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Elizabeth River Bacteria TMDL Action Plan

VSMP MS4 Permit No. VA0088650

Revision 1 – June 2025

31473-032

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Abbreviations

BMP	Best Management Practice
CFU	Colony-forming Unit
City	City of Norfolk
CWA	Clean Water Act
HRPDC	Hampton Roads Planning District Commission
HRSD	Hampton Roads Sanitation District
LA	Load Allocation
MOU	Memorandum of Understanding
MS4	Municipal Separate Storm Sewer System
PARS	Permit Administration and Review System
SWMF	Stormwater Management Facility
TMDL	Total Maximum Daily Load
VDEQ	Virginia Department of Environmental Quality
VSMP	Virginia Stormwater Management Program
VPDES	Virginia Pollutant Discharge Elimination System
WLA	Waste Load Allocation

1. Introduction and Background

1.1 Background

With a continued commitment to water quality improvement, the City of Norfolk (City) has developed this Action Plan to address the Bacterial Total Maximum Daily Load (TMDL) for the Elizabeth River Watershed as outlined in our Municipal Separate Storm Sewer (MS4) permit. The City is pleased to have this opportunity to provide more specific information regarding existing management programs as well as its proposed implementation strategies specific to Norfolk's unique environment that will be implemented to improve the water quality of this valuable resource. Due to the City's proximity to the Chesapeake Bay and its unique waterfront lifestyle, the Elizabeth River provides direct economic benefits through increased tourism, diverse fisheries, and an enhanced quality of life for residents; therefore, the City is devoted to seeing the Elizabeth River clean-up efforts succeed.

This report provides specific programmatic and structural best management practices (BMPs), both existing and planned, implemented by the City to address bacterial contamination. The City understands it's role and responsibilities in the implementation of relevant local strategies through an adaptive management approach to support a reasonable assurance of TMDL compliance. The City is dedicated to improving the quality of both the Chesapeake Bay and local waterways.

Norfolk has had a long-standing commitment to storm water management. The City implemented its Environmental Storm Water Management Program in July 1991 making Norfolk one of Virginia's forerunners in VPDES implementation. Norfolk's comprehensive program addresses the quality and quantity of our storm water runoff while meeting state and federal regulations. With approximately 140 miles of shoreline, water quality is a primary concern to this coastal community located at the junction of the James River, the Chesapeake Bay and the Atlantic Ocean.

The City is designated as a Phase 1 MS4 and is authorized to discharge stormwater from municipal-owned or -operated storm sewer outfalls under Virginia Stormwater Management Program ("VSMP") MS4 Permit No. VA0088650. This permit requires the City to address pollutants of concern ("POC") in accordance with state requirements where it has been allocated a waste load in an approved TMDL. A TMDL establishes the maximum amount of a pollutant that can enter a water body without violating water quality standards.

The City's most recent MS4 permit was issued by the Virginia Department of Environmental Quality (DEQ) with an effective date of January 22, 2024 and will expire January 21, 2029. This TMDL Action Plan documents how the City of Norfolk intends to meet the "TMDL Action Plans other than the Chesapeake Bay TMDL" requirement found in Part I.D.2 of its Phase I MS4 Permit. This document, required to be completed "no later than 18 months after the permit effective date" according to Part I.D.2.a)1) of the MS4 Permit, addresses that requirement and serves as the City's MS4 specific TMDL Action Plan to identify the BMPs and other activities to be implemented to address the bacteria waste load allocation assigned to the City's regulated MS4 area by:

- evaluating significant sources of bacteria;
- assessing the adequacy of existing programs and legal authorities;
- identifying new action items and associated schedules and milestones; and,
- determining how the effectiveness of the plan will be assessed.

1.2 Regulated Areas

Regulated areas are lands that produce runoff that drain through the City's stormwater system and discharge through pipes and/or ditches to the natural waterways within and adjoining the City. These are the lands covered by the City's MS4 Permit and to which a waste load allocation has been assigned. Direct discharges from land to the surrounding waters that do not pass through the City's stormwater system are not regulated under the City's MS4 permit. However, most policies and pollutant reduction practices recommended in this Action Plan will apply city-wide and address discharges from both regulated and non-regulated lands.

The City recently revised the MS4 service area in 2024 consistent with Part II, Section 2 of *Guidance Memo No. GM20-2003* (dated February 6, 2021). The regulated areas have not changed since the delineation and were used in the development of this TMDL Action Plan. The City's geographic information system ("GIS") data was used in the delineation of the MS4 regulated areas and allowable exclusions. The extent of the regulated MS4 service area and the impaired waters covered by this TMDL are provided graphically in **Figure 1-1**. In **Figure 1-1**, the impaired waters shown are representative of the impairments listed in DEQ's 2022 Integrated Report. Lafayette River was relisted as impaired in the 2018 Integrated Report and remains listed. However, water quality monitoring stations in the Lafayette River contain insufficient information to assess and analyze the new water quality standards; therefore, until there is adequate data to delist the Lafayette River, it remains indicated as impaired.

1.3 Permit Compliance Crosswalk

Guidance Memo No. GM-16-2006, "TMDL Action Planning for Local Total Maximum Daily Loads as required in the Small MS4 General Permit (VAR04) Effective July 1, 2013 and MS4 Individual Permits", was published by VDEQ on November 21, 2016 for use in developing local TMDL Action Plans. **Table 1-1** provides an overview of the organization of this plan and how each section addresses Norfolk's MS4 permit requirements and VDEQ guidance.

1.4 Public Notification and Comment

This TMDL Action Plan has been subjected to public notification and review. The Action Plan was published on the City of Norfolk's website between May 15 and May 30, 2025, for public comment. Email notifications of the comment period were sent to contact lists for Keep Norfolk Beautiful, Bay Star Homes, and Civic League Presidents. There were no public comments received during this notification period.

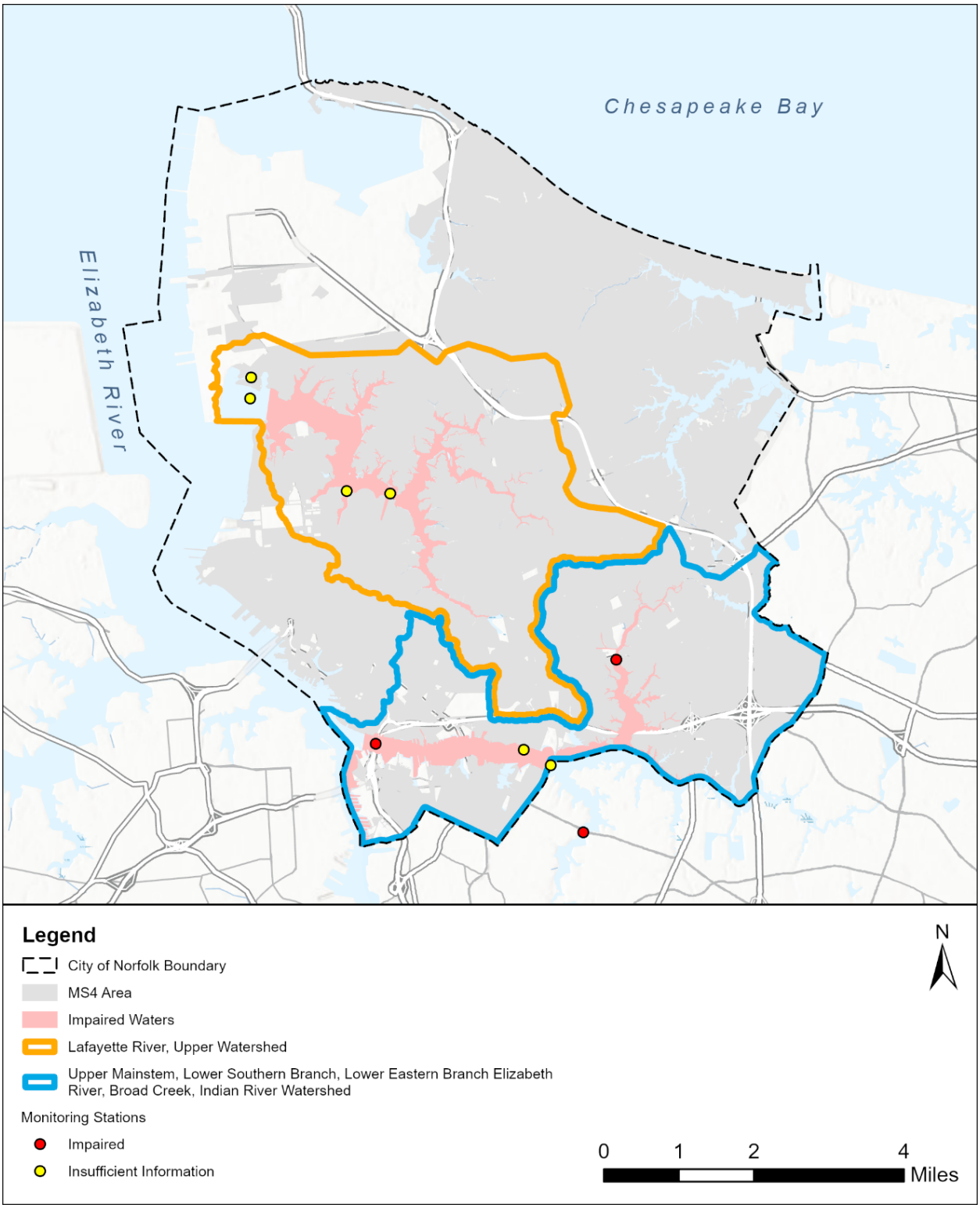

FIGURE 1-1: Impaired Waters Covered by this TMDL

Table 1-1: Action Plan and Permit Compliance Crosswalk

Action Plan Section	Action Plan Element	DEQ Local TMDL Action Plan Guidance	MS4 Permit Requirement Reference Section
Section 2.0	TMDL Report	The name(s) of the final TMDL report(s)	Section I.D.2.c)1)
Section 2.0	Pollutant of Concern	The pollutant(s) causing the impairment(s)	Not Applicable
Section 2.0	EPA Approval Date	-	Section I.D.2.c)2)
Section 2.0	Bacteria TMDLs	The WLA(s) assigned to the MS4 as aggregate or individual WLAs	Section I.D.2.c)3)
Section 3.0	Evaluation of Significant Sources of Bacteria	Significant sources of POC(s) from facilities of concern owned or operated by the MS4 operator that are not covered under a separate VPDES permit	Section I.D.2.c)4)
Section 4.0	Existing and Planned Management Controls	Existing or new management practices, control techniques, and system design and engineering methods that have been or will be implemented as part of the MS4 Program Plan	Section I.D.2.c)5) Section I.D.2.d)
Section 5.0	Legal Authorities	Legal authorities such as ordinances, state and other permits, orders, specific contract language, and inter-jurisdictional agreements applicable to reducing the POCs	Not Applicable
Section 6.0	Enhanced Education, Outreach, and Training	Enhancements to public education, outreach, and employee training programs to reduce discharges of the POC(s)	Section I.D.2.c)5)(b)
Section 7.1	Schedule and Milestones	A schedule of interim milestones and implementation of the items in 5, 6, and 7;	Section I.D.2.c)5)(c)
Section 7.2	Assessment of Effectiveness	Methods to assess TMDL Action Plans for their effectiveness in reducing POC(s)	Section I.D.2.a)1)(a)
Section 7.3	Measurable Goals	Measurable goals and the metrics that the permittee and Department will use to track goals (and milestones required by the permit)	Section I.D.2.b)5)

2. Applicable TMDL Report, Pollutant of Concern, and Waste Load Allocation

Based on the water quality assessment presented in the April 2010 *Bacterial Total Maximum Daily Load (TMDL) for the Elizabeth River Watershed,* herein referred to as the Elizabeth River TMDL, prepared by the Louis Berger Group, Inc. for the Virginia Department of Environmental Quality ("VDEQ"), the Elizabeth River does not support its designated use of primary contact recreation (e.g. swimming and fishing). In accordance with Section 303d of the Clean Water Act and the US Environmental Protection Agency's ("EPA") Water Quality Planning and Management Regulations (40 CFR Part 130), VDEQ has developed a TMDL for the POC enterococcus bacteria in the Elizabeth River, and the City has been allocated a waste load allocation ("WLA"). The TMDL was approved by the EPA on July 20, 2010, and by the State Water Control Board ("SWCB") on September 30, 2010.

The City of Norfolk is subject to two (2) separate TMDLs that assign WLAs for discharges of bacteria to impaired waters. The WLAs are assigned in aggregate to multiple MS4 permit holders within the City of Norfolk's geographic boundary. MS4 permit holders include the City of Norfolk, Norfolk State University (VAR040097), and Old Dominion University (VAR040078). **Table 2-1** summarizes the approved TMDL WLAs for enterococcus.

Table 2-1: Elizabeth River TMDL Enterococcus Waste Load Allocations (WLAs)

TMDL Watershed	WLA	Aggregated Permittee
Southern Branch, Elizabeth River – Lower Broad Creek, Eastern Branch - Elizabeth River Elizabeth River Mainstem – Upper	1.18E+13 cfu/day	Norfolk State University (VAR040097)
Knitting Mill Creek Lafayette River - Upper	1.03E+13 cfu/day	Old Dominion University (VAR040078)*

*Not included in the 2010 *Bacteria TMDL Development for the Elizabeth River Watershed,* but does discharge to Lafayette River – Upper.

3. Significant Sources of the Pollutant of Concern

The MS4 Permit requires the City to assess all significant sources of the POC from facilities of concern owned or operated by the City that are not covered under a separate VPDES permit. This topic is covered more fully in Section 4 of this plan. However, as a whole, it is important to understand the magnitude of each of the bacterial sources in the affected watersheds so that effective programs can be developed and implemented to address the TMDL in a cost-effective manner. **Table 3-1** summarizes the nature and magnitude of the bacterial sources in each of the affected watersheds, the required reductions, and the amount of the source reduction as a percentage of the total reduction required.

Table 3-1: Bacteria Sources and Required Reductions for Each TMDL Watershed

Bacterial Source	Impaired Watershed					
	TMDL #1 Lower Eastern Branch, Lower Southern Branch, Indian River, Broad Creek Upper Mainstem			TMDL #3 Lafayette River		
	Percent of Existing Load (%)	Required Reduction in Source (%)	Required Reduction in Source as a Percent of Total Reduction (%)	Percent of Existing Load (%)	Required Reduction in Source (%)	Required Reduction in Source as a Percent of Total Reduction (%)
Sanitary Sewer Overflows	5.7	100	6.0	51.2	100	54.1
Failed Septic Systems	< 0.1	100	< 0.1	< 0.1	100	< 0.1
Pets	45.3	100	47.7	44.4	98	45.9
Wildlife	15.9	68	11.4	4.4	0.0	0.0
Livestock	33.1	100	34.8	0.0	98	0.0
TOTAL	**100.0**		**100.0**	**100.0**		**100.0**

Table 3-1 illustrates that a large percentage of the source load reduction requirements are associated with pet waste in both TMDL watersheds. Each watershed also has nominal removal requirements for bacterial sources resulting from sanitary sewer overflows and failing septic system. Norfolk has substantial existing programs in place to address these bacterial sources.

An anomaly of the TMDL is the rather high source loadings associated with livestock within the Elizabeth River watershed. In TMDL #1, according to Table 2-28 in the *Bacteria TMDL Development for the Elizabeth River Watershed*, there are zero livestock in this Norfolk watershed, but **Table 3-1** indicates that livestock in Norfolk contribute 33.1% of the existing load. This livestock loading percentage is a result of the overall ratio of livestock for the combined cities located in this portion of the Elizabeth River watershed. According to the *Bacteria TMDL Development for the Elizabeth River Watershed*, the only city that contains livestock in this TMDL watershed is Chesapeake; therefore, the livestock loading for Norfolk in TMDL #1 results from the livestock percentages present in Chesapeake rather than within Norfolk. As a result, Norfolk has no real requirement to address livestock loads.

In TMDL #3, Table 2-28 from the Elizabeth River TMDL indicates that Norfolk indeed has livestock in this watershed; however, the attributed loading in **Table 3-1** indicates that livestock contributes 0% of the existing bacterial load. Therefore, Norfolk has no real requirement to address the livestock loads in this watershed either.

4. Existing Management Practices

Part 1.D.2.c)5) of the MS4 Permit requires the City to identify and maintain an updated list of all "…BMPs designed to reduce the pollutants of concern in accordance with Part I.D.2.d."

This section highlights the existing management practices performed by the City to address bacterial sources of water quality impairments. These practices have both great depth and breadth. It is worth noting that these practices are not new; conversely, since the Elizabeth River TMDL came to fruition in 2010, the City has been implementing and adding programs to address the bacterial issue even prior to the requirement to do so. In fact, many of the programs discussed below were instigated to specifically address the 2010 TMDL, examples of which include the City's pet waste management and public education programs.

The City of Norfolk has an aggressive storm water management program in place to address water quality improvements related to the Elizabeth River Bacteria TMDL including, but not limited to:

- A BMP program that includes aggressive inspections;
- Maintenance, repair, and cleaning of the City-owned and operated MS4 system including ditches, pipes, structures, outfalls, and BMPs;
- Sweeping of all streets within the City of Norfolk;
- An Environmental Crimes Task Force, a collaboration of specially trained staff in several Departments that collectively investigate and enforce environmental ordinances throughout the City including pollution of the storm water system;
- A Spill Response and Illicit Discharge Detection and Elimination Program to prevent, identify, and clean potential discharges to the City's MS4;
- A program to inspect storm water structures to identify and eliminate illicit discharges;
- A Sanitary Sewer Overflow (SSO) and cross connection elimination program;
- Annual dry weather monitoring of the MS4 system;
- Local and regional coordination and participation on committees such as the Watershed Management Task Force, Keep Norfolk Beautiful / Norfolk Environmental Commission, Hampton Roads Planning District Commission Stormwater Education Committee, and Elizabeth River Project;
- A public education and outreach program to address water quality improvement; and,
- Construction of water quality improvement projects.

VDEQ Guidance Memo No. 16-2006, TMDL Action Planning for Local Total Maximum Daily Loads as Required in the Small MS4 General Permit (VAR04) Effective July 1, 2013, and MS4 Individual Permits, dated November 21, 2016, stipulates that any illicit discharges (e.g., illicit discharges, leaking pipes, sanitary sewer overflows) must be addressed by the permittee in the TMDL Action Plan. However, DEQ has also recognized that existing programmatic practices, ordinances, and outreach currently in place may be sufficient to address bacterial sources and permittees are encouraged to consider practices such as public education and outreach to influence behaviors. Accordingly, the remainder of this section of the

TMDL Action plan is organized by: (1) activities which address illicit discharges; and (2) other programmatic activities which improve bacterial water quality.

4.1 Activities Addressing Illicit Discharges

4.1.1 Sanitary Sewer Overflows

The Norfolk Department of Utilities makes notification of sanitary sewer spills to DEQ through the DEQ/HRPDC Sanitary Sewer Overflow Reporting System (SSORS). SSORS is a web-based spill reporting and tracking system developed by the HRPDC that simplifies the initial notification and 5-day letter reporting requirements for sanitary sewer overflows. Once Norfolk logs into the SSORS system and enters necessary data, a report is automatically sent to DEQ and, for spills exceeding 1,000 gallons, to the Virginia Department of Health.

Data collected in SSORS includes the date and time of reporting, date and time of the incident, location of the incident, possible receptors/affected water body, material spilled, amount spilled, amount cleaned up, amount reaching state waters, and corrective actions taken. SSORS provides a summary of spill reports, upon request, that can be downloaded into Microsoft Excel or similar programs.

Table 4-1 provides a summary of the sanitary sewer overflows the City has addressed and reported in each annual report for each fiscal year.

Table 4-1: Sanitary Sewer Overflows Addressed

	FY19	FY20	FY21	FY22	FY23	FY24
SSOs Addressed	31	98	47	20	39	17

4.1.2 Sanitary Sewer System Maintenance and Repair

The Norfolk Department of Utilities, Division of Wastewater performs preventive maintenance to repair pipes and clear blockages to minimize exfiltration from the sanitary sewer system. The Division maintains a list of lines and a schedule of when they are to be inspected and maintained. The Division performs television inspection of sanitary sewer lines. Potential problem areas are inspected on either a 30 or 60-day basis, depending on the assigned level of risk. The Division tracks the maintenance and inspection performed and reports this data annually to the Division of Environmental Storm Water Management for inclusion in the Annual Report.

The MS4 permit under Part I.B.2.e)2) requires the City to “continue implementing a sanitary sewer inspection program to minimize the exfiltration from the sanitary system to the MS4.” While the Department of Public Works is not responsible for the inspection and maintenance of the sanitary sewer system, the Department works closely with the Department of Utilities to identify and correct deficiencies within the sanitary sewer network in part through implementation of a storm water preventative

maintenance inspection program for storm water infrastructure. This effort is instrumental in allowing the Departments of Public Works and Utilities to cooperatively identify and remove cross-connections between the sanitary and storm sewer systems.

The City will continue to inspect a minimum of 724,000 linear feet of sanitary sewer as required by Part I.B.2.e)2) of the MS4 permit to identify deficiencies in the sanitary sewer system. **Table 4-2** provides a summary of the linear footage of sanitary sewer pipe inspected and reported each fiscal year in the annual reports. While there was a decrease below the minimum requirement in fiscal years 2020-2022, the City has reinforced its commitment to the minimum required inspection footage in the two most recent fiscal years.

Table 4-2: Linear Feet of Sanitary Sewer Pipe Inspected

	FY19	FY20	FY21	FY22	FY23	FY24
Sanitary Sewer Pipe Inspected (LF)	756,561	685,205	689,040	416,500	1,055,333	733,279

A list of recent sanitary sewer evaluation and rehabilitation construction projects addressing potential illicit discharges, an initiative that will continue in the future, is provided in **Appendix A**. A summary of the projects initiated each fiscal year is provided in **Table 4-3** below. Note there are 31 additional projects initiated that are not associated with a specific fiscal year. The continuous initiation of sanitary sewer rehabilitation projects depicts the City's dedication to maintaining and improving the quality of its sewer system to minimize exfiltration.

Table 4-3: Recently Initiated Sanitary Sewer Evaluation and Rehabilitation Projects

	Previous Report	FY18 and Before	FY19	FY20	FY21	FY22	FY23	FY24
# of Sanitary Sewer Projects	13	36	-	49	6	5	2	-

4.1.3 Illicit Discharge Detection and Elimination (IDDE)

The City addresses illicit discharges to the stormwater system in accordance with Sections I.B.2.e)5) and I.B.2.l)1) of the MS4 permit with the goal of detecting the presence of potential illicit connections and unauthorized discharges by conducting dry weather screening. The City's IDDE program has existed since the inception of the stormwater management program dating back more than 20 years but has seen significant expansion of staff and scope since 2010 in support of the Elizabeth River Bacteria TMDL and other regulatory requirements, with many of these efforts formalized as requirements in the 2016 MS4 permit renewal.

Prior to 2017, IDDE and infrastructure inspections were predominately based on complaints received from citizens or City field staff. In 2017, the City expanded its IDDE program to a more strategic approach to meet both environmental regulatory screening and preventative maintenance inspection goals.

The Department of Public Works also performs dry weather monitoring each year during industrial inspections and standard preventative maintenance storm system inspections. The dry weather sampling typically occurs approximately 72 hours after a rainfall event. The City screens at a minimum 50 sites throughout the city based on:

- areas of concern such as pet kennels, commercial car washes, car dealerships, and restaurants;
- sites requiring further investigation, as identified through previous screening;
- the age and density of development, with a focus on older residential, commercial, and industrial areas;
- the general land uses in the city;
- areas with poorly maintained gas stations, service stations, and shopping centers;
- areas with environmentally sensitive downstream features; and,
- areas having a history of complaints.

Table 4-4 summarizes the number of stormwater structures inspected each fiscal year and reported in each annual report. The City maintains a large inspection volume of stormwater structures, indicating its commitment to detecting illicit discharges.

Table 4-4: Stormwater Structures Inspected

	FY19	FY20	FY21	FY22	FY23	FY24
Stormwater Structures Inspected	2,006	21,467	9,691	9,225	8,530	9,153

The Department of Public Works also conducts dry weather monitoring on a complaint driven basis. If a resident reports flow during a dry weather event, the complaint is investigated to ensure the flow is not an illicit discharge. Residents also report strange odors to the Division of Environmental Storm Water Management, and the Environmental Staff investigates to ensure there is no illicit discharge.

During inspections, the structures are checked for flowing water, discharges, strange odors, blockages, and maintenance problems. If flow is discovered, the lines are traced back using GIS mapping. Approximately 60% of the City's infrastructure is influenced by inundation during normal tidal cycles. Inspectors utilize tidal data when investigating flow. Field samples, where applicable, are taken to determine the source of flow. Samples may be analyzed in the field for pH, alkalinity, chlorine, petroleum and detergents. Action is taken if the sample results fall outside a targeted range of values or there is evidence of an odor typical of sanitary sewage.

If an illicit discharge is discovered during inspections and action is required based on the screening values, efforts are made to contain the discharge, take necessary corrective actions to eliminate the discharge, and report the discharge immediately to the Department of Environmental Quality (DEQ). If the discharge is suspected wastewater from Hampton Roads Sanitation District or Department of Utilities systems, stormwater field inspectors will coordinate with the responsible party to address and eliminate the sanitary sewer overflow. If a discharge from private property is suspected to require individual

coverage under a storm water permit, the owner/manager is notified to contact VDEQ regarding obtaining a storm water permit. VDEQ is also notified by the City to follow up with the private property owner. **Table 4-5** provides a summary of the number of illicit discharges addressed each fiscal year and documented in each annual report. The City maintains a constant dedication to detecting and addressing illicit discharges as indicated by the high volume of discharges addressed each fiscal year.

Table 4-5: Illicit Discharges Addressed

	FY19	FY20	FY21	FY22	FY23	FY24
Illicit Discharges Addressed	55	19	49	58	42	39

The City also maintains a list of high risk industrial and/or commercial dischargers to the MS4 that do not have a VPDES industrial discharge permit. The list includes, but is not limited to, major automotive facilities such as: repair shops, body shops, auto detailers, auto dealers, tire repair shops, service stations, commercial car washes, and car rental facilities. It also includes other facilities such as nurseries, landscape facilities, pet care facilities, carpet cleaning facilities, junk dealers, transportation services, laundry and dry cleaners, and areas with a history of complaints.

Inspection of facility discharges to the MS4 are prioritized by Norfolk based on: historical discharges; local water quality impairments for pollutants; and citizen complaints. Norfolk inspects, but does not necessarily monitor, all VPDES industrial permitted outfalls that tie into to the City's MS4 at least once every five years. The City also inspects other non-VPDES-permitted facilities that tie into the MS4 to determine their risk of contributing significant loading. **Table 4-6** provides an overview of the number of high-risk facilities inspected each fiscal year. It is important to note that the variability in the inspection values does not reflect the City's inconsistency in inspections, rather it is representative of the 5-year intervals that the City inspects these facilities. Different facilities may be due for inspection in separate years, resulting in large variability in inspections each year.

Table 4-6: High-Risk Facilities Inspected

	FY19	FY20	FY21	FY22	FY23	FY24
High Risk Facilities Inspected	11	7	12	18	6	1

4.2 Programmatic Activities to Improve Bacterial Water Quality

4.2.1 Septic System Programs

Most of the City's household sanitary sewage is discharged to the public sewer system. Records indicate that a limited number of properties continue to use a septic system city-wide, including properties within Norfolk's regulated MS4 service area contributing to the Elizabeth River watershed. **Figure 4-1** illustrates the location of active septic systems within the City of Norfolk while **Table 4-7** summarizes the distribution of septic systems within the City. Septic systems in the City will continue to be reduced as

new connections to the public sewer are made through sewer extensions which allow property owners to connect to the sanitary sewer system and abandon/remove their septic tanks, effectively reducing the risk of septic tank discharges. One of these sewer connection projects includes the Huette Drive Sewer Collection System project where, in its first phase, will abandon 16 septic tank systems by connecting properties to a new sanitary sewer system. These systems to be removed are seen in **Figure 4-1**. While these septic tanks may not be within an impaired watershed, this project indicates the City's commitment to reducing the number of active septic tanks to improve bacterial water quality city-wide. Section 39.1-5 of the City Code requires the owner of any premises or other building in which humans live or congregate to connect to public sewer when accessible within 200 feet of the property line.

In accordance with Section 39.2-4 of the City Code, all on-site sewage disposal systems not requiring a Virginia Pollution Discharge Elimination System (VPDES) permit are required to be pumped out at least once every five (5) years in accordance with state and local law and HRSD requirements. As failed drainfields are the primary cause of failed on-site wastewater treatment systems, Section 39.2-3 of the City Code requires that a reserve sewage disposal site with a capacity at least equal to that of the primary sewage disposal site be provided for systems installed after October 1, 1989.

Table 4-7: Distribution of Septic Tank Systems

Service Area Delineation	Unimpaired Waterbodies	Impaired Water Bodies		TOTAL
		Lafayette River	Elizabeth River	
In MS4 Service Area	95	47	27	**169**
Outside MS4 Service Area	0	1	0	**1**
TOTAL	**95**	**48**	**27**	**170**

In its Eastern Branch Environmental Restoration Strategy adopted November 2014, the Elizabeth River Project (ERP) set a goal to establish a regional task force on septic tanks, with the Eastern Branch as the pilot focus area. The purpose of the task force is to increase tracking of existing septic tanks, enforce tank pump outs, provide education and consider incentives and grant programs for replacing tanks with wastewater hookups. The regional task force has been established in partnership with the ERP, municipalities including the City, the Virginia Department of Health (VDH), and the Hampton Roads Sanitation District (HRSD). The City will remain a stakeholder on the Task Force. The various City Departments, including Public Works, Utilities, and Health will also continue to cooperate to ensure that the effective review and implementation of septic tank pumpouts is accomplished. Finally, the City will coordinate with outside parties and NGOs to identify grant opportunities and cost sharing opportunities to remove septic systems on qualifying properties.

In FY24, ERP installed 4 conservation landscaping areas treating 5,065 ft2, 4 living shorelines totaling 9,935 ft2 and 537 linear ft, 2 riparian buffer plantings totaling 2,300 ft2 and 129 linear ft, and 54 trees outside of other project areas.

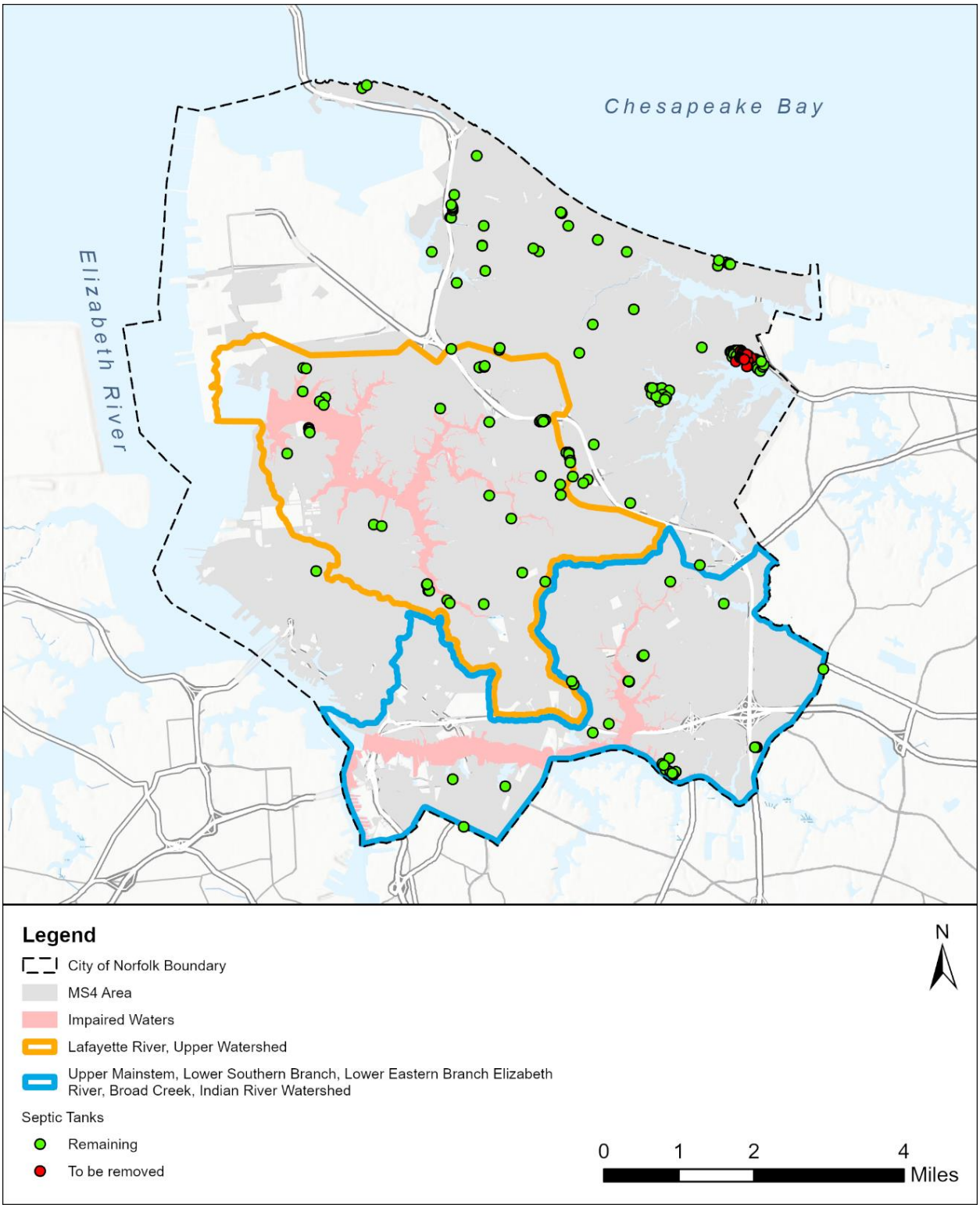

FIGURE 4-1: Septic Tank Locations

As a stakeholder and supporter of the ERP and the Eastern Branch Environmental Restoration Strategy, in 2020, Norfolk helped the Easter Branch of the Elizabeth River to become the 2nd Chesapeake Bay tributary in Virginia to reach oyster restoration goals established by Bay scientists. The programs and efforts to help restore the Eastern Branch have been successful in their goals and continue the pledge to maintain the health of the river.

4.2.2 Boater Programs

Marinas and heavy boating can contribute to bacteria loads when waste is not properly collected and transported for treatment via the sanitary sewer system in pump stations. The Virginia Clean Marina Program promotes the voluntary adoption of measures that reduce pollution from marinas, boatyards, and recreational boats. A marina that is in compliance with all legal regulatory requirements and has adopted best management practices (BMPs) as outlined in the clean marina criteria checklist is certified as a "Virginia Clean Marina". While not all marinas are located within the limits of the impaired watersheds, many are located adjacent to impaired segments. It should be recognized that boats are mobile sources and the available pumpout facilities provide water quality benefits for both impaired and unimpaired waters in the Elizabeth River.

The City, along with other municipalities and organizations, has entered into an agreement, "The Hampton Roads Boater Pump-Out Internship Program" with HRSD, to educate local boaters about proper disposal of vessel sewage at marinas within HRSD's service area. The Hampton Roads Boater Pump Out Program is a supportive effort from the City of Norfolk, HRSD, and other local governments administered by the VDH. As part of the program, HRSD:

- educates the public on the reasons for proper disposal of waste from marine sanitation devices;
- recognize the City on displays promoting the program;
- attends water-themed events and festivals in the City to promote the program; and,
- provides boat owners with another vessel-friendly alternative to using marina pump out facilities, including residential appointments.

Marina Interns provide a free 25-gallon pump out of marine sanitation devices (MSDs) to the boating community of Hampton Roads. During the pump out, they also educate the public on the hazards of dumping vessel sewage into local estuaries, creeks, rivers, the bay, and ocean. Our interns' staff pickup trucks, each with a 125-gallon sewage storage tank and a manual portable pump out cart. Sewage is pumped out of MSDs, transferred to the truck storage tank then transported to one of the HRSD sewage treatment plants for proper treatment.

Table 4-8 summarizes the performance of the Boater Pump-out Internship Program. This collaborative effort continues to educate individuals and collect thousands of gallons of sewage that may have otherwise found its way into local water due to equipment failure of illicit discharge.

Table 4-8: Boater Pump-out Internship Program

	FY19	FY20	FY21	FY22	FY23	FY24
Individuals/Groups Educated	100	64	64	46	81	57
Pump Outs	964	826	390	355	470	320
Gallons of Sewage Collected	13,521	10,830	4,773	5,237	6,585	4,938

Table 4-9 indicates which marinas in Norfolk participate in this pump out program, as well as which ones are certified as "Virginia Clean Marinas" and located in impaired watersheds. **Figure 4-2** provides a visual depiction of this same information.

Table 4-9: Private Marinas Located in the City of Norfolk

Marina Name	Water Body	Virginia Clean Marina	Impaired Watershed
Bay Point Marina Little Creek	Little Creek		
Cobbs Marina Little Creek	Little Creek	✓	
The Oasis at East Beach Marina Little Creek	Little Creek		
Harbor Walk Marina Little Creek	Little Creek		
Electrifield Marina Knitting Mill Creek	Knitting Mill Creek		✓
Lag # 88 Naval Station (Rec) Willoughby Bay	Willoughby Bay	✓	
Aspire at East Beach Little Creek	Little Creek		
Nauticus Marina Elizabeth River	Elizabeth River		✓
Norfolk Yacht & Country Club Lafayette River	Lafayette River	✓	✓
Rebel Marine Service Willoughby Bay	Willoughby Bay		
Morningstar-Little Creek Little Creek	Little Creek		
Waterside Marina Intracoastal Waterway	Intracoastal Waterway	✓	✓
Willoughby Harbor Marina Willoughby Bay	Willoughby Bay		

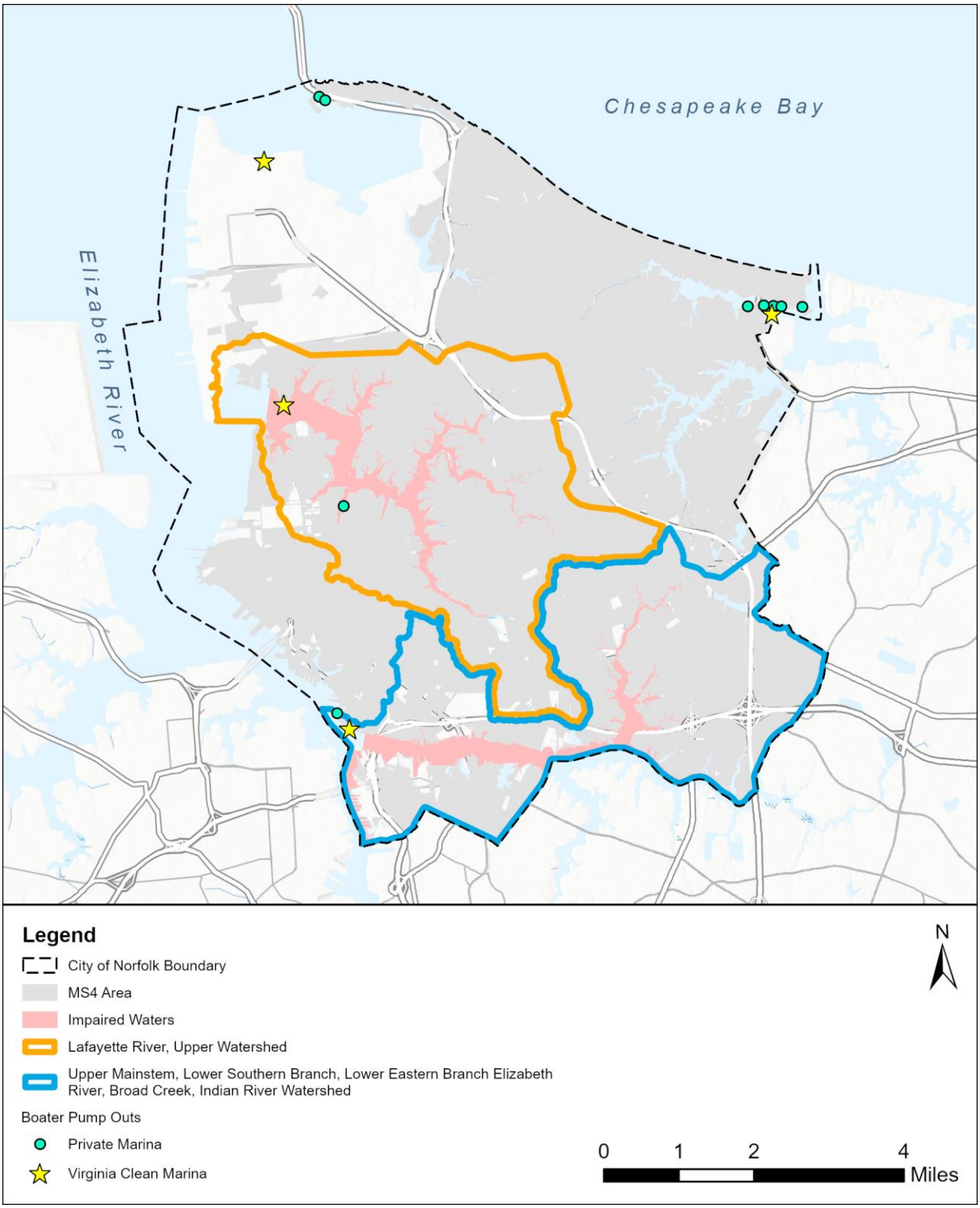

FIGURE 4-2: Boater Pump-out Locations

4.2.3 Pet Waste Programs

Pet waste can enter the MS4 when it is left on a surface that drains to a storm sewer. Dog parks, dog kennels, and veterinary facilities are examples of specific land uses with a potential high risk for bacteria to enter the MS4.

The Department of Public Works has a multitude of programs to address proper disposal of pet waste. The City's "Scoop the Poop" program is an ongoing campaign that has been coordinated through the Hampton Roads Planning District Commission and adopted by the City. The "Scoop the Poop" campaigning varies from year to year, but is incorporated in outreach campaigns through civic presentations, school programming, special events, festivals, and other media venues and brochure development. Additionally, proper pet waste disposal is a key component of the City's Star Homes programs, established since 2010 to assist with TMDL requirements and other City goals.

Norfolk has identified 13 dog parks, both fenced and unfenced, located within the City's MS4 service area. **Figure 4-3** identifies the locations of these dog parks. All but one of the dog parks, the fenced Maple Avenue Dog Park located at 176 Maple Avenue in the Little Creek Watershed, are located in the Elizabeth River watershed. Since 2010, the City has afforded citizens increased assistance in managing pet waste by encouraging environmental stewardship, including: providing baggies for collecting pet waste; procuring and installing pet waste stations at parks, beaches, and dog parks; and creation of a community-based program for installing additional pet waste stations.

Table 4-10 summarizes the pet waste education and outreach program over the permit cycle. The continuous additions to the Bay Star Homes and Business programs indicates the continued effectiveness of the various education materials.

Table 4-10: Pet Waste Program

	FY19	FY20	FY21	FY22	FY23	FY24
Outreach Events*	75	56	18	19	17	23
New Pet Waste Stations	-	-	2	5	5	1
Pet Waste Bag Dispensers	-	-	200	200	200	150
Bay Star Homes Additions	-	-	228	55	44	24
Bay Star Business Additions	-	-	-	18	2	20

*Includes events listed as presentations to groups, handouts and material distributions to groups, social media posts, and other outreach events as in the annual reports.

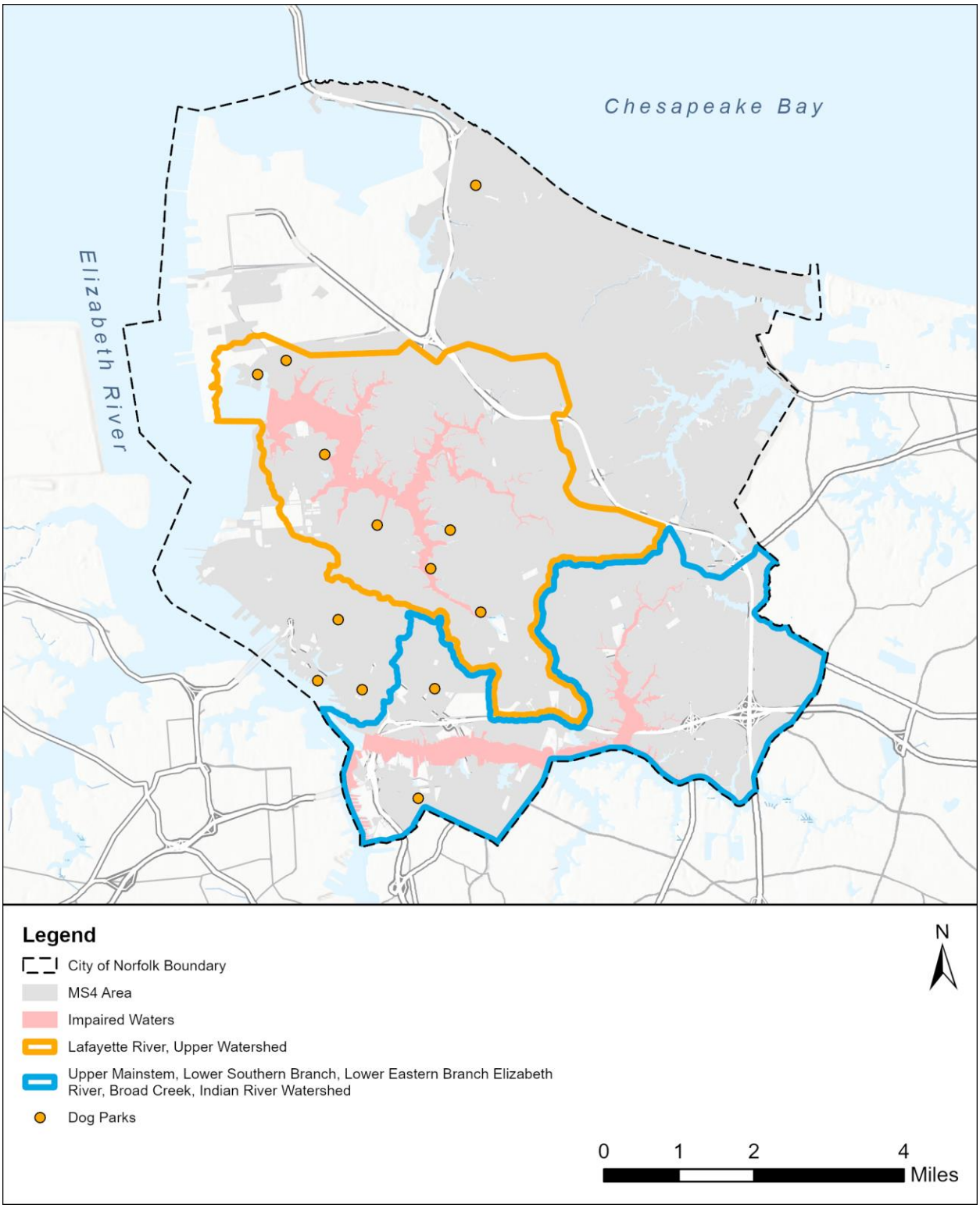

FIGURE 4-3: Dog Park Locations

4.2.4 Wildlife Contribution Controls

By ordinance, feeding of native Virginia wildlife, except by bird feeders, is unlawful within the City limits except in areas designated for that purpose. While the City has no requirement to address additional wildlife contribution controls, it continues to implement BMP sign initiatives including educational information regarding not feeding the wildlife as seen in **Figure 4-4**. The City will also continue to explore additional opportunities which may present benefits. Specifically, the City will investigate whether additional signage discouraging wildlife feeding may be beneficial at select locations including areas surrounding publicly maintained wet ponds and at high profile public facilities such as the Virginia Zoological Park.

FIGURE 4-4: Wildlife Management Sign Example

Furthermore, to address the issue of bacterial pollution from wildlife whose behavior is altered by human activity, such as Canada Geese who remain in the area all year round, the City and partners have continued to review and implement several options. Vegetated buffers are now required for all City-owned stormwater pond upgrades or shoreline restorations to discourage congregation of geese in these areas where they frequently feed.

4.2.5 Structural Best Management Practices

Over time, both the City and private concerns have implemented well over 1,600 structural best management practices (BMPs) providing direct water quality benefits to the Elizabeth River. **Figure 4-5**

illustrates the location of active BMPs within the City of Norfolk while **Table 4-11** summarizes the distribution of the BMPs. Collectively, these BMPs treat more than 7,200 acres (11.3 square miles) of land area and these BMPs provide a significant bacterial loading reduction. **Table 4-12** provides VDEQ recognized bacterial removal efficiencies for the structural BMPs present in Norfolk.

The City has instituted an aggressive inspection and maintenance program to ensure these facilities maintain their pollutant removing capabilities. Inspection of City-owned BMPs, including those of Norfolk Public Schools, are typically conducted annually and City maintenance crews perform maintenance on the City-owned BMPs based on inspection discrepancies or on the preventative maintenance program. Re-inspections of storm water facilities are conducted to ensure maintenance has been completed.

The City also performs regular inspections of privately-owned structural BMPs, at a minimum frequency of once every 5 years. Prior to site plan approval for a project constructing a privately-owned BMP, a Declaration of Covenants (i.e., BMP Maintenance Agreement) must be completed and recorded with the City Clerk of the Court. The Declaration of Covenants outlines the property owner's responsibility to maintain the BMP and permits the City of Norfolk to conduct routine inspections and maintenance if necessary. Additionally, per the authority of Section 41.1 of the Norfolk City Code, the City requires property owners to install and maintain BMPs per their approved site plan. Violation of this ordinance may result in a class 1 misdemeanor charge.

If a condition is discovered on a private BMP and maintenance is required, the owner of the BMP is notified by an inspection report to correct all maintenance items. The BMP is then re-inspected to ensure all maintenance items are corrected and in compliance with all state and federal regulations. If problems persist, enforcement action is taken.

The City will continue implementing and maintaining projects identified as part of its Chesapeake Bay TMDL Action Plan. While the primary purpose of the Chesapeake Bay TMDL Action Plan is the reduction of nutrients and sediments to the Chesapeake Bay, the City has and will continue to invest significant resources to capital projects identified in the plan which will also serve to reduce anthropogenic sources of bacteria within not only the impacted watersheds covered by the bacteria TMDL, but across the entire watershed on both regulated and unregulated lands. Because the Elizabeth River watershed is a direct tributary to the Chesapeake Bay, implementing BMPs to help achieve the Bay TMDL Bay goals will also help to reduce bacteria levels in the river.

Table 4-11: Distribution of Structural BMPs

Service Area Delineation	Unimpaired Waterbodies	Impaired Water Bodies		TOTAL
		Lafayette River	Elizabeth River	
Inside MS4 Service Area	675	328	552	**1,555**
Outside MS4 Service Area	31	26	62	**119**
TOTAL	**706**	**354**	**614**	**1,674**

Table 4-12: Bacteria Removal Efficiencies of Structural BMPs

LUCITY BMP Designation (1)	No. of BMPs Present in Norfolk	VDEQ BMP Designation (2)	VDEQ Recognized Bacteria Removal Efficiency (2) (%)
Bioretention 1	74	Bioretention	90
Bioretention 2	28	Bioretention	90
Bioretention Basin	90	Bioretention	90
Bioretention Urban	3	Bioretention	90
Constructed Stormwater Wetlands	3	Constructed Wetland	80
Detention Basin	164	Dry Detention Pond	30
Dry Swale 1	8	Bioswale	80
Dry Swale 2	2	Bioswale	80
Extended Detention Basin	56	Wet Pond	70
Extended Detention Pond 1	1	Wet Pond	70
General Infiltration Practices	332	Infiltration Trench	90
General Intermittent Sand Filter Practices	1	Filtering Practice	35
Grass Channel	17	Bioswale	80
Grassed Swale	73	Bioswale	80
Infiltration 1	27	Infiltration Trench	90
Infiltration 2	10	Infiltration Trench	90
Manufactured BMP Systems	393	Manufactured BMPs	80
Other SWMF	164	Not Applicable (3)	
Permeable Pavement 1	86	Not Applicable (3)	
Permeable Pavement 2	10	Not Applicable (3)	
Rainwater Harvesting	10	Not Applicable (3)	
Retention Basin	77	Wet Pond	70
Rooftop Disconnect	20	Not Applicable (3)	
Vegetated Filter Strip	9	Riparian Buffer – Grass/Shrub	50
Wet Pond 1	16	Wet Pond	70

(1) LUCITY is a program management software that stores information regarding all active BMPs located throughout the City.
(2) As provided in Appendix A of *Guidance Memo No. GM-17-2004, "Guidance Manual for Total Maximum Daily Load Implementation Plans",* published by VDEQ on June 6, 2017.
(3) No corresponding entry available in GM-17-2004.

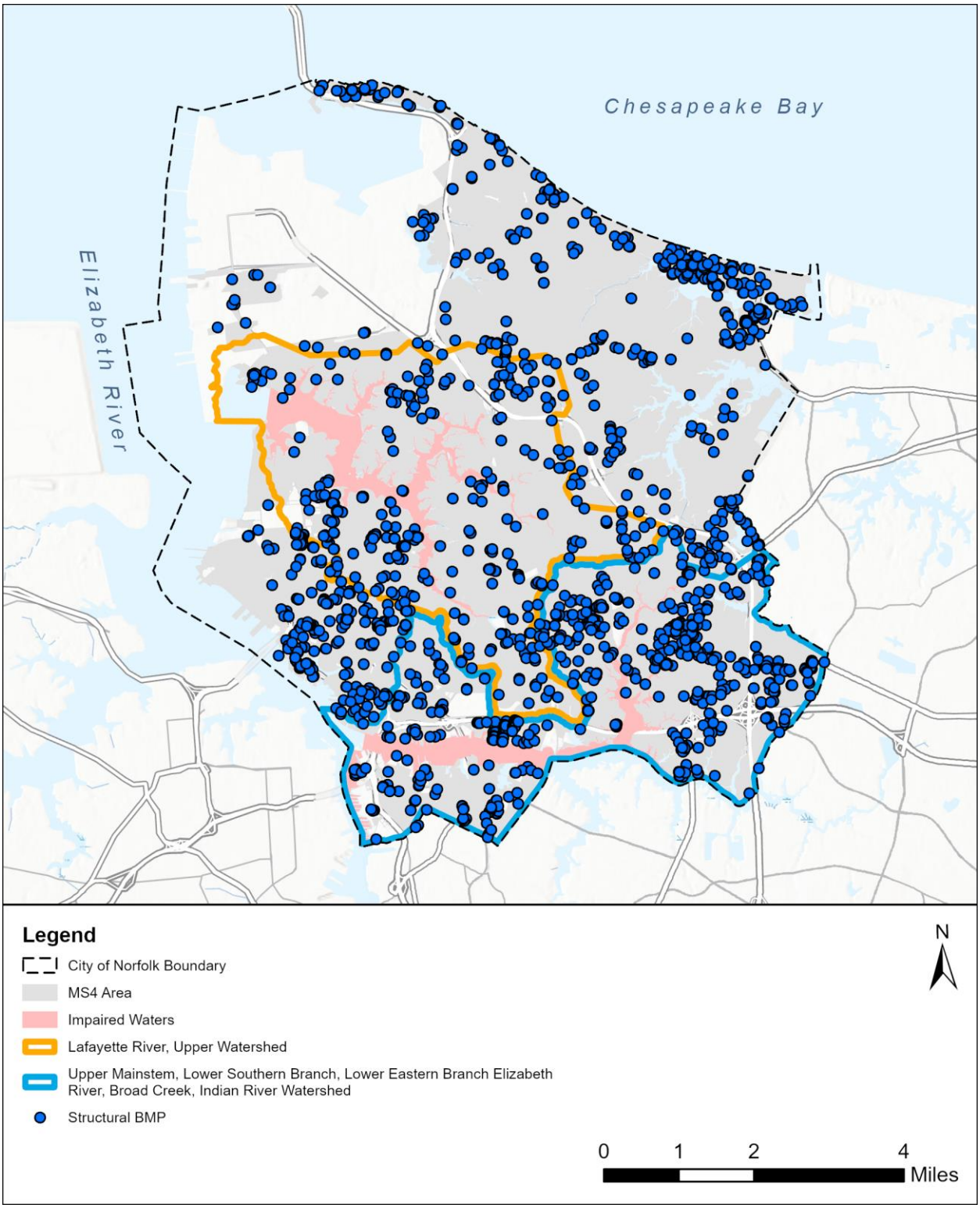

FIGURE 4-5: Structural BMP Locations

4.2.6 Water Quality Monitoring

In addition to the monitoring protocols implemented as part of the IDDE program, the City implements water quality monitoring as warranted by specific problems, including problems typically manifested as acute events related to bacterial contamination. In the past, the City has partnered with HRSD and other stakeholders to identify the source of contamination using bacterial source tracking (BST) and microbial source tracking (MST) techniques. This has been accomplished in the past in the headwaters of the Lafayette River and in Knitting Mill Creek and is currently underway in Haven Creek and Broad Creek. The City will continue to accomplish local monitoring for bacterial source identification and removal as circumstances merit.

5. Legal Authorities

Norfolk has developed an MS4 Program Plan in accordance with Virginia Stormwater Management Law, Virginia Stormwater Management Regulations, and MS4 Permit requirements. The Program Plan was most recently revised and submitted to VDEQ in June 2017.

Part 6 of the "Action Plan Content" section of the Guidance Memo No. GM-16-2006, *"TMDL Action Planning for Local Total Maximum Daily Loads as required in the Small MS4 General Permit (VAR04) Effective July 1, 2013 and MS4 Individual Permits"* (dated November 21, 2016) indicates the City to develop and maintain a list of "legal authorities such as ordinances, state, federal, and other permits, orders, specific contract language, and interjurisdictional agreements applicable to reducing the POCs."

A review of City Codes and Ordinances was conducted during development of this TMDL Action Plan. No new or modified legal authorities are currently planned or necessary to meet the Special Condition requirements of the permit. The City has adequate legal authority to address not only the permit-related waste load allocation (WLA), but pollution attributable to other bacterial sources included in the load allocation (LA).

A list of applicable ordinances addressing both LA and WLA pollutant sources are listed below. The list of legal authorities is extensive and provides the opportunity for improving bacterial water quality in the Elizabeth River and its tidal tributaries. A full copy of the City of Norfolk ordinances can be found online at https://library.municode.com/va/norfolk/codes/code_of_ordinances.

- Sec. 6.1-13 - Feeding of native Virginia wildlife, except by bird feeders, is unlawful within the city limits except in areas designated for that purpose. (Ord. No. 39,717, § 2, 8-31-99; Ord. No. 42,840, § 1, 9-18-07)
- Sec. 6.1-72 - Allowing animals to defecate on public property or on private property of other persons is unlawful unless immediately removed and disposed of in a proper waste receptacle. (Ord. No. 39,717, § 2, 8-31-99)
- Sec. 6.1-79 - It is unlawful for the owner, custodian or other person in charge or control of any animal to permit or allow such animal to be at large within the city limits or to negligently fail to prevent such animal from being at large within the city limits. (Ord. No. 39,717, § 2, 8-31-99; Ord. No. 43,299, § 1, 11-25-08)
- Sec. 7-35 - All sewage and liquid waste shall be disposed of in a public sanitary system or by another method approved the director of public health; Ord. No. 38,730, § 1, 5-13-97
- Sec. 12-31(b) - This restriction shall not apply to any domestic animal, including, but not limited to, dogs, under the immediate leashed or lead control of their owners or custodian or secured in an appropriate animal carrier as required by Section 6.1-79 of this Code, 1979, as amended. The owners or persons in control of such an animal, when the animal is on leash within a cemetery, shall obey all laws governing the disposal of animal feces; (Code 1958, § 10.1-25; Ord. No. 43,606, § 1, 9-22-09)

- Sec. 21-10 All sewage and liquid waste in a health parlor shall be disposed of in a public sanitary sewage system or by another method approved by the director of public health: (Ord. No. 38,552, § 1, 10-29-96)
- Sec. 29-16.1 - It is unlawful for any person to urinate or defecate on any public street, alley, sidewalk, park, beach or other public place or area where the public gathers or has access, other than in facilities designed for such purpose. (Ord. No. 31,457, § 1, 12-8-81; Ord. No. 40,456, § 1, 8-28-01)
- Sec. 30-10(d) - The owners or custodians of such leashed dogs and domestic animals when lawfully present in public parks or on public sand beaches pursuant to this section shall obey the city's provisions concerning animal feces contained in Chapter 6.1, as amended: (Ord. No. 48,503, § 4, 9-14-21)
- Sec. 39.1-5 - The owner of any premises or other building in which humans live or congregate is required to connect to public sewer when accessible within 200 feet of the property line. Following connection, it is unlawful to empty any sewage or residential, commercial or industrial waste into any well, septic tank, open stream or waterway, upon any other land or water or into any noncertified sewer service at any time. (Ord. No. 44,838, § 1, 9-11-12)
- Sec. 39.1-6 - The Director of Utilities is authorized to permit premises or buildings located outside of and adjacent to the city limits to connect directly with the public sewerage system of the city if sewer service is not available from the adjacent locality. (Ord. No. 44,838, § 1, 9-11-12)
- Sec. 39.2-1 - Any person violating any provision of this chapter shall be guilty of a Class 3 misdemeanor. Each day's continuance of such violation shall constitute a separate offense. (Ord. No. 36,176, § 1, 8-28.90)
- Sec. 39.2-2 - The Commonwealth of Virginia, State Board of Health, Sewage Handling and Disposal Regulations, 1988, as amended, are hereby adopted as the private sewer disposal regulations for the City of Norfolk. (Ord. No. 36,176, § 1, 8-28-90)
- Sec. 39.2-3 - For septic tank systems, a reserve sewage disposal site with a capacity at least equal to that of the primary sewage disposal site shall be provided for lots recorded after October 1, 1989. (Ord. No. 36,176, § 1, 8-28-90)
- Sec. 39.2-4 - All on-site sewage disposal systems not requiring a Virginia Pollution Discharge Elimination System (VPDES) permit shall be pumped out at least once every five (5) years in accordance with state and local law and Hampton Roads Sanitation District requirements. (Ord. No. 36,176, § 1, 8-28-90)
- Sec. 39.2-4 - It shall be unlawful for any person to fail, neglect or refuse to maintain or cause to be maintained any septic tank or other sewage disposal system … in a manner satisfactory to the director of the health department. (Ord. No. 36,176, § 1, 8-28-90)
- Sec. 39.2-5(a) - It shall be unlawful for any person in any manner to discharge, cause to be discharged or allow to be discharged, or allow or cause to accumulate any sewage, as defined in the regulations, on any public or private property within the city. (Ord. No. 36,176, § 1, 8-28-90)

- Sec. 39.2-5(b) - It shall be the duty of the director of the department of health or his authorized agent to direct the person who is responsible for the discharge or accumulation to cause such matter to be removed, or the conditions corrected, within forty-eight (48) hours. (Ord. No. 36,176, § 1, 8-28-90)
- Sec. 39.2-6 - If the director of the health department or his authorized agent shall find any violation of this chapter or the provisions of the permit issued under it, he shall direct the person to whom the permit was issued, by written notice, to make the necessary corrections, within such reasonable time as shall be specified therein. (Ord. No. 36,176, § 1, 8-28-90)
- Sec. 41-30 - No fecal matter or other nonhousehold organic waste other than bagged pet waste or bagged food waste shall be placed in any container used for the collection of waste by city forces, nor will city forces collect such waste. It shall be the responsibility of the producer to obtain private collector services for this type of solid waste. It shall be the responsibility of the owners or producers to collect, store and dispose of such wastes in such a way that the public health and welfare is not prejudiced. Excrement from household pets is excluded from this section, provided it is wrapped and placed in a collection container: (Ord. No. 39,971, § 2, 5-23-00)
- Sec. 41.1-2 - Any person who violates any provision of the Stormwater Management chapter or any regulation promulgated pursuant to authority granted in the chapter shall be guilty of a class 1 misdemeanor. (Ord. No. 38,344, § 1, 5-14-96)
- Sec. 41.1-3 - The director of public works shall be responsible for the use, management, operation and maintenance of the stormwater system and shall have authority to establish procedures and to enforce regulations pertaining to the stormwater system (Ord. No. 38,344, § 1, 5-14-96)
- Sec. 41.1-4(a) - It shall be unlawful for any person to put, throw, place or deposit … any filth, animal or vegetable matter … or any other substance or pollutant … in the stormwater system or … in an area which drains into the stormwater system. (Ord. No. 38,344, § 1, 5-14-96)
- Sec. 41.1-4(b) - It shall be unlawful for any person to pour or discharge, or to permit to be poured or discharged, or to deposit, so that the same may be discharged, any gasoline, oil waste, antifreeze, or other automotive, motor or equipment fluids into the stormwater system: (Ord. No. 38,344, § 1, 5-14-96)
- Sec. 41.1-4(c) - It shall be unlawful for any commercial, industrial, or manufacturing entity to discharge process water, wash water, or unpermitted discharge into the stormwater system. (Ord. No. 38,344, § 1, 5-14-96)
- Sec. 41.1-5 - It shall be unlawful to neglect or fail to install or maintain a stormwater best management practice as shown on an approved site plan where the stormwater best management practice has been reviewed and approved by the stormwater management division of the department of public works: (Ord. No. 38,344, § 1, 5-14-96)
- Sec. 42-23 - No person shall install or maintain, or cause to be installed or maintained, any defective private sewer, drain or underground utility, where the same passes under a public street. The director of utilities shall have the right to cause such defective sewer, drain or

underground utility to be closed and the cost thereof shall be recoverable from such person; (Code 1958, § 45-12)

- Sec. 44-38(a) - The only system of sewage disposal for trailer coach parks shall be the public system of the Hampton Roads sanitation district commission. Any other system of sewage disposal is prohibited.
- Sec. 44-51 - No dog, cat or other pet animal shall be permitted by its owner to run at large in any trailer coach park. A violation of this section shall constitute a Class 4 misdemeanor. (Code 1958, § 48-28)

6. Enhanced Education, Outreach, and Training

The City has robust education and outreach programs that vary from year to year to address water quality improvement, pollution prevention, good housekeeping, sustainability, recycling, litter prevention, HHW collection, e-waste collection, yard waste collection, illicit discharge and detection, and public involvement for project development. The City utilizes various techniques to reach students, residents, civic leagues, managers, business owners, and City staff. These techniques include community meetings, presentations, workshops, mass mailings, social media, constant contact, brochures, website, and the media. These public involvement campaigns keep residents informed and allow them the opportunity to provide input, participate, and comment. Public involvement assists management with decision making processes.

6.1 School Education Programs

The City, Department of Public Works, coordinates with a multitude of public schools each year. The goal of the Department is to educate Norfolk's youth regarding environmental topics including water quality improvement, the water cycle, stormwater management, litter prevention and recycling.

6.2 Star Homes Programs

The City, Department of Public Works, currently administers the city-wide Bay Star Homes program. This is a program where residents pledge to do good for the environment. This program is designed to encourage and teach residents how simple acts at home make a difference to the environment. The program includes water quality improvement, water conservation, energy efficiency, recycling, and litter prevention. Upon signing up for the program, residents receive ongoing information such as tips, opportunities to receive free items when available (ex: rain barrels, trees, soil analysis, nutrient management plans, etc.), volunteer opportunities, event notifications, and workshop information. The Department also partners with the Elizabeth River Project (ERP), a not-for-profit special interest group, on a similar program known as River Star Homes.

6.3 Watershed Management Task Force

The City currently has a Watershed Management Task Force (WMTF) comprised of representatives from a number of City Departments as well as not-for-profit special interest groups. The WMTF meets regularly to coordinate on water quality projects and initiatives.

6.4 MyNorfolk

The City maintains the "MyNorfolk" call center. This centralized location allows residents to contact one location via phone or website for all concerns or questions related to City-work or programs. Once these questions or complaints are received, staff at MyNorfolk are trained to notify the appropriate

Department/Division. The Division responds to the inquiries and reports back to MyNorfolk as to the outcome. The MyNorfolk system maintains this information in a database system.

6.5 Website Updates

Within Norfolk, each department is responsible for the content on its individual portion of the City website, www.norfolk.gov. The Department of Public Works is responsible for the content of the Department website, which includes information regarding the MS4 permit, illicit discharges, recycling, litter prevention, etc.

6.6 Illicit Discharges and Improper Disposal of Materials into the MS4

The Department of Public Works has developed programs to educate the public regarding illicit discharges to the MS4. The Department utilizes various media venues to identify and report illicit discharges and spills including but not limited to civic presentations, training sessions, website information, brochures, social media, letters, Star Homes programs, and ultimately enforcement activity. The general message of "Only Rain Down the Storm Drain" is a slogan utilized by the City to inform residents that anything other than storm water is a violation. The City actively promotes reporting illicit discharges through either the Impact Call Center or directly to Storm Water staff.

The Department of Fire-Rescue manages the HazMat response team. They are the primary responders for any chemical spill in the City. By code, the City's Fire Marshall's Office must be contacted whenever a chemical spill occurs in the geographic boundary of the City of Norfolk. The inspectors and investigators educate the commercial businesses and industrial facilities on the proper storage, disposal, and clean-up efforts of hazardous materials/waste. The Fire Marshall's office reports spills that have reached a natural waterway to the NRC. They also refer information pertaining to any discharges to the City's MS4 to the Storm Water environmental staff for further analysis, enforcement, and reporting, where applicable.

The Department of Public Works, Environmental Storm Water Management manages the training program to educate appropriate City staff on spill response and illicit discharge detection.

6.7 Local Water Quality Improvement Project Initiatives

The Department of Public Works has a comprehensive public involvement and outreach program for project design and construction of water quality projects. Civic league presentations and other stakeholder outreach is arranged during the project design process to obtain stakeholder input. Upon completion of design, projects go through the standard City Site Plan Review process, where departments throughout the City review projects for completeness and compliance with all applicable City standards. Appropriate permits are obtained where necessary. Prior to construction beginning, outreach is performed to keep stakeholders up-to-date of the project status.

6.8 Pet Waste

The Department of Public Works has a multitude of programs to address proper disposal of pet waste. The City's "Scoop the Poop" program has been an ongoing campaign that has been coordinated through the Hampton Roads Planning District Commission and adopted by the City. The "Scoop the Poop" campaigning varies from year to year, but is incorporated in outreach campaigns through civic presentations, school programing, special events, festivals, and other media venues and brochure development. Additionally, proper pet waste disposal is a key component of the City's Star Homes programs.

6.9 Litter Prevention and Local Cleanup Programs

The City of Norfolk organizes and promotes volunteer litter removal programs to provide a means by which citizens can get involved in environmental cleanup efforts and to remove litter from the City. The Keep Norfolk Beautiful group develops and implements programs to encourage citizens to participate in litter collection and recycling in the City. KNB utilizes various techniques to solicit volunteers to assist with local cleanup efforts including community meetings, presentations, workshops, mass mailings, social media, Constant Contact, brochures, website, event calendars, and the media.

6.10 Private Property Stormwater Management Initiatives

The City of Norfolk developed the BayStar Homes Program in 2014 as a homeowner initiative to "Do Good" for the environment. This program was introduced to expand the "River Star Homes" program started by the Elizabeth River Project, to the entire City. Under this program residents pledge to implement green practices at home such as recycling, reducing the application of fertilizer to their property, installing rain barrels, planting trees, turning lights off, etc. In 2015, the Norfolk program was adopted regionally by the Hampton Roads Planning District Commission for all localities within Hampton Roads.

The City of Norfolk also has a stormwater rate reduction program to encourage private property owners to install stormwater structural BMPs on their lots.

6.11 Commercial, Industrial, and Institutional Stormwater Management Initiatives

The Departments of Public Works and Fire-Rescue regulate commercial, industrial, and institutional entities. The Departments perform routine inspections on these sites. During inspections, the inspectors educate managers and property owners on, among other things, stormwater pollution prevention. This education may range from verbal communication to written notices or violations depending on the severity of the violation.

6.12 Bay Star Business Programs

As part of the regional effort, the City, Department of Public Works, administers the city-wide Bay Star Business program started in May 2018. This is a program where business managers or owners pledge to do good for the environment at their facility. This program is designed to encourage and teach businesses and their employees how simple acts at work make a difference to the environment. The program includes water quality improvement, water conservation, energy efficiency, recycling, and litter prevention. Upon signing up for the program, businesses receive information on pollution prevention practices that may implemented. The program is focused on businesses that may have impacts to water quality

7. TMDL Action Plan Progress

7.1 Schedule and Milestones

The City will continue to execute its existing MS4 program in accordance with the approved MS4 Program Plan, dated January 2024. Additional actions identified in Section 4.0 and outlined below will be implemented and documented in the MS4 annual report as previously described.

Ongoing activities, implemented since 2010, will continue to be undertaken and include the following:

- participation in a joint HRSD-VDH-City boater pump out initiative;
- performing an enhanced system inspection and dry weather screening program;
- completing high risk industrial/commercial inspections;
- installing or retrofitting structural BMPs and restoration projects;
- installing community-adopted pet waste stations;
- accomplishing pet waste baggie giveaways;
- continue targeted public education efforts regarding pet waste, wildlife, and sanitary overflows;
- actively promoting Bay Star Homes and River Star Homes campaigns;
- coordination with local non-profits on outreach and pollution reduction projects;
- participating on all relevant regional task forces; and,
- coordinating with HRSD on bacteria source tracking monitoring efforts as warranted.

7.2 Assessing Effectiveness

Unlike structural stormwater management controls, the practices put in place to reduce bacteria pollution do not have assigned reduction efficiencies. Further, ambient in-stream water quality monitoring programs, while effective at measuring overall progress toward bacteria reduction targets, are not appropriate indicators of MS4 permit compliance or for the success of programmatic activities in the near term.

As shown throughout Section 4 of this document, the City continues to improve its best management practices to address illicit discharges and other bacterial source concerns. Inspections of sanitary sewer pipes lead to the development of sanitary sewer improvement projects to decrease exfiltration from sanitary sewers. Other sanitary sewer projects are effective in decreasing the number of active septic tanks. The Boater Pump-out Internship program continues to be effective by intercepted sewage that may have otherwise entered the Elizabeth River. Public outreach efforts from the pet waste program continue to be effective as indicated by the increase in participants in the Bay Star Homes and Business Programs. The City will continue to assess the effectiveness of its efforts by reviewing the accomplishments for the previous year against permit requirements during submission of each Annual Report to DEQ.

7.3 Measurable Goals

The City's measurable goal will be to reduce bacteria loads to the impaired waterbodies covered by the applicable TMDL through implementation of the programs developed or enhanced since 2010 and those planned for future implementation, as summarized in Section 4. The City has already made measurable progress as the Elizabeth River Mainstem – Upper has been delisted as impaired by enterococcus and now fully supports recreation use. Continued progress toward implementing the actions in this plan will be reported annually to DEQ in each MS4 permit annual report.

Hazen

Rev. 1, June 4, 2025

Appendix A: List of Sanitary System Upgrade Projects Completed by Department of Utilities Since 2018

#	LIST OF SANITARY SYSTEM UPGRADE PROJECTS COMPLETED BY DEPT OF UTILITIES SINCE 2018
1	Annual Construction Contract FY17A (IV), WO #30 - Granby St. Sewer Repair Near Maycox Avenue
2	Annual Construction Contract FY17A (IV), WO #31 - Tidewater Drive & Easy Street Sewer Rehab
3	Annual Construction Contract FY17A (IV), WO #32 - Pump Station 70 Force Main Extension
4	Annual Construction Contract FY17A (IV), WO #34 - Virginian Drive Sewer Replacement
5	Annual Construction Contract FY17A (IV), WO #35 - City Hall Avenue Sewer Repair near St. Paul's Blvd - Addtl. Work
6	Annual Construction Contract FY2020A (BC) - WO #20 Redgate Avenue Sewer Repair FY19
7	Annual Construction Contract FY2020A (BC) - WO #22 Princess Anne Road Water & Sewer Main Replacement FY19
8	Annual Construction Contract FY2020A (BC) - WO #23 Backyard Sewer between 38th & 37th St FY19
9	Annual Construction Contract FY2020A (BC) - WO #24 Children's Ln Sewer Rehab FY19
10	Annual Construction Contract FY2020A (BC) - WO #27 2451 Birch Street Sewer Rehab
11	Annual Construction Contract FY2020A (BC) - WO #29 A Avenue – Cement Main – Service Lines
12	Annual Construction Contract FY2020A (BC) - WO #35 Woodall Rd Sewer Main Repair
13	Annual Construction Contract FY2020A (BC) - WO #40 Greenleaf Drive Sewer Repair
14	Annual Construction Contract FY2020A (BC) - WO #41 Chesterfield Blvd Backyard Sewer and Norchester Sewer Work
15	Annual Construction Contract FY2020A (BC) - WO #42 St. Julian Ave. CCTV
16	Annual Construction Contract FY2020A (BC) - WO #43 Ransom Rd Sewer Repair
17	Annual Construction Contract FY2020A (BC) - WO #44 Kenlake Court Water Main Installation
18	Annual Construction Contract FY2020A (BC) - WO #5 824 Redgate Avenue Sewer Repair
19	Annual Construction Contract FY2020A (BC) - WO#11, Pump & Haul Services
20	Annual Construction Contract FY2020A (BC) - WO#13, May Avenue Sewer Replacement FY19
21	Annual Construction Contract FY2020A (BC) - WO#15, Granby Street Emergency Sewer Replacement
22	Annual Construction Contract FY2020A (BC) - WO#17, Stanhope Avenue Property Work FY17
23	Annual Construction Contract FY2020A (BC) - WO#18, 1400 Vine Street Lateral
24	Annual Construction Contract FY2020A (BC) - WO#2, Fairfax Avenue Emergency Sewer Repair
25	Annual Construction Contract FY2020A (BC) - WO#21, Norchester Ave Force Main Relocation FY17
26	Annual Construction Contract FY2020A (BC) - WO#33, 2745 Victoria Avenue Sewer Lateral in Chesterfield Heights
27	Annual Construction Contract FY2020A (BC) - WO#34, Five Points Sewer Replacements
28	Annual Construction Contract FY2020A (BC) - WO#39, 1209 Monticello Ave Sewer Lateral
29	Annual Construction Contract FY2020B (East West) - WO #1 4707 Killam Ave Lateral Replacement
30	Annual Construction Contract FY2020B (East West) - WO #10 Ingleside Sewer Replacement
31	Annual Construction Contract FY2020B (East West) - WO #11 Kingwood Avenue Sewer Repair
32	Annual Construction Contract FY2020B (East West) - WO #12 Shorewood Dr Sewer Repair
33	Annual Construction Contract FY2020B (East West) - WO #14 702 Westover Avenue Sewer Lateral Replacement
34	Annual Construction Contract FY2020B (East West) - WO #15 Trouville Avenue Temporary Sewer Bypass
35	Annual Construction Contract FY2020B (East West) - WO #2 Remsen St Sewer Cleaning
36	Annual Construction Contract FY2020B (East West) - WO #20 Colley Avenue Sewer Replacement
37	Annual Construction Contract FY2020B (East West) - WO #21 123 Greenbrier Ave Sewer Lateral
38	Annual Construction Contract FY2020B (East West) - WO #22 2664 Chesapeake Blvd Sewer Connection
39	Annual Construction Contract FY2020B (East West) - WO #24 201 Bellamy Avenue Sewer Lateral
40	Annual Construction Contract FY2020B (East West) - WO #25 Krick Street Sewer Repair
41	Annual Construction Contract FY2020B (East West) - WO #27 Young's Terrace Sewer Repairs
42	Annual Construction Contract FY2020B (East West) - WO #28 Muskogee Ave Sewer Rehab
43	Annual Construction Contract FY2020B (East West) - WO #29 855 W Brambleton Ave Sewer Point Repair
44	Annual Construction Contract FY2020B (East West) - WO #2A Remsen St Sewer Cleaning
45	Annual Construction Contract FY2020B (East West) - WO #30 1615 Melrose Pkwy Sewer Lateral Replacement
46	Annual Construction Contract FY2020B (East West) - WO #32 1463 W. Little Creek Rd. Temporary Sewer Bypass
47	Annual Construction Contract FY2020B (East West) - WO #33 130 W York St Sewer Lateral Replacement
48	Annual Construction Contract FY2020B (East West) - WO #34 2405 Harrell Street Sewer Lateral Replacement

49	Annual Construction Contract FY2020B (East West) - WO #35, 200 Delaware Ave Sewer Replacement
50	Annual Construction Contract FY2020B (East West) - WO #4 Brooke Avenue Sewer Lateral Replacement
51	Annual Construction Contract FY2020B (East West) - WO #6 East Virginia Beach Blvd Cave-in and Sewer Repair FY17
52	Annual Construction Contract FY2020B (East West) - WO #7 Berry Hill Rd Sewer Repair FY18
53	Annual Construction Contract FY2020B (East West) - WO #8A E. Virginia Beach Blvd Cave-in and Sewer Repair, Addtl. Work FY19
54	Annual Construction Contract FY2022A (BC) - WO #1, Chesterfield Tank Drain Line
55	Annual Construction Contract FY2022A (BC) - WO #13 Olney Road Sewer Repair
56	Annual Construction Contract FY2022A (BC) - WO #4, 43rd St and Hampton Blvd Water Main Repair
57	Annual Construction Contract FY2022A (BC) - WO #6, 645 Church Street Water & Sewer Main Installation
58	Annual Construction Contract FY2022A (BC) - WO #8, 1300 W Ocean View Ave Sewer Main Replacement
59	Annual Construction Contract FY2023 (East West) WO #1 - 7020 North Military Highway New Sewer Lateral
60	Annual Construction Contract FY2023 (East West) WO #4 - Culfor Cres. Point Repair and Lining
61	Annual Construction FY17-A (IV) WO#21 - Dune Street Sewer Replacement
62	Annual Construction FY17-A (IV) WO#22 - Lindsay Avenue Water & Sewer Replacement
63	Annual Construction FY17-A (IV) WO#33 - W 22nd St Sewer Replacement
64	Annual Construction FY17-B (TAS) - WO#10 Various Water Main Repairs and Sewer Repair
65	Annual Construction FY17-B (TAS) - WO#12 Marathon Avenue Emergency Sewer Main Replacement
66	Annual Construction FY17-B (TAS) - WO#13 Berkley Ave Extension of Sewer
67	Annual Construction FY17-B (TAS) - WO#14 Bolton Street Extension of Sewer
68	Annual Construction FY17-B (TAS) - WO#15 Azalea Garden Road Emergency Deep Sewer Repair
69	Annual Construction FY2015 (TUC) WO#19; Rosmar Ct W & S Installation
70	Annual Construction FY2018 (TUC) WO#10; Waterside Drive Manhole and Pipe Repair
71	Annual Construction FY2018 (TUC) WO#16; Upper Brandon Pl. / Rockbridge Ave. Sanitary Sewer (FY19)
72	Annual Construction FY2018 (TUC) WO#17, Appomattox Street Sewer Repair
73	Annual Construction FY2018 (TUC) WO#18; St. Paul's Blvd. and Brambleton Ave. PS 97 Sewer Force Main Repair FY18
74	Annual Construction FY2018 (TUC) WO#2; Stafford Street Sewer Replacement
75	Annual Construction FY2018 (TUC) WO#21; PS 141 Force Main Replacement
76	Annual Construction FY2018 (TUC) WO#22; Waterside Drive Sanitary Sewer Relocation FY20
77	Annual Construction FY2018 (TUC) WO#23; Woodall Rd & Little Creek Rd Sewer Repair FY17
78	Annual Construction FY2018 (TUC) WO#28; Graydon Ave Sewer Repair FY19
79	Annual Construction FY2018 (TUC) WO#5; 154 Colley Ave
80	Annual Construction FY2018 (TUC) WO#8; Colonial Avenue Sewer Repair (Wards Corner) (FY18)
81	Annual Construction FY2018 (TUC) WO#9; Rolfe Ave Sewer Repair
82	Annual Construction FY2021 (TUC) WO#1; 985 S Quail St Manhole Replacement
83	Annual Construction FY2021 (TUC) WO#8; E Virginia Beach Blvd Sewer Replacement
84	Annual Construction FY2021 (TUC), WO #10 - Copeland Place Emergency Sewer Repair
85	Annual Construction FY2021 (TUC), WO #2 - 714 Graydon Ave Sewer Point Repair
86	Annual Construction FY2021 (TUC), WO #4 - 6315 Tidewater Dr Cleaning and Lining
87	Annual Construction FY2021 (TUC), WO #6 - 701 Maury Avenue Sewer Lateral Replacement
88	Wastewater Force Main Replacement - Fire & Rescue FY18
89	WO#20 Larkin Street Emergency Deep Sewer Repair (Estabrook)
90	Bayview / Cottage Line - PS 17 Service Area Phase 9 (Peters & White Construction)
91	Bayview / Cottage Line - PS 23, Ph 6, Water and Sewer Replacement
92	Bayview / Cottage Line - PS 23, Ph 7, Sewer Replacement (Trident Civil)
93	Bayview / Cottage Line - PS 23, Ph 8, Sewer Replacement
94	Annual Construction FY17-B (TAS) - WO#13B Berkley Ave Extension of Sewer, Addtl. Work
95	Botanical Garden (Shoreline Contractors Inc), PS 124
96	Bruce's Park - PS 152, Phase 3A, Water and Sewer Upgrade
97	Central Brambleton Sewer Replacement - PS 5 Phase 1
98	Annual Construction Contract FY17A (IV), WO #29 - Stanhope Ave Sewer & Water Replacement (Chesterfield Heights PS 149 / Ohio Creek)
99	Annual Construction Contract FY17B (TAS), WO #17 - Kimball Terrace & Chesterfield Blvd Sewer & Water Replacement (Chesterfield Heights PS 149 / Ohio Creek)

100	Annual Construction FY2018 (TUC) WO#4; Westminster & Victoria Ave Sewer Replacement
101	Chesterfield Heights (MEB) - Filer St. and Westminster Ave Sewer Replacement
102	Chesterfield Heights (MEB) - Marlboro Ave
103	Chesterfield Heights PS 149 / Ohio Creek (MEB) - Titan Property Water and Sewer Work FY20
104	Colonial Place, PS 155, Phase 2, Sewer Upgrade
105	Colonial Place / Park Place - PS 155 Phase 1 - VNG Work FY17
106	Colonial Place / Park Place - PS 155 Phase 1 (FY18)
107	Colonial Place / Park Place - PS 155 Phase 1, Electric Service Connection Set-up (Dominion Energy)
108	Downtown Norfolk - PS 4A Ph 1
109	Downtown Norfolk - PS 4A Ph 2 - Planting for Pump Station 4A - 1550 Armistead Avenue (RPOS - PW) (FY18)
110	Downtown Norfolk - PS 4A Ph 2 Sewer and Water Replacement
111	Pumps for East Ocean View - PS 83
112	East Ocean View - PS 88, Ph 5, Water and Sewer Upgrade
113	Fairmount Park - PS 18, Ph 15, Sewer Upgrade
114	Fairwater Drive Sewer Mains (Larchmont) Kevcor
115	Mowbray Arch Improvements - PS 151, Ph 3 (water and sewer)
116	Nancy Drive Construction Sewer Replacement
117	Pump Station #98 Repairs for Operations - Ireland Electric
118	River Oaks, PS 44 Service Area Phase 1
119	River Oaks, PS 44 Service Area Phase 2
120	SCADA Upgrades to Wastewater Pump Stations
121	St Paul's PS 156 - Electric Service Connection Set-up (Dominion Energy)
122	St. Paul's Construction - Phase 1
123	St. Paul's Sewer - Pump Station Construction (PS 156)
124	St. Paul's Sewer - Construction (Wood Street)
125	St. Paul's Sewer - Construction (Wood Street) - Compaction Testing Services under PW Contract (ETS)
126	Titustown - PS 34, Ph 5, Water and Sewer Upgrade (FY18)
127	Virginia Beach Blvd. Force main Repair, (Kevcor)
128	Wards Corner - PS 150, Ph 5 & Burleigh Avenue Roadway Improvements
129	Wards Corner - PS 150, Ph 6 Sewer Replacement FY18