

Stormwater Management

Program Description

Fairfax County's Stormwater Management program is managed on a comprehensive watershed basis and consists of: Regulatory Compliance, Dam Safety and Facility Rehabilitation, Stream and Water Quality, Emergency and Flood Control, Conveyance System Rehabilitation, contributory funding requirements and Operational Support.

Link to the Comprehensive Plan

The Public Facilities Drainage and Stormwater Management Section and the Environment Section of the Policy Plan within the Fairfax County Comprehensive Plan includes the following established objectives:

- Provide for a comprehensive drainage improvement and stormwater management program to maximize property protection and environmental benefits throughout the watershed.
- Provide a system of drainage facilities that prevents or minimizes structure flooding, stream degradation and traffic disruption in an efficient, cost effective and environmentally sound manner.
- Prevent and reduce pollution of surface and groundwater resources. Protect and restore the ecological integrity of streams in Fairfax County.
- Protect the Potomac Estuary and the Chesapeake Bay from the avoidable impacts of land use activities in Fairfax County.
- Identify, protect and enhance an integrated network of ecologically valuable land and surface waters for present and future residents of Fairfax County.

Source: 2017 Edition of the Fairfax County Comprehensive Plan- Public Facilities, Amended through 4-9-2019; Environment (amended through 12-3-2019)

Program Initiatives

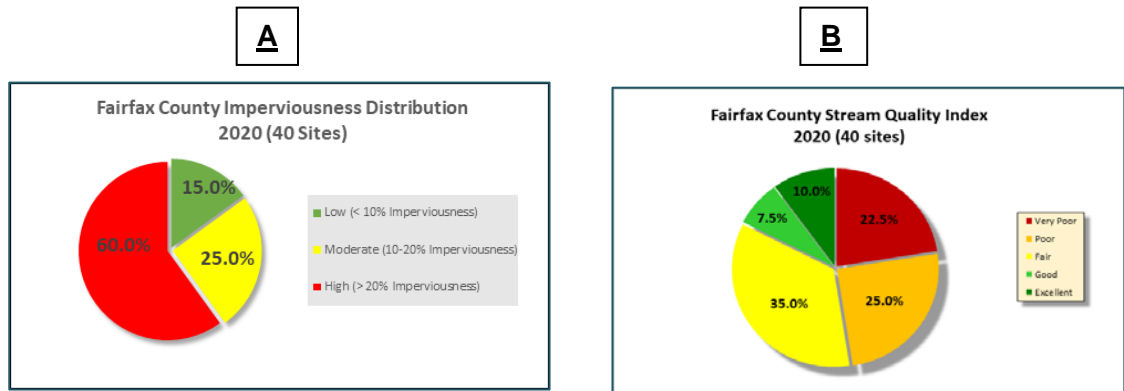
The long-range goal or mission for the stormwater program is dictated by the County's need to preserve and restore the natural environment and water resources, while being in full compliance with all applicable federal and state laws and mandates. Many of the requirements are derived from the State's Chesapeake Bay Initiatives, Municipal Separate Storm Sewer System Permit (MS4), and other Clean Water Act requirements and County ordinance and policies, such as the Water Supply Protection Overlay District. In order to comprehensively address program requirements and strategies for restoring water quality on a holistic basis, updated watershed management plans have been completed.

Watershed Planning and Implementation

Plans for all 30 County watersheds have been completed. Previously prepared watershed master plans developed during the 1970s did not reflect changes in stream conditions resulting from land use practices, water quality standards and environmental goals, most of which have evolved over the last 30 years. The watershed plans provide targeted strategies for addressing stream health given current and future land use practices and relative stream conditions.

Stream physical and biological degradation becomes apparent when the extent of impervious surfaces within a watershed area approaches 10 to 20 percent. High levels of degradation occur as imperviousness exceeds 20 percent. During previous decades, prior to implementation of modern stormwater controls, the County's percent of imperviousness increased drastically which contributed to the current degraded conditions of many County streams. As depicted on graph A below, 60 percent of County stream monitoring sites in 2020 had impervious levels at or above 20 percent

(high). In addition, 25 percent of the 40 sites monitored were between 10-20 percent impervious (moderate). As depicted on the graph B below, and based on the same 2020 stream monitoring, just 17.5 percent of the County's streams are in good to excellent biological health condition. This condition is determined using an Index of Biological Integrity (IBI) which evaluates stream ecological health based on the community structure of bottom-dwelling aquatic invertebrates inhabiting the streams.



The Federal Clean Water Act and Virginia state laws require Fairfax County to meet water quality standards for surface streams. The County discharges stormwater from its storm drainage network into the waters of the state and must comply with all pertinent water quality standards and conditions established by the MS4 permit. The permit conditions require that the County have a comprehensive stormwater management program that includes inspection of existing stormwater facilities, watershed planning, public outreach, monitoring and implementation of practices to improve stormwater quality.

In addition to the MS4 permit requirements, Virginia and other signatory states to the Chesapeake Bay 2000 Agreement prepared "The Potomac River Tributary Strategies" in 2005 to set specific targets for reduction and capping of nutrients and sediment pollutants entering the Bay through its various tributaries and from both point source (e.g. wastewater treatment plants) and non-point source pollution. However, the Tributary Strategies are now replaced by the State's Watershed Improvement Plans (WIP) in response to requirements for a Chesapeake Bay-wide Total Maximum Daily Load (TMDL), established by the EPA in December 2010. The TMDL for the Chesapeake Bay has established a "pollution diet", or pollution load reduction targets needed to remove the Bay from the impaired waters list. The requirements for Bay states and localities are also being driven by a Presidential Executive Order of May 2009 that called for more stringent actions, increased accountability and firm deadlines. The implementation phase of the TMDL is well on the way and Bay states have developed a Phase III WIP which was submitted to EPA in August 2019. The WIP involves increased measures tied to firmly established milestones and an ultimate implementation deadline of 2025. Through the stormwater program and other efforts, the County is doing its part to increase water pollution control measures in order to effectively improve local stream conditions, comply with increasing regulations and help restore the Chesapeake Bay.

While every effort has been made to accurately reflect the 5-year capital improvement plan for the stormwater program, there are currently multiple issues that are in various stages of the regulatory and permitting processes that will possibly have significant funding impacts on the Stormwater program. Increases in regulatory requirements associated with the reissuance of the next 5-year MS4 permit, updates to Chesapeake Bay-wide TMDL requirements as a result of the 2017 program

assessment, and the Phase III WIP and State stormwater regulations impact the funding requirements on a continual basis. Unforeseen flood mitigation efforts resulting from County-wide flooding events require a significant investment to implement corrective actions and correct failing and deficient storm drainage systems that are impacting county residential and commercial properties. In addition to these funding impacts, the transfer of responsibility for the Fairfax County Public Schools MS4 permit program to the County represents added funding requirements to the stormwater program as well.

Additional, funding impacts to the stormwater program include long term stormwater management maintenance requirements of County facilities that are designed and built using innovative stormwater management systems, such as Low Impact Development Systems (LIDS), also called Green Stormwater Infrastructure (GSI). Past stormwater maintenance at County-owned and operated facilities traditionally consisted of maintenance of catch basins, storm pipes and surface ponds. However, to meet current stormwater quality requirements, more extensive and complex stormwater management systems are being implemented for the treatment of stormwater runoff. These water quality systems continue to require more complex operational and maintenance efforts to function properly and comply with the stormwater permit requirements. Without the proper on-going maintenance, the systems will likely fail, requiring more extensive costs to reconstruct the systems to function as designed. As these water quality systems and stormwater facilities come on-line, funding will be needed to meet the recurring maintenance requirements.

Financing the Stormwater Program

The Board of Supervisors approved a special service district to support the Stormwater Management Program as part of the [FY 2010 Adopted Budget Plan](#). This service district provides a dedicated funding source for both operating and capital project requirements by levying a service rate per \$100 of assessed real estate value, as authorized by [Code of Virginia](#) Ann. Sections 15.2-2400. Since FY 2010, staff has made significant progress in the implementation of watershed master plans, public outreach efforts, stormwater monitoring activities, water quality and flood mitigation project implementation and operational maintenance programs related to existing storm drainage infrastructure including stormwater conveyance, and regulatory requirements.

An ultimate rate of \$0.0400 per \$100 of assessed value has been estimated to be required to fully support the stormwater program in the future; however, staff is currently evaluating the long-term requirements for the program to address other community needs. Some of the additional community needs under evaluation include debt service to support the Board's approval of the dredging of Lake Accotink, the anticipation of additional flood mitigation requirements, and strengthening the role and financial support for the implementation of stormwater requirements associated with Fairfax County Public Schools sites under renovation. This enhanced program may require incremental changes to the rate over time and may result in a higher ultimate rate to fully support the program. Staff will be evaluating these requirements, as well as the staffing to support them, and analyzing the impact of increased real estate values and revenue projections.

While staff continues to further evaluate the impact of recent initiatives and the long-term requirements for the Stormwater Program, the FY 2022 rate will remain the same as the [FY 2021 Adopted Budget Plan](#) level of \$0.0325 per \$100 of assessed value. However, based on capital project costs and projected revenues, it is anticipated that in the next several years, incremental rate increases will be required based on continued growth of stormwater facilities and infrastructure that must be inspected and maintained by the county, the implementation of flood mitigation projects, and additional requirements in the forthcoming Municipal Separate Storm Sewer System (MS4)

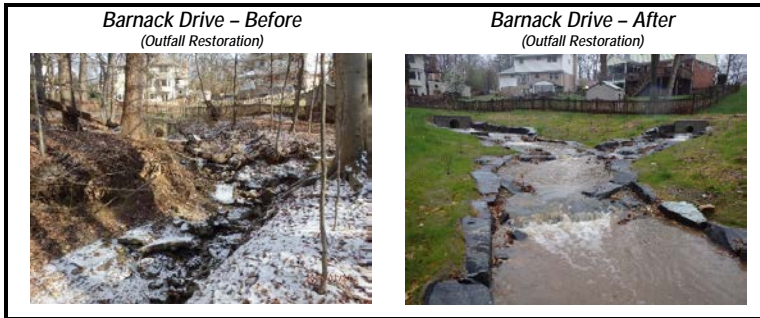
permit. On an annual basis, staff will continue to evaluate the program, analyze future requirements, and develop Stormwater operational and capital resource needs.

The FY 2022 levy of \$0.0325 will generate \$87,175,738, supporting \$24,240,283 for staff and operational costs; \$61,810,455 for capital project implementation including, infrastructure reinvestment, regulatory requirements, dam safety, and contributory funding requirements; and \$1,125,000 transferred to the General Fund to partially offset central support services such as Human Resources, Purchasing, Budget and other administrative services supported by the General Fund, which benefit this fund.

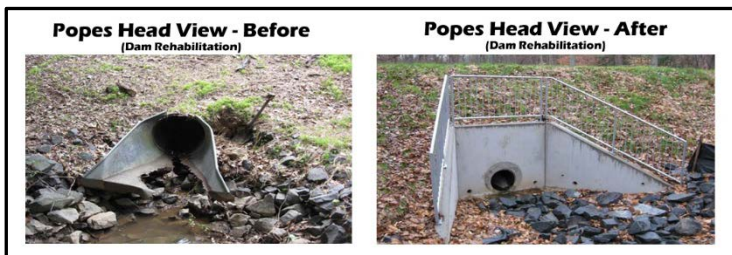
In summary, Stormwater funding is essential to protect public safety, preserve property values and support environmental mandates such as those aimed at protecting the Chesapeake Bay and the water quality of other local jurisdictional waterways. Projects include repairs to stormwater infrastructure, measures to improve water quality, such as stream stabilization, rehabilitation and safety upgrades of dams, repair and replacement of underground pipe systems and surface channels, structural flood proofing and Best Management Practices (BMP) site retrofits. This funding also supports increased public outreach efforts and stormwater monitoring activities. The approach to capital investment in stormwater management will be to improve infrastructure reinvestment cycles and increase capital project implementation schedules to responsibly manage stormwater runoff within Fairfax County, while maintaining compliance with increasing regulatory requirements and operational requirements. Focus will be provided to balance effectiveness and efficiencies through management of staff resources balanced with delivery of services through outsourced opportunities.

Current Project Descriptions

1. **Conveyance System Inspection and Development (Countywide):** This program provides inventory inspection and assessment services for storm drainage conveyance systems and stormwater drainage structures in the County. The County owns and operates approximately 1,500 miles of underground stormwater pipes and paved channels with an estimated replacement value of over \$1 billion dollars. The County began performing internal inspections of the pipes in FY 2006. MS4 Permit regulations require inspection and maintenance of existing conveyance systems, as well as 65,000 stormwater structures, and a portion of the 7,000 regulated pipe outlets. Once the initial internal inspections are complete, the goal of this program is to inspect pipes on a 20-year cycle and rehabilitate pipes and improve outfall channels before total failure occurs. Funding of \$2,000,000 has been included for inspections and development in FY 2022.
2. **Conveyance System Rehabilitation (Countywide):** This program provides repair and rehabilitation of storm drainage conveyance systems and stormwater drainage structures in the County. Acceptable industry standards indicate that one dollar re-invested in infrastructure saves seven dollars in the asset's life and \$70 dollars if asset failure occurs. Funding in the amount of \$7,000,000 is included for conveyance system rehabilitation in FY 2022.



improves dam safety by supporting annual inspections of 20 state-regulated dams and the Huntington Levee and by developing Emergency Action Plans required by the state. The Emergency Action Plans are updated annually. In addition, these plans include annual emergency drills and exercises, and flood monitoring for each dam. This initiative also includes the removal of sediment that occurs in both wet and dry stormwater management facilities to ensure that adequate capacity is maintained to treat the stormwater. The program results in approximately 50 projects annually that require design and construction management activities as well as contract management and maintenance responsibilities. Funding in the amount of \$5,000,000 is included for dam maintenance in FY 2022.



3. Dam and Facility Maintenance (Countywide): This program provides for inventory, inspections, operations and maintenance of all stormwater facilities within the County. There are currently approximately 2,400 stormwater management facilities in service that range in size from small rain gardens to large state regulated flood control dams. The County is responsible for inspecting both County owned and privately-owned facilities and for maintaining County owned facilities. This inventory increases annually and is projected to continually increase as new development and redevelopment sites occur in the county. This program

4. Dam Safety and Facility Rehabilitation (Countywide): This program provides for capital repair and rehabilitation of stormwater management facilities in the County. The County currently owns and operates dams, green infrastructure facilities, and various types of other facilities such as underground detention and proprietary systems with an estimated replacement value of over \$500 million. Funding in the amount of \$6,000,000 is included for Dam Safety and Facility Rehabilitation in FY 2022.

5. Emergency and Flood Response Projects (Countywide): This program supports flood control projects for unanticipated flooding events that impact storm systems and structural flooding. The program provides annual funding for scoping, design, and construction activities related to flood mitigation projects. Funding in the amount of \$5,000,000 is included for the Emergency and Flood Response Projects in FY 2022.

6. Lake Accotink Dredging (Braddock District): \$5,000,000 has been allocated from stormwater funds to support the design phase of the dredging of Lake Accotink. Lake Accotink is a 55-acre lake surrounded by managed conservation areas, wetlands, deciduous and evergreen forests, and historic and pre-historic sites. Over 300,000 patrons visit the park annually to enjoy a variety of facilities and activities that vary with the season. Sediment from the upstream areas of the watershed has continued to be deposited in Lake Accotink over the years filling in the lake and limiting recreational use of the lake. The estimated additional cost for dredging including sediment disposal is \$30,500,000 and is reflected in the Park Authority section of the CIP. Therefore, the total cost of the project is \$35,050,000. As presented to the Board of Supervisors on October 29, 2019, staff has identified the option of a low interest loan via the Virginia Clean Water Revolving Loan Fund (VCWRLF) as the preferred funding mechanism to fund the dredging project costs. Future debt service costs associated with the loan will be funded by the Stormwater Services Fund.

7. **Pro Rata Share Drainage Improvements (Countywide):** This is a continuing Program which utilizes Pro Rata funds received from developer to support watershed planning, regional pond development and other drainage improvement projects. Contributions are received in accordance with the Pro Rata Share Program approved by the Board of Supervisors on December 16, 1991. The Pro Rata Share Program provides a funding source to correct drainage deficiencies by collecting a proportionate share of the total estimated cost of drainage improvements from the developers of the land. As projects are identified and prioritized during scheduled budgetary reviews, Pro Rata funds on deposit are appropriated.
8. **Stormwater Allocation to Towns (Countywide):** This project is a continuing project which provides for allocations to the Towns of Vienna and Herndon. On April 18, 2012, the State Legislature passed SB 227, which entitles the Towns of Herndon and Vienna to all revenues collected within their boundaries by Fairfax County's stormwater service district. An agreement was developed for a coordinated program whereby the Towns remain part of the County's service district and the County returns 25 percent of the revenue collected from properties within each town. This allows for the towns to provide services independently such as maintenance and operation of stormwater pipes, manholes, and catch basins. The remaining 75 percent remains with the County and the County takes on the responsibility for the Towns' Chesapeake Bay TMDL requirements as well as other TMDL and MS4 requirements. This provides for an approach that is based on watersheds rather than on jurisdictional lines. Funding in the amount of \$900,000 is included for the allocations to Vienna and Herndon in FY 2022.
9. **Stormwater Regulatory Program (Countywide):** This is a continuing program to support County operations to meet the conditions of a state issued MS4 Permit. Stormwater staff annually evaluates funding required to meet the increasing federal and state regulatory requirements pertaining to the MS4 Permit requirements, and State and Federal mandates associated with controlling water pollution delivered to local streams and the Chesapeake Bay. The MS4 Permit allows the County to discharge stormwater from its stormwater systems into state and federal waters. The County currently owns and/or operates approximately 15,000 outfalls, and 7,000 of these outfalls are regulated outfalls within the stormwater system that are governed by the permit. The current permit was issued to the County in April 2015. The permit requires the County to document the stormwater management facility inventory, enhance public outreach and education efforts, increase water quality monitoring efforts, provide stormwater management and stormwater control training to all County employees, and thoroughly document all of these enhanced efforts. The permit also requires the County to implement sufficient stormwater projects that will reduce the nutrients and sediment delivered to the Chesapeake Bay in compliance with the Chesapeake Bay TMDL implementation plan adopted by the State. Funding in the amount of \$4,000,000 is included for the regulatory program in FY 2022.
10. **Stormwater Related Contributories (Countywide):** This project provides funding for contributions associated with the Northern Virginia Soil and Water Conservation District (NVSWCD), and the Occoquan Watershed Monitoring Program (OWMP). The NVSWCD is an independent subdivision of the Commonwealth of Virginia that provides leadership in the conservation and protection of Fairfax County's soil and water resources. It is governed by a five-member Board of Directors - three members are elected every four years by the voters of Fairfax County and two members are appointed by the Virginia Soil and Water Conservation Board. Accordingly, the work of NVSWCD supports many of the environmental efforts set forth in the Board of Supervisors' Environmental Excellence 20-year Vision Plan. The goal of the NVSWCD is to continue to improve the quality of the environment and general welfare of the citizens of Fairfax County by providing them with a means of dealing with soil, water conservation and related natural resource problems. It provides County agencies with

comprehensive environmental evaluations for proposed land use changes with particular attention to the properties of soils, erosion potential, drainage and the impact on the surrounding environment. NVSWCD has consistently been able to create partnerships and leverage state, federal and private resources to benefit natural resources protection in Fairfax County. The OWMP and the Occoquan Watershed Monitoring Laboratory (OWML) were established to ensure that water quality is monitored and protected in the Occoquan Watershed. Given the many diverse uses of the land and water resources in the Occoquan Watershed (agriculture, urban residential development, commercial and industrial activity, water supply, and wastewater disposal), the OWMP plays a critical role as the unbiased interpreter of basin water quality information. FY 2022 funding of \$554,811 is included for the County contribution to the NVSWCD and \$172,138 is included for the County contribution to the OWMP.

11. **Stormwater/Wastewater Facility (Braddock District):** This project will provide funding for a Public Works complex to consolidate functions and operations and maximize efficiencies between the Stormwater and Wastewater Divisions. The Stormwater business area provides essential watershed planning, engineering design, project management, contracting, monitoring, and maintenance services for stormwater management, storm drainage, flood control, snow removal, water quality, commercial revitalization, county-maintained roads and walkways, trails, public street name signs, and other designated county infrastructure. Current program operations are conducted from various locations throughout the County and are inadequate and outdated. The Wastewater Collection Division operates out of the Freds Oak facility and provides for the sewer collection and conveyance system for the County. The new facility will collocate both functions. This project is currently in design with construction scheduled to begin in summer 2021. It is anticipated that the facility will be financed by EDA bonds with the Stormwater Services Fund and Wastewater Fund supporting the debt service.
12. **Stormwater/Wastewater Facility Debt Service (Countywide):** \$5,000,000 is estimated for the annual debt service payments associated with the Public Works Complex for the Stormwater and Wastewater Divisions. It is anticipated that EDA bonds will be sold in June 2021 and debt payments will begin in FY 2022.
13. **Stream and Water Quality Improvements (Countywide):** This project supports water quality improvement necessary to mitigate the impacts to local streams and the Chesapeake Bay resulting from urban stormwater runoff. This includes water quality projects such as construction and retrofit of stormwater management ponds, implementation of low impact development techniques on stormwater facilities, stream restoration, and approximately 1,900 water quality projects identified in the completed Countywide Watershed Management Plans. This will aid in the reduction of bacteria, sediment and Polychlorinated Biphenyl (PCB) entering local streams in order to comply with federal Clean Water Act (CWA) water quality standards. It is estimated that over 80 percent of



the streams in the County are considered to be from fair to very poor condition and likely do not meet CWA water quality standards. In addition, TMDL requirements for local streams and the Chesapeake Bay are the regulatory drivers by which pollutants entering impaired water bodies are reduced. The Chesapeake Bay TMDL was established by the EPA and requires that MS4 communities as well as other dischargers implement measures to significantly reduce the nitrogen, phosphorous and sediment loads entering waters draining to the Chesapeake Bay by 2025. MS4 Permit holders must achieve 35 percent of the required reductions in the current five-year permit cycle, and 60 percent of the required reductions in the next five-year permit cycle.

The Capital Improvement Program includes a gradual increase that will help meet these requirements. In addition, compliance with the Chesapeake Bay TMDL requires that the County undertake construction of new stormwater facilities and retrofit existing facilities and properties. The EPA is currently updating the Chesapeake Bay compliance requirements and it is anticipated that the update will result in changes to both the assigned targets as well as how projects are credited, which will likely impact future compliance estimates. In addition to being required to meet the Chesapeake Bay TMDL targets, the current MS4 Permit requires the County to develop and implement action plans to address local impairments. Most of the 1,900 watershed management plan projects contribute toward achieving the Chesapeake Bay and local stream TMDL requirements. Funding in the amount of \$26,183,506 is included for stream and water quality Improvements in FY 2022.

14. **Tree Preservation and Plantings (Countywide):** This project provides for tree plantings throughout the County. Revenues collected through the land development process are appropriated at year end to support the tree preservation and planting program. Funding in the amount of \$105,316 has been received to date.

Project Cost Summaries

Stormwater Management

(\$000's)

Project Title Project Number		Budgeted or Expended Through FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	Total FY 2022 - FY 2026	Total FY 2027 - FY 2031	Total Project Estimate
1	Conveyance System Inspection and Dev. 2G25-028-000	C	\$2,000	\$2,000	\$3,000	\$3,000	\$3,000	\$13,000	\$15,000	\$28,000
2	Conveyance System Rehabilitation SD-000034	C	\$7,000	\$8,000	\$11,500	\$13,000	\$13,000	\$52,500	\$65,000	\$117,500
3	Dam and Facility Maintenance 2G25-031-000	C	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$25,000	\$25,000	\$50,000
4	Dam Safety and Facility Rehabilitation SD-000033	C	\$6,000	\$7,000	\$10,500	\$11,600	\$11,600	\$46,700	\$58,000	\$104,700
5	Emergency and Flood Response Projects SD-000032	C	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$25,000	\$25,000	\$50,000
6	Lake Accotink Dredging SD-000041	\$5,000						\$0		\$5,000
7	Pro Rata Share Drainage Improvements Fund 30090	\$3,228						\$0		\$3,228
8	Stormwater Allocation to Towns 2G25-027-000	C	\$900	\$1,000	\$1,000	\$1,000	\$1,000	\$4,900	\$5,000	\$9,900
9	Stormwater Regulatory Program 2G25-006-000	C	\$4,000	\$4,000	\$4,000	\$4,000	\$4,000	\$20,000	\$20,000	\$40,000
10	Stormwater Related Contributories 2G25-007-000, 2G25-008-000	C	\$727	\$727	\$727	\$727	\$727	\$3,635	\$3,635	\$7,270

Project Cost Summaries

Stormwater Management

(\$000's)

Project Title Project Number	Budgeted or Expended Through FY 2021						Total FY 2022 - FY 2026	Total FY 2027 - FY 2031	Total Project Estimate
		FY 2022	FY 2023	FY 2024	FY 2025	FY 2026			
11 Stormwater/Wastewater Facility SD-000039	<i>\$10,000</i>	\$88,000					\$88,000		\$98,000
12 Stormwater/Wastewater Facility Debt Service 2G25-117-000	C	<i>\$5,000</i>	\$5,000	\$5,000	\$5,000	\$5,000	\$25,000	\$25,000	\$50,000
13 Stream and Water Quality Improvements SD-000031	C	<i>\$26,184</i>	\$26,184	\$26,184	\$26,184	\$26,184	\$130,920	\$130,920	\$261,840
14 Tree Preservation and Plantings 2G25-030-000	<i>\$105</i>						\$0		\$105
Total	\$18,333	\$149,811	\$63,911	\$71,911	\$74,511	\$74,511	\$434,655	\$372,555	\$825,543

Notes: Numbers in bold italics represent funded amounts. A "C" in the 'Budgeted or Expended' column denotes a continuing project.

Key: Source of Funds

B	Bonds
G	General Fund
S	State
F	Federal
X	Other
U	Undetermined