

CAPACITY, MANAGEMENT, OPERATIONS, MAINTENANCE (CMOM) REPORT



HALLSDALE-POWELL
UTILITY DISTRICT

2019

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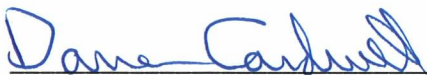
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SECTION 1.0 - 2019 CMOM PROGRAM SUMMARY

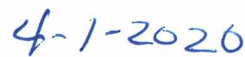
A. Certification Statement

This 2019 Annual Report is submitted to fulfill the requirements of Hallsdale-Powell Utility District's (HPUD's) Consent Order #WPC-14-0044 as agreed upon in August 2014. This Consent Order is a legal agreement between the Tennessee Department of Environment & Conservation (TDEC) and HPUD. The purpose of the Consent Order is to address sanitary sewer overflows (SSOs) in the HPUD sanitary sewer system in an effort to improve water quality throughout HPUD service area. In accordance with the 2014 Consent Order, this report details the results of activities undertaken during the annual reporting period beginning January 1, 2019 and ending December 31, 2019.

The format of this report will follow the outline presented within the Table of Contents and is presented in response to the information requested in the Consent Order. All pertinent and supplemental data, maps and background documentation will be retained on file in the main office located at 3745 Cunningham Drive, Knoxville, Tennessee and is available upon request.



Signature



Date

B. Purpose and Scope

The Capacity, Management, Operation, & Maintenance Program (CMOM) Annual Report provides a summary of CMOM Program activities (past and planned) and is intended to be a communication tool. The report is intended for District staff, regulatory authorities, customers, and the general public. The report serves four general purposes:

- To provide an annual overview of the activities completed under the CMOM Program;
- To describe and document changes to the CMOM Program on an annual basis, which may include changes to objectives, strategies, and performance measures;
- To describe the activities that are planned or currently being undertaken to support the CMOM Program;
- To continue compliance with the August 2014 Agreement between the District and State of Tennessee, Department of Environment and Conservation (TDEC) which requires that HPUD provide an annual report regarding implementation and performance of the CMOM program.

C. Overview of HPUD Infrastructure

HPUD's wastewater system serves approximately 25,946 wastewater connections which covers an area of roughly 146 square miles. The District runs from North Knox County into Union County and extends into portions of Anderson County.

The District has more than 476 miles of sewer mains buried below the 146 square miles of HPUD's service area. HPUD maintains a 5 million gallon (MG) sewer storage tank, 22 wastewater lift stations, 9,656 manholes, and operates an on average 9.82 million gallon-per-day (MGD) wastewater treatment plant, which uses an advanced membrane bioreactor treatment technology.

Figure 1. HPUD's Wastewater Infrastructure

No. of Sewer Connections	25,946
Service Area	146 square miles
Wastewater Treatment Plants	2
Decentralized Treatment Plants	2
Rated Treatment Plant Capacity	9.7 million gallons per day
Daily Max WWTP Flow	21.7 million gallons per day
Treated Wastewater	2.87 billion gallons per year
Sewer Storage Tank	5 MG capacity
Wastewater Lift Stations	22
Sewer Manholes	9,656
Force Main & Gravity Sewer	476 miles

D. Roles and Responsibilities for CMOM Program

The Sewer Collection Department, under the direct supervision of the Collection System Project Supervisor, includes a staff of full-time employees who divide their time between operation and maintenance of the sewer collection system. HPUD's Chief Operating Officer also devotes significant time to the management and oversight of the sewer collection system.

Figure 2. Roles and Responsibilities for CMOM Program

Title	Role or Responsibility
Board of Commissioners	Develops policy for District
General Manager	Manages all personnel, procurement, budget, operations, and management of HPUD departments and activities
Assistant General Manager	Serves as the assistant to the General Manager and has the authority to conduct the same duties/responsibilities as the General Manager, under his direction and approval.
Chief Operating Officer	Manages the daily operation of all water and wastewater facilities, water distribution, sewer collection and construction activities
Manager of Field Operations	Manages HPUD the operations/crews for the collection and distribution systems on a daily basis.

Collection System Project Supervisor	Directs HPUD's daily sewer operations, responds to sewer problems, assists engineer/contractor on sewer projects, implements the SORP.
Manager of Safety, Environmental and Field Services	Manages safety procedures, environmental programs, and oversees daily field services
Safety and Education Coordinator	Oversees education and outreach efforts with schools, residents, and local businesses.

E. CMOM Program Overview

The CMOM Program provides a method for HPUD to document current activities that are intended to help HPUD achieve goals related to control or elimination of sanitary sewer overflows, to improve effluent quality, and to ensure adequate system capacity. As part of this effort, HPUD has completed this 2019 annual review of the Program in conjunction with evaluating the performance measures outlined in the Program.

1. Management Plan

The CMOM Program Annual Report provides a summary of CMOM Program activities. The report is intended for District staff, regulatory authorities, customers, and the general public. HPUD's CMOM Management Plan describes the approach that the District is undertaking to ensure all necessary activities and programs are in place in order to support the CMOM Program.

Each year, the annual report details the progress toward meeting objectives of the Plan. The following is a list of the some of the major accomplishments that have helped move the CMOM Program forward:

- Continued implementation of the Collection System Preventative Maintenance Inspection (PMI) Program in order to identify, pinpoint, and prioritize areas of the collection system that need rehabilitation or replacement;
- Use of the Geographic Information System (GIS) data as the basis for the asset management system for collection system & treatment plant infrastructure.

2. Performance Measures and Management Review

The review of the performance measures is intended to be an evaluation of the District's status with respect to achieving its CMOM objectives. The purpose of the performance measures is to track District activities over time and gauge achievement of CMOM program objectives. Some of these performance measures have been selected as key measures to gauge the overall performance of HPUD in the areas of collection system operations and maintenance and capacity assurance. **(See Attachment 1: Performance Measures and Management Spreadsheet).**

3. Data and Asset Management

Throughout 2019, the District continued to improve asset management processes and data quality and accuracy. The District continues to evaluate and monitor the process of tracking capital project costs at the asset level to verify the accuracy of these assets and costs associated with them.

HPUD continues to utilize Cityworks and Geographic Information System (GIS) to track and evaluate assets. Cityworks is used to track customer issues, service requests, and work orders HPUD receives on a daily basis. HPUD uses GIS to track and locate upgrades and changes to the sewer system. HPUD also uses GIS as a tracking and assessment tool for PMI which helps evaluate assets to develop rehabilitation and construction projects. These rehabilitation projects are then entered in the Combined Rehab database and shown in GIS.

4. Capital Improvement Plan

HPUD utilizes the 5-year Capital Improvements Plan (CIP) to ensure adequate financial resources are set aside to fund required components of the sewer capital improvements plan. The CIP is discussed in more detail in Section 5.0 of this report and a summary of the plan is included in Appendices as **(See Attachment 2: Sewer System Capital Improvements Plan (CIP)).**

5. Sewer Overflow Response Plan

The Sewer Overflow Response Plan (SORP) describes the measures the District has put in place for response, containment, clean up, stream sampling and analysis, public notification, and regulatory reporting of overflows in the collection system. The SORP details the steps to be taken when a potential overflow is identified, categorization of whether it is a wet weather or dry weather SSO, and if it reaches State Waters.

Historically, the District has collected data about pipe defects, line blockages, mechanical or electrical equipment problems, and inflow and infiltration, which are the primary causes of sanitary sewer overflows. The Sewer Operations and Maintenance Superintendent has a dedicated staff that oversees operation and maintenance activities in the collection system, including SSO response and clean up.

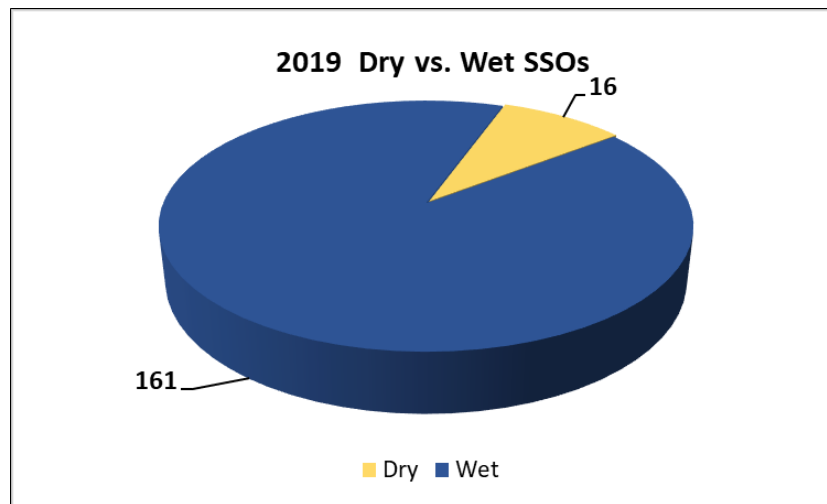
The Sewer Operations and Maintenance Superintendent maintains the SSO tracking spreadsheet. Overflow data is also incorporated into the GIS. The following section of this report details specifics about SSO data captured during this reporting period.
(See Attachment 3: Map - 2019 SSO Locations)

The majority of HPUD's chronic SSOs occur in wet weather and are located on the Interceptor line or a manhole or two upstream of the Interceptor line. To try and alleviate this issue, HPUD has began replacement of approximately 30,000 linear feet of the Interceptor line to help convey the wastewater to wastewater treatment plant and allow for more capacity. HPUD is also focusing on upgrading sewer mains in areas of known SSOs.

(See Attachment 4: Map – CMOM Projects and Chronic SSOs)

a. Summary of SSO Data

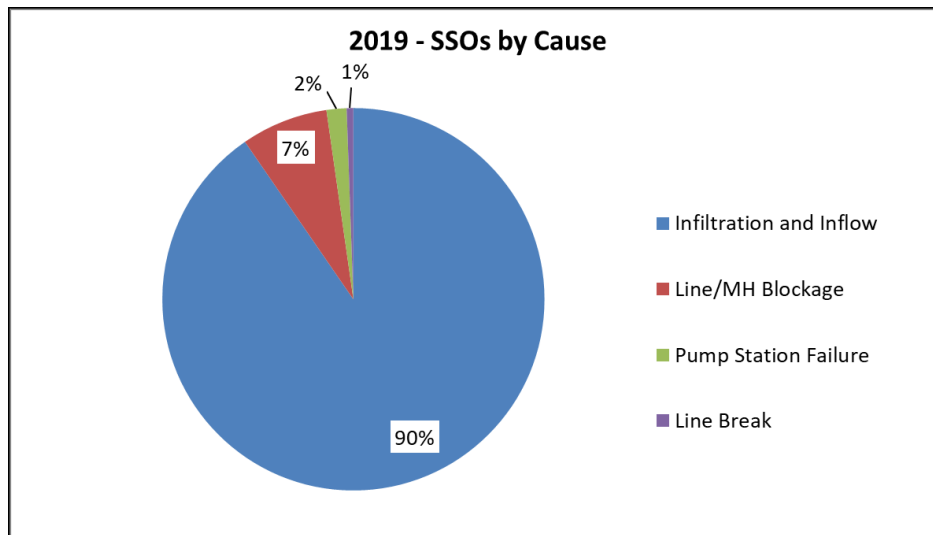
For the 2019 calendar year, there were a total of 177 SSOs (Jan 1, 2019 to Dec. 31, 2019) due to either operational issues or wet weather events throughout the HPUD service area. A total of 161 of the discharges were due to wet weather events and caused by inflow/infiltration. The other 16 discharges were dry weather overflows as reflected in the following chart.



Of the 16 recorded dry weather SSO events during the 2019 annual reporting period, most were caused by operational issues such as line blockage, roots, or debris. The majority of the SSO's (161) were caused by wet weather issues attributed to inflow and infiltration. All SSOs are periodically reviewed to identify if any problems exist that warrant the need for a larger-scale inspection or rehabilitation projects.

b. Summary of SSO Events by Cause

All SSOs, regardless of the cause, are immediately responded to and the problems are remediated as soon as possible. Parts of the collection system, where blockages occur, are put on a cleaning program to be inspected and cleaned as needed, or placed on a schedule for rehabilitation or replacement. The following chart depicts a summary of SSO events by cause for the 2019 calendar year.



6. Fats, Oil, & Grease Program

As part of the Fats, Oil, & Grease Program (FOG), HPUD has continued to outsource grease trap inspections. Since late 2009, HPUD has contracted with Robert G. Campbell & Associates (RGC&A) to conduct grease and grit trap inspections. For the calendar year of 2019, RGC&A conducted 526 inspections on 175 businesses. The frequency of the inspections varies as to the type of business and whether follow up inspections are necessary.

Contracting with a third party for inspections and management of the program has enabled HPUD Collection System staff to be more effective in the operation and maintenance of the collection system. HPUD staff periodically review inspection reports and update the written FOG Program as often as necessary.

HPUD started a “Can the Grease” campaign. Customers are encouraged to pick up a grease can lid to cover the grease until it cools and can be disposed of properly. This campaign offers residential customers a solution to grease disposal.

7. System Evaluation and Corrective Action Plan

The Corrective Action Plan & Engineering Report (CAP-ER) was submitted to TDEC on March 17, 2015 and HPUD received approval on May 23, 2015. In response to TDEC’s review of HPUD’s System Evaluation and CAP-ER, HPUD continues progress toward meeting the following objectives:

- Continue to address HPUD's Infiltration and Inflow (I/I) problem;
- Continue to identify collection system rehabilitation priorities;
- Complete Capital Improvement Projects;
- Continue the Preventative Maintenance Inspection (PMI) program;
- Continue with lift station improvements;
- Continue monitoring of HPUD's nine (9) permanent flow monitoring stations.

One of the tools utilized to develop the District's CAP-ER is HPUD's collection system hydraulic model. HPUD developed a collection system hydraulic model in 2005 and has since periodically updated the model to reflect ongoing improvements to the collection system. Flow characteristics are calibrated by utilizing rainfall and flow monitoring information data. HPUD has nine permanent flow monitoring stations with three rain gauges currently in place.

HPUD last updated the collection system model assets in 2019 to include the 5 MG Dry Gap Storage Tank and 5,800 LF of 48" sewer while a 2014 calibration updated the flow characteristics. Using the updated model, HPUD reported a reduction in SSO's from existing improvements, with further decrease in SSO's anticipated as a result of planned system/interceptor related improvement projects.

Hydraulic models require recalibration periodically to understand and update the flow characteristics within the model. HPUD is planning to perform the flow study and recalibration of the model after the ongoing interceptor construction projects are completed in order to obtain the most accurate flows for the system and offer the best possible results for calibration. This effort will include the implementation of temporary flow monitoring to isolate specific trouble areas, coupled with sewer system inspections to identify deficiencies. Defects identified as a part of this effort will be systematically addressed through system improvements and work associated with HPUD's ongoing rehabilitation program.

The updated and calibrated collection system hydraulic model was used to perform the capacity assessments. The objectives of the capacity assessment included the following objectives:

- Identify locations and causes of hydraulic constraints in the collection system;
- Assess the Beaver Creek WWTTP ability to accommodate/treat peak flows,
- Assess how existing sewer system performance will be improved by planned rehabilitation and improvement projects, and
- Assess the performance of planned rehabilitation projects to accommodate future population growth.

8. CMOM Communication Plan

The CMOM Communication Plan documents the types and frequency of communications that are prepared and distributed regarding the status of the CMOM Program and the CMOM Annual Report. The District maintains communication with the Tennessee Department of Environment and Conservation (TDEC), the Board of Commissioners, HPUD employees, and HPUD customers on a regular basis.

The Board of Commissioners meet monthly to determine policy issues related to finance, personnel, operations, water and sewer system improvements, and other HPUD business. HPUD utilizes its quarterly customer newsletter, “WaterWorks”, the CMOM Annual Report, and a dedicated website, www.hpudactnow.org, to inform customers about projects related to the sewer collection system. HPUD uses Twitter (@hpudknox) and Facebook, to keep customers informed of projects and emergencies.

Annual meetings are held which include a presentation of HPUD’s CMOM program, information about upgrades at the wastewater treatment plants, upgrades to collection system infrastructure, and a summary of data collected from inspections of the collection system.

The past year’s activities included communication of the CMOM Program to the public through articles in the customer newsletter, and a presentation to the Board of Commissioners on May 13, 2019.

SECTION 2.0 - COMPLETED, ONGOING AND PLANNED PROJECTS

A. Completed, Ongoing, and Planned Collection System Projects

The major collection system projects that were completed, ongoing, and planned in 2019 included the following:

1. Preventative Maintenance & Inspection Program

In 2006, HPUD established a Preventative Maintenance and Inspection (PMI) Program to target problematic areas in the collection system to help prevent sanitary sewer overflows (SSOs). The Preventative Maintenance and Inspection activities include techniques such as manhole inspections, smoke testing, closed-circuit television (CCTV) inspection, pre-conditioning, and pipeline cleaning.

Results of these investigations have been captured digitally and integrated into HPUD's Geographic Information System (GIS). A final summary report is prepared detailing the problems found and the priority in which they should be addressed. These problems or defects are then put in a rehabilitation or construction project to be repaired by outside contractors or HPUD crews. HPUD is continuing to perform PMI work using in-house crews for inspections and outside Contractors, as needed, in more concentrated areas that I/I is prevalent.

2. Flow Monitoring

One of the key tools for enabling Hallsdale-Powell Utility District to analyze the performance of the sewer collection system is flow monitoring. Since 2004, HPUD has maintained continuous Flow Monitoring Units throughout the collection system. These flow monitoring devices have been installed within selected manholes at locations which are able to provide the best information to HPUD about how the collection system is performing on dry days and wet weather days.

During 2019, the Hallsdale-Powell Utility District continued long-term flow monitoring at nine locations, along with rainfall monitoring at three locations. During 2019, the average flow observed was 8.15 million gallons per day (mgd). HPUD saw a peak flow of 27.6 mgd and low flow of 4.03 mgd. *(See Attachment 5: Map - Long-Term Flow Monitoring Locations)*

3. Beaver Creek Interceptor Replacement Projects

Phase 1: The Beaver Creek Interceptor Improvement Project consists of replacing the existing 36-inch diameter interceptor beginning at the Beaver Creek WWTP and continuing for approximately 10,900 linear feet into the HPUD collection system near Powell Presbyterian Church in Powell.

The existing interceptor will be replaced with a new 48-inch diameter interceptor, accompanying manholes and other structures, 300 linear feet of sewer line near West Emory Road and Clinton Highway, and 2,200 linear feet of sewer line replacement. An additional 14,500 linear feet of lines and manholes are planned to be rehabilitated as part of the project.

Jacobs Engineering rebid this project in October 2019 and the project was awarded to Garney Construction. Prior to the rebid, the original contractor had installed approximately 1,060 LF of 48" pipe and 7 manholes. The project duration is 670 days, making the final completion on December 2021. Garney Construction began work at the end of February 2020.

Phase 2: The Beaver Creek Interceptor Improvement Project Phase 2 is the continuation of replacing the existing 36-inch diameter with a new 48-inch diameter interceptor from where

Phase 1 stopped approximately 13,740 linear feet to Morton View Lane. The project also includes the replacement of approximately 3,300 linear feet of gravity sewer line ranging from 12-inch to 8-inch in diameter.

Jacobs Engineering bid this project on January 7, 2020, and the project was awarded to Cleary Construction. The Notice to Proceed is currently pending. The project duration is 900 days. Construction is set to begin late spring/early summer 2020. Completion of this project is estimated to be in December 2022.

Phase 3: The Beaver Creek Interceptor Improvement Project Phase 3 continues with the replacement of the existing 36-inch diameter interceptor from behind Morton View Lane to the east side of Interstate 75. This project consists of approximately 5,500 linear feet of the new 48-inch diameter interceptor along with the improvement of approximately 650 linear feet of smaller diameter pipes in the area.

Robert G. Campbell & Associates (RC&A) awarded the project to Cleary Construction, Inc. with the Notice to Proceed date of October 15, 2018. Cleary Construction completed this project and the new 48-inch interceptor was in service as of October 2019. ***(See Attachment 6: Map – Beaver Creek Interceptor Replacement Projects)***

4. Brown Gap Interceptor Replacement Project

The Brown Gap Interceptor project will start at Brown Gap Road and go upstream to Beeler Road. The project consists of upsizing the existing sewer mains which includes the following: approximately 10,140 linear feet of 21-inch diameter pipe, 658 linear feet of 16-inch diameter pipe, and 3,600 linear feet of pipe ranging from 12-inch to 8-inch in diameter. It also includes the replacement of the existing manholes and service connections.

Due to left over funds on the project, the scope has been increased to include the replacement of approximately 2,300 linear feet upstream. This will include the replacement of all manholes and service connections.

Robert G. Campbell & Associates (RC&A) awarded the project to Hurst Excavating with the Notice to Proceed date of January 15, 2019. The project duration is 570 days making the final completion date of August 2020. Currently, Hurst Excavating is approximately 56% completed with the project. ***(See Attachment 7: Map – Brown Gap Interceptor Replacement Project)***

5. Downtown Powell Sewer Rehabilitation Project

Hallsdale-Powell Utility District is working with Robert G. Campbell & Associates (RGC&A) on a rehabilitation project to upgrade the sanitary sewer system in downtown Powell. The project includes the gravity sewer main line pipe bursting of approximately 5,600 linear feet of 8-inch in diameter and 10,500 linear feet of cured in place pipe (CIPP). The project will also rehabilitate/repair the sewer laterals and manholes associated with the main line rehabilitation.

Robert G. Campbell & Associates (RC&A) awarded the project to Hurst Excavating with the Notice to Proceed date of February 17, 2020. The project duration is 330 days making the final completion date of January 12, 2021. ***(See Attachment 8: Map – Downtown Powell Sewer Rehabilitation Project)***

6. North Fork Phase 2 Interceptor Replacement Project

Hallsdale-Powell Utility District is working with WK Dickson to design improvement options to the North Fork Interceptor sewer due to overflows during large rain events and the future development in the area. These improvements will begin at Ledgerwood Road and extend upstream toward Stillbrook Ln. WK Dickson is in the final design stages to develop the improvement plans that will eliminate localized sanitary sewer overflows and increase capacity for this area. This project is planned to bid Spring 2020. ***(See Attachment 9: Map – North Fork Phase 2 Interceptor Replacement Project)***

7. Bishop Road/Taggart Lane Sewer Improvements Project

Hallsdale-Powell Utility District is working with Cannon & Cannon, Inc. at options for improvements to the sewer mains located around Bishop Road, E Emory Road, and Taggart Lane due to overflows during large rain events, the potential of future development in the area, and the TDOT Bishop Road relocation project. These improvements will be concentrated around Bishop Road at E Emory Road and extend to HPUD's Interceptor line. Cannon & Cannon, Inc. is working to develop a plan for HPUD's approval. This project is planned to bid Spring/Summer 2020.

B. Completed, Ongoing and Planned Wastewater Treatment Plant Projects

The major wastewater treatment projects that were completed, ongoing, and planned in 2019 included the following:

1. Beaver Creek Clarifier and Hydraulic Capacity Improvements Project

Hallsdale-Powell Utility District is currently working with Fox PE on a project that consists of improvements to maximize capacity from clarifiers for peak loading. The project includes demolition of the existing chlorine contact tank and installation of ultraviolet disinfection equipment at the Beaver Creek WWTP. This project is planned to bid April 2020.

C. Completed, Ongoing and Planned Lift Station Projects

The major lift station projects that were completed, ongoing, and planned in 2019 included the following:

1. Bright Lane Lift Station

Hallsdale-Powell Utility District is currently working with W.K. Dickson to relocate and redesign the Bright Lane lift station. The new lift station will be repositioned on the same property that it is on currently. When the project is complete it will be a completely new station with a new wet well, controls, etc. The discharge line will be rerouted to the location of the new lift station. These improvements will help upgrade the existing equipment along with helping with potential future development in this area. The construction of this project is planned for summer/fall 2020.

2. Temple Baptist Lift Station

HPUD is also working on improvements to the existing Temple Baptist Lift Station with W.K. Dickson. The improvements to this station will include new pumps and controls. The improvements to this lift station will allow HPUD to replace aging equipment and make the lift station operate more efficiently. The construction of this project is planned for summer/fall 2020.

Lift station reliability continues to be a focus of the HPUD collection system improvement efforts. The District's Capital Improvements Plan (CIP) has provisions for continued upgrades and rehabilitation of existing pump stations. HPUD personnel will continue to monitor the pump station's performance within the collection system to determine if any sites will require major rehabilitation in future years.

SECTION 3.0 - SUPPLEMENTAL ENVIRONMENTAL PROJECT

HPUD's educational trailer, "Water on Wheels", is used to educate students and community members.



Visit to Adrian Burnett Elementary

In 2004, HPUD developed the "Water on Wheels" Program to educate area elementary school students about the importance of water quality and the impact it has on everyday life. These lessons are aligned with the students' science curriculum. The trailer makes visits to local elementary schools and is used in high school vocational programs for job fairs. During the past year, HPUD presented the program to about 400 students within the HPUD service area. This hands-on activity is focused on educating students about the basic components of the water treatment process.

Beginning with a discussion about where our drinking water comes from, the students have an opportunity to learn about the potential contaminants that may be found in water sources and how they might get there. Students learn concepts about "source water protection" and taking personal responsibility for water conservation and preserving water quality.

SECTION 4.0 - EDUCATION AND OUTREACH ACTIVITIES

A. Utility Tours - HPUD Wastewater Treatment Plant

One of the most significant educational outreach efforts that HPUD supports is to provide tours of the Beaver Creek Wastewater Treatment Plant. The water and wastewater industries have become more technologically advanced over time, so it is vital to attract young people into careers within the industry.

Some of the various groups that have toured the facility within the past few years are Halls High School students, AmeriCorps students, West High School students, Grace Christian Academy students, Halls Business & Professional Association student interns, and other community groups.



AmeriCorps Students a tour of BCWWTP in October 2019

B. Halls Outdoor Classroom Sponsor

The Halls Outdoor Classroom (HOC) is a community partnership project which HPUD has provided support and in-kind service to make the site adjacent to Halls High School an educational resource for the community.

Each year the AmeriCorps students, community partners, teachers, and students participate in an annual celebration at the Halls Outdoor Classroom. HPUD's initial contribution to the site was obtaining building materials, constructing the footbridge and fence, adding water service, and providing food and drinks for the annual HOC Celebration. HPUD continues to provide ongoing support and food for the annual activity.



Left: HPUD Staff & Knox Co Clerk, Sherry Witt serving food. Right: Pie Eating contest

C. Brickey-MCloud Elementary School STEM Night

Another community learning event that Hallsdale-Powell Utility District participates in is the Brickey-McCloud Elementary School STEM night. It is an event put on by the school's science department. The department looks at the Science, Technology, Engineering, and Math standards and invite area businesses that work in those fields to explain their trade.



Brickey students and parents at the 2019 STEM Night

D. Job Fairs and Ride to Decide Program

In 2019, HPUD participated in several job recruitment fairs. Tennessee Department of Environment and Conservation (TDEC) had a spring job recruitment fair for students in science programs at local colleges and universities. These job fairs and school programs are great opportunities for students to explore options for careers involving Trades Education.

Hallsdale-Powell partnered with CTEP (Construction Trades Education Partnership) to participate in career day presented by Builders Exchange of Tennessee with the purpose of promoting careers in construction fields to Knox County CTE students. HPUD also partners with Union County High School and Knox County Schools. At Union County Schools, HPUD works with the CTE Program for a job recruitment fair. HPUD participates in Knox County Schools "Ride-to-Decide" program that allows students in the trade industry to experience the trade by assisting in the paid work functions during summer break. HPUD placed three students in the program in 2019.



Left: Students at CTEP career day. Right: TDEC job fair.

E. Knoxville Area Medication Collection Program

The Knoxville Area Medication Collection Program started in 2008 to keep unwanted medications and over-the-counter drugs off the streets and out of the hands of children.

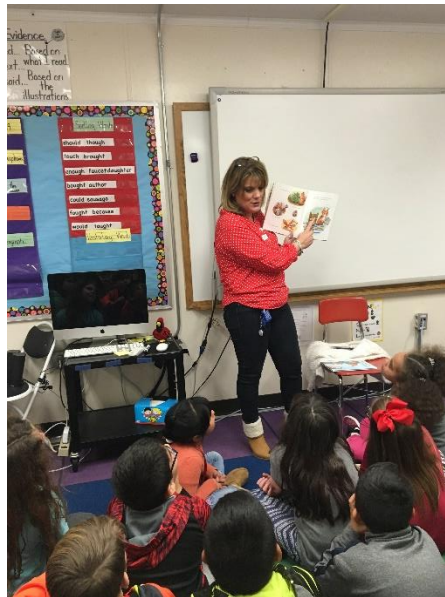


HPUD employee at Drug Collection Event at Ingles in Powell

Due to an interest in protecting the community's water source, HPUD joined the program in fall of 2009. Since the program began, partners have collected approximately 7,000 lbs. of unwanted medication through these organized collection events and the installation of a permanent drop box at the Knoxville Police Department's downtown station. HPUD has been a co-sponsor of several Knox County collection events.

F. Other Education/Outreach with Local Schools

In addition to the Water on Wheels Program and other educational programs, HPUD has provided in-kind services and equipment such as donating of colorimetric water quality test kits to AmeriCorps workers. The AmeriCorps students used the test kits in their work with elementary school students through the local “Adopt a Watershed” Program. HPUD continues to provide support for educational programs in the local schools within the District. HPUD attended Read Across America Day in March at a local elementary school to be a guest reader.



HPUD employee reading to students at Adrian Burnett Elementary School

G. Water Fest - Community Water Education

WaterFest is an annual educational event held at Hams Nature Center in the Spring of each year and is open to Grades K-4 in the Greater Knoxville area School District. Activities promote water resource stewardship and integrate the arts with the sciences. Groups participating in the event include Knox County Stormwater, University of TN Water Resources Research Center, Knox County Soil and Water Conservation District, AmeriCorps, KUB and HPUD. Each year, HPUD sets up a booth and/or sponsors an educational activity to support this effort.



HPUD Booth at WaterFest May 6, 2019

H. Professional Memberships

In addition to these activities, HPUD participates in the following local organizations:

- Beaver Creek Watershed Education Committee
- Beaver Creek Watershed Outdoor Classrooms (Halls High and Brickey-McCloud Elementary School)
- Water Quality Forum
- Halls and Powell Business and Professional Associations
- Knox County and Union County Emergency Planning Committees

SECTION 5.0 - CHANGES TO CMOM AND CORRECTIVE ACTION PLAN

A. Engineering Support and Management

The District relies on engineering support and management and good sound financial management to fund sewer system improvements over the next ten (10) years. HPUD relies on support from various consultants to assist in the implementation of a comprehensive Corrective Action Plan and Engineering Report (CAP-ER). The CAP-ER established short and long-term actions to address hydraulic deficiencies including prioritization, alternative analysis, and a schedule for completion of these steps.

The District utilizes several consultants to assist HPUD with implementing the components of the 2006 Wastewater Master Plan, as well as the long-term CAP-ER for improvements to the collection system. HPUD will continue the Preventative Maintenance and Inspection (PMI) Program and develop a list of priority repairs to the collection system. This work is essential in assisting HPUD manage assets and the collection system. ***(See Attachment 10: Spreadsheet - Updated CAP/ER Projects List)***

B. Financial Management

HPUD continues to develop a solid capital improvement and financial plan to fund the improvements required as a result of this Consent Order. The Budget for Fiscal Year 2021 (April 1, 2020 - March 31, 2021) was presented for consideration at the March Board Meeting which was held on March 9, 2020. Discussion at the March Board meeting also focused on the revised water and sewer rate schedule for FY 2021. The Board of Commissioners approved the revised rates and adopted the revised rate schedule, which incorporates a three (3%) percent increase in water rates and a six percent (6%) increase in sewer rates. These rates will become effective on September 1, 2020.

HPUD remains committed to ensuring rates support the Capital Improvement Projects outlined in our Capital Improvements Plan (CIP) through FY 2025. To ensure our customers understand the importance of these rate changes, there is a continued communication effort by the District using the HPUD website, newsletters, mailers and pamphlets and newspaper article.

SECTION 6.0 - OVERVIEW OF FIVE-YEAR CAPITAL IMPROVEMENTS PLAN

Most of the one-year and five-year capital improvements projects have been described in different sections of the Annual report. A summary of the one-year and five-year CIP is included in the Appendices. The strategy of formulating a Capital Improvements Plan for at least a five-year period requires continuing data analysis, prioritization of system defects, and possible revision of implementation schedules from year to year.

Several projects have been prioritized and placed into the five year CIP as grant funding, SRF loans, and revenue bonds are available for financing the projects. **(See Attachment 2: Spreadsheet – Sewer System Capital Improvements Plan)**

SECTION 7.0 - SUMMARY OF CMOM PROGRAM IMPLEMENTATION

Hallsdale-Powell Utility District is continuing to prioritize and evaluate the sewer collection system upgrades and rehabilitation. As each project is completed, HPUD evaluates the effectiveness of the project and the surrounding area to see if additional improvements are needed to address issues in the collection system. HPUD continues the Preventive Maintenance and Inspection (PMI) Program allowing the District to achieve the changes necessary to ensure adequate capacity in the collection system, and to reduce and eliminate sanitary sewer overflows. Improvements and enhancement of the District's Geographic Information System (GIS) allows HPUD to geographically track customer complaints, work orders, collection system problems, manage collection system assets, and analyze system issues.

Combined with information from the long term flow monitoring program, the data in the GIS provided HPUD with an indication of which sanitary sewer basins required further investigation and the likelihood of which sanitary sewer pipelines and/or manholes required rehabilitation. Each year we have further refined our database and found it to be invaluable as a tool for managing data for the CMOM program.

Throughout 2019, the District continued to improve asset management processes and data quality and accuracy. Over time, the Cityworks Work Order Management System has become more compatible with the District's overall asset management program.

In evaluating the effectiveness of HPUD's CMOM Program development and implementation over the past few years, several key factors have been noted. The efficient operation and management of HPUD's collection system assets is essential as well as the ability to continuously monitor collection system performance. Our main focus continues to be:

- Maintaining a comprehensive system inventory and information management system.
- Implementing an effective sewer overflow response program including better emergency response and reporting procedures.
- Performing timely and adequate collection system operation and maintenance.
- Conducting effective system hydraulic capacity assessment, evaluation, and assurance.
- Implementing and maintaining an effective public communication and outreach program.

<u>Program/Performance Measures</u>	<i>2016</i>	<i>2017</i>	<i>2018</i>	<i>2019</i>
<u>Infrastructure From GIS</u>				
# Gravity Lines (feet)	2,284,611	2,290,422	2,298,089	2,309,227
# Forcemain (feet)	212,523	213,961	215,721	215,893
# Connections	22,992	22,992	24,420	25,946
<u>Sanitary Sewer System Overflow Response</u>				
# Overflows	101	84	122	177
# Estimated Gallons of Overflows	898,300	245,700	733,500	9,834,000
# Overflows Reaching Waters	93	74	111	164
# Estimated Gallons of Overflows Reaching Waters	500,100	106,500	450,000	9,592,000
95	0 BCWWTP 0 RVWWTP	0 BCWWTP 0 RVWWTP	0 BCWWTP 0 RVWWTP	1 BCWWTP 0 RVWWTP
# Dry Weather Overflows	12	14	15	16
# Wet Weather Overflow Events per NPDES Permit Language				
# Wet Weather Overflow Individual Releases	89	70	107	161
# Overflows Cleaned Up	73	68	108	158
# Overflows Reported on Electronic DMR				
# Overflows Initial Report Notification to TDEC	101	84	122	177
# Overflows Follow-up Report Sent to TDEC within 5 Days	101	84	122	177
# Building Backups Due to Public System Failure during Dry Weather	12	16	11	15
# Building Backups Due to Public System Failure during Wet Weather	2	0	0	0
<u>Customer Complaint Tracking</u>				
# Complaints Received	252	283	324	296
# Complaints Investigated	251	280	322	296
# Complaints Resolved	235	267	304	280
# Complaints determined to be Customer Private Line Issues	53	65	73	669
<u>Assessment and Prioritization - Corrosion</u>				
# Locations Subject to Corrosion	None Identified to Date	None Identified to Date	None Identified to Date	None Identified to Date
# Corrosion Inspections Conducted	N/A	N/A	N/A	N/A
# Corrosion Defects Identified	N/A	N/A	N/A	N/A
<u>Manhole Inspection/ROW</u>				
# Manholes in System	9,528	9,555	9,591	9,656
# Manholes Inspected during the Calendar Year	1,211	664	0	1,375
# Manholes Inspected since Program Began	9,107	9,771	9,771	11,146
# Manholes with Defects	388	270	0	76

<u>Program/Performance Measures</u>	<i>2016</i>	<i>2017</i>	<i>2018</i>	<i>2019</i>
Flow Measurement (ADS)				
Year of Most Recent Flow Monitoring	2016	2017	2018	2019
Peak Flow Observed During Monitoring Period(gpd)	18,270,000	21,960,000	20,552,200	25,140,000
Instantaneous Peak Flow Observed(gpd)	20,150,000	23,750,000	23,100,000	27,650,000
Average Flow Observed during Monitoring Period(gpd)	6,129,000	7,032,321	7,310,000	8,153,000
Low Flow Observed during Monitoring Period(gpd)	3,693,000	4,340,000	4,370,00	4,032,000
List Basins that Contribute Flow to this Basin	See System Map	See System Map	See System Map	See System Map
CCTV Inspection (Contractor & Internal)				
# Feet Inspected by CCTV this Calendar Year	319,630	252,404	76,946	41,003
# Feet Inspected since Program Began	2,410,398	2,662,802	2,739,748	2,780,751
# Feet Cleaned for Inspection	190,290	108,901.8	0.0	0.0
# Feet Cleaned for Routine or Scheduled Maintenance	57,713	56,455	53,117	53,114
# Defects Identified by CCTV Inspection	2,242	2,090	0	0
# Defects Catalogued or Recorded into Database	2,242	2,090	0	0
Smoke Testing (Contractor & Internal)				
# Feet Smoke Tested this Year	275,814	0	0	0
# Leaks Identified on Public System	229	0	0	0
# Public System Leaks Repaired	0	0	0	0
# Public System Leaks Not Repaired This Year	229	0	0	0
# Leaks Identified on Private Service Connections	90	0	0	0
Gravity Line Rehabilitation (Contractor & Internal)				
# Feet Gravity Lines Rehabilitated	0	12,292	32,234	0
# Feet Rehabilitated Since Program Began	228,170	240,462	272,697	272,697
# Feet Replaced	0	0	2818	7,242
# Feet Replaced Since Program Began	25,821	25,821	28,639	35,881
# Feet Sliplined	0	0	0	0
# Feet Sliplined Since Program Began	0	0	0	0
# Feet Cured in Place	0	12,292	29,416	0
# Feet Cured in Place Since Program Began	209,009	221,301	250,717	250,717
# Manholes Rehabilitated	20	96	246	29
# Manholes Rehabilitated Since Program Began	1,532	1,628	1,874	1,903
# Manholes Replaced	0	4	0	18
# Manholes Replaced Since Program Began	109	113	113	131
# Feet of Gravity Line Rehabilitation Inspected	0	12,292	32,234	0
# Feet Of Gravity Line Rehabilitation Tested	0	0	0	0

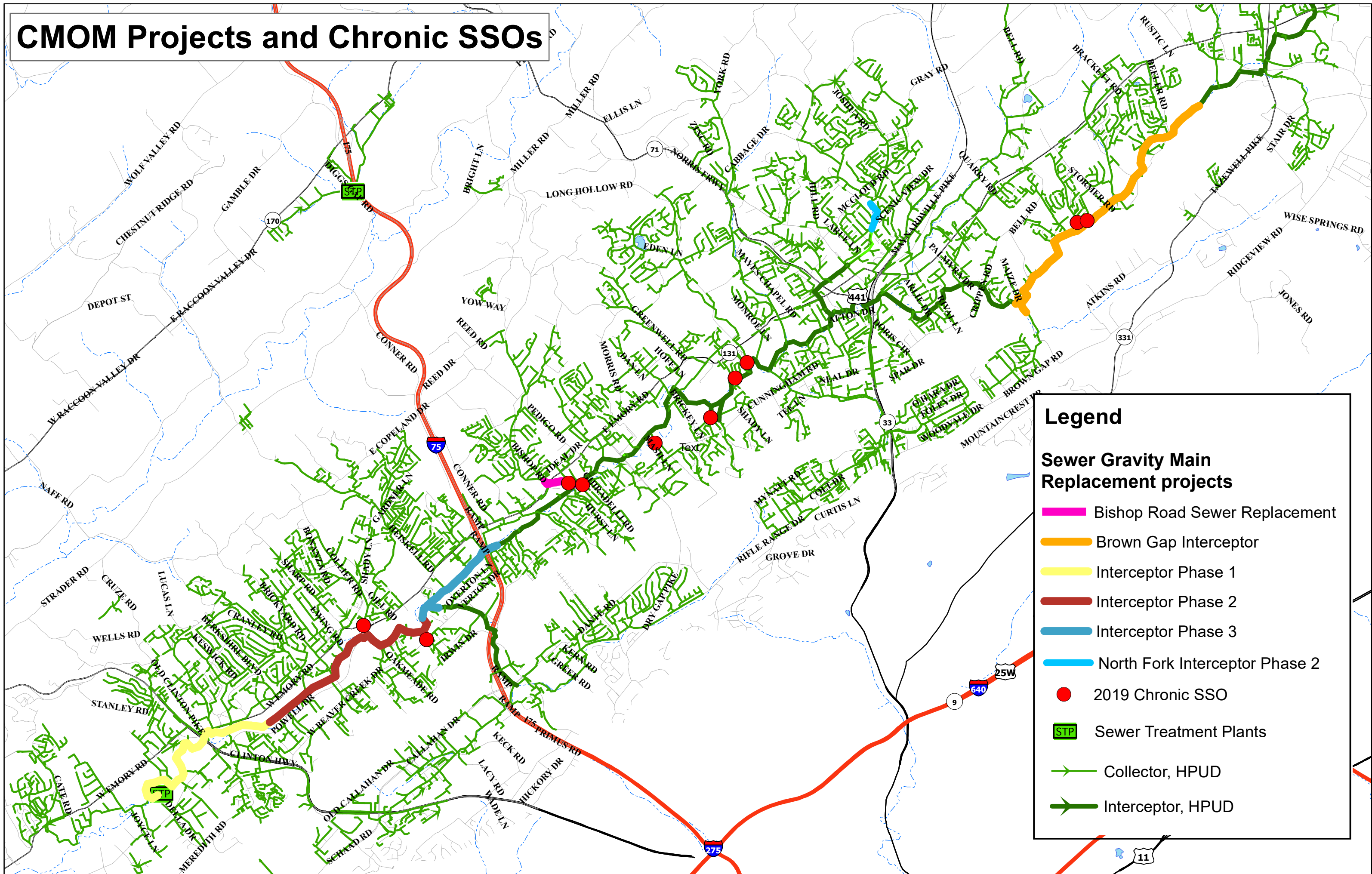


<u>Program/Performance Measures</u>	<i>2016</i>	<i>2017</i>	<i>2018</i>	<i>2019</i>
<u>Grease Program</u>				
# Facilities Identified for Inclusion in Grease Program	149	157	160	175
# Facilities with Installed Grease Devices	149	157	160	175
# Grease Installation Inspections Conducted and Documented	11	4	1	9
# Routine Grease Inspections	499	502	487	526
<u>Other Inspections</u>				
# Construction Inspections	9	5	4	8
# Pump Station Inspections	625	401	314	282
# Documented Pump Station Inspections	625	401	314	282
# Customer Owned Service Line (lateral) inspections	163	203	209	275
⁽¹⁾ Note this number may not be quantifiable in wet weather				
⁽²⁾ Final data numbers were not available as of the date this report was prepared				

HALLSDALE-POWELL UTILITY DISTRICT - CAPITAL IMPROVEMENT PLAN

Sewer Capital Improvements	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	Total
Beaver Creek Interceptor Replacement Phase 2 RUS and 2019 Bonds	11,125,000	11,125,000						\$ 22,250,000
Beaver Creek Interceptor Replacement Phase 1 2019 Bonds	13,250,000	-						13,250,000
Sewer Line Improv. Along Bishop & Taggart Area 2019 Bonds	1,500,000							1,500,000
Temple Acres Sewer Rehab & Around Area 2019 Bonds	1,500,000							1,500,000
Downtown Powell Sewer Rehab 2019 Bonds	1,500,000							1,500,000
								-
Sewer Rehab Phase 5	1,500,000							1,500,000
Sewer Rehab Phase 6			4,000,000					4,000,000
Sewer Rehab Phase 7				4,000,000				4,000,000
Sewer Rehab Phase 8					5,000,000			5,000,000
Sewer Rehab Phase 9						5,000,000		5,000,000
Sewer Rehab Phase 10							5,000,000	5,000,000
North Fork Interceptor Imp. Phase 2	600,000							600,000
								-
Sharps Chapel Sewer System	-	100,000	100,000					200,000
Beaver Creek WWTP Upgrades to add ACTIFLO wet weather system					7,500,000			7,500,000
Beaver Creek WWTP Clarifer Drive Replacements 2019 Bonds	3,000,000							3,000,000
Beaver Creek WWTP Chlorine Contact Chamber Improvements2019 Bonds	2,500,000							2,500,000
Beaver Creek Interceptor Brown Gap to Beeler Road RUS								-
Miscellaneous Sewer Line Extensions	100,000	100,000	200,000	200,000	300,000			900,000
Wastewater Pump Station Improvements	200,000	200,000						400,000
Breaver Creek WWTP Membrane Replacement				1,875,000				1,875,000
Sewer Equalization Storage Norris Freeway			9,000,000					9,000,000
Sewer Equalization Storage near I-75				11,000,000				11,000,000
Sewer Investigation	500,000	500,000	500,000	500,000	500,000			3,351,750
Total Sewer Capital Improvements	\$ 37,275,000	\$ 12,025,000	\$ 13,800,000	\$ 17,575,000	\$ 13,300,000	\$ 5,000,000	\$ 5,000,000	\$ 104,826,750

CMOM Projects and Chronic SSOs



Dry Weather SSOs
16

Wet Weather SSOs
161

2019 Sanitary Sewer Overflows (SSO)

Legend

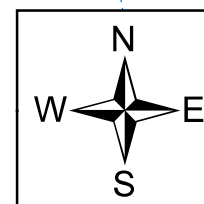
SSO (Total 177)

Weather Conditions

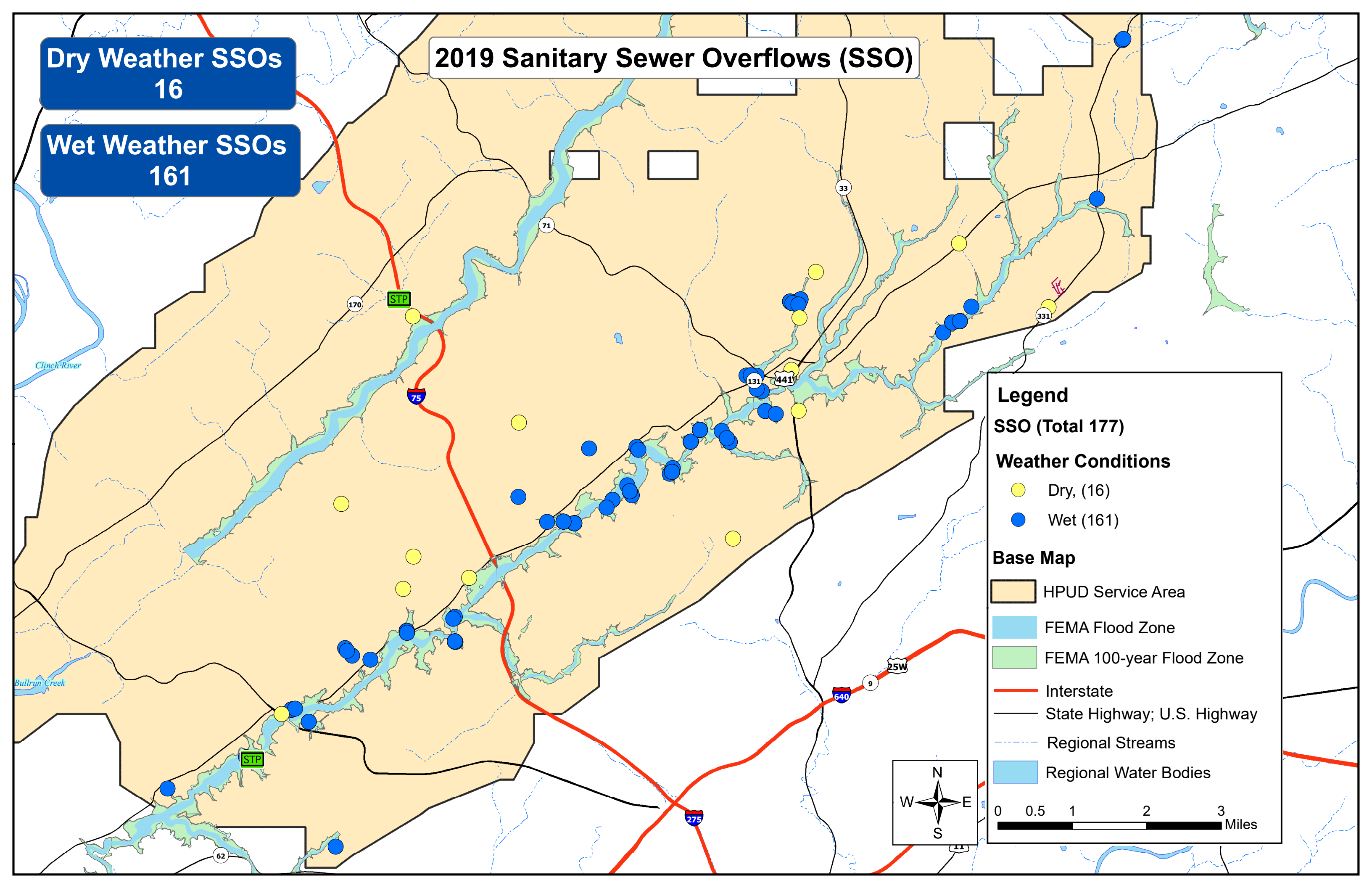
- Dry, (16)
- Wet (161)

Base Map

- HPUD Service Area
- FEMA Flood Zone
- FEMA 100-year Flood Zone
- Interstate
- State Highway; U.S. Highway
- Regional Streams
- Regional Water Bodies

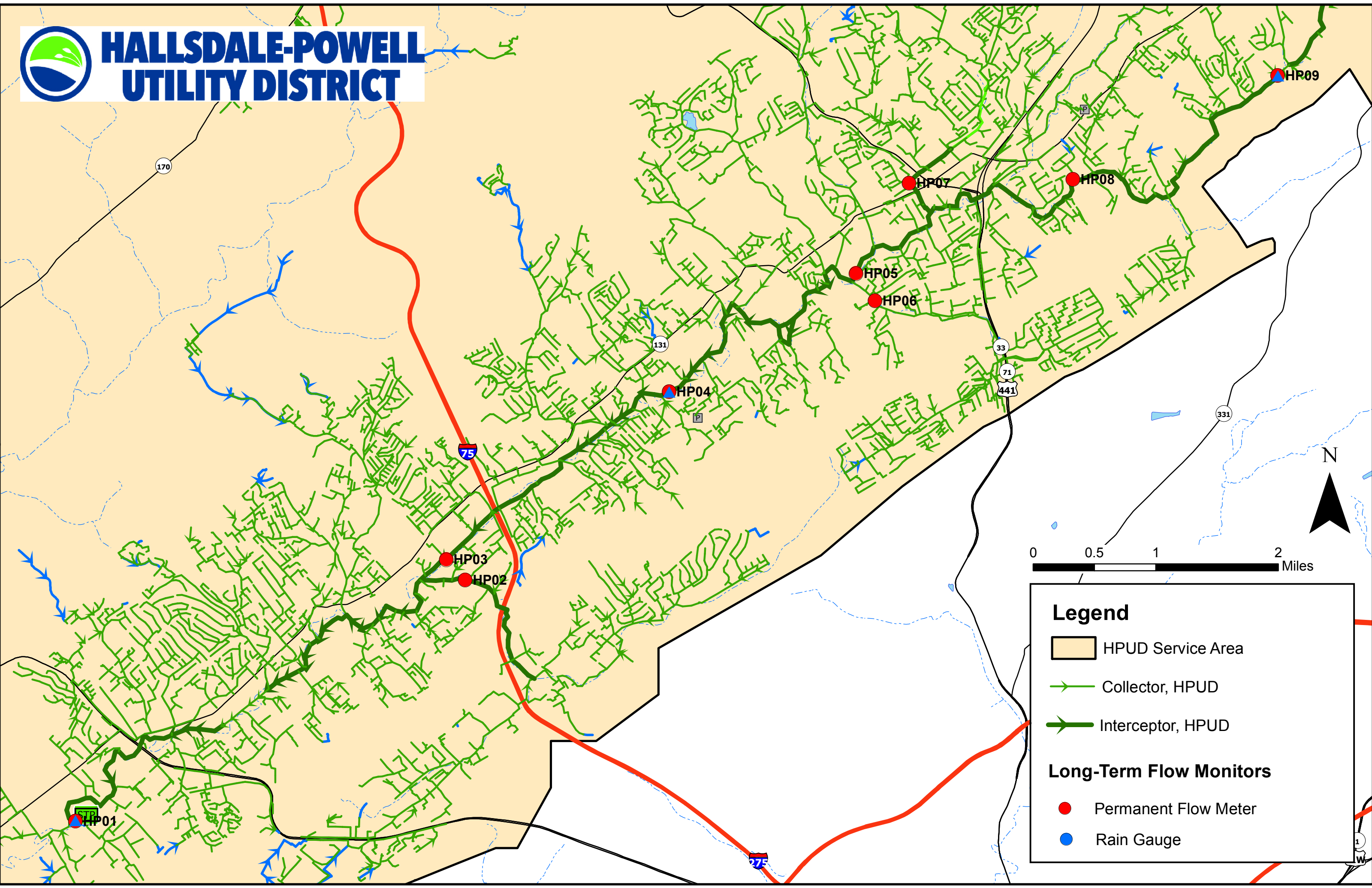


0 0.5 1 2 3 Miles










HALLSDALE-POWELL UTILITY DISTRICT



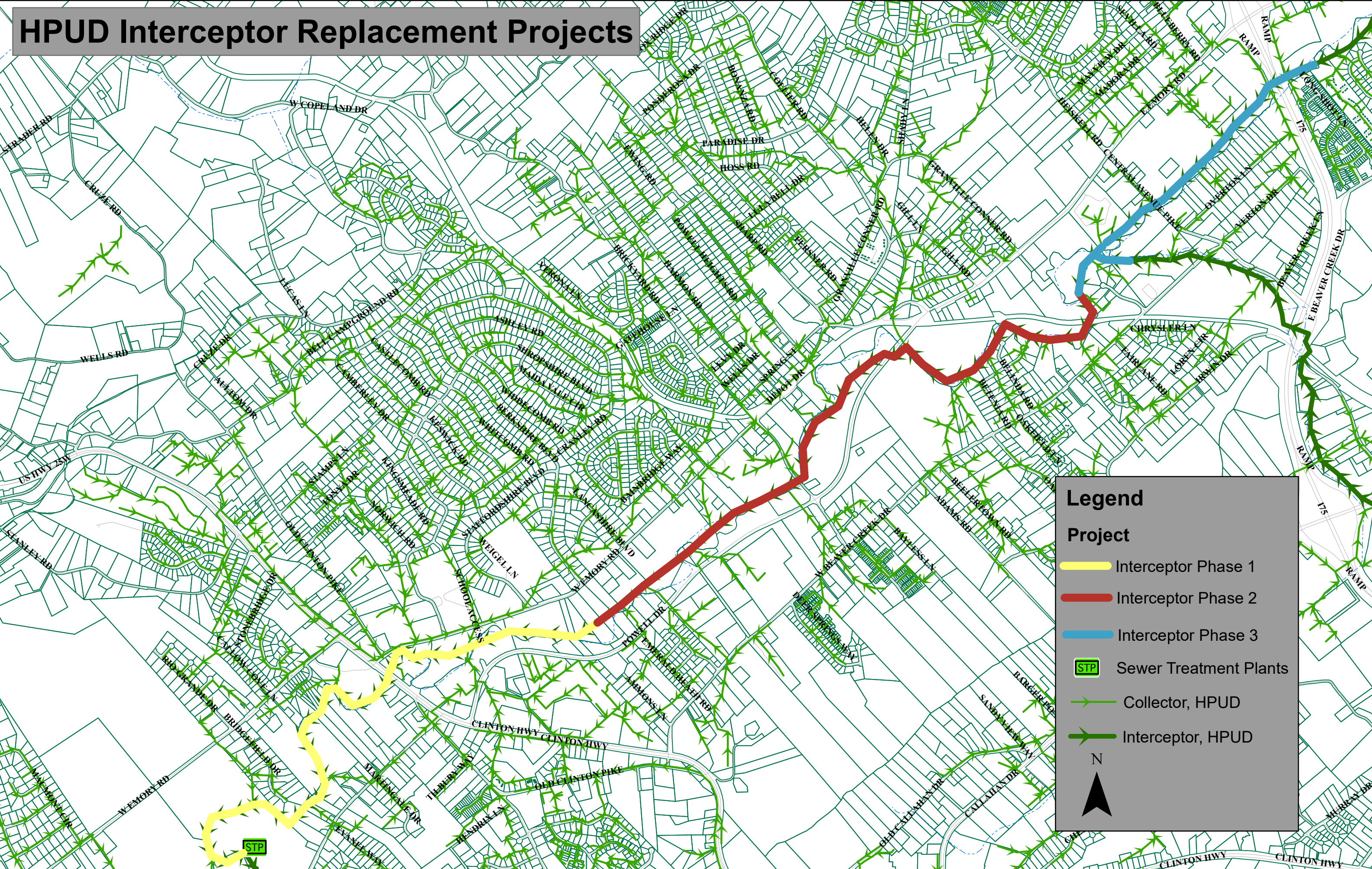
Legend

-  HPUD Service Area
-  Collector, HPUD
-  Interceptor, HPUD

Long-Term Flow Monitors

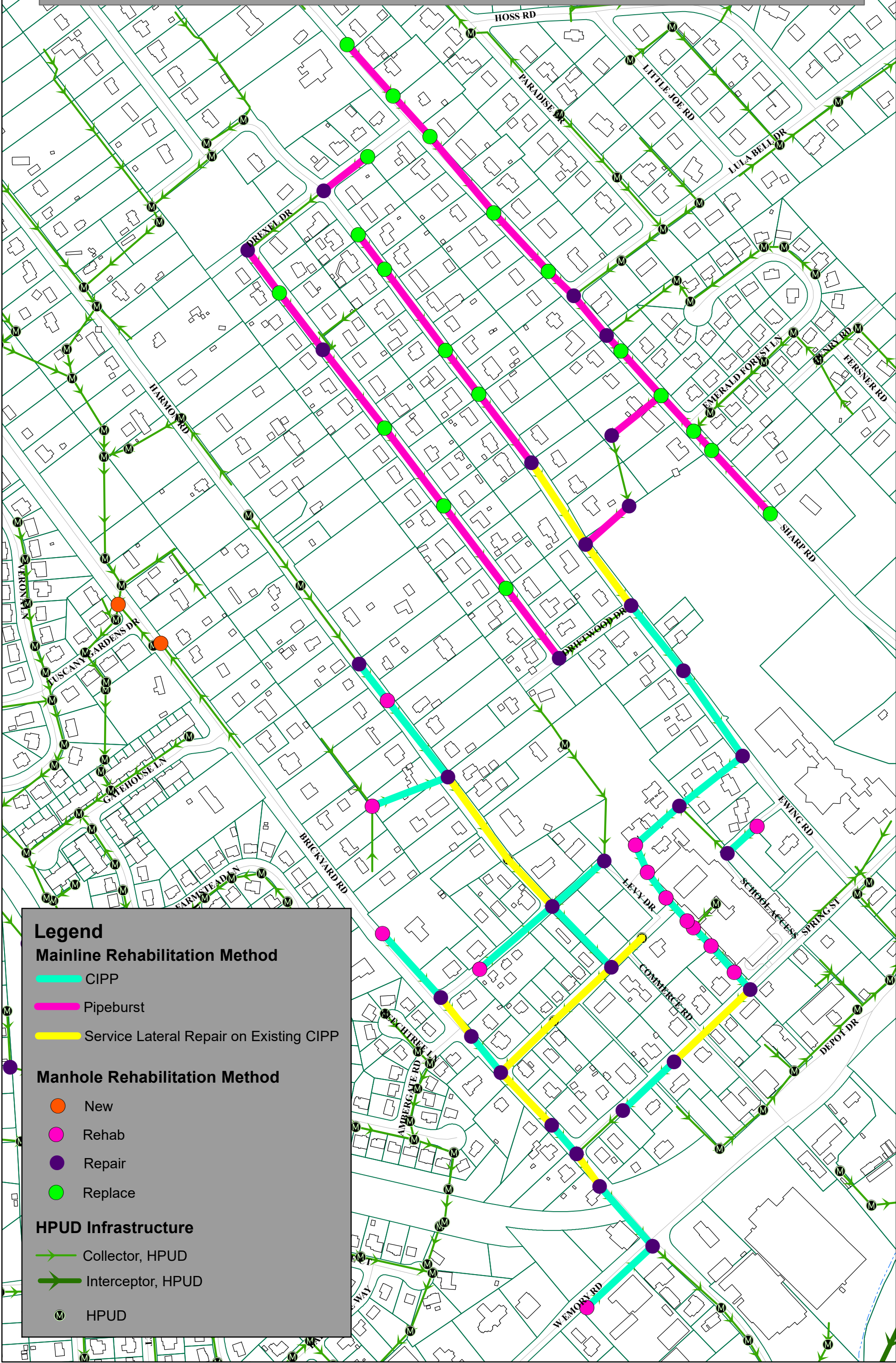
-  Permanent Flow Meter
-  Rain Gauge

HPUD Interceptor Replacement Projects

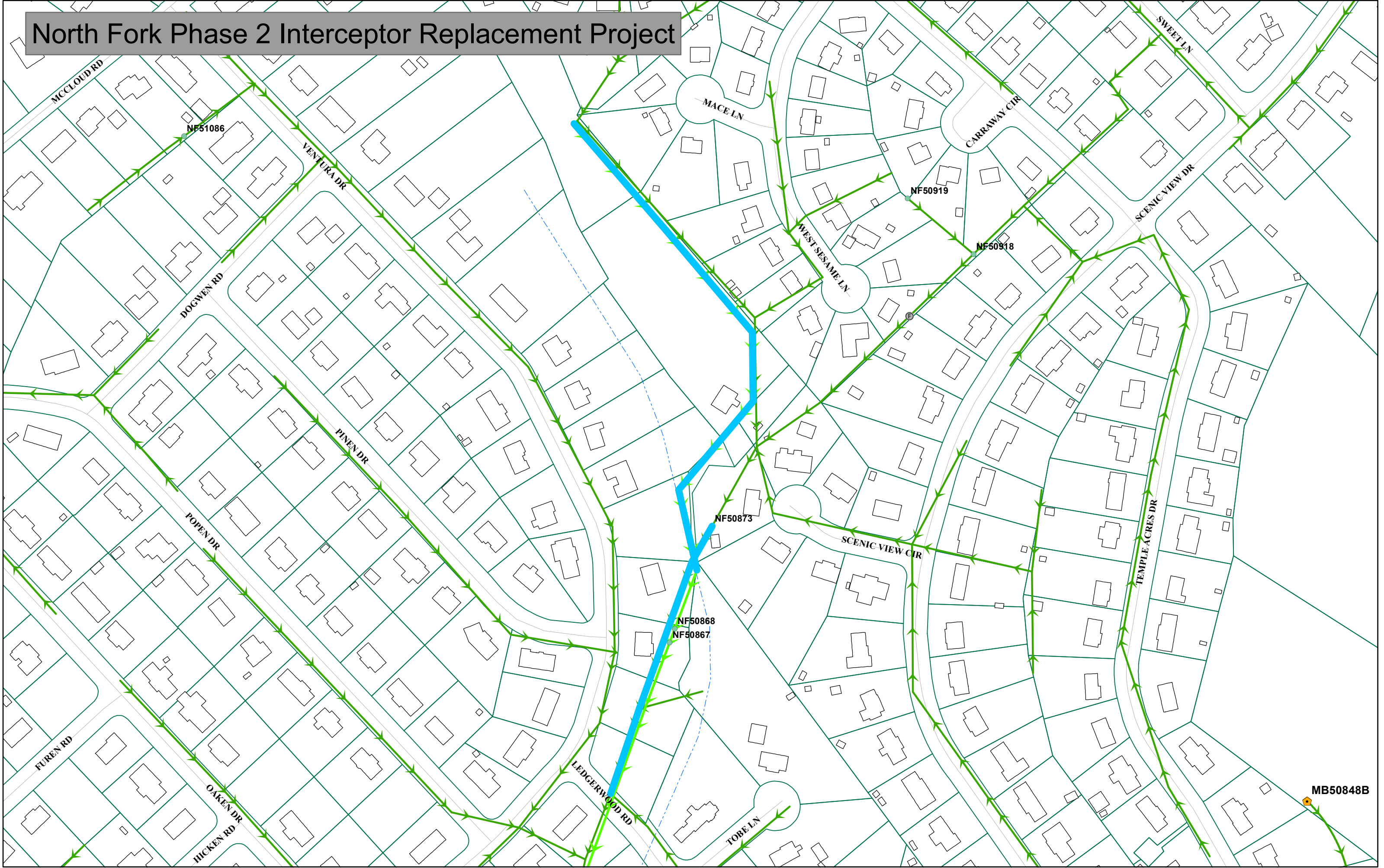


Brown Gap Interceptor Replacement Project

Downtown Powell Sewer Rehabilitation Project



North Fork Phase 2 Interceptor Replacement Project



Hallsdale-Powell Utility District Consent Order Project Schedule Update: 2014 -2020			
Category of Work	Project	Approximate Start Date	Approximate Completion Date
Program	SEP	9/24/2014	1/24/2018
	System Flow Monitoring Assessment and Analysis Program (Efficacy)	01/01/2023	1/1/2024
Storage	Storage - Dry Gap Location	8/24/2015	2/1/2017
PMI (Preventative Maintenance & Inspection)	HP08 Interceptor	4/1/2015	5/1/2015
	Completion of Initial System Survey	2/1/2016	2/1/2017
	HP08 & HP06	12/1/2016	11/1/2017
	HP07 & HP09 - Neighborhoods	2/24/2020	8/1/2020
Rehabilitation	Sanitary Sewer Rehabilitation - Phase 3	1/5/2015	10/30/2015
	Sanitary Sewer Rehabilitation - Phase 4	8/16/2017	2/1/2020
	Downtown Powell Sewer Upgrades	2/17/2020	1/12/2021
	Sanitary Sewer Rehabilitation - Temple Acres	8/1/2020	5/1/2021
Interceptor/Gravity Sewer Replacement	Beaver Creek Interceptor - Phase 1 Rebid	2/1/2020	1/31/2022
	Beaver Creek Interceptor - Phase 2	7/1/2020	12/18/2022
	Beaver Creek Interceptor - Phase 3	10/15/2018	10/1/2019
	Beaver Creek Interceptor - Brown Gap	1/15/2019	5/1/2021
	Bell Air Plantation Collector Sewer Replacement	9/1/2015	10/30/2015
	North Fork Interceptor - Phase 2	9/1/2020	1/1/2021
	Bishop/Taggart Lane Sewer Improvements	9/1/2020	1/1/2021
Pump Station Reliability	Yellowbrick lift station	3/1/2016	4/1/2016
	Campbells Point lift station	7/1/2016	8/1/2016
	Bright Lane lift station	6/1/2020	8/1/2020
	Temple Acres lift station	8/1/2020	10/1/2020