.00
SU9106	Stormwater Pond Retrofit, BMP/LID	Sugarland - Lower Middle	Near Tralee Drive & Old Holly Drive	\$400,000.00
SU9108	Stormwater Pond Retrofit	Sugarland - Lower Middle	Dranesville Road & Woodson Drive	\$210,000.00
SU9110	Stormwater Pond Retrofit	Sugarland - Lower Middle	Methven Court cul-de-sac	\$130,000.00
SU9117	Stormwater Pond Retrofit	Sugarland - Folly Lick	Dranesville Road & Hiddenbrook Drive	\$500,000.00
SU9120	Stormwater Pond Retrofit	Sugarland - Upper Middle	Near Eddyspark Drive & Kingsvale Circle	\$460,000.00
SU9123	Stormwater Pond Retrofit	Sugarland - Folly Lick	Near Philmont Drive & Judd Court	\$310,000.00
SU9129	Stormwater Pond Retrofit	Sugarland - Upper Middle	Near Quail Ridge Court cul-de-sac	\$190,000.00
SU9130	New Stormwater Pond	Sugarland - Upper Middle	Near Jenny Ann Court cul-de-sac	\$150,000.00
SU9135	Stormwater Pond Retrofit, BMP/LID	Sugarland - Upper Middle	Trinity Presbyterian Church	\$320,000.00
SU9136	New Stormwater Pond	Sugarland - Upper Middle	Runnymede Park	\$190,000.00
SU9139	Stormwater Pond Retrofit	Sugarland - Upper	Towns at Stuart Pointe Subdivision, Stuart Pointe Lane	\$70,000.00
SU9141	Stormwater Pond Retrofit	Sugarland - Upper	Substation near Grove Street & Grant Street	\$70,000.00
SU9143	Stormwater Pond Retrofit	Sugarland - Upper	Near Grove Street & Herndon Parkway	\$140,000.00
SU9144	New Stormwater Pond, BMP/LID	Sugarland - Upper Middle	Bowman Towne Drive and Fountain Drive	\$200,000.00
SU9146	Stormwater Pond Retrofit, New Stormwater Pond	Sugarland - Upper	Next to St. Timothy's Episcopal Church, Spring Street	\$130,000.00
SU9147	Stormwater Pond Retrofit	Sugarland - Upper	Near Edmund Halley Drive & Sunrise Valley Drive	\$140,000.00
SU9149	New Stormwater Pond, Stream Restoration, Stormwater Pond Retrofit	Sugarland - Headwaters	Polo Fields Subdivision	\$1,930,000.00
SU9150	New Stormwater Pond	Sugarland - Headwaters	Near Nutmeg Lane cul-de-sac	\$250,000.00
SU9201	New Stormwater Pond, Stream Restoration	Sugarland - Folly Lick	Folly Lick stream corridor between Fantasia Dr & Monroe St	\$910,000.00
SU9203	Stream Restoration	Sugarland - Upper Middle	Hunters Creek HOA & Runnymede Park	\$550,000.00

Table ES.1 Master Project List

Priority Structural Projects (10 Year Implementation Plan)				
Project #	Project Type	WMA	Location	Cost
SU9204	Stream Restoration	Sugarland - Folly Lick	Herndon Centennial Park golf course	\$1,880,000.00
SU9205	Stream Restoration	Sugarland - Upper Middle	Fairfax County Parkway & Walnut Branch Road	\$810,000.00
SU9208	Stream Restoration	Sugarland - Headwaters	Near Sanibel Drive & Tigers Eye Court culs-de-sac	\$1,170,000.00
SU9209	Stream Restoration	Sugarland - Headwaters	Pinecrest Road & Glade Drive	\$290,000.00
SU9210	Stream Restoration	Sugarland - Headwaters	Fox Mill Road & Keele Drive	\$80,000.00
SU9500	BMP/LID	Sugarland - Upper Middle	Herndon High School	\$850,000.00
SU9502	BMP/LID	Sugarland - Upper Middle	Herndon Elementary School	\$580,000.00
SU9504	BMP/LID	Sugarland - Upper Middle	Reston North Park	\$130,000.00
SU9505	BMP/LID	Sugarland - Upper	Near Elden Street & Van Buren Street	\$380,000.00
SU9509	BMP/LID	Sugarland - Upper Middle	Trader Joe's	\$330,000.00
SU9511	BMP/LID	Sugarland - Folly Lick	Dulles Park Court & Alabama Drive	\$140,000.00
SU9512	BMP/LID	Sugarland - Upper Middle	Reston Hospital	\$200,000.00
SU9514	BMP/LID	Sugarland - Upper	Sunset Hills Road & Fairfax County Parkway	\$290,000.00

Total Cost: \$28,860,000.00

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 Road & electric substation
HC9104	New Stormwater Pond	Horsepen - Merrybrook	Centreville Road & McNair Farms Drive
HC9108	Stormwater Pond Retrofit	Horsepen - Middle	Near Copper Creek Road & Copper Creek Court
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

Table ES.1 Master Project List

Long-Term Structural Projects (25 Year Implementation Plan)			
Project #	Project Type	WMA	Location
HC9131	Stormwater Pond Retrofit, Culvert Retrofit	Horsepen - Upper	Near West Ox Road & Mclearen Road
HC9133	Stormwater Pond Retrofit, BMP/LID, Stream Restoration	Horsepen - Cedar	Near Glen Taylor Lane & Mother Well Court
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
HC9143	Stormwater Pond Retrofit	Horsepen - Cedar	Off of Ashburton Avenue, near Thistlethorn Drive & Saffron Drive
HC9146	Stormwater Pond Retrofit, BMP/LID	Horsepen - Cedar	Near Ashburton Avenue & Wheeler Way
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
HC9501	BMP/LID	Horsepen - Middle	Along stream corridor between Floris St & 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
SU9005	Regional Pond Alternative Suite	Sugarland - Lower Middle	Near Leesburg Pike, between Rolling Holly Drive & Sugarland Road
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 & Jenkins Ridge Subdivisions
SU9118	Stormwater Pond Retrofit	Sugarland - Folly Lick	Near stream corridor in Dranesville Estate Section 1 & 2
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

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Long-Term Structural Projects (25 Year Implementation Plan)			
Project #	Project Type	WMA	Location
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
SU9138	New Stormwater Pond	Sugarland - Folly Lick	Center Street & Vine Street
SU9140	New Stormwater Pond, Stormwater Pond Retrofit	Sugarland - Upper	Safeway; corner of Post Drive & Grove Street
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
SU9513	BMP/LID	Sugarland - Upper	Near Old Dominion Avenue & Aspen Drive
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 Mcclarean 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

Table ES.1 Master Project List

Non-Structural Projects			
Project #	Project Type	WMA	Location
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
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