2016 Annual Report – Hamilton Township Department of Water Pollution Control

Overview

The Hamilton Township Wastewater Utility (WPC) operates a regional wastewater treatment facility with a nominal capacity of twenty (20) million gallons per day (MGD), an NJPDES permit limit of sixteen (16) MGD and an average daily flow of 7.40 MGD during 2016. The Utility has been in operation for over 78 years and is currently serving over 100,000 residents from three municipalities. The Hamilton Township collection system for the Utility contains 389 miles of sewer lines and 31 pumping stations in its 40 square mile service area. We continue to provide the licensed, operational responsibility for the ten Robbinsville Township pumping stations and are receiving compensation from Robbinsville for this service. The shared services agreement has reduced costs for Robbinsville Township and WPC (through increased efficiency) while improving pump station maintenance.

Our goal for 2016 was to continue the efforts begun previously that included ensuring proper plant operation, and performing capital improvements and maintenance activities that had been deferred prior to 2008. We continue to follow the recommendations established by the New Jersey Clean Water Council, which include a mandate for sustainable asset management. We are following the EPA Capacity Assurance, Management, Operations and Maintenance (CMOM) approach to achieve this mandate. For our plant operations this year, this effort included conducting evaluations of the condition of the electrical systems, the mechanical and structural condition of our air quality scrubber systems, and the efficiency biological treatment systems to remove ammonia and reduce the biochemical oxygen demand of the effluent.

For our collection system, our efforts in 2016 focused on assessing the condition of our sanitary sewer lines. Inspection and condition assessment of the collection system was accomplished using a new camera inspection truck received in November of 2015. The data collected from the inspections are directly linked to our Geographic Information System (GIS) database which streamlines review and prioritization of any necessary rehabilitation and/or repairs. In addition, several main line and lateral repairs were made using the dig-and-replace method.

WPC received and responded to approximately 744 Q-Alerts in 2016. This work included residential and main line sanitary sewer back-ups, storm drainage problems, and odor complaints. In addition, WPC worked with subcontractors to repair several storm sewer pipes and inlets.

We continued our efforts to improve the skill level and technical training of the work force. WPC also continued our cross training program to develop employees knowledgeable in all work areas at WPC. Anthony Gonzalez has continued his apprenticeship to become a plumber, while Jeff Kane is completing his classes to become an electrician.

We continued to encourage employees to undertake technical training through California State University Sacramento Water Programs required for obtaining NJDEP Operator Licensing.

During 2016, Keith Kaczorowski earned his NJDEP C-1 Collection System Operator License, Charles Wagner earned his NJDEP S-1 Wastewater Operator License, and Donald Sutton earned his NJDEP S-2 Wastewater Operator License. Kurt Willever obtained his CDL license and Bee Jay Cooper, Christopher Stinger and Willever obtained additional endorsements on their CDL licenses.

The effectiveness of the personnel organization continues to improve through promotions and out of title assignments to fill open positions. We have continued to address personnel changes necessitated by the "Baby Boomer" retirements that occurred at the end of the union contracts (June 30, 2013).

We continue to make safety a primary goal in all operations and are holding safety meetings with supervisors weekly and with individual groups on specific topics in order to focus attention on the varying safety issues for each group. In addition, we have received multiple safety suggestions submitted by employees into the "safety suggestion box".

We had received our NJPDES Permit renewal during 2015, however, we have not received additional conditions from the Delaware River Basin Commission (DRBC) as yet. Once the additional conditions are added, we will re-evaluate our connection fees and use charges to make sure that they properly account for all costs related to plant operations and facility maintenance. We have continued our efforts to reduce unnecessary spending. This includes evaluating methods to reduce paperwork by conducting more work electronically, specifically through use of GIS and TRAISR, and reducing energy and chemical use wherever possible.

We have continued our award-winning Educational Outreach Program in which environmental scientists from WPC present a program on Water Pollution and the Environment to numerous elementary, middle, and high schools. The program, which consists of a computer-enhanced multi-media presentation and visual demonstrations, motivates the young students to participate. By learning how wastewater is created and treated as well as how we can all help protect and preserve water quality, the students become an integral part of Hamilton's environmentally aware community. In addition, we have conducted numerous on-site tours for a variety of students including students from the Plumber Apprentice Class at Mercer County Vocational Technical School and regional high school students.

Wastewater Treatment Plant – 2016 Major Projects

In our continuing effort to maintain the efficiency of the treatment operations and improve the overall infrastructure condition, we have initiated several significant plant improvement projects. The following major Treatment Plant projects were undertaken during 2016:

Treatment Plant Instrumentation and Control System Upgrade

Based on the recommendations made by Morehouse Engineering, WPC has completed the fiber optic loop around the plant to provide a robust data communication network. Work has also continued to facilitate migration of SCADA systems from serial to Ethernet communication protocol. WPC has started necessary upgrades to the instrument and control systems including upgrade of older equipment so that spare repair parts are available for purchase. These improvements will increase and maintain the instrument and control system reliability in order to conform to the NJDEP NJPDES permit requirements.

Bio-Primary Clarifier Rehabilitation

This project consists of the replacement of clarifier drive mechanisms, installation of additional surface collectors to improve treatment efficiency, replacement of bottom scraper assemblies, replacement of steel baffles and weirs with fiberglass reinforced plastic (FRP), and coating of all structural steel components. The first clarifier was completed in November and the second clarifier will be completed in early 2017.

Rehabilitation of Five Buildings

Five buildings within the treatment plant underwent rehabilitation of the building envelopes including roofs, doors, windows, electrical lighting, and HVAC improvements. These buildings included the Administrative Office, Laboratory, MIPP Office, 1968 Digester Control Building and Plant Foreman's Office.

Structural and Mechanical Repairs to Scrubber #3

R3M and Associates prepared construction bid specifications for the structural and mechanical repairs to plant Scrubber #3. WPC anticipates construction to be completed in 2017.

RBC Roof Replacement Engineering

Roberts Engineering Group was awarded the contract to prepare plans and bid specifications for the replacement of the RBC roof. Bids were taken and the project will be constructed during early 2017.

PCB Minimization Study

Kleinfelder and Associates was awarded a contract to assist WPC personnel in the preparation of the PCB Minimization Study for the Delaware River Basin Commission. This study was required under our revised NJPDES Permit was submitted prior to December 31, 2016.

Rehabilitation of the Plant Potable and Utility Water Systems

Suburban Consulting Engineers was awarded a contract for the preparation of the preliminary and final engineering documents for the replacement of the plant potable water system and the fortification of the plant utility water system. This project will improve the reliability and quality of the potable and utility water delivery throughout the plant. Increased delivery volume, pressure and improved operational control will be realized through gridding and the installation of additional valves. We have preemptively installed some of the additional valves

throughout the plant to provide the ability to isolate breaks, redirect flow and maintain critical operations in the event of cold induced freeze or failure. The balance of the project will be undertaken in the summer of 2017.

Wastewater Collection System – 2016 Projects

The following major tasks were undertaken during 2016:

Pond Run Pump Station Upgrade Engineering

Roberts Engineering Group was awarded the contract for final design and bid specification preparation for the rehabilitation of this pump station. The scope of work involves the removal of the dry well and replacement of existing pumps with wet well submersible pumps. This will eliminate an OSHA confined space improving safety and will simplify station maintenance. The project is scheduled for during 2017.

Klockner Pump Station Upgrade Engineering

T&M Associates was awarded a contract to evaluate the condition of the concrete encased structural steel beams and to develop rehabilitation plan. Based upon the results of T&M's initial study, a follow-up study was performed by R3M Engineering who was also awarded the contract to prepare construction plans and a bid specification for the repair of the structural beams in the station wet well. Construction is scheduled for early 2017.

Klockner Pump Station Electrical Upgrade

We also contracted Suburban Consulting Engineers/DLB Associates to prepare bid specifications for the procurement and installation of a replacement emergency generator.

Elkton Pump Station Rehabilitation Engineering

Roberts Engineering Group was awarded the contract for the preparation of the final design and bid specification for the replacement of this pump station. Construction will take place in 2017.

Emergency Underground Infrastructure Repair Projects

We were required to make numerous emergency repairs to sewer piping that had failed unexpectedly or before project funding was approved. The projects completed are shown on the following page.

Pump Station Replacement/Upgrade Projects

Bypass piping and valves were added to the final eight pump station force mains where bypassing the pump stations with external pumps was deemed necessary based upon potential flow conditions. Bypass piping allows for the quick hook-up of external, diesel-fueled pumps in the event of emergency or scheduled maintenance as necessary.

Yardville Groveville Pump Station Upgrade Engineering

A contract was awarded for the second phase of engineering and design for the rehabilitation of the Yardville Groveville Pump Station. The construction phase of this project is expected to be initiated during 2017.

Emergency Underground Infrastructure Repair Projects Completed During 2016

Date	Repair Type	Location
1-Jan-16	Lateral Repair	50 Foy Drive
2-Feb-16	Wye & Lateral Replacement	1572 Hamilton Avenue
2-Mar-16	Wye & Lateral Replacement	178 Chapman Avenue
3-Mar-16	Lateral Replacement	1937 Genesee Street
3-Mar-16	Wye & Lateral Replacement	224 Natrona Avenue
3-Mar-16	Wye & Lateral Replacement	2911 Quakerbridge Road
15-Mar-16	Sidewalk Replacement	50 Foy Drive
28-Mar-16	Wye & Lateral Replacement	36 Winding Way
20-Apr-16	Lateral Replacement	1741 Hamilton Avenue
17-May-16	Manhole Casting Repair	Whitehorse Circle
2-Jun-16	Water Line Replacement & Re-pavement	300 Hobson Avenue
7-Jun-16	Sewer Main Repair (PSEG broke Main and reimbursed WPC)	115 Redfern Avenue
19-Aug-16	Lateral Repair	41 Wolfpack Drive
7-Sep-16	Lateral Replacement	1843 Hamilton Avenue
7-Sep-16	Lateral Replacement	1847 Hamilton Avenue
17-Nov-16	Lateral Replacement	109 Locust Avenue
6-Dec-16	Lateral Repair	72 Clayton Avenue

Engineering Department Road Project Sanitary Sewer Main Repairs

WPC worked closely with the Engineering Department in 2016 to inspect the sanitary sewer lines slated to be paved or reconstructed by both Public Works and contractors in 2016. Completing sanitary sewer repairs while the road is already being worked on can provide considerable cost savings. In addition, by coordinating these efforts, it minimizes having to dig up a newly paved road for a repair which can accelerate the need to repave in the future. Sanitary sewer repair work was included on the following streets prior to paving in 2016: Sunset Boulevard and South Olden Ave.

Inspection and Cleaning of Sanitary Sewer Lines

In March 2016, Wachs Valve and Hydrant Services finished delivering the final data for a two-year assessment program that included an initial phase of less expensive, quicker assessment of the sanitary sewer mains using zoom camera technology of all older pipelines not inspected in the last seven years (about 1,000,000 linear feet or 189 miles). This assessment was used to identify what pipe segments should be inspected with the more detailed closed-circuit television (CCTV) inspection. Both the zoom and CCTV inspection data were integrated into Hamilton's existing Geographic Information System (GIS) and used for asset management. Management of the sanitary sewer system assets includes identifying needed repairs, scheduling of routine maintenance, and both short and long-term budgeting for the repairs and maintenance.

In addition, in-house sewer cleaning and CCTV inspections were conducted on 83,000 linear feet or almost 15 miles of pipe in 2016.

Geographic Information System (GIS)

2016 included the full usage of our new TRAISR system for service requests, work orders, and asset management. The WPC inspection data collected with the new inspection truck is incorporated into the GIS as data is generated.

Miscellaneous Lateral Replacement Project

Inspection work that was conducted in recent years had identified 60 laterals that needed either full or partial replacement throughout Hamilton. These lateral repairs were conducted by an outside contractor in 2016.

Work Proposed for 2017 - Wastewater Treatment Plant

Treatment Plant Building Evaluation – Phase II

Building repair and roof replacement of the Personnel Building, Superintendent's Office, Control Building, Headworks, and Electrical Shop have been deferred since 1980. Therefore, replacement of the failing roofs and windows, repair of the exterior walls, and replacement of the failing HVAC Systems is necessary. We will be going out to bid for the final design and bid spec preparation for these buildings in 2017.

Bio-Primary Clarifier Rehabilitation

This project was started in late fall 2016 and will be completed in 2017.

RBC Roof Replacement

This roof is approximately 35 years old and is in need of total replacement. The existing roof system will be removed down to the structural concrete deck and replaced with a modified membrane system with a 20 year warranty.

Plant Potable Water System Replacement

Work will continue through 2017 on the replacement of the existing potable water distribution system in the plant. This will provide system redundancy, operational control and improved water quality.

Scrubber #3 Rehabilitation

Upgrades to the structural and mechanical components of Scrubber 3 will performed to improve reliability and efficiency of the scrubber system.

Work Proposed for 2017 - Wastewater Collection System

Inspection and Cleaning of Sanitary Sewer Lines

We will continue our Capacity, Management, Operations and Maintenance (CMOM) efforts to accurately assess the overall condition of the collection system infrastructure through use of zoom and CCTV camera inspections. We will input the information obtained from the inspections into the TRAISR GIS system and will utilize this information in order to prioritize capital projects that will be performed in 2017 and beyond.

Sanitary Sewer Rehabilitation

As WPC receives data from all the sanitary sewer inspection that is done continually in-house and from contractors, defects within the system are prioritized and put on lists based upon category or type of work. WPC will continue to prioritize and put out contracts for excavation and repair of mains and laterals, installation of lateral cleanouts for further cleaning and assessment, manhole rehabilitation and for CIPP lining. We anticipate putting a CIPP lining contract out to bid in late 2017 for work to be completed in 2018.

Miscellaneous Lateral and Main Replacement Project

Inspection work that was conducted in 2016 had identified numerous laterals that needed either full or partial replacement. These lateral repairs will be conducted by an outside contractor in 2017.

Route 130 Force Main Installation Project

In conjunction with the new construction of the FedEx building and jughandle on Route 130, a new sanitary sewer force main will be installed. This force main will be parallel and larger than the existing force main to manage the increasing flows from new development in the area. The force main pumps sewage from the pump station on Rout 130 at Back Creek southbound to a

manhole in front of Body by Mulé.

Elkton Pump Station Replacement

The existing, below grade, can station will be replaced with an above grade enclosure with new pumps and controls. This will improve reliability while providing a safer working environment for station maintenance.

Pond Run Pump Station Improvements

The existing, below grade dry well will be abandoned and new, wet well submersible pumps will be installed to eliminate the need for OSHA confined space entries for station maintenance. Additionally, a permanent station bypass system will be installed to be used in the event of station emergencies.

Klockner Pump Station Improvements

The wet well structural support beams will be repaired and coated to protect against corrosion in the aggressive wet well environment. Additionally a new emergency generator will be procured and installed to replace the existing unit that is obsolete and difficult to maintain due to limited parts availability.

Yardville Groveville Pump Station Improvements

Final engineering and design is complete for the station. WPC anticipates bidding and awarding the construction phase of this project in early 2017, with work commencing in Summer. This project will consist of replacing the existing 2 pumps with a 3 pump system with new controls and variable frequency drives, replacement of the roof, installation of a station emergency bypass system, and repairs to bring the station into code compliance.

Water Resources and Flood Control Program

In the past five years, RCE Water Resources Program (Rutgers) has made tremendous strides in developing and implementing solutions to the flooding and water quality issues facing Hamilton Township. During 2016, they continued working with Hamilton Township in developing and implementing innovative, cost-effective programs to engage the community in addressing these issues. Specifically, their efforts targeted the following goals:

1. *Prepared a comprehensive characterization document of stormwater infrastructure and flooding in Hamilton Township* - Rutgers has completed a number of studies to better understand the hydrologic issues in Hamilton Township. This comprehensive characterization study compiles the results of these studies and provides the municipality with the knowledge it needs to set priorities for repairing aging infrastructure and enabling them to develop a financial strategy to ensure that prioritized actions are implemented. Additionally, this characterization study allows for the incorporation of effective sustainable technologies, approaches and practices, particularly including green infrastructure measures and strategies that improve the resiliency of the township to climate change.

2. Rutgers continued their efforts to educate and engage homeowners in Hamilton Township to help reduce stormwater runoff. Our recent success with demonstration rain garden projects as well as rain barrel workshops indicate that local residents are willing to participate in these efforts when given the “tools” and information they need to move forward. Rutgers worked closely with the Township Environmental Commission and Green Team to develop a program that included rain garden design workshops for homeowners and rain garden design services for Hamilton residents.

3. Rutgers has evaluated and selected stormwater and flood management alternatives, prepared approximate implementation schedules, and provided order-of-magnitude cost estimates for these alternatives.

To begin planning for municipal flood resilience, an assessment of flood prone properties is proposed for 2017. Hamilton Township can benefit from inventorying and evaluating flood prone areas and developing strategies for acquiring and managing them. With a comprehensive plan, Hamilton Township will be well positioned to quickly and efficiently take advantage of funding and technical resources made available through federal and state programs. Hamilton Township will be able to demonstrate its commitment to pursuing floodplain protection on behalf of its residents. Key activities that are proposed include:

1. *Development of a Flood Acquisition Plan* **-** A flood acquisition plan is a planning tool that municipal leaders can use to identify specific properties that are repetitively damaged by flooding. With this knowledge and understanding, the community can begin to prioritize efforts to acquire repetitively damaged properties through state and federal funding programs. This plan is a tool for the community as it begins to address resiliency issues related to recovery from damaging storm events.
2. *Development of a Floodplain Restoration Plan* - This plan will identify priority areas based on the results of the Acquisition Plan described above. Rutgers will first prepare a single, unified vision plan for flood prone areas, focusing on both habitat and public amenity connections. They will then prepare a focused restoration strategy for the community.

FAST FACTS – 2016	
Hamilton Users	30,182 (2016)
Robbinsville Users	4,954 (2016)
Total Users	35,136
Permitted Industries	6
Permit Capacity	16,000,000 gallons per day
Hamilton Average Daily Flow	7,400,000gallons per day
Robbinsville Average Daily Flow	1,143,777 gallons per day
Total Yearly Flow	2,708,460 gallons
Hamilton Collection System	389 miles of sewer line
Hamilton Pump Stations	31
Hamilton Manholes	7355
Robbinsville Collection System	71.71 miles of sewer line
Robbinsville Pump Stations	10
Robbinsville Manholes	253
Plant Electric Consumption	4,283,888 kilowatts
Pumping Station Electric Consumption	1,324,197 kilowatts
Sludge Disposed	4,971 tons (2015)
Screenings Disposed	138.77 tons (2015)
Capital Budget – CY2016	$ 5,547,000
Operating Budget – CY2016	$17,4075,754

SANITARY SEWER CONNECTION PERMITS				
Year	Commercial		Residential	
2008	52	$660,504	11	$ 27,500
2009	54	$246,975	32	$ 80,000
2010	27	$171,350	129	$322,500
2011	85	$212,500	31	$77,500
2012	21	$137,648	78	$195,000
2013	31	$266,853	179	$418,375
2014	34	$458,184	106	$265,000
2015	32	$665,650	97	$242,500
2016	32	$393,072	124	$308,250

Regulatory Agency Review

The Water Pollution Control facility (WPC) is a highly regulated facility and is subject to oversight by the following regulatory agencies:

1. **Environmental Protection Agency (EPA)**
    - CMOM
    - Pretreatment
    - Sludge 40CFR503
    - Laboratory Certification
2. **NJ Department of Environmental Protection**
    - Water Quality
    - Sludge Quality
    - Hazardous Waste
    - Air Quality
    - Lab Certification
    - Treatment Works Approvals
    - Bioassay
    - Underground Storage Tanks
    - Groundwater Monitoring
    - Backflow Preventer Permits
    - Pretreatment
    - Enforcement
    - Wetlands
    - Water Allocation
    - Stormwater
3. **NJ Department of Transportation - Road Opening**
4. **Delaware River Basin Commission (DRBC)**
5. **NJ Department of Health – Right to Know**
6. **NJ Department of Labor- Safety**
7. **Municipal Fire Inspections**
8. **Federal Emergency Management Agency - FEMA**
9. **Mercer County Soil Conservation District**
10. **NJ Board of Public Utilities - One Call**
11. **Federal Highway Administration - CDL Testing**
12. **Nuclear Regulatory Commission**
13. **Federal Communications Commission**

During 2016, we were subjected to numerous inspections by the NJDEP and other agencies.

Workplace Safety

Because the WPC employees work in an industrial environment, workplace safety is an important issue with the Utility. Proper training as well as issuance of proper Personal Protection Equipment (PPE) is imperative for the safety of all workers. The operation and maintenance of wastewater treatment plants and its associated collection system include potential hazards such as chemicals, confined spaces, moving parts and heavy machinery.

Annual safety training, including but not limited to confined space, forklift and Right-To-Know, is mandatory for all operation and collection system personnel in order to review and simulate possible hazards. The identification of potential hazards and the review of the WPC proper safety procedures aid in keeping all Utility employees safe.

Management continues to stress good safety practices to the plant and collection system supervisors weekly. These discussions facilitate remediation of any pending or previous safety issues and the status of required training. In addition they encourage an open dialogue between employees and management as well as aid in lowering worker's compensation injuries.

Safety Training

- Personal Protective Equipment
- Right-To-Know
- Lock Out/Tag Out
- Arc Flash Safety
- Forklift
- Back Safety and Proper Lifting
- Slips, Trips and Falls Avoidance
- Air Monitoring Equipment
- Self-Contained Breathing Apparatus
- Snow Removal Safety
- Commercial Driver's License
- Traffic Safety
- Accident Reporting for Supervisors
- Job Safety Analysis
- Respiratory Fit Testing
- Respiratory Medical Testing
- Blood-Borne Pathogen Training
- Lyme Disease Training and Vaccine
- Hepatitis Training and Vaccine
- Ebola Safety

Other Training

- Webinars
- Wastewater License Holder, Operator and Collection
- Geographic Information System
- Management Skills for New Supervisors
- Computer Software Programs

Technical Training

Operating the Hamilton Township Wastewater Utility involves continuous knowledge of biology, chemistry, mechanics, regulatory issues, computers and health/safety issues. Training the staff in proper operation procedures as well as compliance with our operating permit is important to our success in a dynamic environment such as wastewater collection and treatment. Many employees in the department hold wastewater operating licenses which require a minimum amount of continuing education credits be earned during a three year cycle. The Township has endorsed higher training/education for all employees. We have committed to providing the required continuing education credits for all of the Utility license holders in order for them to be current with the Department of Environmental Protection.

In 2016, the Utility hosted training sessions on technical and safety at our facility. The Utility also provided several training sessions via the internet "Webinars" which allowed employees to learn without the added travel and registration expenses. In addition, we continued to reduce costs by utilizing in-house employees with specific expertise and vendors to provide necessary training to our staff members. Finally, we sent key personnel for further technical training at offsite seminars and symposiums during the course of the year. The following is a list of training offered during the previous calendar year:

Month	Course Title	Trainer	Location
January	Confined Space/Lockout Tagout	Certified Health	at WPC
March	Conference	NJWEA	Atlantic City
July	Respiratory Fit Testing/Blood Borne	Certified Health	at WPC
September	Technology Transfer	NJWEA	Eatontown
October	Annual Conference	AEA	Atlantic City