

Cleaning

Prior to the closed-circuit televising (CCTV) of the sanitary sewer lines, the lines must be clean and free of debris or anything that may hinder the inspection of the line. Properties connected to the line that is going to be cleaned should be notified at least 48-hours in advance of any cleaning activities by advertising in the local newspaper and/or placing door hangers at each property that could be affected. Cleaning should be completed no more than two days prior to the scheduled CCTV work.

Inspection Process

Once the pipe segment is clean, the camera is inserted. The camera must be assembled to keep the lens as close as possible to the centerline of the pipe. The camera is either self-propelled with the robotic crawler or pulled on the skids through sewer mains, transmitting an image to a monitor located inside the truck, where the image is recorded to an mpeg video file. The operator observes the video as it records lateral connections, pipe segments and pipe joints. Most systems are equipped with audio provided by the operator and a distance display to determine where the camera is physically located in the pipe. Any infiltration points, pipe corrosion, broken pipe, crushed pipe, collapsed pipe or offset joints will be recorded. The operator inputs the findings of the inspection to pipeline inspection software that will later be downloaded to the sewer server and filed accordingly. For consistency, the Pipeline Assessment and Certification Program (PACP) codes developed by NASSCO should be used when completing the inspection on the pipeline inspection software. These codes are rapidly becoming a national standard.

The inspection shall be conducted from upstream or downstream, terminating at the corresponding manhole. In the event that the camera is unable to proceed to the terminating manhole, the remainder of the line will be videoed from the terminating manhole to the same point encountered originally.

Records

The videos and logs of the inspections will be stored on the Sewer Department's computer network attached storage device (N.A.S). This network is equipped with back-up capabilities in the event that a failure occurs. A hard copy of the inspection reports should also be kept at an alternate location, in the event that the computer system is not able to be accessed or has a loss of information.

The record of each line will be kept until the line has been re-inspected as part of the rotating schedule. Once the new inspection has been completed, the new updated inspection video and log will replace the existing information.

Upon completion of the designated inspection area, a summary of the lines shall be provided to the Sewer Department Supervisor for review. Upon review by the Sewer Department, the lines that were inspected will be rated and prioritized for rehabilitation.

2.5.5 Smoke Testing

Smoke testing should be performed as part of the yearly sewer shed inspection cycle and on an as-needed basis to identify sources of defects, infiltration and inflow. All smoke testing should be done during the dry times of the year when the groundwater table is down for best results.

Smoke testing is conducted by placing a blower over a centrally located manhole and forcing non-toxic, smoke-filled air through a portion of the sanitary sewer system. The smoke, under pressure, fills the sanitary sewers, manholes and any building sewers. Once filled, the smoke will follow the path of least resistance, revealing any leaks by appearing at the ground surface. After filling the system with smoke, the field crew performs a visual inspection of the area being tested. Any defects found in the sanitary sewer mains, manholes or private building sewers should be documented on the inspection sheet, as well as, on a grease board and should include the date, manhole section number, property address and the nature of the observation. All observations should be photographed and downloaded into the Sewer Department database for record keeping.

2.5.6 Inspection of Properties

The Township implemented a Property Inspection Program in September of 2008. As part of the Program, each property within Lycoming and Old Lycoming Townships that are connected to sanitary sewer system will be inspected for I&I. Once the initial inspections have been completed and as specified in the Township's Sewers and Sewage Disposal Ordinance (Ordinance), inspections of the properties will continue on a yearly basis.

Property Inspection Cycle

The properties in Lycoming and Old Lycoming Townships will be inspected on a rotating schedule. The properties have been divided into a six year rotating schedule. Each year, approximately 300 properties will be inspected. Yearly sewer shed inspections should take place during the spring months or during times of increased precipitation.

Inspection Process

The following is a summary of the sequence of events needed to complete a property inspection:

1. An initial letter should be sent to the home owner from the Township to notify the home owner that their property is due for an inspection. The letter shall include a timeframe of 30 days for the homeowner to contact the Sewer Department secretary and schedule their inspection.
2. An appointment is scheduled and placed on the Sewer Department Outlook calendar.
3. Representatives from the Sewer Department conduct the inspection. An inspection form, a video of the building sewer and pictures of all potential sources of inflow will be done for each property. A sample of the inspection form is attached in Appendix C.
4. Once the inspection has been completed, a review of the inspection will be done by a competent Sewer Department inspector.

5. A summary of the review will be provided to the Sewer Department secretary detailing the results of the inspection.
6. A letter from the Sewer Department will be sent to the home owner summarizing the results of the inspections. Each property will be deemed to be either compliant or non-compliant. A sample letter of each condition is attached in Appendix C.
7. In the event the property is found to be non-compliant for a building sewer issue, a timeframe of 90 days will be granted to make the proper corrections; for a building inspection violation a timeframe of 30 days will be granted to make corrections. Extensions may be granted at the discretion of the Sewer Department Supervisor for extenuating circumstances such as inclement weather or homeowner funding assistance. Extensions will only be granted when the homeowner has supplied a contract between themselves and a contractor with both parties' signatures and a tentative start date; (all timeframes are subject to change).
8. Once the corrections have been made, a follow-up compliance inspection will be conducted to determine if the property has made the necessary repairs.

Records

A copy of the inspection form and pictures will be kept on file until the property is inspected again as part of the rotating schedule. The database that was generated as part of the initial property inspection program should be updated with the most recent information. A hard copy of the inspection form should be kept in an alternative location in the event that a loss of data occurs.

2.6 Sanitary Sewer System Rehabilitation

In order to achieve the goal of eliminating infiltration and inflow into the Township's collection and conveyance system, the remainder of the system that is not rehabilitated as part of Sanitary Sewer Rehabilitation Project No. 1 will have to be rehabilitated in segments by both outside contractors and the Sewer Department on a yearly basis as funding is available. Sanitary Sewer Rehabilitation Project No. 1 rehabilitated approximately 19.5 percent of the Township's system. The phasing approach summarized below will achieve complete rehabilitation of the collection and conveyance system in approximately 50 years. If the Township decides to undertake another large rehabilitation project in the future, it will drastically cut down on the amount of time required to re-construct the entire system.

Each year the Township should complete rehabilitation of the prioritized lines and manholes. Each of these projects should target approximately 1.5 percent of the entire system. In the event that lines from previous years' inspections may be deemed a higher priority, they can be added to subsequent rehabilitation projects. Other circumstances may dictate which lines should be rehabilitated. The targeted rehabilitation should not be limited to the inspections that were completed in a specific year.

2.6.1 Mainline Repairs

A single inspection area (approximately 16 percent of the Township's system) will be inspected each year. Once the inspection of an area has been completed, a thorough review of the data collected will be reviewed. In this review, the lines will be rated and prioritized. Once the lines have been prioritized, the highest priority lines will be targeted for subsequent rehabilitation the following year. The total length of lines to be rehabilitated each year should be approximately 1,500 linear feet or approximately 1.5 percent of the entire system.

2.6.2 Manhole Repairs

A single inspection area (approximately 59 manholes) will be inspected each year. Once the inspection of the area has been completed, a thorough review of the data collected will be reviewed. In this review, the manholes will be rated and prioritized. Once the manholes have been prioritized, the highest priority manholes will be targeted for subsequent rehabilitation the following year. The total number of manholes to be rehabilitated each year should be approximately 8 manholes or approximately 1.5 percent of the manholes.

2.6.3 Building Sewers

The private portion of the Township's Sanitary Sewer System can contribute a significant amount of infiltration and inflow. Each building sewer within the Township will be inspected as part of the Property Inspection Program and repairs will be completed as identified.

2.7 Grease Interceptors

The accumulation of grease in the sanitary sewer system forms obstructions to flow in pipes and manholes. Direct consequences of grease accumulation are; decreases in pipe capacities creating the potential for "back-ups" into homes; surcharges from manholes and potential for SSOs. Obviously, if grease accumulation in the sanitary sewer system is a problem, then in order to avoid these consequences, the Sewer Department must complete the work required to remove the accumulations of grease. Lines inspected that contain large amounts of grease should be cleaned thoroughly during the inspection process with Jet-Power II or an equal emulsifying agent before CCTV is attempted. Grease removal from the three pump station wet wells shall be done once per year and hauled to the landfill.

Consequently, in order to reduce the accumulation of grease in the sanitary sewer system, treatment facilities to remove fats, oils, and grease from the wastewater generated by establishments, where large volumes of food are prepared (in comparison to a single family home), are commonly required. These establishments include restaurants, schools and full time care and assisted living facilities. The treatment facilities are typically some type of grease interceptor.

As part of the Township's Ordinance, grease interceptors shall be required, when in the opinion of the Township, they are necessary for the proper handling of wastewater containing excessive amounts of grease and oil, or sand. Grease interceptors shall not be required for residential users.

Each grease interceptor within the Township shall comply with the requirements set aside in the Township's Ordinance. An inspection of the grease interceptor should be completed on a semi-annual basis to confirm that the interceptor is in proper working order. A Grease Interceptor Inspection Form will be completed for inspection and kept on file by the Sewer Department. A sample Grease Interceptor Inspection Form is attached in Appendix D.

In the event an inspection of a grease interceptor is refused by the owner, it will be assumed that the property is non-compliant and measures to address the non-compliance shall be performed in accordance with the Township's Ordinance

The Township requires properly installed and maintained grease interceptors to treat the wastewater generated from all restaurants and food establishments. This requirement is found in the Township's Sewers and Sewage Disposal Ordinance. Section 18-405 of the Ordinance states, "Grease interceptors shall be provided when, in the opinion of the Township, they are necessary for the proper handling of wastewater containing excessive amounts of grease and oil, or sand; except that such interceptors shall not be required for residential users."

Grease interceptors and their installation details must be approved by the Township Sewer Department before a building permit is issued for new construction of a non-residential establishment, or the addition to an existing non-residential establishment, which may generate wastewater containing significant amounts of animal or vegetable fat, oil or grease. The applications for grease interceptors must contain information regarding the type and size of the grease interceptor, a floor plan or site plan showing where the grease interceptor will be located, a list of the fixtures being connected to the grease interceptor and an estimate of the wastewater flow which will be discharged from each fixture. Standard grease interceptor policies and procedures are provided in the Township's Sewer Use Ordinance. After the grease interceptor has been installed, but prior to the discharge of wastewater into the grease interceptor and the Township's sanitary sewer system, the owner of the non-residential establishment shall have the grease interceptor, as installed, approved by the Township Sewer Department.

In order to ensure that the grease interceptors, which have been approved, are providing adequate treatment, it is the responsibility of the non-residential establishment owner to ensure that the fats, oil and grease retained by the grease interceptor are periodically removed. The Township shall require all non-residential establishments, which have outside grease interceptors with permits, to have the retained fats, oil and grease removed from their grease interceptor at a minimum of four times per year. All non-residential establishments which have "under the sink" grease interceptors with permits shall have the retained fats, oil and grease removed from their grease interceptor at a minimum of once every two weeks. The owner of the non-residential establishment shall confirm that the retained fats, oil and grease have been removed from their grease interceptor by submitting a completed Record of Grease Interceptor Cleaning, included in Appendix D, on every onsite visit.

The completed Records of Grease Interceptor Cleaning will be filed by the Township's Sewer Department administrative staff in the grease interceptor permit file. The Sewer Department staff will be responsible for monitoring the grease interceptor permit files and initiating an enforcement action, if at any time after the grease interceptor has been installed, a non-residential establishment does not supply the Township with a completed Record of Grease Interceptor Cleaning a minimum of every onsite inspection. The enforcement action will include the following steps:

1. A violation Notice will be sent to the owner. A standard written letter for this purpose is provided in Appendix D. The business will then be given (30) days from the date of this letter, to correct the violations and schedule for a re-inspection of the property. The Sewer Department will perform the inspection of the property. If at the time of the inspection, it is found that the property is still in violation, the Township will issue a surcharge penalty immediately along with another letter of non-compliance and will continue to do so until the property becomes compliant. A standard written letter for this purpose is provided in Appendix D. The courtesy notice will only be provided once. All future action after an initial non-compliant notice will proceed directly to receiving a surcharge penalty.
2. If a follow-up inspection to the courtesy notice identifies continued neglect, a sample of the establishment's discharge can be collected and analyzed for grease and oil concentration. This will be performed by a contracted laboratory and a sewer department representative. The Township shall bill the establishment for all laboratory costs, should the results be greater than the Township's discharge limit.
3. When the result of the analysis becomes available, the establishment will be notified in writing. If the concentration of grease and oil exceeds the Township's discharge limit provided in the Sewer Use Ordinance, a written notice of violation of the Township Ordinance and an order to comply will be issued.
4. The establishment will be routinely inspected every month, resulting in further citations until laboratory analysis confirms compliance.

2.8 On-lot Sewer Systems

Old Lycoming Township has implemented an On-lot Inspection Program in accordance with Ordinance NO. 238, Part 5: On-lot Systems. As part of the Program, Old Lycoming Township has been divided into five areas. Each property within Old Lycoming Township that is not connected to the sanitary sewer system will be inspected for system malfunction as well as proper pumping frequency. Once the initial inspections have been completed, regular inspections of the properties will continue on a five year cycle, in accordance with the Township's Sewers and Sewage Disposal Ordinance; thus, 1/5 of the Township will be inspected each year.

2.8.1 Property Inspection Cycle

The properties in Old Lycoming Township will be inspected on a rotating schedule. The properties have been divided into a five year rotating schedule. Each year, approximately 100 properties will be inspected. Yearly on-lot inspections should take place during the summer months or during times of decreased precipitation.

2.8.2 Inspection Process

The following is a summary of the sequence of events needed to complete an on-lot inspection:

1. An initial letter should be sent to the home owner from the Township to notify the home owner that their property is due for an inspection. The letter shall include a timeframe of 90 days for the homeowner to obtain a pumping permit from the Old Lycoming Twp building and have the septic tank pumped and inspected by the pumper hauler.
2. Representatives from the Sewer Department conduct the remainder of the inspection. That includes checking for evidence of a malfunctioning drain field/cesspool or any illegal connections. An inspection form, and pictures of all potential malfunctions, points of interest, as well as the location of tank and drain field will be done for each property. A sample of the inspection form is attached in Appendix G.
3. Once the inspection has been completed, a review of the inspection will be done by a sewage enforcement officer.
4. A summary of the review will be provided to the Sewer Department secretary detailing the results of the inspection.
5. In the event the property is found to be non-compliant for an on-lot malfunction, the property owners will be sent a letter identifying the failures and the order of events needed to rectify the problem(s).
6. Any property failing to comply within the initial 90-day permit/pumping time frame should receive a notice of violation letter and receive an additional 30 days to comply. Failure to do so will result in the appropriate action to be taken as described in ordinance NO. 238. Part 5 of on-lot systems.

2.8.3 Records

A copy of the inspection form and pictures will be kept on file until the property is inspected again as part of the rotating schedule. The database that was generated as part of the initial property inspection program should be updated with the most recent information. A hard copy of the inspection form should be kept in an alternative location in the event that a loss of data occurs.

2.8.4 Small Flow Treatment Facilities

Old Lycoming Township has implemented a sampling procedure for SFSTF systems in accordance with ordinance 236, section 18-609. Each SFSTF system shall be required to be inspected three times per year. Two inspections will be done between April 1st and September 30th. The last inspection will be conducted in the remaining portion of the year.

2.8.5 Sampling

A township official may inspect the system at any time, but shall sample at least three times per calendar year. A deposit is required by the resident to cover the cost of the laboratory fee's and site inspection procedures.

The testing for adequate chlorine residual at levels required by the DEP permit must be met. Landowners are required to test chlorine residual on a monthly basis and keep a written record of the date and the results of the test. The land owner must assure that the chlorine residual levels are in compliance with all DEP standards.

The inspector may collect a sample for fecal coliform analysis at any time. An EPA approved laboratory must perform a bacteriological analysis.

A copy of all written inspection reports and lab results will be kept in a permanent file. The records shall be available for inspection by DEP upon request.

2.8.6 Inspection/ Sampling Process

The proper township representative will perform a basic visual inspection of all the system components to ensure they are working properly. This includes checking lids to make sure they are secured to prevent unauthorized access. A grab sample will then be collected from either the chlorine contact tank or the outfall pipe. This sample must be placed on ice in a cooler and taken to the laboratory for testing. A free chlorine residual test by the township representative is then performed on site and the data is recorded. All testing information is then placed in a permanent file at the township building.

2.9 Other Equipment

2.9.1 Investigation Equipment

As part of the ongoing operation and maintenance program, one sewer per year will be inspected from start to finish. The steps for inspection include cleaning and televising of all mainline sewers within the sewer shed, all manholes to be inspected, smoke testing and property inspections.

To conduct the sewer shed investigations there is a certain amount of required equipment that will need to be maintained and updated on an as needed basis.

Mainline Investigation Equipment Maintained by the Township:

1. EnviroSight Rovver X mainline crawler for 6" to 72" sewer lines.
2. Wincan V8 inspection software.
3. Trimble GEO XT hand held GPS.
4. Lumidor Micromax pro Air Quality Meter.
5. Confined space tripod and harness.
6. Ramfan positive pressure ventilation.
7. Survivair 2216psi self contained breathing apparatus (Qty 2).
8. Prototec line finder sonde locater.
9. Rain wise rain gauge.
10. Sigma 910 flow meters (Qty 5).
11. Hurco ripcord sewer line smoke machine.

Property Inspection Equipment Maintained by the Township:

1. Metrotech Vivax lateral push camera systems (Qty 3).
2. Prototec line finder sonde locater.

Office Equipment:

1. HP laptop computers (Qty 3).
2. HP desktop computers (Qty 4).
3. HP 4100 LaserJet printer (Qty 1)
4. Network attached storage devices (NAS) (Qty 2).

Summary of Man Hours:

The following table (table 2.2) provides an estimate of hours to complete each task associated with the sanitary sewer system on a yearly basis. Based on the amount of work, a minimum of four workers are needed to complete the yearly tasks.

Table 2.2 Man Hour Estimate

Description	Amount	# of Workers	# of Personnel	Total Man Hours	# of months worked on per year	Man Hours
			hrs/month	hrs/month		hrs/year
Pump Stations						
Operation and Maintenance	3 per month	2	6	12	12	144
Routine checks	5 per week	2	62	124	12	1488
Emergencies	1 per month	4	8	8	12	96
Complaints		2				
Other Crew Assistance						
Sampling and Charts						
Sampling	58 per year	2	8	16	12	192
Weekly Charts	52 per year	2	4	8	12	96
I & T Monitoring						
Rain Gauge Download	1 per month	1	1	1	12	12
Data Logger Download	4 per month	1	4	4	12	48
Flow Meter Download	4 per month	2	2	4	6	24
Sanitary Sewer Lines						
Cleaning	19,360 ft/year	1	160	160	2	320
CCTVing	19,360 ft/year	1	160	160	2	320
Smoke Testing	19,360 ft/year	2	160	160	1	160
Records		1	80	80	1	80
Manholes						
Cleaning	100/year	1	160	160	1	160
Inspections	100/year	1	160	160	1	160
Records	100/year	1	80	80	1	80
Property Inspections						
Property Inspections Initial	300/year	2	80	160	4	640
Property Inspection Follow up	150/year	2	80	160	4	640
Records	300/year	2	32	64	4	256
Inspection Review	300/year	1	80	80	4	320
Grease Interceptors						
Inspections	15 properties (3 insp / yr)	1			2	50
Rehabilitation Projects						
Review of Documentation	1 per year	1				80
Recommendation	1 per year	1				24
Coordination with Engineer	1 per year	2				160
Inspection of Work	1 per year	2	40	80		240
On Lot Inspection						
Inspections	100	1	160	160	1	160
Records	100	1	100	100	1	100