

**South Whitehall Township
Sewer Collection System Management, Operations
and Maintenance Plan
and
Inflow/Infiltration Source Reduction Plan**

June 2018

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1. COLLECTION SYSTEM MANAGEMENT

a. Goals

South Whitehall Township's (SWT) preventive maintenance plan (PMP) covers the assets we manage in our wastewater collection system and is one component of our overall Management, Operations and Maintenance (MOM) Plan. This plan combines preventive, predictive and corrective maintenance strategies with our best management practices. The MOM Plan has been prepared to help South Whitehall effectively manage its wastewater collection system and achieve the following goals:

Goals

- Prevent public health hazards
- Protect the environment
- Comply with regulations
- Minimize the frequency of SSOs
- Mitigate the impact of SSOs
- Minimize disruptions in service
- Minimize complaints
- Provide quick response to any disruption in service that occurs
- Protect South Whitehall's large investment in the sewer collection system by maintaining maximum capacity and extending the useful life of the associated assets
- Prevent unnecessary damage to public/private property
- Efficiently use the funds available for the maintenance of the infrastructure and the operation of services
- Reduce expenditures for emergency maintenance
- Convey wastewater to the City of Allentown waste water treatment facility with a minimum of infiltration, inflow and exfiltration
- Provide adequate capacity to convey peak flow
- Provide immediate, responsive, and efficient service to all emergency calls
- Provide a safe work environment for employees, employers, and residents in SWT
- Perform all operations in a safe manner to prevent personal injury
- Utilize evolving technology to increase our effectiveness and efficiency
- Provide reliable service now and into the future

b. Organization

South Whitehall Township's Public Works Department is responsible for the operation and maintenance of all aspects of the wastewater collection system. Contractors are used for some maintenance activities and emergency support when needed. Figure 1 shows the organizational structure of the Department.

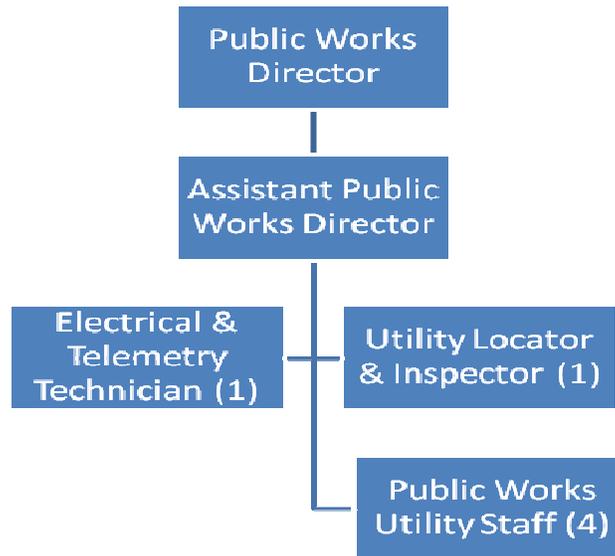


Figure 1 South Whitehall Township Organization Chart - Public Works Department

The Public Works Department has 8 full time employees assigned to the operation of the sewer system and operates under the following organizational structure:

Public Works Director – Establishes policy, plans strategy, leads staff and delegates responsibility, allocates resources, authorizes outside contractors to perform services, and may serve as public information officer.

Assistant Public Works Director – Responsible for the daily operation and management of the sewer system and leadership of staff. Prepares and implements contingency plans, leads emergency response, investigates and reports SSOs, and trains field crews. Supervises outside contractors to perform services, and may also serve as public information officer.

Consulting Engineer – Provides assistance to the Public Works Department staff in operating and maintaining the sewer system. Prepares wastewater collection system planning and construction documents, provides input for the capital improvement delivery system, documents new and rehabilitated assets, and coordinates development and implementation of CMOM Plan. The Engineer is required to have a Professional Engineer's License.

Electrical and Telemetry Technician – Responsible to plan and maintain all electrical and telemetry features associated with the sewer system.

Inspector – Ensure that new and rehabilitated assets meet Township standards, works with field crews to handle emergencies when contractors are involved, and provides reports to the Assistant Public Works Director.

Public Works Utility Staff – Conduct staff operations and preventive maintenance activities, mobilize and respond to notification of stoppages and SSOs (e.g., mobilize sewer cleaning equipment, by-pass pumping equipment, and portable generators).

Administrative/Public Relations – Support staff operations and preventive maintenance activities, assist with data entry and quality control, handle billing, dispatch, payroll, customer response, outreach, education, and other support functions as needed.

Relation to Other Municipal Functions

Many activities of the South Whitehall Township sewer collection system are supported by the following departments within the Township:

- Collection system mapping is supported by a GIS consultant. The consultant is responsible for maintaining and updating the GIS existing sewer infrastructure mapping system.
- The Community Development Department provides support, policy recommendations, and advice concerning future growth and development, and is assisted by the consulting engineer.
- Resources and budget are overseen by the Township's finance department.
- Training for collection system staff is provided through training partners approved by the PA Department of Environmental protection.
- Outreach to building contractors is done by the Community Development Department.
- Design and Construction Standards for installation, rehabilitation and repair are overseen and reviewed by the Public Works Department with input from the consulting engineer.
- Standards for inspection and testing are developed by the Public Works Department with input from the consulting engineer.
- Inspection of grease interceptors/separators is coordinated by the Public Works Department.
- Outreach for Fats, Oils and Grease is performed jointly by the Public Works Department personnel with assistance from the consulting engineer and a laboratory consultant.
- Procurement of non-routine equipment, services or supplies is authorized by the Board of Commissioners and the Township Manager.
- The Public Works Department coordinates paving services on all sewer repairs performed within public streets and works to coordinate street-paving schedules with sewer work.

c. Training

SWT's training program provides a mechanism for educating employees and establishing their technical competence through the USEPA, EPWPCOA, PA-AWWA, PA DEP, and NASSCO certification programs. SWT utilizes a combination of in-house skill training and the purchase of specialized training through state and national associations, conferences and vendor training programs to enhance skills for performing daily work duties and provide certified operators

continuing education hours. Skills training for SWT's employees includes, but is not limited to:

- Routine Line Maintenance
- Heavy Equipment Operation
- Maintenance Equipment Operation
- Line Testing and Inspection
- Infrastructure Installation
- Meter Station Operation and Maintenance
- Electrical and Instrumentation
- Emergency Response
- Public Relations
- Safety

Safety training is obtained from training agencies including EPWPCOA, PA-AWWA, PA DEP, and PA Rural Water Association. South Whitehall Township expects employee adherence to the following written safety policies and procedures.

- Confined Space Entry
- Hard Hat Policy
- Vehicle Operation Policy
- Seat Belt Policy
- Respiratory Protection Program
- Excavation Safety Policy and Program
- Chlorine Safety Policy
- Injury Reporting Policy
- Post Accident Drug Testing Policy
- Safety Teams and Committee Policy
- Personal Protective Equipment (provided for the employee)
- First Aid, CPR and AED (First aid supplies are available in office areas and vehicles)
- Flaggers
- Hazard Communication Program
- Defensive Driving Program (employees who are required to maintain a commercial driver's license must complete a four (4) hour defensive driving course)

Training records are maintained for each employee. The Public Works Department maintains appropriate safety equipment including: protective clothing, safety glasses, hard hats, gloves, respirators, filters, harnesses, tripods, hoists, and fire extinguishers. The Department also maintains and calibrates atmospheric testing equipment. Lights, barricades, signage and exhaust fans are also available.

d. Customer Service

1. Complaint Management Program

Complaints and requests are received by various means (e.g., phone calls, e-mail, and

occasionally in person). Regardless of the nature or means of receipt, all complaints and requests are logged. Entries include the following detailed information about the complaint/request:

- Receiver of complaint / dispatcher
- Time and date of request
- Form number (Work Order)
- Complainant information (Name, address, call back phone number)
- Location of the problem
- Type of complaint (Codes, e.g. home back up, odor, manhole overflow, etc.)
- Specific request
- Personnel assigned to complaint
- Findings type, including cause of problem
- Complaint closeout information
- Date complaint closed

Once a complaint is assigned, our field personnel perform an investigation. If the problem cannot be immediately resolved, Public Works will generate a work order to take appropriate action for permanent correction of the problem. If South Whitehall Township is not responsible for correcting the problem, Public Works will provide the complainant with guidance on a recommended course of action. Once an investigation has been completed the complaint is closed-out.

2. Public Information and Education Program

South Whitehall Township uses a variety of outlets for providing information and education to customers. The outlet(s) used to disseminate information is often based on the type of information and the targeted audience. South Whitehall Township routinely uses the outlets listed below to provide its citizens with the most up-to-date information possible:

- Township Website
- Local Media (TV and Newspaper)
- South Whitehall Township Board of Commissioner's Meeting Agenda
- Public Hearings
- Personal Visits / Phone Calls
- Door Hangers
- Sign Postings
- Customer Mailings

South Whitehall Township has had good community relations regarding issues with the operation and maintenance of our collection system. Types of information and education provided to our customers are as follows:

Information and Education Programs

Sewer System Evaluation Survey Work
Major Repairs and Rehabilitation
New Construction

Sewer Use Ordinances
Types of Waste Treated
Industry Pretreatment Requirements

Road Closures
 Point Repairs for Street Paving
 Sewer Use Rates
 Grease Handling Information
 Grease Disposal Pamphlet
 Private Hauler Instructions

Wastewater Treatment Processes
 Customer Emergency Response
 Complaint Procedures
 Service Connection Requirements
 Wastewater Collection

e. Information Management and Geographic Information Systems

South Whitehall Township uses ARC GIS to manage information on our collection system. The following Table shows the information that is included in our GIS database of the collection system.

Table 1: Collection System Map Information included in South Whitehall’s GIS

<p>Manholes Basic Map Information - ID number or other unique identifier - Location, with reference to streets and property lines - GPS coordinates - Size</p>	<p>Manholes Additional Map Information - Date built - Rim elevation - Invert elevation - Material Type</p>
<p>Pipes and Siphon Basic Map Information - ID number or other unique identifier - Location, with reference to streets, surface waters, property lines and manholes - Size - Direction of flow - Length - Material type</p>	<p>Pipes Additional Map Information - Slope - Pipe invert elevations - Plan or as-built ID number - Service laterals</p>
<p>Meter Stations Basic Map Information - ID number - Location - Service Area</p>	<p>Pump Stations Additional Map Information - Record drawings of each meter station</p>

General System information is managed in various software programs and includes:

General

- Parts inventory
- Equipment and tools
- Purchase orders
- Revenue

Collection System

- Continuous Sewer System Assessment
- Collection system mapping
- Collection system inventory
- FOG compliance

- Flow monitoring
- SSO/Emergency response

Personnel

- Department staff
- Safety incidents
- Training
- Job performance

Maintenance program

- Routine and Priority Planned maintenance (cleaning, etc.)
- Inspection scheduling and tracking
 - Manhole
 - Pipeline (Closed Circuit Television (CCTV), camera)
 - Meter Station
- Work Orders
- Monitoring/Sampling scheduling for
- Vehicle maintenance

Customer service program

- Complaints
- Customer service response
- Billing information

f. Legal Authorities and Controls

1. Sewer Use Ordinance

South Whitehall Township has established and implemented regulations regarding the use of the wastewater collection system. The Township has a comprehensive sewer use ordinance, consistent with EPA's model ordinance, and complimentary to the standards required by the City of Allentown's wastewater treatment plant. As regulations and requirements have changed, the Township has passed additional ordinances to address those issues. Ordinances are kept up-to-date and are available electronically at the Township's website.

The items addressed through our sewer ordinances include: sewer use and standards, access to pipelines and structures, FOG management, pretreatment requirements, service connections, hauled waste/septage, user rates, permitting of flows into the system, inflow/infiltration control, enforcement of proper design, installation, and testing standards, and inspection requirements for new and rehabilitated sewers. The Township also has agreements with the Coplay-Whitehall Sewer Authority and the City of Allentown. The Finance Department, the Township Manager, and the Board of Commissioners review the adequacy of user rates annually.

2. Joint Sewer System Agreement

South Whitehall Township has had an agreement with the City of Allentown for treatment of its wastewater since the 1930's. The latest agreement is dated 1988. South Whitehall Township has purchased capacity rights for 3 million gallons per day of wastewater treatment.

The Township also has two connections with the Coplay-Whitehall Sewer Authority, whereby sewage is transported through the Authority's system en route to the City of Allentown for treatment. These connections are governed under an existing transportation agreement.

2. GENERAL INFORMATION ABOUT THE SOUTH WHITEHALL TOWNSHIP SANITARY SEWER SYSTEM

a. Wastewater Treatment and Collection System Description

The sanitary sewer system is operated under the jurisdiction of the Township Board of Commissioners.

The oldest portions of the sewage collection system date to the mid-1930s. Sewer pipe materials include Vitrified Clay Pipe (VCP), concrete, cast iron, ductile iron, and PVC. The system serves approximately 6,700 customers and includes nearly 118 miles of sanitary sewer pipe ranging in size from 6 to 30-inches in diameter. All sewage flows through the system by gravity – the Township does not own or operate any sewage pumping stations. The system is currently arranged into six (6) sub-basins, and each is metered for billing purposes, as well as to monitor inflow and infiltration. All flow from the Township (except for two drainage areas that flow through the Coplay-Whitehall Sewer Authority system) is transported directly to the City of Allentown sewage collection system for ultimate treatment at the Kline’s Island WWTP. The sanitary sewer collection system is maintained by the Township Public Works Department. Employees routinely flush and televise the sewer mains looking for defects, grease, and root blockages. When a problem is discovered, the crew uses a pressurized water jet flusher to eliminate the grease and blocks, and debris is vacuumed for later disposal. When defects in pipes or manholes are identified, they are prioritized for repair depending on severity. Township staff is available on a 24-hour basis each day of the week to respond to any emergency situation in the sewage collection system.

b. Collection System Details

- Service Area: 13 Square miles
- Customers Served in primary community: 6,700
- System Inventory owned by South Whitehall Township, below:

Miles of gravity sewer	Miles of force main	Number of pump stations		Number of siphons	Number of air relief valves
		Public	Private		
100	0	0	0	0	0

- Wastewater Flow Characteristics in MGD

Annual Average Daily System Flow	Average Daily Dry Weather Flow	Peak Wet Weather Flow	Treatment Plant Allocation (MGD)	
2.0 MGD	1.8 MGD	3.2 MGD	Average: 3.0	Maximum Flow: 9.0

c. Age Distribution of Collection System

South Whitehall Township conducts an ongoing program to assess the structural condition and maintenance needs of the collection system as a part of our Cleaning, Inspection and Assessment program and our capital planning. The oldest portions of the system date to the 1930’s.

d. Length of Pipe by Diameter (Mains)

Pipe Diameter (inches)	Length (miles)
6	11.67
8	70.66
10	3.97
12	4.09
15	2.46
16	0.86
18	1.39
21	1.95
24	0.32
30	2.50
TOTAL	99.87

e. Sanitary Sewer Overflow History

The Township has not experienced any sanitary sewer overflows (SSOs) in the last 5 years. The following table describes the overflow dates, locations, quantities and causes.

Table 2: Sanitary Sewer Overflow History - **NONE**

SSO date	Location	Volume released	Cause of release

To assure sewer capacity, the Township has developed programs to address capacity, inflow/infiltration, and the condition of our collection system.

f. System Map

A current version of the Township’s sewage collection system map is attached to this plan. The map is updated on an annual basis to reflect additions and upgrades to the sewage collection system.

3. CLEANING, INSPECTION AND ASSESSMENT PROGRAM

In 2007 South Whitehall Township began development of a preventive maintenance plan (PMP). This includes a Cleaning, Inspection, and Assessment program to assess the maintenance needs and structural condition of the entire collection system. The goal of this program is to complete the entire system assessment within 5 years.

The Township began the cleaning, inspection and assessment program with a focus on the known problem areas and the older sections of the service area near the City of Allentown. The results from the cleaning, inspection and assessment program are used to categorize the cleaning frequency and the repair or replacement needs for each component. Critical infrastructure components will also be identified and assessed. Previous knowledge of the condition of the sewer system has also been used to establish more frequent cleaning scheduled for identified problem areas.

The cleaning, inspection and assessment efforts are performed by the Public Works Department staff. All data is entered into the GIS system.

All work is performed on a drainage area basis, with the goal of completing the cleaning and inspection of approximately 15 to 20% of the entire collection system each year, such that 100% of the system is televised after a 5 year period. The drainage basins are each metered and labeled as follows for the purposes of recording the data:

- MS 51
- MS 52
- MS 53
- MS 54
- MS 55
- MS 56

The cleaning, inspection and assessment program includes: sewer cleaning, CCTV inspection of piping, visual inspection and classification of the manhole structures and their flow channels, and an evaluation of the condition of the pipes and manholes. Results from the assessment program are used to categorize the cleaning and inspection frequencies for both the sub-areas and problem pipe-sections.

The cleaning and CCTV schedules are closely coordinated. As the Township's goal is to have a complete cleaning, inspection and system assessment every 5 years, approximately 20 percent of the system is reviewed by CCTV each year. Approximately 20 percent of the system is cleaned annually: the cleaning performed each year includes the priority cleaning plus the remaining parts of the collection system, factoring in the intermediate and long term interval cleaning schedules. All of the system cleaning is for gravity lines.

Information from cleaning and inspections (see Inspection section, below), including any findings, is entered into an EXCEL database, and incorporated into the maintenance software for scheduled maintenance and capital improvement. This information is also used to update this long term Preventive Maintenance Plan (PMP). Televised and cleaned lines are also recorded in

the GIS system.

a. Cleaning

The primary sewer maintenance activity is sewer line cleaning. The Township's service area is divided into 6 drainage areas as shown on the collection system map.

The cleaning of sewer lines, manholes and other appurtenances is categorized as: priority (annual or more frequent cleaning); intermediate (2-5 year interval); or long term (6 or more year interval).

Areas of the system with higher concentrations of restaurants are typically targeted for priority cleanings. Other priority areas include known structural defect areas, such as sagged lines or lines with minimal slope.

All cleaning records are kept in a spreadsheet that tracks the following:

- date, time and location of cleaning activity;
- specific lines cleaned;
- equipment used;
- identity of cleaning crew;
- number of passes needed to clean the line;
- presence of root, grease, or debris; and
- problems identified or other follow up actions necessary.

Each line segment cleaned is identified by an upstream and downstream manhole number. A log is submitted for each day of work completed. Support from outside contractors is also used for cleaning and repairs, and for emergencies during non-business hours.

Manhole deficiencies are also noted in cleaning logs. Information about manholes requiring attention is provided to the Assistant Public Works Director and either a repair work order is issued or it is added to the capital repair schedule.

b. Pipe and Manhole Inspection

Planned manhole and pipe inspections are coordinated with the cleaning program and generally follow the cleaning schedule. South Whitehall Township uses television inspections to document:

- the structural condition of the pipe
- root intrusion
- grease
- protruding taps
- evidence of inflow and infiltration (I/I) or surcharging
- manhole pave-overs, and
- other deficiencies that factor into condition assessment

Planned video inspections are generally scheduled to follow the planned cleaning schedule.

However, in the event of a blockage, a video inspection assesses the cause of the blockage.

All newly constructed sewer lines are required to be CCTV inspected by the contractor or developer to verify as-built drawings and ensure the line has no construction defects. Additionally, all new pipes and manholes are required to be pressure tested to ensure tightness and prevent release of sewer odors and future infiltration of storm water. This inspection and testing process must be completed prior to backfilling and before the Township will accept the infrastructure from the construction contractor.

Manhole inspections help keep our asset inventory up to date and are used not only to update collection system maps, but to determine structural condition. During manhole inspections, field crews take a complete inventory of each manhole including construction materials, ring size, depth to invert, flow conditions and evidence of problems.

Manhole inspection results are reviewed for condition rating. Those needing repair are placed on a priority schedule, and routine repairs are coordinated with re-paving work when possible. When repairs are recommended, as described below, work orders are created.

Public Works Department staff are responsible for completing structural repairs to manholes. Repairs include invert work, frame and cover grade adjustment, and frame and cover replacement. More comprehensive repairs, such as complete relining of the manhole structure, are performed by outside contractors.

c. Assessment

Pipe condition information is used to determine short and long term maintenance strategies including increased cleaning, root treatment, sewer line repair, or replacement. The condition assessment helps establish the cleaning frequency and inform the Townships' capital planning. As more condition assessment information becomes available, the priority of capital projects may change. Sewer line repair or replacement projects are also coordinated with re-paving schedules.

Condition assessments document the following details and deficiencies:

- 1. Characteristics including pipe diameter, and age and type of material**
- 2. Dips in line**
- 3. Grease build-up**
- 4. Root intrusion**
- 5. Sediment accumulation and encrustation**
- 6. Structural condition, including cracks, corrosion and erosion**
- 7. Joint alignment and movement**
- 8. Reverse slope**
- 9. Obstructions**
- 10. Deformations in line**

Condition Rating	Condition Description	Maintenance Required
0	New	Normal
1	Excellent Condition	Normal
2	Minor Defects Only	Minor
3	Backlog Maintenance	Significant
4	Requires Major Renewal	Renew
5	Almost Unserviceable	Replace

d. Staffing and Equipment

South Whitehall Township has multiple staff trained for cleaning, inspection and assessment of sanitary sewers, and they are deployed in two-person crews for year-round cleaning and inspection activities. Inspection work is coordinated with the Township's Public Works Department.

Crews are assigned a specific area of the collection system with an associated map and are responsible for cleaning all lines (or, in the case of preliminary evaluation, determining if cleaning is needed) within the assigned area within the specified time frame. Crews receive training on use of equipment and how to address problems that might be encountered while cleaning the collection system (roots, fats, oils and grease, and protruding laterals), including when to call in outside contract services.

Crews report back on a daily basis on progress and problems including any inconsistencies between the map and the actual sewer lines which are noted and submitted with their log for entry into the database and correction of mapping or location errors. As the crews perform cleaning and evaluation, the long term cleaning schedule for the entire sub-area is reviewed to determine if any lines designated for long term cleaning need to be cleaned before the crew moves to a new area.

Cleaning crews perform manhole inspections during cleaning and approximately 15% of manholes are inspected in the average year.

The following equipment is available for cleaning:

- High pressure jet nozzle for light cleaning
- High pressure jet nozzle for heavy cleaning
- Root saw

4. GRAVITY LINE PREVENTIVE MAINTENANCE

a. Fats, Oils and Grease (FOG)

The discharge of fats, oils and grease (FOG) is regulated through our High Strength Waste program by ordinance. The High Strength Waste Ordinance sets specific limits on the strength of sewage that can be discharged to the collection system, and establishes surcharges for those customers that are out of compliance with the requirements.

The Township works in concert with a testing consultant to collect wastewater samples from commercial and industrial customers. Protocols have been established for following up with customers that exceed the discharge limits. In the case of FOG, establishments that serve food are required to comply with International Plumbing Code requirements for the use of grease traps or grease interceptors to prevent grease from entering the collection system.

b. Root Control

South Whitehall Township currently uses mechanical root removal for sewer lines with chronic root problems. Root saw attachments are standard equipment on cleaning trucks. When a crew encounters roots during routine cleaning, a hydraulic saw is attached to the jetter and used to cut and remove the roots. The severity of the problem is recorded on the daily log, and if necessary, the pipe section is placed on the list for priority cleaning. Root control is also a major part of easement maintenance, as described in Section 5.

c. Service Laterals

The Township maintains service laterals from the property line to the sewer main (portions in the public right-of-way); the service lateral from the building to the property line is the owner's responsibility. The Township will repair laterals that are located in the public right-of-way when responding to service complaints. If a complaint is received and the field crew determines that the problem is limited to the section of the lateral between the property line and the main, the "lower" lateral will be rodded out if needed (at no cost to the customer) if a cleanout is available at the property line. The Township also televises this portion of the lateral if needed.

If service lateral problems are found to be the result of blockage or a collapse in the portion of the lateral under the property owner's responsibility, the property owner is responsible for the repair.

5. EASEMENTS AND PAVING: MAINTENANCE AND ACCESS

a. Maintenance of Right of Way and Easements

Easements are important to operate and maintain the collection system. The Township's goal is that all easements remain clear of any fences, buildings, gardens, trees, shrubs and extensive landscaping to allow equipment access for maintenance of the collection system. The Township is not liable to repair or replace any such items that are removed in the process of completing repairs or maintenance on the collection system. Crews are, however, instructed to work with the property owner whenever possible.

Maintenance of easements is accomplished in various ways. Easements on privately-owned parcels are often maintained by the owner.

b. Street Paving Coordination

The Township's Public Works Department is responsible for coordinating street resurfacing and ensuring that all utilities are aware of scheduled resurfacing. A prioritized list of streets to be paved on a 5 year schedule is developed each budget year. This list is distributed to facilitate coordination of all underground work. Each department assesses the condition of their associated infrastructure to determine where repairs may be necessary, and notifies Public Works as to which streets need underground infrastructure work completed prior to resurfacing.

When the street resurfacing list is developed, maps are reviewed for the presence or absence of sewer lines. If a street does not have a sewer line under the pavement, it is released immediately. The streets remaining on list are cross-checked with the results of the Cleaning, Inspection and Assessment program, to locate sewer lines that may need repair or replacement in the same time frame as the street repaving plans.

As sewer lines are inspected and assessed under the Cleaning, Inspection and Assessment program, repairs are scheduled in conjunction with the repaving schedule whenever possible. Sometimes work is performed on a priority basis so that repairs are completed on the highest priority street, working in coordination with the Public Works paving schedule. In this case, the Cleaning and Inspection schedules are modified to coordinate with Public Works' schedule for paving; pavement replacement or resurfacing is often included within the scope of work for sanitary sewer repair or replacement projects.

6. GENERAL EQUIPMENT AND TOOL SUMMARY

a. Essential Day-to-Day Items

The Township provides operations and maintenance crews with the essential work related items they use on a day-to-day basis. Should new or replacement equipment or tools be needed, the crew leader is authorized to obtain replacements as needed. For non-stocked items, the Assistant Public Works Director will request a purchase order for the needed item(s). The crew leader will then procure the requested items through the local vendor in an “in-stock” format.

b. Spare Equipment and Tools

The Township maintains a reasonable supply of spare equipment and tools for personnel.

A generalized inventory of the equipment and tools used by the Township to maintain the wastewater collection system is provided. A list of supplies and essential spare parts necessary to be kept on site for normal and emergency use is included. Specialized attachments are often used with these tools to perform specialized maintenance tasks.

Description	Use	Typical Useful Life, yrs
Tractor/Backhoe	Sewer repairs	15
Flushing Truck (Jetter)	Sewer flushing	10
Vac-Con Sewer Cleaner (Combo Jet/Vacuum)	Sewer flushing/vacuuming	10
Dump Truck (2-Yard)	Haul sewer debris	10
Service Trucks	Transportation	10
Service Truck (Stand-by)	Transportation	10
Compactor/Rammer	Sewer trench compaction	10
Gas Generator	Portable power for hand tools and lighting	5
Diesel Generator	Emergency generator	12
Root Cutters	Sewer pipe cleaning	10
CCTV Video Camera	Televising sewer laterals and mains	10
Centrifugal Pump	Sewer bypass pump	5
Gas Detection Monitor	Confined space entry	10
Safety Tripod	Confined space entry	4

7. CAPACITY MANAGEMENT

Sewer Capacity Certification/ Connection Policy

The Sewer Capacity Certification is a process where any new development requiring the connection of its sanitary sewer service to the Township's sewer system is reviewed to determine whether adequate sewer system capacity exists to convey the new wastewater flow from the proposed development to the City of Allentown's wastewater treatment facility. A capacity certification analysis by a professional engineer is required for all developments, or any existing customer that requires an increase in its sewer allocation. The certification process also assigns the development capacity within the Township's current treatment allocation of 3 million gallons per day.

This process aligns with the processing of Sewage Facilities Planning Modules with the PA Department of Environmental Protection.

8. RESOURCES AND BUDGET

a. Budget Process

The Public Works Department's budget is a part of the Township's overall budget cycle. Specific items related to the operation of the sewage collection system are identified under separate categories within the Department budget. Public Works staff works with the Finance Department and Township Management staff through a process to present a budget to the Board of Commissioners for approval. For the Collection System operations and maintenance budget, the process begins with last year's numbers and projected needs for the next budget year. The Township maintains a multi-year budget process to manage anticipated expenses.

b. Rate Review

The current sewer rate structure is based on metered water usage. Customers are billed quarterly for wastewater services based on 100 % of the metered water use. In addition to flow charges, customers are also assessed a base charge to recover fixed costs. Rates are examined and adjusted as needed based on anticipated O & M and Capital expense for the sewer system.

c. Operating and Maintenance Expense

Operating and maintenance expenses include:

- Employee salary and compensation
- Operating supplies
- Utilities
- Repair and maintenance
- Professional services
- Routine capital outlay
- Debt service expenses for repair and replacement

Professional Services includes planning and engineering studies for replacement projects and daily operations.

Contractor Services includes contractual work for cleaning sewer lines and manholes, CCTV, and improvements to the collection system map.

Routine Capital Outlay includes items that are considered capital assets and are purchased from annual operating revenue rather than through bonds or the capital reserve fund. Items such as vehicles, specialized maintenance equipment, pumps, motors, office equipment and other smaller items are included in this category.

Debt service is the annual principle and interest payments for bonds, loans and other fiduciary instruments owed by the Township. The debt service supports capital improvement projects.

d. Capital Improvement Program Overview

The Township has prepared a 5-Year Capital Improvements Plan to address the implementation of projects that are essential to the long-term successful operation of the sanitary sewer system.

The 5-year Plan addresses the following types of projects:

- Excavation repairs to replace defective pipe segments
- Trenchless repair of isolated pipe defects
- Lining of existing sanitary sewers
- Replacement of sanitary sewers and sewer laterals
- Manhole rehabilitation
- Continual sewer televising and cleaning
- Updates and improvements to flow measurement facilities

The 5 year budget is intended to be a fluid document that can be adjusted as necessary to meet the Township's needs. The plan will be reexamined each year and projects will be added, adjusted, or revised as necessary as work is completed and new work is identified.

9. SEWER SYSTEM PREVENTIVE MAINTENANCE PLAN UPDATES

a. Plan Update Process

South Whitehall Township will complete reviews of its Preventive Maintenance program annually. This will be done in conjunction with the preparation of its annual “Chapter 94 Report” that is prepared for review by the Department of Environmental Protection. The review will consider the progress that has been made in developing and implementing our Preventive Maintenance Program, the results of monitoring programs, and will incorporate updates to this Plan including:

- Changes to organizational structure, information management, contacts, and system maps,
- Changes to information on the collection system, such as the size and age of pipes, to incorporate information on repairs completed during the year,
- Incorporation of successful cleaning, inspection and assessment program improvements during the past year,
- Changes to the Sewer Use Ordinance and Fats, Oils and Grease programs,
- Budget and Capital Planning updates

b. Monitoring, Measurement, and Program Modifications for Infiltration and Inflow Source Reduction

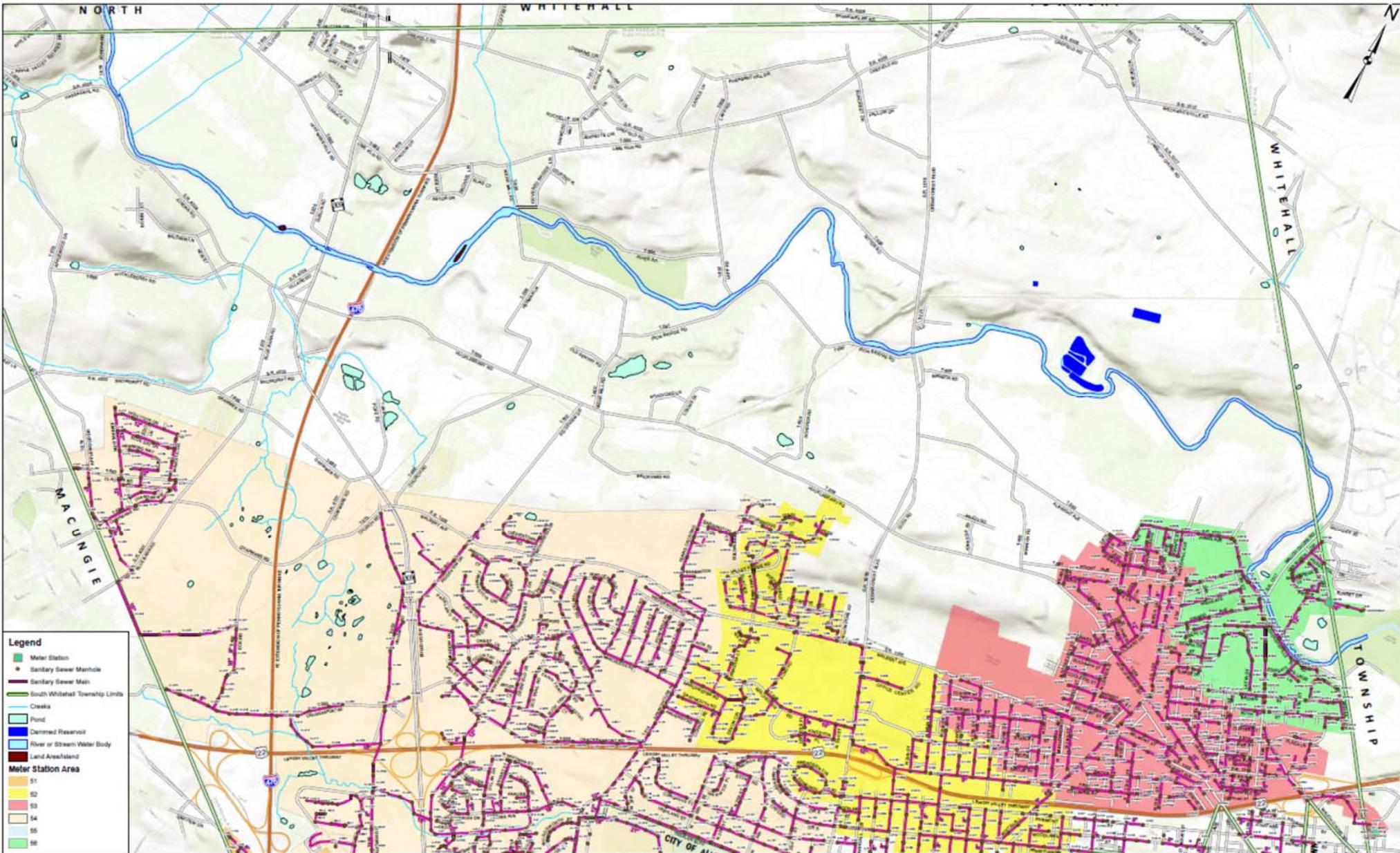
The Township will maintain records of key information to continually assess improvements to the collection system.

The information will measure the effectiveness of the Maintenance program by tracking various parameters related to service calls and maintenance and inspection activities. Comparison of trends from previous years and identifying system defects are key components. Tracking the following parameters will measure the effectiveness of the Plan and its effectiveness in reducing Inflow and Infiltration:

- Number and cause of SSOs per year
- Length of gravity sewers cleaned annually
- Actual versus scheduled cleaning dates for gravity sewers
- Length of gravity sewers CCTV inspected annually
- Percent of system rehabilitated (repaired or upgraded) each year
- Number of FOG inspections and compliance with FOG requirements
- Improvements in capacity due to reductions in I/I
- Safety history/incidents
- Continuous tracking of average and peak flows within each metered drainage basin to determine the effectiveness of repair and maintenance activities.

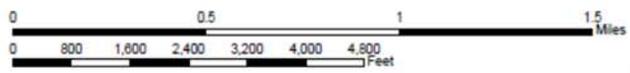
South Whitehall Township
Summary of Budgeted Sanitary Sewer Expenditures for Inflow and Infiltration Reduction

				2018	2019	2020	2021	2022	
D. Sanitary Sewer									
1. Allowance for Flow Meter Pit Upgrades	600,000	High	Potential meter pit renovations based on COA requirements		150,000	150,000	150,000	150,000	
2. Meter 52 Drainage Area Sewer Access Improvements	100,000	Medium	General Easement access improvements at various locations.			50,000	50,000		
3. PA Street Sewer Main Replacement	500,000	High	Replace 3,000 ft. of sewer lines in conjunction with Project A.5		500,000				
4. Hausman Road Interconnection	150,000	Low	Complete 250 feet interconnection to Tilghman Street pipe					150,000	
5. Lining of 21" Interceptor	300,000	Low-Medium	Potential lining of 1,500 feet interceptor for I/I removal			300,000			
	Subtotal: \$ 1,650,000								
E. EPA Sanitary Sewer Repairs									
1. Cast in Place Lining Repairs	2,200,000	High	Point repairs and lining work at various locations	550,000	550,000	550,000	550,000		
2. PW Repairs	100,000	Medium	Sewer repair work to be performed by PW staff.	25,000	25,000	25,000	25,000		
	Subtotal: \$ 2,300,000								
Total of Proposed Projects				\$ 3,950,000	-	575,000	1,225,000	1,075,000	300,000



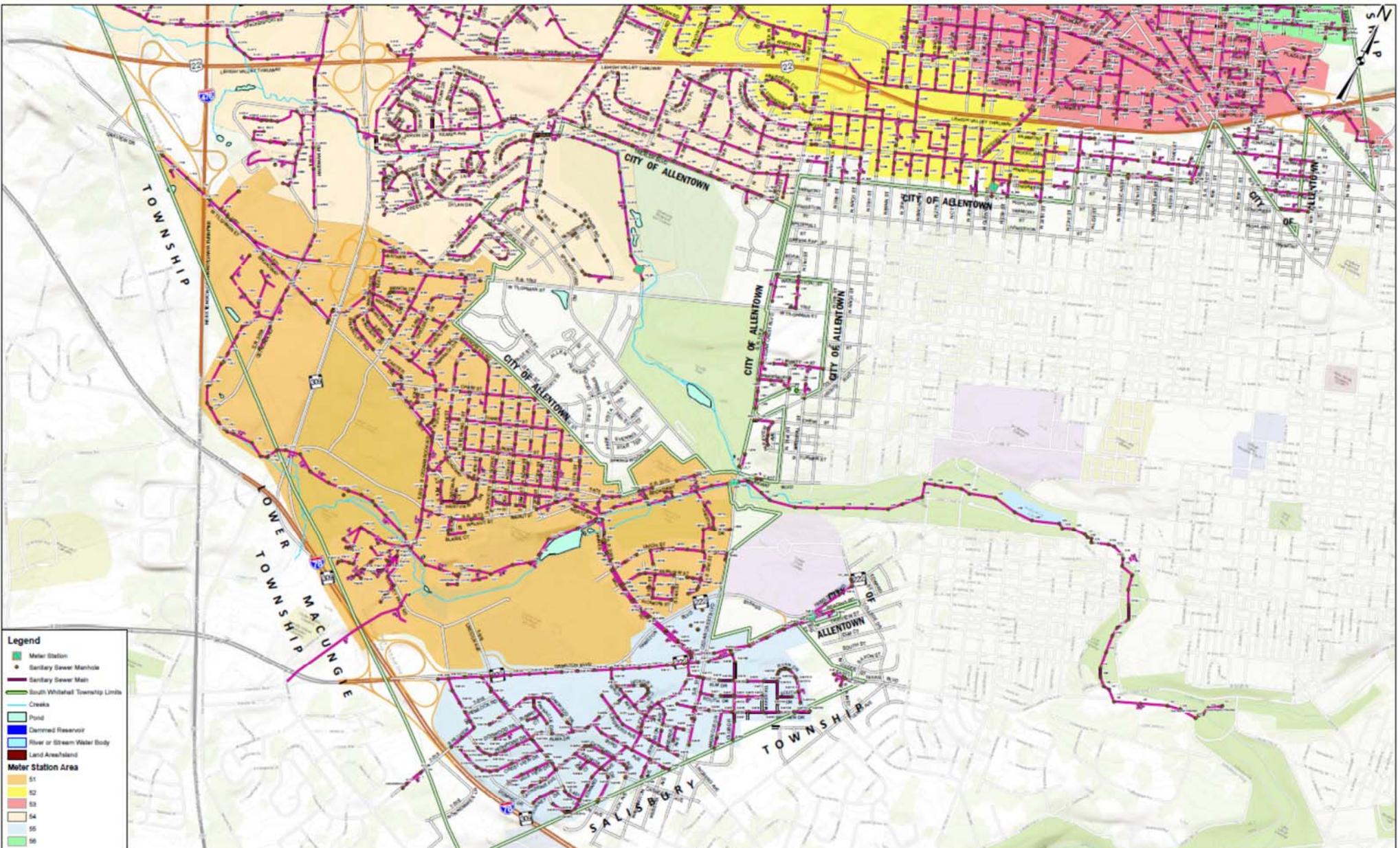
- Legend**
- Meter Station
 - Sanitary Sewer Manhole
 - Sanitary Sewer Main
 - Sanitary Sewer Main
 - South Whitehall Township Limits
 - Creeks
 - Pond
 - Dammed Reservoir
 - River or Stream Water Body
 - Land Area/Island
- Meter Station Area**
- 51
 - 52
 - 53
 - 54
 - 55
 - 56

**SOUTH WHITEHALL TOWNSHIP
NORTHERN REGION SANITARY SEWER DELINEATION**
Lehigh County, Pennsylvania



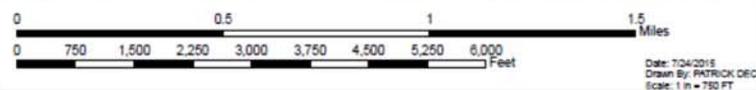
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- Legend**
- Meter Station
 - Sanitary Sewer Manhole
 - Sanitary Sewer Main
 - South Whitehall Township Limits
 - Creeks
 - Pond
 - Dammed Reservoir
 - River or Stream Water Body
 - Land Area/Island
- Meter Station Area**
- S1
 - S2
 - S3
 - S4
 - S5
 - S6

SOUTH WHITEHALL TOWNSHIP
SOUTHERN REGION SANITARY SEWER DELINEATION
 Lehigh County, Pennsylvania



South
Whitehall
Township



Date: 7/24/2015
 Drawn By: PATRICK DEC
 Scale: 1 in = 750 FT

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