**Template for Developing Sewer Collection System Preventive Maintenance and Sewer Overflow Response Plans**

***Assistance for Capacity, Management, Operations and Maintenance of your Sewer Collection System***

***U. S. Environmental Protection Agency, Region 1***

***Working Document, November 2009 Version***

**Preventive Maintenance Programs [November-2009 version]**

*Overview*

*A good preventive maintenance program is key to keeping a wastewater collection system in good repair. It helps preserve capital investment while preventing service interruptions and the excessive infiltration/inflow (I/I) and system failures that can result in Sanitary Sewer Overflows (SSOs). Putting together a good preventive maintenance program also helps you to better understand your system and how it works under various conditions.*

*Preventive maintenance activities can include, but are not limited to:*

*• Scheduled cleaning and inspection of gravity sewers and siphons; more frequent cleaning in those areas with a history of stoppages due to sediment, roots, debris, and fats, oils, and grease to minimize the potential for SSOs*

*• Root control in areas that are known to have recurring SSOs or premature structural damage due to root intrusion*

*• Recording, investigating and resolving customer complaints*

*• Fats, Oils, Grease, Odor, Corrosion prevention programs and controls*

*• Pump station inspections, maintenance, repair and emergency power load tests*

*• Scheduled inspection and/or cleaning as needed of force mains and siphons*

*• Force main air release valve maintenance*

*• Maintenance activity records to support appropriate analysis and reporting*

*• Easement maintenance for access to collection system components*

*• Evaluation and assessment*

*Many systems have operators with a great deal of expertise and knowledge of how their system functions and where the trouble spots are. Unfortunately, this knowledge and information is often not written down. Preparing a written maintenance plan provides an opportunity to capture and document all those details – the institutional knowledge and experience - that will be essential for operating an effective maintenance program into the future. For example, planning for routine operations such as sewer cleaning should incorporate staff knowledge of known problems. Data on stoppages or other operational problems can be collected in field logs or computer-based information systems and reviewed regularly by system managers for prioritization. Spreadsheets and software programs can be used to help prioritize maintenance activities. Work orders and field logs should be written and used in a way that will help you track progress, update your schedules, and continue to optimize your program.*

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1**Instructions for Using the**

**Preventive Maintenance Plan Template for Wastewater Collection Systems**

This is the Beta Version of a model Preventive Maintenance Plan Template that has been prepared by the U.S. Environmental Protection Agency’s Region 1 assistance office. This Preventive Maintenance Plan Template is for collection systems to use in developing their own preventive maintenance plans. It is designed to help you document your knowledge as well as better understand your collection system. And by knowing your system, you can improve operations and implement preventive maintenance practices to help reduce or eliminate Sanitary Sewer Overflows (SSOs). As a template document, this must be customized to fit your particular system. Follow the steps and instructions below.

Please be aware that completion of this template does not relieve a community or wastewater system of its responsibility to comply with all applicable federal, state, and local laws, regulations and/or applicable permits, and does not constitute a waiver or supersede the terms and conditions of any federal or state requirements or regulations regarding the operation and maintenance of a wastewater collection or conveyance system. This template is not an EPA or state guidance document and should not be relied upon to identify regulatory requirements. The community is solely responsible for ensuring that it takes the steps necessary to ensure compliance with all the applicable requirements of federal, state and local laws. The suggestions herein should not be construed to constitute EPA or state approval of any method or specific equipment or technology installed or utilized by a collection system.

* Save a (dated) copy of this file on your computer to be used as a working document.
* Brackets have been used to denote where you insert information “[Insert information]”. As you type in the information indicated, it will automatically replace the bracketed directions. Delete what does not apply to your system, add other information that you have.

Italicized (*italic)* instructions describe the topic and provide guidance. All instructions (including this page) should be deleted from your final plan document.

* Examples are provided in some sections. These are suggested responses for assistance only and should be deleted from your final document.
* Two or more choices may be provided in the instructions separated by an “OR”. Choose the most appropriate option for your system, delete the other, and edit your choice accordingly.
* Amend the tables, lists and figures as necessary to reflect your system.
* Add your own attachments and/or renumber attachments, as appropriate.
* Date your final preventive maintenance plan, and make it available at your facility. Use it to assist you in communicating, training and completing inspections and monitoring. Update the plan as your procedures change.

**Consider your preventive maintenance plan a work-in-progress. Modify it as you incorporate experiences and insights from staff, and continue the maintenance and improvements to your system.**

Each system is different. Only you can determine the procedures that will work for you.

1**[Insert City/Town name] Sewer System Maintenance Plan**

**[Insert date]**

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*Note: Sewer preventive maintenance planning is a requirement in a number of states. For example, Rhode Island Department Of Environmental Management Office Of Water Resources Regulations: Rule 5 (B) requires submittal of an Operation and Maintenance Plan, Rule 5 (H) indicates required elements of the plan; New Hampshire NPDES permits require O&M plans for sewer collection systems. Please check your requirements and edit this document to ensure compliance with those applicable to your system.*

**1. COLLECTION SYSTEM MANAGEMENT**

**a. Goals**

*Goals are an important aspect of any preventive maintenance plan. They provide focus for your staff to continue good work and implement improvements in your wastewater collection system management. As you work to improve your programs, your goals can be a solid reference point not only for staff but for public officials and citizens.*

[Insert City/Town name]’s preventive maintenance plan (PMP) covers the assets we manage in our wastewater collection system and is one component of our overall Capacity, Management, Operations and Maintenance (CMOM) Plan. The PMP combines preventive, predictive and corrective maintenance strategies with our best management practices. The CMOM Plan and PMP have been prepared to help [Insert City/Town name] effectively manage our wastewater collection system and achieve the following goals:

*Review the goals in the list below. Add or subtract and edit as needed to match your goals. For example you could add your goals for level of customer service.*

**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 [Insert City/Town name]’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 [Insert City/Town name or name of plant] 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 [Insert City/Town name]
* 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**

*Information about staffing and the organization of the wastewater collection system agency can be provided in either a tabular form or as an organizational chart. This section should be used to identify administrative and maintenance positions responsible for implementing the PMP and CMOM Plan, including the chain of communication for reporting SSOs. An example organizational chart, annotated at the bottom to identify responsibilities, is shown in Figure 1.*

*The organizational chart identifies the agency staff responsible for implementing, managing, and updating the PMP/CMOM Plan.*

*Edit one of the following two paragraphs to describe your organization and delete the one you do not use:*

*This paragraph is for a stand-alone wastewater department with a collection system division:*

[Insert City/Town name]’s [Insert "Water Pollution Control Department (WPC) " or whatever you call your department] is an independent department responsible for [Insert "all" or list the aspects that the department covers] aspects of wastewater collection system and treatment. The [Insert which division is responsible (e.g., "Collection System Division")] division is responsible for the operation and maintenance of the collection system, with the exception of [Insert any exceptions, such as "pump stations"], which are maintained by the wastewater treatment facility staff. The collection system division has a staff of [number] full-time and [number] part-time operation and maintenance positions. Contractors are used for maintenance activities and emergency support when [Insert a description of when contractors are called in]. Figure 1 shows the organizational structure of the [Insert "Water Pollution Control Department (WPC) " or whatever you call your department].

*“OR”*

*This paragraph is for a wastewater division that is part of another town department (e.g. Public Works or DPW):*

[Insert City/Town name]’s [Insert "Sewer Division" or whatever you call your division] is under the [Insert "Department of Public Works, DPW" or the department that oversees the sewer collection system] and is responsible for [Insert "all" or list the aspects that the department covers] aspects of our wastewater collection system and treatment, with the exception of [Insert any exceptions, such as "pump stations"], which are maintained by [Insert who else is involved with system maintenance]. The [Insert "Sewer Division" or whatever you call your division] has a staff of [number] full time and [number] part time operation and maintenance positions. Contractors are used for some maintenance activities and for emergency support. Figure 1 shows the organizational structure of the [Insert "Department of Public Works, DPW" or the department that oversees the sewer collection system].

Figure 1- [Insert City/Town name] [Insert "Sewer Division" or whatever you call your division] Organizational Chart *- [This is an example simplified chart – add your own organizational chart, or click on the chart box below and use Word tools to add more boxes]*

[Insert "Sewer Division" or whatever you call your division] has [Insert number] full time and [Insert number] part time employees. The [Insert "Sewer Division" or whatever you call your division] [Insert "is" or "is not"] fully staffed *[if not fully staffed, instead indicate your plans for staffing up]* and operates under the following organizational structure:

*[Edit the following list as necessary to include the roles of personnel within your City/Town and Collection System, job descriptions should include where you require a specific grade of licensure, where it is required:]*

[Insert title eg, "General Manager" or "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. [Insert the name of the current incumbent ] is our [Insert title eg, "General Manager" or "Public Works Director" ].

[Insert "City" or "Town" or if your department has an engineer]Engineer – Prepares wastewater collection system planning documents, manages capital improvement delivery system, documents new and rehabilitated assets, and coordinates development and implementation of CMOM Plan. [Insert City/Town name]’s Engineer is required to have a Professional Engineer’s License.

[Insert "Collection System Supervisor" or appropriate title] –Manages field operations and maintenance activities, provides relevant information to agency management, prepares and implements contingency plans, leads emergency response, investigates and reports SSOs, and trains field crews. [Insert City/Town name]’s [Insert "Collection System Supervisor" or appropriate title] is required to have a Grade [Insert appropriate level] Operator’s License. [Insert the name of the current incumbent ] is our [Insert "Collection System Supervisor" or appropriate title].

Inspector – Ensure that new and rehabilitated assets meet [Insert "city" or "town"] standards, works with field crews to handle emergencies when contractors are involved, and provides reports to [Insert "City" or "Town Engineer and Collection System Manager" or appropriate titles for your system]. [Insert "Sewer Division" or whatever you call your division] has [Insert number] inspectors.

Field Crew – 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). [Insert "Sewer Division" or whatever you call your division] has [Insert number] staff on our field crew. *[Include if some are part time and/or work for other departments as well.]*

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. *[Include a description if you have your own administrative and/or PR staff or if you coordinate with other departments for these services and whether some are part time.]*

Relation to Other Municipal Functions

[Insert "WPC " or whatever you call your department] [Insert "is a separate utility in" City/Town name, or "is not a separate utility, but rather a stand-alone Department within" City/Town name's department of \_\_\_] *[Note: for example, your Sewer Division may be within DPW]*. It is responsible solely for management, operations and maintenance of the wastewater collection and treatment facilities. No [Insert "Sewer Department" or your department name] personnel are utilized for the benefit of other [Insert City/Town name] functions or other utilities *[if personnel are shared, edit out the word “No” and indicate how they are shared]*. Many activities of the [Insert City/Town or System Name] sewer collection system are supported by the following [Insert City/Town Name] departments and partners:

*[Use the following to indicate links to or relationships with other departments that currently exist, or will be linked and the future. Delete those not applicable.]*

• Collection system mapping is supported by [Insert GIS Department, Assessor's Office, or other name]. This department also provides support, policy recommendations, and advice concerning [Insert City/Town Name]’s future growth and development, and is responsible for maintaining and updating [Insert "Sewer Department" or your department name]'s GIS existing sewer infrastructure mapping system.

• Resources and budget are overseen by [Insert finance committee, water and sewer advisory committee or board]

• Contingency equipment and replacement inventories are [Insert "shared by" or "funded by" if applicable, eg, Fire Department or DPW if shared resources]

• Training for [Insert training programs such as safety, operations, management, etc.] is provided through [Insert Narragansett Water Pollution Control Association, NEWEA, New England Interstate, RI DEM, or other training partner, if any]

• Outreach to plumbers and building contractors is done by [Insert Town Department, state program, or trade association partner if any]

• Design and Construction Standards for installation, rehabilitation and repair are overseen and reviewed by [Insert Engineering Department or other oversight]

• Standards for inspection and testing are developed by the [Insert Engineering Department or other oversight]

• Inspection of grease interceptors/separators is performed by the [Insert Health Department or other oversight]

• Outreach for Fats, Oils and Grease is performed jointly by [Insert "Sewer Department" or your department name] personnel and [Insert Health Department or other oversight]

• Personnel hiring and administration are performed by [Insert Human Resources Department or other name] which also provides [Insert the other functions that the department performs]

• Procurement of non-routine equipment, services or supplies is authorized by [Insert "the Town Manager" or name of department that authorizes and at what level (e.g., "over $5,000")]

• Legal Counsel provides legal services and advisory opinions to the [Insert "Sewer Department" or your department name] on departmental issues, contracts and agreements, and is responsible for handling all claims against the [Insert "Sewer Department" or your department name] and prosecuting violations of all Sewer Use Ordinances.

• The [Insert "Public Works Department" or name of department] provides paving services to [Insert "Sewer Department" or your department name] on all sewer repairs performed within public streets and works to coordinate street-paving schedules with sewer work.

• The [Insert City/Town name] Clerk / Treasurer Department maintains copies of Resolutions and [Insert "city" or "town"] Ordinances passed by the [Insert City/Town name] [Insert "Aldermen", "Selectmen", city or town "Council", or other body] related to the operation of the [Insert "Sewer Department" or your department name].

**c. Training**

*Your PMP should include a description of your training program and indicate whether any changes or improvements are anticipated in the near future.*

*A collection system with untrained or poorly trained personnel runs a greater risk of experiencing problems. A successful training program requires management commitment and the recognition of training as a budget expense item. An ongoing training program should incorporate accepted safety practices. It should also address the skills necessary to perform emergency response as well as routine operations and maintenance. An effective training program will include the following elements:*

*• Collection system mission, goals, and policies*

*• Mandatory training requirements identified for key employees*

1. *• Safety training*
2. *• Tracking and measuring job performance and on-the-job training*
3. *• A process for evaluating the effectiveness of training*
4. *• Assurance that new employees receive training*

*Training can take many forms including on-the-job or in-house training, certification programs, and special classes or seminars from a number of different sources (e.g., manufacturers or consultants, regulatory agencies, professional associations, or educational institutions).*

*Edit the following paragraph to reflect your program:*

[Insert City/Town name]’s training program provides a mechanism for educating employees and establishing their technical competence through the [Insert training programs you use, such as NEWEA voluntary] certification program. [Insert City/Town name] utilizes a combination of in-house skill training and the purchase of specialized training through state and national associations, the self-study technical wastewater training courses offered through California State University – Sacramento, conferences and vendor training programs to enhance skills for performing daily work duties and provide certified operators continuing education hours. Skills training for [Insert "Sewer Department" or your department name] employees includes, but is not limited to:

*Edit to reflect training that you do to the following list:*

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

* [Insert others that you specify]

*Edit to reflect your safety training:*

Safety training is obtained from training agencies including [Insert specify training programs that you use]. [Insert City/Town name] 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 in [Insert what you use, e.g., a training database or a log book, etc.]. The [Insert "Sewer Department" or your department name] maintains appropriate safety equipment including *(edit the following)*: protective clothing, safety glasses, hard hats, gloves, respirators, filters, harnesses, tripods, hoists, fire extinguishers and self-contained breathing apparatus. The [Insert "Sewer Department" or your department name] also maintains and calibrates atmospheric testing equipment. Lights, barricades, signage and exhaust fans are also available [Insert "at the DPW yard" or "on the trucks" or other location where you keep such equipment].

**d. Customer Service**

*The citizens in many communities often know very little about the wastewater treatment and collection services performed for them. Your customers may only become aware of the collection system and its owner or operator when the system fails to work as designed, an overflow occurs, or through articles in local newspapers, or public announcements on radio or television. Collection system representatives should create opportunities to build community support to help citizens understand the need to support the operation and maintenance of their system. Examples of public relations activities include:*

*- talking to schools and universities*

*- presentations to local officials and businesses about the wastewater profession*

*- presentations to citizens, building inspectors, public utility officials, and members of the media*

*An effective customer service and public relations program also requires that all inquiries, requests, and complaints are addressed in a timely fashion. Complaint information can help you further develop or revise your programs to better address areas of concern. Keep in mind that collection system field crews influence the public’s confidence in the collection system owner or operator. Personnel should be trained to receive complaints and maintain a data base with the following:*

* *Date and nature of the complaint or request*
* *Location of the problem*
* *Name, address, and telephone number of the customer*
* *Cause of the problem*
* *To whom the follow-up action was assigned*
* *The initial date of the follow-up action*
* *Date the complaint or request was resolved*
* *Total days to end the problem*
* *Feedback to the customer as follow up*

*Remember, everyone has different skills, and while you may choose to designate specific individuals to interface with the public, it is important that all employees have some training on dealing with complaints. All employees should understand the value of an effective customer service and public relations program.*

*Part of customer service also means letting customers know if their service is going to be affected by your plans or programs. For example, affected customers should be notified before work begins on major construction or maintenance. Notification methods may include door hangers, newspaper notices, fliers, signs, and announcements on radio or television. Information should also be provided to residents on cleanup and safety procedures following basement backups and other overflows.*

1. Complaint Management Program

Complaints and requests are received by various means (e.g., phone calls, e-mail, other [Insert City/Town name] departments, and occasionally in person). Regardless of the nature or means of receipt, all complaints and requests are entered via the dispatcher into our [Insert e.g. spreadsheet, database, logbook, etc.]. Entries include the following detailed information about the complaint/request:

*[Edit the following list:]*

* 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, [Insert department, e.g. DPW, Sewer Department] will generate a work order to take appropriate action for permanent correction of the problem. If [Insert City/Town name] is not responsible for correcting the problem, the [Insert department, e.g. DPW, Sewer] will provide the complainant with guidance on a recommended course of action. Once an investigation has been completed, the staff enters closeout information into the [Insert e.g. spreadsheet, database, logbook, etc.]. **Attachment** [Insert attachment number]depicts a typical form from the dispatch [Insert e.g. spreadsheet, database, logbook, etc.].

2. Public Information and Education Program

[Insert City/Town name] 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. [Insert City/Town name] [Insert "routinely uses" if you already have a program or "plans to use" if you are developing your program] the outlets listed below to help [Insert "the City" or "the Town"] provide its citizens with the most up-to-date information possible:

*[Edit to reflect your programs and consider indicating under what circumstances you utilize each outlet]*

* [Insert City/Town name] Public Relations Coordinator

* [Insert City/Town name] Cable TV Channel

* [Insert City/Town name] Website
* Local Media (TV and Newspaper)
* Neighborhood / Town Hall Meetings

* [Insert City/Town name] [Insert "Board of Selectmen", "Council", etc.] Agenda
* Public Hearings
* Personal Visits / Phone Calls
* Door Hangers
* Sign Postings
* Customer Mailings
* School Fair Activities

[Insert City/Town name] [Insert "has had" if you already have a functioning program, or "plans to develop"] 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:

# You may have outreach programs for particular projects or capital improvements and educational programs or pamphlets and instructions that are generally available. Both are important. Edit the following lists to reflect your outreach programs (if you plan to develop some of these, but don’t have them yet, indicate what’s in the works):

Information and Education Programs

Sewer System Evaluation Survey Work Sewer Use Ordinances

Major Repairs and Rehabilitation Types of Waste Treated

New Construction Industry Pretreatment Requirements

Road Closures Wastewater Treatment Processes

Point Repairs for Street Paving Customer Emergency Response

Sewer Use Rates Grinder Pump Operation and Maintenance

Grease Handling Information Complaint Procedures

Grease Disposal Pamphlet Service Connection Requirements

Private Hauler Instructions Wastewater Collection and Treatment

#### e. Information Management and Geographic Information Systems

*Many Municipalities have been shifting their information management from paper to computer maintenance management systems (CMMS). A CMMS is designed to manage the data needed to track a collection system’s operation and maintenance. It can be integrated with a Geographic Information System (GIS). A GIS used to map and quickly locate system parts and facilities can include multiple layers of identifying information such as a sewer map, storm sewer map, manhole location and ID, catch basin location and ID, dates of pipe cleaning and repair, and features such as pipe location, diameter, material, and condition, etc. The GIS also typically contains base information such as streets and parcels.*

*The CMMS is only as accurate as the data used to develop it. Regardless of the information management style, a collection system should have written instructions regarding the use of the management information systems.*

*Information management and tracking includes:*

* *System features such as pipe size, type, age, location, condition assessment, etc.*
* *Inspection scheduling and tracking*
* *Flow monitoring*
* *Planned maintenance*
* *Parts inventory*
* *Customer service and complaints*
* *Overflow, safety and reportable incidents*
* *Emergency response*
* *Employee training*

*[Describe your information management program, the following paragraph is a common model, but if your system is integrated and/or handled entirely by your department, edit accordingly]*

[Insert City/Town or System Name] uses [Insert name of computer program, and/or description of spreadsheets, and/or hardcopy files, log books] to manage information on our collection system. This [Insert 'system' 'data' or other description and 'is' or 'is not' depending on whether your systems are integrated]' connected to [Insert City/Town or System Name]’s Geographic Information System (GIS) through [Insert description of your agreement, or the process you use to link the two, eg, the microsoft access database used for the CMMS]. [Insert City/Town or System Name] receives support from [Insert any details on other departments, eg, Assessor's Office if using their GIS, Information technology if you have access, etc.]. Table [Insert number] shows the information that is included in our GIS of the collection system.

Knowledge of the location of all wastewater collection system facilities is essential to effective management. This requires the maintenance of up-to-date collection system maps. The maps can be available in hard copy or electronic format. The benefit of an electronic format is that it provides a more sophisticated tool for prioritizing repair, replacement, or rehabilitation projects, and for producing work orders for sewer cleaning and other maintenance activities. Sewer maps should include at least the basic information shown in the table below. Additional attributes which may be useful are shown in the column to the right of the basic attributes. Some of this basic information may be included as part of the GIS or CMMS database linked to the map instead of on the map itself. Pump stations should also be indicated on the map, although their technical information can be too complex to display on a map sheet, and it may be more appropriate to place it in the GIS and/or your CMMS database. Service lateral data can optionally be included.

*[Use the table below to include those elements that are in your information system, and which are under development, if any. Edit the description to include how the ID numbers or identifiers are developed for your ID numbering system (e.g., are they simply numerical from 1 to some number going south to north, is there a street or other location association coded into the IDs, etc. This assumes your system is not a combined system; if you have combined sewers, also include a row to indicate information, such as outfall locations, that you have stored or plan to store in your GIS mapping system.]. Include additional rows to describe storm water system map information if you have it.*

**Table** [Insert number]: **Collection System Map Information included in** **[Insert City/Town or System Name]’s GIS**

|  |  |
| --- | --- |
| **Manholes Basic Map Information**  - ID number or other unique identifier  - Location, with reference to streets and property lines  - Depth  - GPS coordinates  - Size | **Manholes Additional Map Information**  - Date built  - Rim elevation  - Invert elevation  - Material Type  - Worker safety information |
| **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  - Date built | **Pipes Additional Map Information**  - Slope  - Pipe invert elevations  - Plan or as-built ID number  - Service laterals |
| **Pump Stations Basic Map Information**  - ID number  - Location  - Capacity | **Pump Stations Additional Map Information**  - Additional information on drawings [Insert where the drawings are located], and in the CMMS |
| **Force Main Basic Map Information**  - ID number or other unique identifier  - Location, with reference to streets, surface waters, and property lines  - Direction of flow and pump station associated  - Length  - Material type  - Location of air release valves  - Date built  - Capacity | **Force Main Additional Map Information**  - Slope  - Invert elevations  - Plan or as-built ID number |
| [Insert other collection system information stored in your GIS] | [Insert other collection system information stored in your GIS] |

*[Edit the following list. If you plan, but have not yet begun, implementation of a particular system, create a separate list indicating your planned additions]*

# System information managed in our [Insert name of computer program, and/or description of spreadsheets, and/or hardcopy files, log books] 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)
  + Pump station
* Work Orders
* Monitoring/Sampling scheduling for [Insert type of monitoring, e.g., hydrogen sulfide, etc.]
* Vehicle maintenance

**Customer service program**

* Complaints
* Customer service response
* Billing information

Any activity performed by department personnel is generated and tracked through the [Insert "CMMS" or indicate your information management process]. The [Insert "CMMS" or indicate your information management process] produces [Insert the time frame for your process such as "daily, weekly, quarterly, and bi-annual"] written work orders for the performance of routine maintenance as well as repairs and corrective actions in response to inspection findings or customer complaints. Upon completion of the task(s), data related to the work order is entered into the [Insert the software product(s) or indicate your hardcopy process (such as if you use log books)] for tracking performance and historical information on [Insert all aspects of your system that are covered by your Info Management System, such as pump station equipment, manholes, pipeline testing, etc.]. The [Insert "CMMS" or indicate your information management process] (along with the SCADA system (see Pump Station section 4)) serves as [Insert City/Town or System Name]’s information management system for the all of the collection systems operation and maintenance.

***[Include a brief description of your security for your information management systems]***

Our [Insert "CMMS" or indicate your information management process] is operated through our Local Area Network (LAN). The system is backed up [Insert appropriate details] and access is restricted. Passwords are provided to [Insert City/Town or System Name] employees designated for access, [Insert list of who has access and at what level if it varies]. [Insert any other appropriate details]

[Include an appendix containing your procedures, protocols, inspection checklists, and examples of the forms used for tracking and managing this information so a new employee, for example, would be able to get an overview of how your process works]

## Examples of procedures and forms are provided in Appendix [Insert Appendix reference].

**f. Legal Authorities and Controls**

*Legal authority refers to powers granted to the wastewater collection system agency to provide services to the public, typically through sewer use ordinances, service agreements, and other mechanisms*. *The Town/City should describe its legal authority to control the type and quantity of wastewater discharged to the collection system, including its legal authority to:*

* *Control the quantity and quality of wastewater from new development and satellite collection systems*
* *Control sources of infiltration and inflow*
* *Control sources of Fats, Oils and Grease (FOG)*
* *Require proper design and construction of new and rehabilitated sewers and connections*
* *Require proper installation, testing and inspection of new and rehabilitated sewers*
* *Access all components of the collection system*

*If legal authority does not currently exist for any of the elements above, your plan should indicate a schedule of activities to obtain the proper legal authority (see appendix guidance for a copy of a Model Ordinance)*.

**1. Sewer Use Ordinance**

[Insert City/Town or System Name] has established and implemented regulations regarding the use of the wastewater collection system. [Insert City/Town or System Name] has a comprehensive sewer use ordinance, consistent with EPA’s model ordinance, in place since [Insert year]. As regulations and requirements have changed, [Insert City/Town or System Name] has passed additional ordinances to address those issues. Ordinances are kept up-to-date and are available electronically at [Insert URL for city/town web address or e.g., http://www.municode.com/, or if your ordinances are not available on the internet, insert "by contacting" and indicate email or mailing address].

*[Edit the following section to include as much of the following as applies to your system]*

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. [Insert City/Town or System Name] also has agreements with [Insert names of agreements with other communities and any other legal issues pertinent to the use of the sanitary sewer]. [Insert City/Town or System Name] reviews the adequacy of user rates annually (see Resources and Budget, Section [Insert Section number]).

**2. Joint Sewer System Agreement**

*[****If you have a treatment plant and agreement(s) with nearby town(s)*** *to accept and treat their wastewater, use this paragraph and edit the following section as needed. If separate agreements are in place for multiple towns, describe the arrangements for each town. If you have a fairly simple joint sewer system agreement, consider editing the following to describe your current agreement. Provide a separate description for those that you plan to include when you renew your agreements.]*

[Insert City/Town or System Name] has a sewer maintenance agreement to convey wastewater and provide limited maintenance for the Town of [Insert Town(s) or System Name(s) for sewer users sending waste to your treatment plant] sewer collection system since [Insert year]. The latest agreement is dated [Insert date]. The main items in the agreement are described below:

*Edit the following:*

• [Insert Town(s) or System Name(s) for sewer users sending waste to your treatment plant] has purchased capacity rights from [Insert City/Town or System Name] for potentially [Insert number] connections based of a unit flow rate of [Insert number] gallons per day (gpd) per connection.

• [Insert Town(s) or System Name(s) for sewer users sending waste to your treatment plant] retains ownership of sewers within the sewer user’s corporate limits.

• [Insert Town(s) or System Name(s) for sewer users sending waste to your treatment plant] is assessed an annual sewer charge updated each [Insert the time of year or date when the sewer charge is updated according to your agreement]. The sewer maintenance service charge includes: costs for sewer maintenance [Insert details ], wastewater treatment, and contribution to the sewer reserve fund.

• [Insert City/Town or System Name] provides limited maintenance for the sewer system within the portion of [Insert Town(s) or System Name(s) for sewer users sending waste to your treatment plant] that discharges to [Insert City/Town or System Name]’s collection system. Maintenance includes routine inspection, rodding, unplugging or flushing of the main sewer.

• [Insert Town(s) or System Name(s) for sewer users sending waste to your treatment plant] is responsible for repairs and CCTV inspection of their own collection system.

• [Insert City/Town or System Name] is responsible for determining the annual sewer maintenance service charge to [Insert Town(s) or System Name(s) for sewer users sending waste to your treatment plant]. The sewer maintenance service charge includes: costs for sewer maintenance, wastewater treatment, and a sewer reserve fund.

• [Insert Town(s) or System Name(s) for sewer users sending waste to your treatment plant] is responsible for system repairs of the part of [Insert City/Town or System Name]’s system that coveys [Insert Town(s) or System Name(s) for sewer users sending waste to your treatment plant] flow to the treatment plant. [Insert Town(s) or System Name(s) for sewer users sending waste to your treatment plant] is also responsible for paying its portion of major capital improvement for the joint sewer system.

• [Insert Town(s) or System Name(s) for sewer users sending waste to your treatment plant] is required to adopt a master plan for the current and future development within the Town’s service area to be used for capacity development within our system.

To date, [Insert City/Town or System Name] [Insert "has not" or "has", if there have been legal issues, add a sentence describing them] encountered legal issues regarding wastewater flow from [Insert Town(s) or System Name(s) for sewer users sending waste to your treatment plant].

*[If you have had legal issues with wastewater flow, consider adding a description of actions taken and current status]*

***“OR”***

***[If you have a collection system and you have an agreement with a treatment plant*** *to accept and treat your wastewater, include edits to the following section. If you have a fairly simple joint sewer system agreement, you may want to consider editing to include the bullets that describe your current agreement and have a separate description for those that you plan to include when you renew your agreement.]*

[Insert City/Town or System Name] has had an agreement with [Insert Town or System Name of treatment plant or system that accepts your wastewater] for treatment of [Insert City/Town or System Name]’s wastewater since [Insert year]. The latest agreement is dated [Insert date]. The main items in the agreement are described below:

• [Insert City/Town or System Name] has purchased capacity rights for potentially [Insert number] connections based on a unit flow rate of [Insert number] gallons per day (gpd) per connection from [Insert Town or System Name of treatment plant or system that accepts your wastewater].

• [Insert City/Town or System Name] is assessed an annual sewer charge from [Insert Town or System Name of treatment plant or system that accepts your wastewater] each [Insert the time of year or date when the sewer charge is updated according to your agreement]. The sewer maintenance service charge includes: costs for sewer maintenance [Insert details if the wastewater plant also helps maintain your collection system], wastewater treatment, and a sewer reserve fund.

• The annual sewer charges include [Insert City/Town or System Name]’s portion of major capital improvement for the joint sewer system.

• [Insert City/Town or System Name] is required to adopt a master plan for the current and future development within the [Insert "City" or "Town"]’s service area in order to provide input for [Insert Town or System Name of treatment plant or system that accepts your wastewater]’s capacity and capital planning.

To date, [Insert City/Town or System Name] [Insert "has not" or "has", if there have been legal issues, add a sentence describing them] encountered legal issues regarding wastewater flow sent to [Insert Town or System Name of treatment plant or system that accepts your wastewater].

*[If you have had legal issues with wastewater flow, consider adding a description of actions taken and current status]*

**2. GENERAL INFORMATION ABOUT THE** [INSERT CITY/TOWN] **SANITARY SEWER SYSTEM**

*General information should include a description of the wastewater collection system and the customer service area such as:*

1. A narrative description of your service area, including names of the towns/cities and communities served or in the same system as your town/city,

*2. Indicator information such as population served by the system, average daily flow, the total length of sewer, size range of pipe diameter, number of and a description of sewage pump stations, whether on-site of portable alternative power sources are available,*

*3. Range and average age of sewers,*

*4. SSO history, and*

*5. A map of the wastewater collection system showing the locations of primary sewers (interceptor, outfall & trunk sewers) and sewage pump stations*

**a. Wastewater Treatment and Collection System Description**

[Insert City/Town name]’s first formal wastewater collection system dates back to [Insert year about when sewer first installed] and the first wastewater treatment facility was constructed in [Insert year when WWTP installed]. The collection system transports wastewater to the treatment facility, [Insert Name of treatment facility], located at [Insert street location and if in different city/town] .

*(Example for continuing narrative, edit or re-write the following section to describe your system)*

The oldest part of the system is the downtown area along the [Insert Name of area, e.g. Pleasant River], which also has the highest density of commercial customers. In [Insert date], [Insert City/Town name] and the [Insert "City" or "Town"] of [Insert Name ] (the [Insert "City" or "Town"]) entered into an agreement to construct a treatment facility to treat the wastewater from both communities. Since [Insert date] [Insert City/Town name] has operated a [Insert number] mgd [Insert type of treatment] treatment facility that provides secondary wastewater treatment for both communities. The last major upgrade of the wastewater treatment facility was completed in [Insert year ] and included [Insert brief description of what was upgraded]. The treated wastewater is discharged to the [Insert Name of receiving waterbody].

[Insert City/Town name] and the [Insert "City" or "Town"] each own the wastewater collection system within our respective jurisdictions and maintain our own collection systems. [Insert City/Town name]’s collection system includes [Insert number] pump stations and approximately [Insert number] miles of sewers, ranging in size from [Insert number] inches to [Insert number] inches in diameter. [Insert City/Town name] also has [Insert number] private pump stations that [Insert City/Town name] is not responsible for maintaining.

[Insert City/Town name] does not own or maintain any portion of the sewer laterals that drain each privately owned parcel or property beyond the property line. However, we do work with homeowners to prevent backups into their homes.

[Insert City/Town name or name of authority that operates your collection system] staff and contractors perform planned maintenance tasks at scheduled frequencies. Frequencies are established based on experience and collection system information to minimize the risk of blockages or equipment failures that could lead to sewer overflows (see Cleaning, Inspection and Assessment, Section [Insert number]). Some portions of the wastewater collection system are maintained more frequently than others based upon past history and their importance to the effective operation of the wastewater collection system. Staff and/or contractors also perform unplanned maintenance (see Sewer Overflow Response Plan, Appendix [Insert number] *[Appendix number A, or if separate plan –give title and date]*.)

**b. Collection System Details**

* Service Area: [Insert number of square miles Square miles
* Population Served in primary community: [Insert population number
* Population in interconnected community: [Insert population number, by municipality if more than one
* System Inventory owned by [Insert City/Town name], below:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Miles of gravity sewer | Miles of force main | Number of manholes | Number of pump stations | | Number of siphons | Number of air relief valves |
| Public | Private |
|  |  |  |  |  |  |  |

* Number of Service Connections:

Residential: Commercial: Industrial: Total:

* WWTF Flow Characteristics in MGD

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Annual Average Daily System Flow | Average Daily Dry Weather Flow | Peak Wet Weather Flow | Treatment Plant Design Capacity (MGD) | |
|  |  |  | Average: | Maximum Flow: |

### **c. Age Distribution of Collection System**

[Insert City/Town or System Name] 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 described in section [Insert number] and our capital planning described in Resources and Budget section [Insert number], below. [Insert City/Town or System Name] has categorized our sewer system by age and size:

[Use the following age brackets, or if your system can be categorized differently, edit the following:]

* Pre 1920
* 1920-1940
* 1940-1960
* Post 1960

The ages of the components of our wastewater collection system are as follows:

|  |  |  |  |
| --- | --- | --- | --- |
| Age | Gravity Sewer miles | Force Main miles | Number of pump stations |
| 0-25 years |  |  |  |
| 26-50 years |  |  |  |
| 51-75 years |  |  |  |
| > 76 years |  |  |  |

### **d. Length of Pipe by Diameter**

*[Insert extra row(s) for pipes of more than one type of pipe material (see example for 8-inch, below). Delete rows that aren’t applicable.]*

|  |  |  |  |
| --- | --- | --- | --- |
| Pipe Diameter  (inches) | Length  (lineal feet) | Material | Replacement Cost per foot |
| 3 |  |  |  |
| 4 |  |  |  |
| 6 |  |  |  |
| 8 | [ 7800] | [VCP] |  |
| [e.g. 8] | [5500] | [PVC] |  |
| 10 |  |  |  |
| 12 |  |  |  |
| 14 |  |  |  |
| 15 |  |  |  |
| 16 |  |  |  |
| 18 |  |  |  |
| 24 |  |  |  |
| 30 |  |  |  |
| 36 |  |  |  |
| 42 |  |  |  |
| 45 |  |  |  |
| 48 |  |  |  |
| Greater than 48 |  |  |  |
| **TOTAL** |  |  |  |

**e. Sanitary Sewer Overflow History**

[Insert City/Town or System Name] has experienced [Insert number] of sanitary sewer overflows (SSOs) since [Insert year, e.g. use previous five years history]. The following table describes the overflow dates, locations, quantities and causes.

Table [Insert Table number]: Sanitary Sewer Overflow History *[add rows/edit as needed]*

|  |  |  |  |
| --- | --- | --- | --- |
| SSO date | Location | Volume released | Cause of release |
|  |  |  |  |
|  |  |  |  |

To assure sewer capacity [Insert City/Town or System Name] [Insert "has developed", "is developing", or a combination that describes your activities] programs to address capacity, inflow/infiltration, and condition of our collection system. These programs are described in Section [Insert section number or numbers, eg. Section 3 of this document includes assessment and section 9 includes capacity assessment...].

f. System Map

A [Insert description, e.g., general, or overview] map of the system is shown in Figure [Insert Figure number]. The map [Insert "is" or "will be" depending on how far along you are in mapping your system] updated by [Insert a description of the process by which you keep the map up to date]. *[If you have not developed a map, describe your process and schedule for developing a complete map of your system. Describe any features from the map (or for your mapping plans) that you want your staff or other readers to know.]*

**3. CLEANING, INSPECTION AND ASSESSMENT PROGRAM**

A good cleaning, inspection and assessment program is an integral part of understanding how your wastewater collection system operates. It is essential for keeping a system in good repair and minimizing the blockages, Inflow/Infiltration and failures that can result in SSOs.

Preventive maintenance protects your investment in your collection system. Higher frequency cleaning of gravity sewers, for example, should be scheduled in areas with a history of overflows, stoppages, FOG, root and odor control problems. Force mains and air release valves should be inspected and cleaned as needed to maintain pump station efficiency and prevent back ups. Maintenance of electrical and mechanical components of pump stations, addressed in Section 4, is also a critical component of preventive maintenance. Each component of the collection system should be inspected, cleaned and televised on a schedule determined by condition and maintenance needs.

This section should include your description of how and when you clean, inspect and evaluate your collection system. It should also include step-by-step protocols of your cleaning and inspecting program and standardized protocols and procedures for evaluating and categorizing the condition or your wastewater collection system tied into your plans for operational improvements to maintain collection system integrity and reduce the frequency of SSOs.

A full cycle of assessment may be needed to establish a cleaning, inspection and assessment program. As you work through these cycles you’ll make improvements and changes to the schedule. As the condition (criticality, performance, capacity, remaining life, redundancy) of each component is assessed, you can develop a schedule for repair and replacement. This effort is time well spent as you move towards managing the assets of your system.

Some portions of your system may have self-cleaning velocities and be in good structural condition. Incorporating screening into the Inspection portion of your Cleaning, Inspection and Assessment program can be useful for identifying segments not needing cleaning or further investigation by CCTV. Screening can also be done using various other technologies including zoom camera technology.

Note: A pipe and manhole identification system is needed to establish this program. A number of different options can be used to do this. For example, subdivide your system into sewer shed areas, with manholes identified by their sub-areas (e.g., MH 2-220 would be a manhole numbered 220, in area 2, or, if part of your system is a combined sewer, you might use CSS to denote the combined sanitary sewer, CSS-2-220).

In [Insert your timeframe, e.g. 2007] [Insert City/Town or System Name] began development of our preventive maintenance plan (PMP). This includes our 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 [Insert number for your goal e.g., 5] years.

[Insert City/Town or System Name] began the cleaning, inspection and assessment program with a focus on the known problem areas and the older sections of [Insert City/Town name]. 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 [Insert "sewer department staff", "a combination of municipal staff and contractors", or a description of who does the work in your system" ]. All data is entered into the [Insert your tracking mechanisms, eg. field logs, computer-based information systems, describe what you use]. *[If you do not currently use a CMMS, you should edit the paragraph above and indicate your anticipated schedule for implementing one]*

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, an evaluation of the condition of the pipes and manholes, [Insert all techniques that you use, using the following list, edit and/or add other techniques you use]. Results from the assessment program are used to categorize the cleaning and inspection frequencies for both the sub-areas and problem pipe-sections (described in more detail below and in Gravity Line Preventive Maintenance, Section 4).

The cleaning and CCTV schedules are closely coordinated. As [Insert City/Town or System Name]’s goal is to have a complete cleaning, inspection and system assessment every [Insert number for your "long term" (5 or more year interval) e.g., 5 years] years, approximately [Insert number] percent of the system is reviewed by CCTV each year. Approximately [Insert number] percent of the system is cleaned annually: the cleaning performed each year includes the priority cleaning plus [Insert number, e.g. 20] percent of the remaining parts of the collection system, factoring in the intermediate and long term interval cleaning schedules. Most of the system cleaning is for gravity lines, as described in more detail in Section b, below.

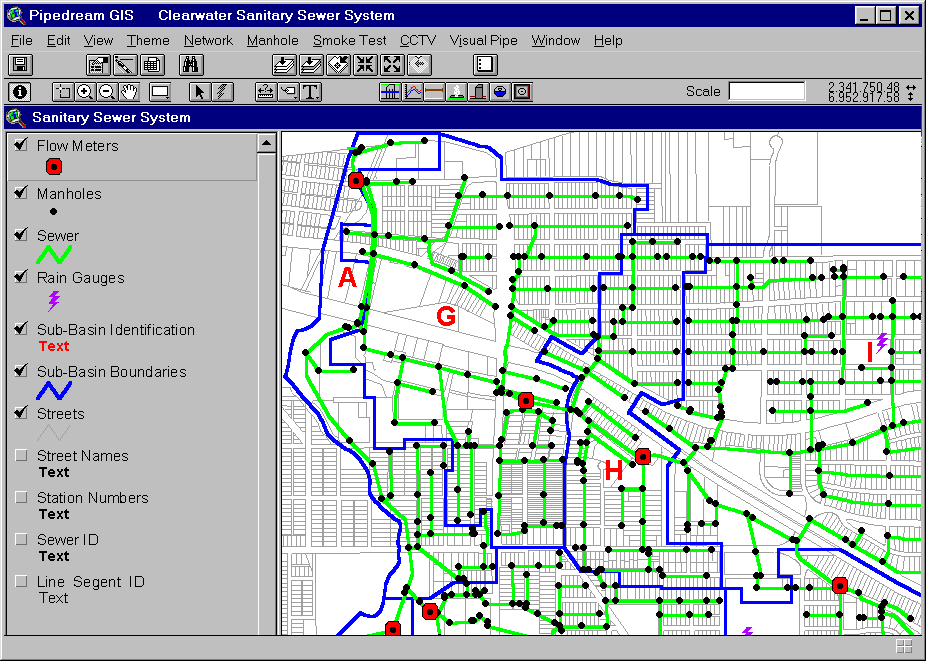
Information from cleaning and inspections (see Inspection section, below), including any findings, is entered into [Insert your tracking mechanisms, eg. field logs, computer-based information systems, describe what you use], and incorporated into the maintenance software for scheduled maintenance and capital improvement. This information is also used to update this long term Preventive Maintenance Plan (PMP).

**a. Cleaning**

Our primary sewer maintenance activity is sewer line cleaning. The [Insert City/Town or system name] service area is divided into [Insert number] sewershed areas as shown in Figure [Insert Figure #].

# The following Figures provide examples of how a system can denote their subareas, delete these figures and replace it with your map(s).





The cleaning of sewer lines, manholes, siphons 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).

**Cleaning Schedules – Priority Cleaning**

Pipe-sections on a priority cleaning frequency are identified based on known Trouble Spots and Critical Service Areas lists. The Trouble Spots (see Table [Insert number]) have a history of blockages or overflows as noted in the table below. The Critical Service Areas (see Table [Insert number] and Figure [Insert number]), locations where sewer malfunction would lead to major disruption, are inspected and maintained at greater frequency due to the importance of their function. Inverted siphons of all diameters are typically treated as trouble spots and receive higher frequency care due to potential grease build up and/or debris settling.

*[Edit and/or combine the following two tables for your system]*

**Table** **[Insert number]: Collection System Inventory of Trouble Spots and Schedule for**

**Priority Cleaning**

|  |  |  |  |
| --- | --- | --- | --- |
| **Location** | **ID #** *(eg GIS # )* | Description of problem | **Cleaning**  **Schedule** |
| **Pipe segments** |  |  |  |
| **[e.g. River St.]** | [e.g. MH55-54] | [e.g. Grease Accumulation] | [e.g., Q] |
|  |  | [e.g., Roots, Grease Accumulation] | [e.g., SA] |
|  |  | [e.g.,Silt Accumulation, flat slope] | [e.g.,A] |
|  |  |  |  |
|  |  |  |  |
| **Manholes** |  |  |  |
|  |  |  |  |
|  |  |  |  |
| **Air Relief Valves** |  |  |  |
|  |  |  |  |
| **Cleanouts** |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| **Siphons** |  |  |  |
|  |  |  |  |
|  |  |  |  |
| **Easements** |  |  |  |
|  |  |  |  |
| *[Add other areas as needed]* |  |  |  |

\* Schedule Key: (M/Q/SA/A) = Monthly, Quarterly, Semi-Annual, Annual *[use others as appropriate to your system]*

**Table** **[Insert number]: Collection System Critical Service Areas**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Component** | **Location** | **Description** | **Cleaning**  **Schedule** | **Contact #** |
| **Critical Facilities Served** |  |  |  |  |
| Hospitals/Nursing Homes |  |  |  |  |
| Schools |  |  |  |  |
| Food/Beverage Processing |  |  |  |  |
| Prisons |  |  |  |  |
| Other Institutions |  |  |  |  |
| *[Add other components as needed]* |  |  |  |  |
|  |  |  |  |  |

# **Cleaning - Gravity Lines Routine Cleaning**

This section details schedules for the routine cleaning of each sub-area of the collection system.

Figure [Insert figure number] color codes the collection system into each section and associated cleaning frequency. Table [Insert table numbers] lists which areas are on each of the schedules.

This template assumes you are beginning your program, and the following paragraph describes the start up. It can be edited once you are further along, to reflect your planning process.

During the first cycle of the Cleaning, Inspection and Assessment program, each pipe and manhole [Insert "is" or "will be" depending on whether you are just starting, or have a program in place] evaluated to determine cleaning frequency. A pole camera [Insert "is" or "will be"] used to evaluate each sewer line to determine the need for cleaning and/or a CCTV structural inspection. A pipe section that has not been cleaned in over 5 years, but has been evaluated using the pole camera and shown that cleaning is not warranted, is assigned to the long term cleaning frequency (5+ years). If the camera evaluation indicates a need for cleaning, the pipe section [Insert "is" or "will be"] put on the intermediate cleaning frequency. The cleaning schedules for other pipe sections in the sub-area will determine whether the cleaning frequency will be closer to [Insert number e.g. 2] years or [Insert number e.g. 5] years.

The priority cleaning schedule (described above) includes [Insert number of linear feet] linear feet of sewer; the intermediate schedule [Insert number of linear feet] linear feet, and the long term schedule [Insert number of linear feet] linear feet. Sewershed areas [Insert descriptors or names for the oldest areas - those which are of concern, eg "Sewershed Areas A and B"] have the oldest pipes, [Insert dates and types of pipe material, such as "clay pipes dating from pre-1930", etc.]. Sewershed [Insert identifier for the top priority maintenance area], has the highest percentage of sewers on the priority cleaning schedule due to the number of restaurants and potential for grease stoppages. For other sections of our gravity sewer, the routine cleaning schedule is listed in the tables below and revised as necessary based on findings and as reported by the crews to the supervisor.

###### Example Cleaning Frequency for 2-5 year: Table Example ( delete when completing template)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Sewershed area name* | *Pipe Diam. (in)* | *Length of segment (lf)* | *Pipe Material* | *Notes* |
| *Sewershed Area 1* |  |  |  |  |
| *Main St., between Elm and Maple MH1-2200 to MH1-2500* | *12* | *1500* | *Ductile Iron* | *Roots expected MH1-2220 and MH1-2250* |
| *Main St., between Maple and Oak. MH1-2750 to MH1-2810* | *12* | *1300* | *Ductile Iron* | *Roots expected between MH1-2770 and MH1-2800* |
| *Sewershed Area 2* |  |  |  |  |
| *First Ave., between Washington and Lincoln MH2-1100 and MH2-1400* | *12* | *2200* | *HDPE* | *Sediments problematic between MH2-1200 and MH2-1280* |

Two-to-Five-Year Cleaning Frequency Table [Insert number] *[insert additional rows or delete rows as needed]*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sewershed area name | Pipe Diam. (in) | Length of segment (lf) | Pipe Material | Notes |
| [Insert name of area 1] |  |  |  |  |
| [Insert name of first segment, eg. street name] | [Insert number] | [Insert number] | [Insert material] | [Insert notes] |
| [etc.] |  |  |  |  |
|  |  |  |  |  |
| [Insert name of area 2] |  |  |  |  |
| [Insert name of first segment, eg. street name] | [etc.] |  |  |  |
|  |  |  |  |  |

Five-plus-Year Cleaning Frequency Table [Insert number] *[insert additional rows or delete rows as needed]*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sewershed area name | Pipe Diam. (in) | Length of segment (lf) | Pipe Material | Notes |
| [Insert name of area 1] |  |  |  |  |
| [Insert name of first segment, eg. street name] | [Insert number] | [Insert number] | [Insert material] | [Insert notes] |
| [etc.] |  |  |  |  |
|  |  |  |  |  |
| [Insert name of area 2] |  |  |  |  |
| [Insert name of first segment, eg. street name] | [etc.] |  |  |  |
|  |  |  |  |  |

*[Edit the following paragraph to include the details of your tracking program]*

All cleaning records are kept in a [Insert database, spreadsheet, or details of how you track] 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. Attachment [Insert attachment number] provides the log form. Support from [Insert name of contracting company] is also used for cleaning and repairs, and for emergencies during non-business hours.

Manhole deficiencies are also noted in cleaning logs (see Section b, below). Information about manholes requiring attention is provided to [Insert name of person the crews report to, or title such as "the supervisor"] and either a repair work order is issued or it is added to the capital repair schedule. *[A system for characterizing the condition of manholes should be established, see example logs in appendix. See manhole ID fact sheet at http://www.epa.gov/region1/sso].*

**b. Pipe and Manhole Inspection**

Planned manhole and pipe inspections are coordinated with the cleaning program and generally follow the cleaning schedule. However, as [Insert City/Town or system name] implements the first cycle of the PMP, and establishes cleaning frequencies and repair schedules, inspection by zoom camera will be used to help establish those cleaning frequencies. The cleaning, inspection and assessment program goal is to inspect the entire collection system within [Insert number for your goal e.g., 5] years. During the first cycle of the PMP, prior to cleaning, a [Insert the type of camera equipment that you use, e.g. pole, zoom, crawler, etc.] camera is used to screen a pipe section to determine the cleaning frequency and whether a full CCTV screening is needed to assess its structural condition or other deficiencies. [Insert City/Town or system name] uses our [Insert the type of camera equipment that you use] 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. After the blockage is removed the line is evaluated with a pole camera again to determine if an inspection with a CCTV crawler is needed to assess the condition of the pipe. [Insert City/Town name] uses a [Insert equipment that you use, e.g. "pole camera"] for this assessment.

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 [Insert "pressure" or "vacuum"] 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 [Insert City/Town name] will accept the infrastructure from the construction contractor. [Insert a sentence or two to describe your program for electronic maps or one-year performance of the new infrastructure if you require it]

The following table ([Insert number]) lists the schedule for the types of cleaning and inspections that are performed.

**Table** **[Insert number]: Combined Routine Cleaning and Inspection Schedule**

| **Description** | **\*H/**  **NC** | **Information on asset** | **Monthly** | **Semi- Annual** | **Annual** | **2-5 year** | **> 5 year** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| [Insert a description that you use for each segment or component that you maintain, including main lines, service laterals, maintenance structures and pumping stations, etc..] |  | [Insert information associated with the pipe segment/manhole/component, such as age, particular issues maintenance personnel need to know, or if a trouble spot, etc.] | [Insert the codes to describe required work] | [Insert the codes to describe required work] | [Insert the codes to describe required work] | [Insert the codes to describe required work] | [Continue inserting the maintenance function using your codes] |
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**Table Legend:**

**\*High Priority (H) Non-critical (NC)**

**\*\* Work Codes:**

**Clean (C) *Rodding (R), Jetting (J), Root Cutting (RC), [etc. ]*,**

**Visual Inspections:** Inspect General condition and overflow evidence **(G),**

Inspect for Surcharging evidence **(S),** Inspect for loose bricks/mortar, **(L),**  Inspect for evidence of I&I **(I/I),**

**CCTV Inspection (***specify* **pole camera PC, crawler camera CC, camera on jetter CJ),**

Flow Monitoring **(FM),** Smoke or Dye testing **(T),** Assess Condition **(A),**

**Clean and Assess Condition (C&A), *[continue the list using your operations]***

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 according to the checklist in Appendix [Insert appendix number]). Information is recorded in [Insert name of computer program, and/or description of spreadsheets, and/or hardcopy files, log books] and used to schedule maintenance and repairs. A digital camera is used during the inspection to document defects.

Manhole inspection results are reviewed for condition rating. Those needing repair (rated [Insert high-priority rating number, e.g. 5]) are placed on a priority schedule, and routine repairs are coordinated with re-paving work, see Section 5.When repairs are recommended, as described below, work orders are created and entered into [Insert your tracking mechanisms, eg. field logs, computer-based information systems, describe what you use].

[Insert personnel description for manhole repairs, such as "Repair crews" or the name of the contracting company] 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 [Insert description comprehensive repairs, such as the name of the contracting company]. As noted in Section [Insert section number], Equipment and Tool Inventory, [Insert City/Town or system name] maintains an inventory of frames and covers. Work is completed based on priority as noted on work orders which are tracked and completed in our work order database.

[Edit the following paragraph for your system, or if you use a contractor service, make appropriate changes]

The [Insert manhole crew or the name of your contractor] rehabilitates manhole cones and risers as identified by the inspections. [Insert manhole crew or the name of your contractor] operates a trailer-mounted grout machine for spraying the inside of manholes and uses chemical grout to stop specific leaks. Work orders are created and entered into [Insert "the database" or other description of what you use]. Repairs are made on a priority basis.

**c. Assessment**

Edit the following paragraphs to describe what you do. If you are not currently scheduling CCTV and/or do not have a system in place to record your results, edit to indicate your schedule to develop and implement CCTV and condition assessment software programs.

While routine cleaning and visual inspection are used to assess the condition of manholes and surface facilities, CCTV video inspections are the primary method used to assess the condition of the sewer pipes. All records are entered into [Insert name of computer program, and/or description of spreadsheets] (see Information Management section).

The results from routine inspection and monitoring are used to prioritize areas needing CCTV inspections to assess pipe condition such as manholes with evidence of slow flow or surcharging. The assessment is logged into [Insert name of computer program, and/or description of spreadsheets] using conventional defect criteria (see attachment [Insert attachment number]). *[If you are not currently using defect codes, a description of Pipeline Assessment and Certification Program (PACP) defect codes can be found by searching the internet. A number of systems have also created simplified codes. If you have already done some CCTV work, include a description such as edits to the following:]* In [Insert year], [Insert number length of feet] feet of pipe were inspected. The [Insert "tapes" if video, or "DVDs"] have been reviewed and condition assessments entered into [Insert name of computer program, and/or description of spreadsheets].

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 [Insert City/Town or System Name]’s 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, see Section 5.

## Condition assessments document the following details and deficiencies: *[add others as appropriate to your system]*

## Characteristics including pipe diameter, and age and type of material

## Dips in line

1. Grease build-up
2. Root intrusion
3. Sediment accumulation and encrustation
4. Structural condition, including cracks, corrosion and erosion
5. Joint alignment and movement
6. Reverse slope
7. Obstructions
8. Deformations in line

[Insert City/Town name]’s [Insert name of computer program] software includes a defect assessment table where each asset (pipe, manhole, pump, etc.) is rated for specific criteria (e.g., roots, grease, sedimentation, cracks, etc.).  Based on the criteria ratings, the [Insert name of computer program] assigns an overall rating for each asset. A ranking of each asset, based on its condition assessment rating (see Table [Insert Table #]), is then used for prioritizing capital repairs and replacement.

*The following tables provide examples of common condition ratings. Insert the rating description you use*

Table [Insert Table #]

|  |  |  |
| --- | --- | --- |
| **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 |

*The following table provides an example of common assessment factors. Insert a description of the method you use or plan to use*

|  |  |  |  |
| --- | --- | --- | --- |
| **Assessment Factor** | **Consideration** | **Scale** | |
| *Criticality* | *How critical is the service of this asset?* | *0 (noncritical) – 10 (critical)* |
| *Performance* | *What level of performance is it providing?* | *New to unserviceable (on a scale of 0 to 5)* |
| *Impact of Failure* | *Is there a process, environmental, or safety issue?* | *0 (no issue) - 3 (significant) for each impact category* |
| *Capacity* | *Is it capable of meeting system needs?* | *Undersized – Oversized* |
| *Remaining Life* | *How much of its design life is used up?* | *Percentage from 0 to 100%* |
| *Redundancy* | *Does the component have a back up?* | *From 0 (no back up) to 200%* |

**d. Staffing and Equipment**

*[Edit the following paragraph to include the details of your program. Edit as necessary to indicate who (including contractors) is doing the work.]*

[Insert City/Town or system name] has [Insert number] staff trained for cleaning, inspection and assessment, and they are deployed in [Insert the number of people in cleaning crews (usually two or three)] person crews [Insert time frame such as "year round"] for cleaning. Inspection work is coordinated with [Insert a description of your crew(s) for inspections, or if you use a contractor, put in the name], with oversight from [Insert who oversees the use of the inspection equipment, for example, the assistant superintendent]. [Insert who reviews the inspections (usually it is personnel trained with the software) e.g., "The GIS technician", "The assistant superintendent", or other] works with [Insert name of contractor or software, if used] on assessing the condition of our collection system, using [Insert techniques for assessment, if used].

[Insert time frame such as "Each day" or "At the beginning of the week"] 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. Appendix [Insert number] contains detailed cleaning procedures that crews must follow. 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 [Insert other issues crews are trained on]), 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 to [Insert name of person the crews report to, or title such as "the supervisor"] 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 [Insert number or description (e.g., "all of our", or "one-third of our"] manholes are inspected in the average year.

*[Add a paragraph to briefly describe the adequacy of your staffing and any staffing needs you have identified to implement your preventive maintenance program. If you need more staff to implement your program, you should include a time frame for increasing staffing and then update this plan as you move forward with staffing and program improvements.]*

[Insert a paragraph describing the number of staff needed for your programs and where you have gaps in staffing]

*[Edit the following paragraph to include the details of the equipment used by your crews or, if you use a contractor, the equipment they will use]*

The following equipment is available for cleaning:

[Insert equipment type such as rodding or jet equipment and/or vactor truck] is used to clean most lines. The standard attachment used is [Insert equipment detail such as spinning jet or power rodder]. Root saws are attached to the jetting equipment and used as needed. [Insert "Jetting equipment" and/or "Rodding equipment"] is used to remove blockages from lines. Rodding equipment is used to clean easement lines that are difficult to access with the jet equipment and lines that are difficult to traverse with large jet nozzles. Equipment inventory is covered more fully in Section 8.

**4. GRAVITY LINE PREVENTIVE MAINTENANCE**

**a. Fats, Oils and Grease (FOG)**

*Fats, Oils and Grease, otherwise known as “FOG”, can be a significant cause of sewer blockages that lead to SSOs. Specific areas in your system with FOG issues should be identified for priority cleaning in Section 3.a. Identification of FOG blockage “trouble spots” and their causes is usually based on blockage history, line investigation, and inspection of FOG dischargers (such as restaurants). Once identified, FOG trouble spots can be addressed through targeted outreach and additional regulation. A wastewater collection system FOG program includes the following elements:*

*• Identification – Identify areas or line segments of your wastewater collection system subject to grease stoppages.*

*• Sewer Cleaning - Establish a prioritized preventive cleaning schedule for each area (and all sources of grease) or line segment with FOG problems. An interim high-frequency cleaning program can be the first step in addressing the problem.*

*• Source Control – Develop and implement source control measures for each area of the wastewater collection system identified with FOG problems.*

*• Facility Inspection – Inspect grease-producing facilities, with priority given to previously identified problem areas.*

• Legal Authority – Ensure your city or town has adequate legal authority to: prohibit discharges of excessive grease to the collection system, levy fines as appropriate, and enforce your ordinance.

• Enforcement – Legal authority is most useful when you take action when your requirements are not followed. You should have a program to inspect and enforce your sewer use ordinance.

*• Outreach – establish an outreach program to educate and inform business, industry and citizens about how to reduce FOG discharges and the costs and impacts of FOG in your system.*

Grease and grease-like products can significantly increase the likelihood of sewer overflows. Grease can also cause blockages or aggravate blockages due to roots or structural deficiencies. Restaurants, cafeterias, and other food service facilities, as well as industrial facilities, can discharge grease as part of their normal sanitary flows that can lead, in time, to blockages, backups and overflows. *[If you have a FOG control program, edit the following. If you do not have a FOG control program, but have problems with FOG, you may need to clean those areas more frequently as an interim measure, and edit the following to describe your time line for developing a program]* The discharge of fats, oils and grease (FOG) is regulated through our [Insert "pretreatment" or if you regulate it through another program or department, specify] program; however, backups can sometimes occur. Areas of the collection system with known grease problems are identified on Table [Insert table number]- Trouble Spots, in Section 3.a.

*[FOG programs, because they deal with food issues, are commonly coordinated with a local or regional Board of Health. If you already have a FOG program working with your Board of Health, edit the following paragraph]*

[Insert City/Town name] began assessing FOG in the collection system in [Insert year], and found most blockages in the [Insert which areas, e.g., "commercial", or describe where there are Food Service Establishments (FSE): restaurants, supermarkets, schools and hospital cafeterias] areas were due to FOG. Although commercial facilities account for a high percentage of the grease blockages, they are not the only contributors of grease to the collection system, as [Insert details that pertain to your system such as industrial users, areas with summer rentals (or other areas)] and residents in general, also contribute grease to the system. In [Insert year], the Board of Health and [Insert department, eg. City/Town DPW] worked cooperatively to develop a FOG program. The purpose of the program is to minimize the introduction of fats, oils, and grease into the [Insert "City" or "Town"]’s wastewater collection system. The FOG program includes education for commercial /industrial facilities and residents, annual inspection and periodic sewer cleaning. Details of our FOG program are found in Appendix [Insert number].

*[“OR”*

If you do not have a FOG program working with your Board of Health, edit the following paragraphs. If you run your own FOG program, edit to describe your program.]

The [Insert name of City/Town] Health Department is tasked with the inspection of all Food Service Establishments (FSEs) which is an important element in managing FOG at FSEs. The Health Department has agreed to assist [Insert sewer department] in inspecting and assuring compliance of FSEs with our FOG Control Program. [Insert sewer department] has had [Insert details of meetings, agreements with your Board of Health, describe what you have done to date] with the Health Department and will be meeting [Insert details of when your next meeting is] to formalize their agreement to assist with inspection of grease traps and maintenance records for all FSEs within our service area.The FOG program will include education for commercial /industrial facilities and residents, annual inspection and periodic sewer cleaning.

*[If you do not have a FOG program, continue editing the following paragraphs to indicate what work you have planned to address FOG issues in your system, otherwise delete.]*

To implement this process as quickly as possible, sewer cleaning crews were interviewed regarding known / unknown problem areas. Concurrently, we are conducting a review of line cleaning work orders, historical SSOs due to grease, and historical claims, to identify problem areas for further investigation and evaluation for grease management.

In [Insert year(s)], all FSEs [Insert "were" or "will be"] visited to develop a database of contacts and to determine the types of FOG removal technologies employed at each facility. A seminar with the FSEs [Insert "was" or "will be"] held to provide information on the grease problem and the [Insert City/Town name] inspection program. A map was developed showing the food service establishments and grease hotspots. [Insert details such as "The EPA and state agency were contacted for assistance,..." and what type of assistance they provided]. An informational brochure was mailed to all residents and posted [Insert "with" other information that you include on your website ] on [Insert City/Town name]’s website.

The [Insert position, e.g., City (orTown) attorney or legal counsel] reviewed the existing sewer use ordinance and found that it grants authority to [Insert City/Town name] to regulate discharges to the sewer system, including grease. [Insert City/Town name]’s sewer use ordinance prohibits discharges to the collection system containing more than [put in number that applies, such as 200] ppm of FOG, or at levels that interfere with the operation of the system. The ordinance also authorizes inspection of facilities during normal business hours.

*[If your community or system has enacted policies and procedures, use the following paragraph to describe what you have done. If not, consider implementing a program and describe your plans in the following paragraphs]*

The [Insert "City" or "Town", and organization (e.g., council, Board of Selectmen)] enacted a policy and procedures requiring all commercial and industrial grease generating facilities to install and maintain a grease interceptor or automatic grease removal device, and maintain records of maintenance and operation. The policy also includes annual inspections of FSEs that will be done by our [Insert "pretreatment staff" or if you regulate it through another program or department, specify] and the Board of Health. The annual inspection is [include the cost of the inspection if there is a charge, or "free"]. If the grease interceptor has not been maintained (with documented removal of accumulated grease and cleaning), has been bypassed, or if significant grease is discovered within the service connection, [Insert City/Town name] will issue a letter to the owner giving notice of the ordinance/policy non-compliance and requiring action be taken to prevent further discharge of grease into the system. A follow-up inspection will require a fee of [indicate the cost of follow up]. If the non-compliance is not remedied within [indicate time frame allowed by ordinance or policy] days, the policy states that the enforcement authority of the sewer use ordinance may be invoked.

[Insert City/Town name] has a [insert contractor and name, or equipment that the system owns and uses] to clean the sewers in these problem areas at a high priority frequency (See Table [Insert table number from Section 3]. All emergencies are handled by [indicate how emergencies are handled, e.g., contractor, or if there is a 24-hour number and city/town department to handle them] (see the [Insert City/Town name] Sewer Overflow Response Plan).

*[If your FOG program has been successful, consider editing the following paragraph, or describe how you intend to improve your FOG program]*

To date, the FOG program has been effective in reducing blockages due to grease, and [Insert City/Town name] has not needed to implement a permit program or require FSEs to monitor for FOG. [Insert City/Town name] is also evaluating data to see if the cleaning frequency in [specify if specific areas are being evaluated] can be reduced. [include a sentence about keeping materials and/or webpage up to date and any ongoing FOG program work]

**b. Root Control**

*Roots can be a significant cause of sewer blockages in some areas of your collection system, potentially leading to SSOs. Problem areas with root intrusion should be identified in the priority cleaning in Section 3.a. Identification of these blockage “trouble spots” and their causes is usually based on blockage history and line investigation. Areas with root intrusion should be addressed when you identify trouble spots and set your sewer cleaning schedule. Identify areas or line segments of the wastewater collection system subject to root blockages and establish a prioritized preventive cleaning schedule for each. An interim high-frequency cleaning program can be the first step in addressing the problem. Mechanical removal is the most common form of root control. This template section is written for a mechanical removal program. If you have a chemical root control program, replace the following with a description of your program.*

[Insert City/Town or system name] currently uses mechanical root removal for sewer lines with chronic root problems (see Table [Insert number]: Collection System Inventory of Trouble Spots and Schedule for Priority Cleaning in Section 3**)**. 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.

Cutting a tree’s roots is like pruning the tree, and stimulates root growth into the system.

Consequently, mechanical treatment must be repeated every year or two, which is factored into the cleaning schedules. *[If the system is using chemical treatment for roots or considering the use of chemical treatment, edit the following sentence, otherwise, delete]* [Insert City/Town or system name] is also investigating a chemical root treatment program to control root growth in the collection system.

Root control is also a major part of easement maintenance, as described in Section [Insert section number].

**c. Service Laterals**

[If you do work on service laterals, edit the following paragraph. If, instead, you refer the owner of the service lateral to a list of plumbers, edit the paragraph to indicate how owners access that information]

While [Insert City/Town or system name] 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. [Insert City/Town or system name] will repair laterals that are located in the public right-of-way when responding to service complaints. If a complaint is received and the [system or department name] 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. [Insert City/Town or system name] also televises this portion of the lateral if needed. Since [Insert year], [Insert City/Town or system name] has averaged approximately [Insert number of feet] ft of service lateral CCTV inspections per year.

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 field crew provides the property owner with [Insert a description of the information you provide and attach a copy or reference your webpage where the information is accessible].

[Insert City/Town or system name] is evaluating our flow monitoring data to determine the amount of infiltration from laterals and will consider funding lateral rehabilitation if it proves to be cost effective. We are also considering adding a requirement that service lateral condition be evaluated as part of a home the sale.

5. EASEMENTS and PAVING: MAINTENANCE AND ACCESS

Pipeline easements are often a critical link in a collection system. You need to know where your easements are and maintain them to ensure ready accessibility in the event of an emergency. If you do not know the location of all easements, and more importantly, the locations of your collection system components within the easements, a plan must be developed to locate them. Outline your plans for easement maintenance. Provide access by removing obstacles or by having equipment readily available for cleaning, inspection, assessment, and repair.

**a. Maintenance of Right of Way and Easements**

Easements give [Insert City/Town name] the right to install and maintain sewer and water facilities on property not owned by the [Insert "city" or "town"]. Easements in [Insert City/Town name] are usually no more than [Insert distances to fit what your system has, eg, "20" ] feet wide, but run from [Insert distances to fit what your system has, eg, "several hundred"] feet to [Insert distances to fit what your system has, eg, "several miles"] in length. [Insert City/Town name] has [Insert number] sewer access easements. These easements are recorded as deed records that are accessed through [Insert City/Town name]’s [Insert e.g., assessor’s department, or location such as County Registry of Deeds]. The Inventory of Sewer System Easements (Table [Insert number], below) lists the easements for the sewer collection system. Figure [Insert number] shows the location of the easements.

**Table** **[Insert number]: Inventory of Sewer System Easements**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Location** | **Assoc. Manhole ID #** *(eg GIS # )* | Owner of Property | **Comments** | **Type of maintenance, frequency, and responsible party** |
| [e.g. End of High Street through conservation land to Main St.] | [e.g. MH 5-54] | [e.g., Town Conservation Commission] | [e.g. contact conservation administrator when scheduling maintenance. Attend conservation hearing] | [e.g., Sewer Dept. inspects annually, DPW removes brush, as needed] |
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Easements are important for our ability to operate and maintain our collection system. [Insert City/Town name or department name]’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. [Insert City/Town name or department name] 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. [If you have summary information on your rights to access easements, whether it is deed information or bylaws, etc., it might be worthwhile to summarize it here so that crews can have it readily available should they need to know the basis for their authority].

[Edit the following paragraph to provide the information on your maintenance activities that you think is important for your staff and town to know]

Maintenance of easements is accomplished in various ways. Easements on privately-owned parcels are often maintained by the owner. The Building Inspector refers construction questions as they arise, to the sewer department. Easements on public land are maintained by the entity responsible for property upkeep, as indicated in the Inventory of Sewer System Easements, Table [Insert number]. The [Insert department] uses signage on many of the manholes within easements to make it easier for field crews to locate them and for property owners to see their location. Manholes in easements are inspected as part of our ongoing preventive maintenance program.

[If you have easements with limited access, use the following paragraph and table to outline your plans for improving access.]

[Insert City/Town name or department name] has a program to identify and improve easement access where needed. Table [Insert table #], below, lists those areas.

**Table** **[Insert number]: List of Collection System Easements with Limited Access**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Location** | **Manhole IDs** *(eg GIS # )* | Owner of Property | **Description of Access Problem** | **Plans to Improve Access** |
| [e.g.Runs north side of property at 20 Main St. through to Elm St.] | [e.g. MH10-54 to MH 10-667] | [e.g., John and Mary Doe] | [e.g. The NE corner of the Doe's garage is on top of the easement] | [e.g., Contact the Doe's by [date], work with property owner to develop plan for access] |
|  |  |  |  |  |
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[If your system includes manholes that you haven’t been able to locate in the field, use the following paragraph and table to define your plans for identification and maintenance.]

[Insert City/Town name or department name] has a program to identify manholes that have been paved over, or are on department maps but not found in the field. Table [Insert table #], lists the manhole locations and the schedule for locating and uncovering them.

**Table** **[Insert number]: List of Suspected Manhole Locations to be Cleared**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Physical Location of Manhole** | **Manhole IDs** *(eg GIS # )* | **Description of Suspected Problem** | **Schedule for Manhole Access** | **Date for Manhole Access** |
| [e.g. in Main St. at the corner of Elm and Main.] | [e.g. between MH A-4 and MH A-10] | [e.g. Manhole suspected paved over in 2000] | [e.g., line scheduled for CCTV investigation [date], will confirm if Manhole is paved over] | [insert date by which manhole must be cleared] |
|  |  |  |  |  |
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b. Street Paving Coordination

[Edit the following paragraph to provide the information on your maintenance activities that you think is important for your staff and town to know]

[Insert city/town name]’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 [Insert number of years your paving schedule is revised on, eg, "5"] year schedule is developed each budget year. This list is distributed in [Insert month] to [Insert specific departments, such as wastewater division] 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.

*[Consider including an example list or format that illustrates your town’s process.]*

When the [Insert department, e.g. wastewater division] obtains the resurfacing list from Public Works, 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 our 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 our Cleaning, Inspection and Assessment program (See Section 3), 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. Upon completion of the sewer repairs for an individual street, it is released to Public Works for resurfacing.

During paving work, the [Insert department who does the work, e.g., whether it is Public Works or the wastewater division, or if it is part of your contracted operations] prepares manholes prior to the re-paving of any street with sewer lines. [Insert a sentence or two to describe how manholes are protected, restructured, or repaired during paving].

**6. PUMP STATION/FORCE MAIN MAINTENANCE**

[Edit the following paragraphs to describe your equipment and any private pump stations. Delete any text not applicable to your system.]

[Insert City/Town name] owns and operates [Insert number] wastewater pump stations listed in **Table** [Insert number]. The collection system also includes [Insert number] grinder pumps that service homes along the [Insert details of where any grinder pumps are located, eg. along Lake Name] and [Insert number] private pump stations. The pump stations owned and operated by [Insert City/Town name] are routinely checked by trained personnel. The maintenance for the grinder pumps and private pump stations is the responsibility of [Insert "city" or "town" or name of your department, or if the responsibility of the owners, describe].

The performance of the [Insert City/Town name] pump stations is monitored through [Insert frequency, e.g., "daily"] inspections [Insert "and our SCADA system", if you have SCADA]. During these inspections, [Insert job position who does this work] reviews pump run hours, totalized flow, wet well levels and alarms. Back-up generators are exercised monthly. On an annual schedule, [Insert name of contractor or department that does this function] pumps the wet wells, removes grease build up, and calibrates the floats. Specific pump station inspection protocols are attached in Appendix [Insert number] for each of [Insert City/Town name]’s [Insert number] pump stations.

Inspection, maintenance and repairs are recorded on [Insert your tracking mechanisms, eg. log book(s), computer-based information systems, describe what you use] at each station and logged into the computerized maintenance management system (CMMS). If a problem or maintenance issue is encountered, personnel must also report it [Insert timeframe, e.g., 'immediately" or "by the end of their shift"] directly to the [Insert position, e.g., supervisor] for resolution. The CMMS [Insert how generated, e.g., "automatically" or if supervisor prints out on a monthly schedule] generates work orders for repairs and routine maintenance. Repairs are a higher priority than routine maintenance.

[Insert City/Town name] [Insert "has"," has recently installed", or "plans to install"] a Supervisory Control and Data Acquisition (SCADA) system for the [Insert names or references for pump stations that have SCADA] pump stations. The SCADA remotely controls and monitors pump station operations, and sends alarms to the [Insert position, e.g., supervisor] in the event of a malfunction or emergency. The SCADA system records all activities at a pump station and provides a hard-copy printout for backup documentation. The SCADA provides continuous status of pump station operations for the following items: *[edit list to add or delete what you are monitoring or plan to monitor with your SCADA]*

* Number of pumps in operation
* Status of pumps (including operational alarms)
* Current pumping flow rate
* Historic flow rate (24 hour Flow Chart)
* Pump start / stop cycles
* Power status (including power failure alarms)
* Wet well conditions (depth, lead / lag elevations, etc.)
* Personnel status (entry / exit alarms)

*[Edit the following paragraph to reflect the status of your system]*

Pump stations with the remote monitoring capabilities of an installed and fully functioning SCADA can be evaluated to determine the need for daily physical inspections.

*[If you do not have SCADA in all stations, and if you are evaluating the maintenance of private pump or lift stations, edit the following paragraph, otherwise, delete]*

Other pump stations will be included in the SCADA system in future years as funding allows. [Insert City/Town name] is also discussing assuming the responsibility for maintenance of the grinder pumps for the homes along the [Insert areas with grinder pumps, e.g. along Lake name, etc.].

*[Edit the following table to include pump station and description as well as inspection frequency. If all pump stations are inspected on the same frequencies (various equipment may require daily checks while other equipment may require quarterly inspections e.g.), you may want to delete the column]*

**Table** [Insert table number]. **Pump Station Locations**

|  |  |  |
| --- | --- | --- |
| **Pump Station Location** | **Description** | **Inspection Frequencies\*** |
|  |  |  |
|  |  |  |
|  |  |  |

**\* D = daily; W = weekly; M = monthly; Q = quarterly; SA = semiannually; A = annually**

**Table** [Insert table number]. **Pump Station Equipment** *[repeat table/ rows, as needed. Separate tables can be created if equipment varies at different pump stations, or a column can be added to indicate the equipment at each pump stations]*

|  |  |  |
| --- | --- | --- |
| Equipment | Number | Specifications |
| Pumps | [number] | [include meter specifications- eg, Brand and Model, rpm, size impeller, rating and serial numbers] |
| Motors |  | [include motor specifications- eg, Brand and Model, rpm and hp, volts, amps and serial numbers] |
| Control Panel |  | [include specifications- eg, Brand and model number, types of alarms, amp rating and serial number(s)] |
| Float Switches |  | [include specifications- eg, Brand and model number, volt and amp rating] |
| Valves |  | [include specifications- eg, Brand and model number(s), type (eg plug, check), and size(s)] |
| Air Compressor |  | [include specifications- eg, Brand and model number, volt and hp rating] |
| Meters |  | [include specifications- eg, Brand and model number and details] |
| Alternate Power Sources | [number] | [include details of what you have for alternate power] |

Manufacturer’s Operation and Maintenance (O&M) manuals for equipment are located in [Insert location(s) where manuals are kept e.g., "each pump station and a copy at the DPW offices"].

Pump rebuilding, motor rewinds, and HVAC repairs for the pump stations are contracted to [Insert names of vendors who do this work]. Repairs to motor control centers, flow meters, remote monitoring equipment, valves, and macerators are typically repaired by [Insert City/Town name] maintenance crews. In general, any replacement parts that are difficult to acquire are kept in stock by the [Insert who has parts, e.g. Sewer Division]; other parts are obtained from local vendors or the manufacturer’s service center (See Spare Parts Inventory). As pumps and other parts are replaced, [Insert City/Town name] is making an effort to standardize pumping station equipment as much as possible.

Whether repairs are made by local vendors or by [Insert City/Town name] personnel, all repairs are recorded and tracked with the [Insert "CMMS" or your software, spreadsheet or database].

**a. Mechanical and Electrical Maintenance**

The size of the pump station and its related equipment determine its specific mechanical and electrical maintenance needs. The [Insert title of responsible person in your system, e.g. maintenance supervisor] is responsible for incorporating the routine maintenance of each pump station into the [Insert "database", "CMMS", or whatever method you use to track this work]. The [Insert title of responsible person in your system, e.g. maintenance supervisor] uses manufacturers’ Operation and Maintenance manuals to establish action items for pump station equipment. Pump stations listed in Table [Insert table number] have individual inspection protocols attached in Appendix [Insert number]. A general description of weekly and bi-annual maintenance performed on pump stations by the [Insert who does your maintenance, e.g. Sewer Division] is listed as follows:

[The following lists are provided only to show how a program can be described. Edit to reflect what is required by equipment manufacturers, what you have been doing and what you would like or need to include in your preventive maintenance program]

|  |  |
| --- | --- |
| Mechanical Maintenance/Inspections | Electrical Maintenance/Inspections |
| Daily | |
| Review pump run hours  Review totalized flow  Check wet well levels, check for debris, turbulence or unusual noise  Check alarms  Ensure that all switches, controls and valves are in the correct position  Pick up litter, general housekeeping  Record findings in log book | Ensure all breakers are on Ensure that all switches and controls are in the correct position |
| Weekly | |
| Log pump hours  Check hydraulic levels  Operate each pump  Check drive belt  Check bearings and packing  Check for pump vibrations, unusual noise, and excessive heat  Check pump and pump base connections  Check chart recorder for routine pump performance  Check valve operations and signs of leakage  Lube and grease equipment (as required by manufacture)  Check, clean and maintain property  [include odor control or grinder screens as applicable to your stations] | Check chart recorderCheck Motor Control Centers (MCC)Check level controllers Check electrical service feed  Check remote monitoring equipment  Check indicator and alarm lamps  Check general electrical items (lighting, etc.)  Check and release intrusion alarm |
| Monthly | |
|  | Check back up generator Exercise stand by power |
| Bi-Annual | |
| Replace hydraulic fluids and oils (as required by manufacturer)  Inspect pumps (oil levels, seals, packing, bearings, etc.)  Replace packing  Inspect pump impellers and clearances  Inspect discharge piping  Check outflow pressure  Calibrate gauges (including pressure gauges used in monitoring)  Check for corrosion problems  Exercise check valves  Check air release valves  Check floats/bubbler system (clean and/or replace) Inspect building and grounds  Check operation of building heat and fans  Inspect HVAC equipment  Check building security | Inspect internal Motor Control Center com-ponents Check insulation resistance Inspect & grease electrical contacts  Inspect electrical pump cables  Inspect electrical breakers  Perform amperage readings on equipment  Check MCC for proper operations  Check Generator:  oil level  water level [*if a level gauge is installed]*  fuel level  inspect hoses and belts  check piping for leaks  check battery condition |
| Annual | |
| Pump the wet wellsRemove grease build upService and calibrate all instrumentation:flow meters, level sensors, alarms, elapsed time meters and telemetry equipment | Alternate Power Sources checked and run as part of emergency drill |

Capacity and discharge head in the pump stations are reviewed annually, following confirmation that the pumps are in good working order. Changes in capacity and discharge head are evaluated to determine whether cleaning of the force main is warranted.

All mechanical and electrical maintenance activities are recorded on a log sheet at each station and entered and tracked by the [Insert "CMMS" or your software, spreadsheet or database]. The [Insert "CMMS" or your software, spreadsheet or database] [Insert how generated, e.g., "automatically" or if supervisor prints out on a monthly schedule] generates work orders for both weekly and bi-annual preventive maintenance actions. These work orders are left in an “open” format until maintenance crews enter completion comments pertaining to the work order. Any problems or maintenance issues noted by crews are reported to the [Insert title of responsible person in your system, e.g. maintenance supervisor] for resolution.

[Edit the following paragraph to reflect the number of force mains and air release valves in your system. Delete if you have no force mains and change the table of contents.]

**b. Force Main Maintenance**

[Insert City/Town name] currently has [Insert number] force mains in the collection system with a combined length of [Insert number] miles. The [Insert name designation of force main] force main has [Insert number] air release valves located at the high points: [Insert locations]. *[Repeat the previous sentence for each force main that has one or more air release valve].* The [Insert name designation of force main] is not long enough to warrant air release valves. Our system includes a total of [Insert number] air release valves. [Insert City/Town name] inspects and maintains the air release valves semi-annually by back flushing the valves with clean water using a minimum of 30 psi. All air release valves and valve vaults are inspected for signs of corrosion, connection point leakage, or improper operating characteristics.

The pressure on the discharge side of the pump is used to determine the need for force main cleaning. If the backpressure is more than 25% greater than the expected total operating head, the discharge pipe will be cleaned. Pressure gauges are calibrated during the [Insert frequency] inspection.

*[If your system has private pump stations, include details on your requirements and responsibilities below, otherwise delete the following section and change the table of contents. Note: in Rhode Island, operations and maintenance plans are required to address private pump stations.]*

**c. Private Pump Stations**

[Insert City/Town name] currently has [Insert number] private pump stations that discharge an average of [Insert number] gallons per day to the collection system. These privately owned and operated pump stations are required to [Insert details of what you or your town require when these stations are installed; e.g. requirements for inspection, maintenance and/or emergency response capabilities or contracts]. The following table lists the private pump stations, owners and locations in [Insert City/Town name].

**Table** [Insert table number]: **Private Pump Stations** *[repeat table/ rows, as needed. A separate table should be created if you have details on the equipment at different private pump stations]*

|  |  |  |  |
| --- | --- | --- | --- |
| Pump Station Name | Location | Owner | Owner/operator contact information |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

Of the [Insert number] of private pump stations in [Insert City/Town name], [Insert number] have a history of service calls and overflows. The history of these issues since [Insert year, e.g. 2003] is summarized in table [Insert table number], below.

*[For any private pump stations that have a history of problems and/or SSOs, include in the following table. If none, delete the paragraph above and the following table.]*

**Table** [Insert table number]: **Private Pump Station History Since** [Insert year, e.g. 2003]*[repeat table/ rows, as needed.]*

|  |  |  |  |
| --- | --- | --- | --- |
| Pump Station Name | # Service Calls | # SSOs | Issue/Resolution |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

*[If your system has problems with corrosion, include details on your corrosion control processes below, otherwise delete the following section and change the table of contents]*

**d. Corrosion control**

The dissolved oxygen content of the wastewater is often depleted in the wetwell of the [Insert name or names of problem stations] pumping station. This wastewater passing through the force main not only lacks oxygen, but often contains sulfides. These sulfides have led to corrosion in [Insert description of where corrosion has been noted, whether pump station equipment or force main valves, or concrete pipes, etc.]. Frequent [Insert what you do e.g.,"cleaning and maintenance", "treatment by \_\_\_\_ " product, etc.] of [Insert description of where or which pumping station(s) or area of force main] is required to prevent solids and grease buildup and minimize corrosion due to the high concentration of sulfides. *[If you use chemical treatments to increase oxygen or control sulfides, include a description of specifically what you want your crews to know to do].*

#### 7. REACTIVE MAINTENANCE

A comprehensive Preventive Maintenance program should include procedures to address unplanned events. The foundation of planning for the unexpected is knowing the capabilities and limitations of your staff and resources. The next step is to formulate contingencies for all types of upsets that your system has encountered in the past or could encounter in the future.

Just as your preventive maintenance program is based on a prioritization specific to your system; likewise, reactive maintenance should involves a prioritization process to determine the timeframe for repairs. Emergency response is always a top priority, however, other unplanned events may need scheduled repairs.

Use this section to describe how you react to unexpected maintenance issues and how you incorporate corrective actions into your preventive maintenance program. This template provides a few key principles, but it will be up to you to assign your priorities for reactive maintenance. Specific procedures for reacting to an overflow are provided in the template section in Appendix A (a template for a Sewer Overflow Response Plan (SORP)), and the following is written assuming you have used the SORP in the Appendix. If you use an alternative emergency response plan, edit references to the SORP that appear in this chapter. Finally, consider developing a comprehensive list of contractors, technical sales representatives, consulting engineers, and material supply companies that you may need in the event of an unplanned event.

This chapter outlines the process used by [Insert City/Town name or system name] to respond to non-overflow, unplanned maintenance needs in our collection system. It also provides an overview of responsibilities for emergency events. While Chapter 3 outlines [Insert City/Town name or system name]’s preventive maintenance and [Insert "Appendix A" or other title for your emergency response plan] details [Insert City/Town name or system name]’s response procedures for emergency sewer overflows, this chapter is written to address those unscheduled maintenance events that don’t result in overflows or backups of sewage into basements. [If you keep copies of the SORP separately, or if are not using the appendix, include the following information, otherwise delete:] The [Insert "Sewer Overflow Response Plan" or other title for your emergency response plan] is available at [Insert description of where the plan is kept]. Crews are trained on sewer overflow emergency response as [Insert "as part of that plan" or, "with the Local Emergency Planning Commission (LEPC)" or other method to describe the training for emergency response].

The following programs are typically utilized in a reactive maintenance situation: *[edit the following list to include other programs you may use, or delete those you do not have]*

* [Insert name of program you use] - information management system
* Equipment and supplies
* Customer service
* Water Quality Monitoring - [Insert your lab location or name of laboratory that you use]
* Pump station programs - [Insert details to direct your crews or the reader if you have more information]

Sewer Overflow Response - [Insert "see Appendix A" or other location for your plan] – is always a priority situation, details are provided in [Insert City/Town name or system name]’s Sewer Overflow Response Plan (SORP).

Responsibilities for reactive maintenance are assigned by the [Insert title (such as sewer system supervisor, DPW director) for who assigns the tasks] based on level of priority for response (as noted in the table [Insert table number], below).

**a. Corrective Maintenance**

*The key aspect of corrective or reactive maintenance is to determine how to prioritize repair needs so that they do not become critical and result in overflows. The following paragraphs provide some examples, and a table that can assist in outlining your plans; however, the way you respond will depend on the characteristics of your system.*

Most repair needs are identified while conducting routine maintenance, inspections and assessments. Because there is such a wide range of potential unexpected events that it is not possible to prescribe the appropriate repair for every possible scenario, [Insert City/Town name or system name] has established a prioritization scheme for determining the timing of repairs outlined in Table [Insert table number], below. This is based on the types of problems that have occurred in the collection system in the past or could occur in the future. While this contingency analysis focuses on system upsets that would not result in immediate sewer overflow, the response timing is based on the potential for a resulting sanitary sewer overflow. Overflow response is covered in Appendix A.

Low-risk items, such as light bulbs or [Insert specify examples of parts that are considered non-critical], and small non-critical valves, are planned for run-to-failure, and as such, are not part of the PM Program. These items are replaced when they fail. When assets critical to the process fail, they are scheduled for corrective maintenance either on an urgent or routine schedule. Some of these repairs are handled under the operations and maintenance account, and some must be put in as capital improvements as part of our asset management activities depending on asset cost and life expectancy. Assets valued at greater than [Insert number] dollars and with a useful life of greater than [Insert number] years are included in the capital budget.

Corrective maintenance repairs include (but are not limited to):

*[Edit the following listing to include or eliminate those repairs that you want to list for your crews to know and consider when using this plan]*

• cleaning to eliminate flow problems that are noted during inspections

• spot repair or replacement of a pipe that shows signs of deterioration

• replacing a rattling or failed manhole cover

• repairing or replacing a pump that is becoming clogged or has been damaged by debris

• responding to, investigating and mitigating customer complaints (see the SORP, Appendix A, for response to complaints of sewer overflows)

• repairing system parts subject to vandalism

Corrective maintenance response is outlined in Table [Insert table number]

b. Scheduling

Scheduling of repairs runs the range from repairing components found to be in substandard condition during inspection, immediate repairs to pump stations that are malfunctioning, to major, capital-intensive, repair projects, such as a manhole-to-manhole pipe replacement or rehabilitation (see Appendix A for manhole to manhole pumping on an emergency overflow). An emergency, however, always supersedes scheduled maintenance. Timing of other repairs is done by [Insert a brief description of how you schedule these larger repair projects, e.g. include if you incorporate into capital planning, software and/or if it is put to a commission or town board]. Major replacement or rehab may be capitalized outside of the annual operating budget when [Insert description for when you go out of the Capital Program to fund repairs. Provide as much description as you think will be useful to your crews and other users of this plan].

**Table** [Insert table number]: Collection System Non-Emergency Response and Repair Priority *[include your information in the following table, some examples are provided, add additional rows as needed]*

| **Problem** | **Response Time** | **Action** | **Repair Time Goal** |
| --- | --- | --- | --- |
| [Insert problem eg "Failure of pump in [name of] pump station"]  *add rows for other pump stations with different holding capacities* | [Insert time, eg "[name of] pump station has a holding time of 2 hours"] | [Insert action, eg, "switch to back up pump, assess repairability of pump or contact [name of] pump supplier"] | [Insert goal such as "within 1 hour of pump alarm"] |
| [Insert problem, eg, "potential pipe failure identified during CCTV inspection"] | [Insert time, eg "Within one working day of report"] | [Insert action eg. "Contact [name of contractor] under [name of contract] and schedule repair"] | [Insert time goal] |
| [Insert problem, eg, "Inspection shows evidence of system surcharging, no ongoing overflow"] | [Insert timing such as "Within 1 day of receiving report or discovering problem"] | [Insert action eg, "Clean sewer line and/or check for proper downstream pump station operation and repair as needed. Re-evaluate problem following cleaning/repair. Begin I&I evaluation and corrections if not corrected."] | [Insert time goal such as "Within # hours of arriving on site for cleaning and station repairs. Initiate I&I evaluation and corrective actions within # days"] |
| [Insert problem, eg, "Failure of Backup Power System during test"] | [Insert timing such as "Within # days of receiving report or discovering problem"] | [Insert actions such as how you would assess whether the equipment could be repaired, and "repair" or "replace" equipment ] | [Insert time goal such as "Within 10 days of response"] |
| [Insert problem eg., "Complaint of odor" or "rattling manhole", etc.] | [Insert timing such as "within # days of report"] | [Insert action you want your crews to take] | [Insert time goal] |

c. Tracking and Recording Repairs

[Insert "Sewer department staff" or more detailed description of who is responsible] document corrective maintenance needs [Insert "in the log book", or "in the [specify maintenance tracking] system", or your reference for work order system] at the time of the event. Corrective maintenance tasks are recorded [Insert "in the log book" or "[specify name of recording form" or reference for where crews report completion] when completed and then [Insert who enters the information into your data files] inputs them into our [Insert "CMMS database" or other system that you use for tracking]. CCTV or other failure analysis may also be done by staff as a corrective maintenance task after a problem occurs when [Insert a brief description of when crews would be expected to use CCTV] to diagnose the cause of the problem and recommend repairs and schedule changes if needed. Findings may lead to a spot repair of the pipe, root cutting, root foaming with an herbicide, re-cleaning for grease or debris removal on a periodic preventive basis, and if so, these tasks are included in an update of our schedule as described in Section 3, Cleaning, Inspection and Assessment.

**d. Complaint Response**

*A strong complaint response program begins with a clear channel for complaints to come into the department with well-trained staff taking the information from complainants. Establish who will be answering calls and provide training on communication skills to handle the calls. Widely advertising the complaint number will help to get the word out (local newspapers, city/town website, bill stuffers, community connections, local cable TV - are all ways to advertise and get the word out). Create a tracking system to log complaints and follow ups use it to help you assess where your trouble spots and problem areas are. This information should be used to update your preventive maintenance schedules and policies.*

The [Insert name of department that responds] is responsible for responding to sewer service complaints. Complaints are generally related to sewer stoppages, overflows, or odors. Response is performed by the [Insert "collection system staff" or reference to your crew(s)] during work hours ([Insert your hours of operation where calls are answered by the name of department that responds a.m. to p.m.]) and by [Insert "the supervisor on call" or name of contractor if you use a contractor on call for off hours, or reference to your off hours contact(s)] during off work hours ([Insert the hours that an outside number responds p.m. to a.m.]). The [Insert name of department that responds] provides directions for after-hours service on [Insert your program, e.g., "the answering machine at [##-####]"] and on our website [Insert web address].

Complaint response includes both assessing the complaint and resolving the problem. The majority of our complaints are related to [Insert where most of your complaints come from, such as "stoppages in lateral sewers", "fats, oils and grease in the Main Street line", some combination or description of where your complaints are from]. During work hours, a cleaning crew is diverted to remove stoppages. During non-work hours, [Insert city/town name] uses [Insert your method for after hours, such as the department that responds or the name of the contractor] on stand-by to address complaints. See Customer Service, Section [Insert Section #, Template Section is 1.d.] and [Insert "Sewer Overflow Response Plan" or other title for your emergency response plan] for further details.

The [Insert "City" or "Town" or name of department that responds] tracks these complaints and response activities [Insert "in a spreadsheet", "in our CMMS", or describe the method you use to track complaint and response], evaluates response time, trouble spots and [Insert other uses for your logs], and uses the information to assess our performance, update this plan and prioritize repairs.

**e. Reactive Response Summary**

*The companion Sewer Overflow Response Plan (SORP) Template (Appendix A) has extensive detail that can be used and edited to develop your system’s emergency response plan. Edit the information to fit your needs (e.g., you may or may not want home phone numbers in a widely distributed public document, but your crews should have the information they need. You can also cut and paste and edit the following information from the SORP in the appendix).*

**For detailed response information, refer to** [Insert "Sewer Overflow Response Plan" or other title for your emergency response plan]. This chapter does not cover overflow response, in the event of a spill or overflow, see the SORP and contact the following:

**Response Coordinator & Alternate**

[Insert Name of Superintendent or key person for contact

Office - [Insert Telephone Number of Superintendent

Home - [Insert Home Telephone Number

[Insert Name of Next in Charge

Office - [Insert Telephone Number of Next in charge

Home - [Insert Home Telephone Number

[Insert Information for others if needed

[Insert reporting info, e.g., "Rhode Island Dept. Environ. Mgmt. 401-222-4700" ] (during business hours, and see [Insert "Sewer Overflow Response Plan" or other title for your emergency response plan])

[Insert Information for others if needed]

*As recommended in the SORP template, in addition to this basic information, you should have a detailed map of your system and a communication plan should phones and radios not work. For example, arrange places to meet and designate less technical ways to share and distribute information.*

**8. EQUIPMENT AND TOOL INVENTORY**

*Continued system ‘operation and maintenance’ requires an adequate inventory of replacement parts. The process of identifying critical parts considers manufacturer’s recommendations, local availability and the experience of maintenance staff. If you have major equipment, you may also want to include it in your Asset Management program. To the extent that equipment, especially pump station equipment, can be standardized, this can help limit the size of the parts inventory that you need to keep on hand.*

**a. Essential Day-to-Day Items**

[Insert City/Town name or system name] provides operations and maintenance crews with the essential work related items they use on a day-to-day routine basis. Should new or replacement equipment or tools be needed, the crew leader notifies the [Insert title such as "superintendent"]. The [Insert title such as "superintendent"] will issue the crew leader stocked items. For non-stocked items, the [Insert title such as "superintendent"] advises the crew leader of a local vendor [Insert City/Town name or system name] and requests 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

[Insert City/Town name or system name] keeps a limited supply of spare equipment and tools for personnel. In lieu of maintaining a full supply of spare equipment and tools for personnel, [Insert City/Town name or system name] has an annual “supply bid” for essential common equipment and tools. This bid requires the vendor to maintain “in-stock” items listed in the annual bid, and the vendor must have a local storefront for item pick-up. Non-bid equipment and tools can be purchased in amounts up to [Insert number of dollars e.g., "seven thousand"] dollars ($[Insert dollar amount, eg. "7,000"].00).

The large equipment and tools needed for certain tasks *[you may want to put specifics in here]* are obtained through current rental contracts or purchased through the [Insert name of department, e.g., "Procurement"] Department for permanent acquisition of the item for [Insert City/Town name or system name].

An inventory of the equipment and tools used by [Insert City/Town name or system name] to maintain the wastewater collection system is provided in Table [Insert table number]. A list of supplies and essential spare parts necessary to be kept on site for normal and emergency use is included in Table [Insert table number]. The estimated remaining life of the equipment inventory was calculated based on the date of manufacture, an estimate by [Insert City/Town name or system name] of the useful life expected, and factors that might be expected to extend or reduce the life of the equipment (e.g., repairs or hard use). The [Insert a description of any equipment that is going to need replacement or upgrade in the near future] equipment in the inventory requires replacement in [Insert an estimate of when youexpect replacement]. Specialized attachments are often used with these tools to perform specialized maintenance tasks such as [Insert details on specialized equipment, eg., "root removal or dislodging grease stoppages"].

***[The following is an example table of Current Equipment and Tool Inventory. Delete it and insert rows into the table below it for entry of the equipment/tools that you want to inventory. Note that due to repair, maintenance or use history, equipment may exceed its typical useful life or may need to be replaced sooner.]***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Description* | *Model Year* | *Use* | *Typical*  *Useful*  *Life, yrs* | *Estimated Year for replacement* |
| *Tractor/Backhoe*  *Flushing Truck (Jetter)*  *Vac-Con Sewer Cleaner*  *(Combo Jet/Vacuum)*  *Dump Truck (2-Yard)*  *Service Truck (Ranger)*  *Service Truck (Stand-by)*  *Compactor/Rammer*  *Gas Generator (2)*  *Diesel Generator*  *Sewer Power Rodder (2)*  *Root Cutters*  *CCTV Video Camera*  *Centrifugal Pump (3)*  *Mobile Radios (6)*  *Gas Detection Monitor*  *Safety Tripod*  *Computers/GIS Photography* | *2001*  *2004*  *1999*  *2005*  *1995*  *1995*  *1999*  *2002*  *1996*  *2000*  *1999*  *2003*  *1998*  *2003*  *2001*  *2000*  *2003* | *Sewer repairs*  *Sewer flushing*  *Sewer flushing/vacuuming*  *Haul sewer debris*  *Sewer supervisor truck*  *Sewer service truck*  *Sewer trench compaction*  *Portable power for hand tools and lighting*  *Emergency generator*  *Sewer lateral and easement rodding*  *Sewer pipe cleaning*  *Televising sewer laterals*  *Sewer bypass pump*  *Field vehicle*  *Confined space entry*  *Confined space entry*  *Sewer system management* | *15*  *10*  *10*  *10*  *10*  *10*  *10*  *5*  *12*  *10*  *10*  *10*  *10*  *5*  *5*  *10*  *4* | *2017*  *2014*  *2010*  *2015*  *2010*  *2009*  *2010*  *2008*  *2008*  *2010*  *2009*  *2013*  *2010*  *2008*  *2010*  *2012*  *2008* |

**Table** [Insert table number]: Current Equipment and Tool Inventory

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Description | Model Year | Use | Typical  Useful  Life, yrs | Estimated Replacement Year |
| [Insert equipment description] | [Insert year] | [Insert description of use] | [Insert number of years expected from the equipment] | [Insert year you estimate you will need to replace the equipment] |

**Table** [Insert table number]: Supplies and Essential Spare Parts

|  |  |  |
| --- | --- | --- |
| Description | Use | Quantity  On hand |
| [Insert description of supply or part] | [Insert description of use] | [Insert number] |

**9. CAPACITY MANAGEMENT**

The capacity of a collection system is determined by the size and condition of its parts. Generally, system operators know if they have capacity problems contributing to overflows.

You should be assessing capacity within the collection system as you note whether any portions of the system are subject to surcharging and overflows. These assessments and your overflow report tracking provide information that is critical for planning and decision making to:

Set up and conduct priority cleaning

Direct extraneous flow investigation(s)

Implement capacity evaluation program(s) and the need for hydraulic models

Implement programs for detecting, identifying and removing inflow and infiltration (I/I) sources

Address the prevention of sanitary sewer overflows

Determine whether new connections may be permitted

Determine rates and your fee structure for future connections.

Even when the treatment plant flows are within the designed capacity of the treatment plant, there could still be capacity issues in the collection system. Any portion of the collection system could be receiving flows in excess of its design capacity, or could be surcharging, due to capacity limitations associated with inadequate size, inadequate cleaning or other physical restrictions. Where these conditions are suspected or verified, you should use specific evaluation methods to determine the sources of the physical restrictions and whether excessive extraneous flows are entering the collection system.

**a. Capacity Background**

[Insert City/Town Name or name of system]’s collection system [Insert "has", "has not to date", or how you would describe your system's current capacity] exceeded design capacity to contain wastewater flows from the [Insert "city" or "town"]. *[If you have known capacity issues in only certain areas of your system, you can include a sentence or two about that here.]* The following tables and discussion summarize the state of our system capacity to carry and contain flows.

[Edit any of the following paragraphs that apply to describe the state of your evaluations and capacity of your collection system]

Sanitary sewer overflows and building and basement backups caused by capacity restrictions in [Insert City/Town Name]’s collection system have historically occurred in the following collection system locations.

*[Insert information in the table listing specific sewer segments and causes of the capacity issues. This table is directed at capacity issues and not other SSOs with other causes]*

|  |  |  |
| --- | --- | --- |
| Date | **Location of Capacity Problem** | **Cause of Capacity Issue** |
| [Insert date or dates] | [Insert specific location of concern] | [Insert known cause or causes or suspected cause] |
|  |  |  |

[Insert City/Town Name or name of system] has undertaken the following evaluations to identify and remedy the causes of these capacity issues:

*Use the following table to list and describe major findings of any capacity assessments, extraneous flow or other engineering evaluations* *including infiltration/inflow (I/I) or extraneous flow investigations, sewer system evaluation survey (SSES) investigations, Capacity Assessments, and/or hydraulic models, what they covered and when they were done.*

|  |  |  |
| --- | --- | --- |
| Study Title | Scope of Study | Date |
| [Insert description of study or name of report] | [Insert description of area covered by the study] | [Insert date] |
|  |  |  |

[Insert City/Town Name] has implemented the following measures to remedy and/or alleviate the capacity issues identified in the above table:

*[Provide as much detail as possible to indicate the work you are doing and plans for maintaining the capacity of your collection system.]*

*Circumstances can vary from system to system. This template recommends that you list the scope and date of the activities performed in response to your investigations using the following topic items to help provide details on your programs and the work you have done and plan to do. Add others that pertain to your collection system:*

* *Non-structural rehabilitation measures i.e. manhole and sewer testing & sealing programs*
* *Structural rehabilitation measures i.e. elimination of pipe restrictions; elimination of storm sewer--sanitary sewer cross connections, storm sewer catch basin redirection; manhole, sewer, and private lateral replacement; construction of relief sewers, force mains, pump station expansions etc.*
* *Development and calibration of hydraulic models*
* *Evaluation of the extent and capacity of storm water collection systems*
* *Implementation of extraneous flow and illicit discharge home inspections during property transfers*
* *Implementation of private extraneous flow incentive or disincentive (fines or flow surcharge) programs*
* *Increased cleaning to maintain collection system capacity*
* *Implementation of Fats, Oils & Grease programs*
* *Periodic review of flows received from satellite communities*
* *Implementation of sewer/DPW reviews of building permits*

[Insert paragraphs describing your programs]

In light of ongoing capacity issues, [Insert City/Town Name] plans to implement the following measures to remedy and prevent capacity restrictions that result in surcharges and sanitary sewer overflows in the collection system:

*At this point, describe your City/Town or sewer department’s specific plans and schedule to further investigate or evaluate the causes of any capacity issues that you have in your collection system, and how you plan to implement the measures necessary to resolve the capacity issues. This information should be updated annually. Include a discussion of your assessment as to whether the work can be performed by your workforce or outside contractors and provide a discussion of your plans to finance these activities or refer your reader to the budget Section 10.*

[Insert paragraphs describing your plans and schedule(s)]

**b. Sewer Capacity Certification/ Connection Policy**

*[Most communities have a program to assess capacity and effects of new development on its collection system. Edit the following to describe what your system does]*

Sewer Capacity Certification is a process where any new development requiring the connection of its sanitary sewer service to the [Insert City/Town Name or name of sewer system] sewer system is reviewed to determine whether adequate sewer system capacity exists to convey the new wastewater flow from the proposed development to our wastewater treatment facility. A capacity certification analysis by a professional engineer is required for all developments of [Insert number, such as "three"] or more units.

Separate from the connection fee, developers of newly-constructed homes and businesses are required to pay a sewer capacity charge for removal of infiltration/inflow (I/I) from the system. The fee is based on removing an amount of I/I equivalent to [Insert number you require, such as three or ten, e.g.] times the requested additional wastewater flow. The monthly capacity charge is assessed for [Insert number] years after connection, but property owners can save [Insert number] percent of overall charges if they choose to pay a lump sum upfront.

**c. Lateral replacement program**

*[The following provides a description of programs to address I/I issues with sewer laterals, edit to match what your system does]*

[Insert City/Town Name] has [Insert number of miles] miles of sewer mains and an almost equal length of private service laterals. The [Insert "City" or "Town" and political organization, e.g. City Council or Town Board of Selectmen] [Insert "passed", "has been asked to pass", "is considering adopting", etc. to match your programs] a policy that remedial work to remove infiltration within a sewer shed will also include private service lateral investigation and replacement if necessary. [Insert City/Town Name] will pay up to [Insert percent or maximum dollar amount] to repair or replace private service laterals. [Insert City/Town Name] will CCTV the service lateral at no cost.

**10. RESOURCES AND BUDGET**

*Funding and budgetary support form a foundation for the operation of the collection system. The planning process for your CMOM and Preventive Maintenance Plan should include an assessment of whether your resources (funds and staffing) are adequate for an acceptable delivery of services to the public, including capital repair and replacement. Further details on Asset Management concepts and determining your level of service are outside the scope of this template, but well worth considering as you improve your plans and programs.*

*You may have a facilities plan or a capital improvement plan that you use in budgeting for repair and replacement. You can bring that information into this template, work from the tables in this chapter, or use a software program that you already have. Remember, however, that following up on the preventive and reactive maintenance plans and issues in your collection system may require increases in budgets, both capital and operations and maintenance.*

*The resources required for effective wastewater collection system operation, maintenance, and repair include:*

*• A reliable, consistent, and sufficient funding source for both the operating budget and capital replacement plan. (A user-supported rate-paying structure, commonly known as an enterprise fund, is the strongest funding mechanism and is separate from general fund revenue sources.)*

*• A formal operation and maintenance budget and expenditure plan. – An operations and maintenance (O&M) budget includes all annual costs of operating and maintaining the collection system, including staff, equipment, tools, consumables (utilities, chemicals, etc.), contract services, spare parts, debt payments, and support facilities such as equipment yards or utility service centers. The O&M budget is usually funded by the sewer user charges and miscellaneous revenue. Some utilities have a policy requiring that funds should be available to pay for operating expenditures for up to 180 days at any one time. Funds in excess of this maximum balance can be transferred to the capital improvement fund. Also, the Government Accounting Standards Board includes recommendations on depreciation of assets. Depreciation expense would be included in the O&M budget and the revenues to offset the depreciation would usually be found in the capital improvement or reserve fund.*

*• A capital improvement plan (CIP) sufficient to ensure the continued longevity of the system. – A CIP includes all on-going funding for major rehabilitation or replacement of the collection system as it wears out, and upgrading of the system because of expansion. Costs include planning, design, construction, and inspection of new or rehabilitated facilities.*

*• Other resources may be required, such as contract services for operations and maintenance.*

*Perhaps the question that is most frequently asked is "How much will it cost to rehabilitate our sanitary sewer system and operate and maintain it in a way to prevent failures?” In order to answer this question, several decisions must be made.*

* *How much needs to be budgeted?*
* *Will a rate increase be required?*
* *Are other revenue sources available?*
* *Will a bond be necessary?*
* *What are the program's priorities?*
* *Is it crucial to abate I/I from private property?*
* *Can studies be conducted in-house?*
* *Can some of the rehabilitation work be done in-house?*
* *Can the program be phased? How long?*
* *Are there O&M savings?*

*Although a proactive assessment program will require some up-front capital investments, such as equipment and hardware, cities and towns can expect cost-recovery within a 3-5 year period (or less) depending on the reduction level of emergency repairs.*

*The following subsections have been written to provide an outline of your community’s budget process, the history of your budgeting and your rates, and a description of your planning process for both preventive maintenance within the operations and maintenance context and repair/rehabilitation within the capital projects context.*

**a. Budget Process**

[Insert your department's name]’s budget process complies with the [Insert City/Town name] budget cycle, which requires that the annual budget be completed by [Insert date (month, day) by which time you have to complete your budget] of each year. For the Collection System operations and maintenance budget, the process begins with last year’s numbers and projected needs for [Insert number of years] years into the future.

[Insert your department's name] works with [Insert consultant or committee name(s) that you work with on budget] to prepare for [Insert "budget hearings" or what type of presentations you may make to get your budget passed]. [Insert a further overview of your process, timing and which committee(s) you go through to get a budget passed].

**b. Rate Setting, Budgetary Policies and Financial History**

[Insert City/Town name or name of your department, who sets rates]’s rate-setting policies are based on the following principles:

*Edit the following list to include your requirements*

1. Rates and fees will be based on the actual cost to deliver each service.

2. Current rates must be sufficient to cover current costs and to meet all bond covenants.

3. Rates will include funding for Capital Improvement Plan projects included in an annually updated [Insert number, e.g. "ten"]-year financial plan (both operating and capital).

4. Rate increases will be [Insert a statement of your principles such as "implemented in a gradual and predictable manner, avoiding large one-time rate increases."]

5. Contributions to and usage of a rate stabilization fund, as needed. Each year, after reviewing pay-go financing and any other non-recurring financing uses of excess operating cash, the annual rate stabilization fund deposit, if any, is determined. This fund was established in [Insert year] and its balance at the end of FY-[Insert year] was [Insert number] dollars.

*Edit or add to the following to fit your history. If you do not have reserve or enterprise funds, indicate if it has been considered in your community or whether you have plans to implement this type of funding.*

[Insert City/Town name or name of your department] operates as [Insert how you operate, e.g. "an Enterprise Fund" or "a division of the DPW budget", etc.]. [Insert City/Town name or name of your department]’s revenue is generated from user fees, connection fees from new customers, pretreatment permits, fines, engineering review and inspections, interest earnings, and other miscellaneous income.

The [Insert time frame for user charges, e.g. "semi-annual"] user charge has two components: an administrative service charge and a volume charge based on [Insert what your fees are based on e.g., "average water use"]. [Insert City/Town name or name of your department]’s expenses included operation and maintenance, debt service, and capital reserve fund replenishment.

**c. Historical Rate Review**

Our current sewer rate structure is based on [Insert what your fees are based on e.g., "metered water use"]. Customers are billed [Insert time period eg; "quarterly"] for wastewater services based on [Insert percentage (usu. between 80 and 100)] % of the metered water use. In addition to flow charges, customers are also assessed a base charge to recover fixed costs. See Table [Insert table #], for a summary of user rates for the last [Insert # years included in table] years.

The comprehensive nature of the Preventive Maintenance program will result in increases in the sewer user rates starting in [Insert year] to implement our preventive maintenance and asset management program. Although the expectation is that reactive maintenance costs will decrease as the preventive sewer cleaning program is implemented, an initial increase in costs to initiate the preventive program and establish baseline cleaning, inspection and assessment schedules (reviewed in Chapter 3) is expected. The rate increase also included [Insert other things included, e.g., "GIS improvements to the collection system map and establishing a computerized maintenance management system", etc.]. As CCTV data is provided, future rate increases to address capital improvements may also be expected.

The following table shows [Insert City/Town name or name of your department]’s sewer rates over the last [Insert number of years, five or ten] years.

**Table** [Insert number]: **Sewer User Fee History** [*Add rows as needed]*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Fiscal Year** | **% Rate Increase** | **Base Charge** | **Residential Rate**  **$/100cf** | **Commercial Rate**  **$/100cf** |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Avg. Increase |  |  |  |  |

**d. Operating and Maintenance Expense**

Estimated operating expenses for FY 2008 totaled $ [Insert number]. This is a [Insert either percentage, or qualifier, eg "slight increase" "increase" or "decrease"] over the FY 2007 operating budget of $ [Insert number].

Operating and maintenance expenses include:

#### *Edit the following list to include all that your O&M budget incorporates*

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

*If you have done an analysis, include the follow sentence and attach your analysis.*

Current year and projected future expenses are shown in the User Fee Revenue Requirement Analysis at the end of this chapter.

*Edit the following to include the services that you contract:*

**Professional Services** includes planning and engineering studies for replacement projects.

**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 generally costing less than $ [Insert number].

**Debt service** is the annual principle and interest payments for bonds, loans and other fiduciary instruments owed by [Insert City/Town name or name of your department]. The debt service supports capital improvement projects. [Insert City/Town name or name of your department]’s policy is to not accumulate a maximum debt greater than [Insert number] percent of the operating budget.

**e. 1Capital Improvement Program Overview**

The Capital Improvement Plan (CIP) is part of the long-term CMOM planning, which uses the Cleaning, Inspection, and Assessment program (see Chapter 3) to evaluate the existing system and to recommend improvements needed to correct existing deficiencies. The CIP also incorporates our Capacity Assessment (Chapter 9) program to assess projected needs for maintaining the integrity of the collection system and expanding sewer capacity to accommodate growth by providing a detailed [Insert number]-year capital improvement program.

Capital projects are evaluated based on [Insert a description of how you determine the capital projects and how your CIP is developed. For example, if you use the cleaning, inspection and assessment program results, describe how you go from CCTV to CIP]

[Insert City/Town name or name of your department] has [Insert number, or description, such as "many"] ongoing projects in its Capital Improvement Program. [Insert City/Town name or name of your department] develops a long-range CIP program covering a [Insert number]-year period that is updated annually. The CIP describes each proposed project, the budgeted cost for the project and the financing source(s). The CIP was primarily funded with [Insert your source of funds, e.g. SRF or bonds...] authorized in [Insert year(s)], plus additional funds from the capital reserve fund. The [Insert year] [Insert funding, e.g. SRF loan, or bond] was for the amount of $ [Insert number].

The capital reserve funds result from the balance of funds remaining after the payment of all operating and maintenance, debt service and other expenses. The capital reserve fund also accounts for the depreciation expense in the O&M budget. The reserve funds are primarily used for:

*[Edit the following to include your use of the balance of funds]*

* Non-bond funded capital projects
* Additional funds for bonded projects
* Emergency repair and maintenance

The available reserve funds generally range from $ [Insert number] to $ [Insert number]. The amount varies based on the number of connection fees collected and increases in revenue as each annual budget is prepared.

# **f. Capital Improvement Plan**

Appendix [Insert number] shows the proposed CIP adopted by [Insert City/Town name or name of your department]. The CIP shows both funded and un-funded projects. The un-funded projects are included for tracking purposes and to allow for changes in the priority of the projects and as funding levels change. The CIP summary is found in Table [Insert number], below.

The total [Insert number]-year CIP exceeds $ [Insert number]. The current pace of project completion has been [Insert description, e.g., "growing steadily due to availability of funds", or "keeping up with growth and revenue generated by \_\_\_", or "limited by the availability of funds and the size of the staff" etc.].

Estimated total debt service for fiscal year [Insert current year] is $ [Insert number], which is [Insert number] % of the O&M budget.

In discussing growth and capacity, you should refer to the capacity issues identified for your system as you developed Chapter 9. The fees that you charge for future development should reflect the true cost of the additional flows to your collection system. The true costs include both the new operations and maintenance from adding sewers and the downstream costs as supported by your capacity studies and other known issues. Edit the following to reflect the character of population growth and capacity in your community.

**1. Population Growth**

[Insert City/Town name] has been growing steadily for a number of years. In the 1990 census, the population of [Insert City/Town name] was [Insert number]. By 2007, the population had grown to [Insert number], an average growth of [Insert number] percent per year. The long range population growth for [Insert City/Town name] is expected to [Insert what the projections estimate, e.g., "continue at this rate", "level out", etc.] through the year [Insert number], reaching a population of [Insert number].

[Insert City/Town name] issued [Insert number] housing permits between [Insert years for which you have data, eg, 1997-2007], indicating an average of [Insert number] of permits each year.

#### *The following goes into further detail on your potential capacity and capital needs. If you have capacity problems, further edit the following paragraphs to include your constraints.*

#### *If you have it, include a list of CIP projects, rating, and estimated cost. If not, this should be part of your update plans to be included in Chapter 11.*

###### **2. Capacity and Fees**

The service capacity and treatment of [Insert number of gallons estimate you use, e.g., 180] gallons per day (GPD) per residential equivalent plus [Insert percent estimate you use, e.g., 15] percent reserve capacity meets the needs of the current service area and provides for additional capacity to accommodate projected residential growth through the year [Insert year you use]. This service capacity includes current average sewer demands of [Insert number of gallons] MGD and growth-related reserves of [Insert number of gallons] MGD for a total sewer capacity for the [Insert name of your system] Collection System and [Insert name of the Treatment Plant for your system] Wastewater Treatment Plant of [Insert number of gallons] MGD.

The growth related projections utilize a [Insert percent estimate you use, e.g., 2-3] % average yearly growth for new sewer services within the existing sewer service area basin. (See Table [Insert table number] Capital Facility Requirements to [Insert year you use]).

Based on the expected population growth of [Insert City/Town name], the collection of connection fee revenue can be expected to [Insert what the projections estimate, e.g., "continue at this rate", "level out", etc.] through the next [Insert number e.g., 10] year financial planning period.

*[The following assumes that you have connection fees that are based on CIP needs. If not, edit the paragraph to explain how capacity needs are funded, and if you have plans to increase connection fees to pay for upgrades, indicate those plans.]*

Connection fees are used to fund planned capital improvements and are set based on those plans. The current capital program identifies $ [Insert number] in capital projects to meet the projected future growth needs. With the new housing unit growth over the next [Insert number e.g., 10] years expected to be [Insert number] units, the single family residential connection fee will need to be increased from the present level of $ [Insert number] by [Insert number] % per year reaching $ [Insert number] in the year [Insert year] to provide full funding of capital requirements for growth as planned in the current capital program.

**3.** **Capital Facilities Projects and Financing.** The total cost of the planned [Insert number of projects] capital and non-capital projects during [Insert year range you use] period is $[Insert dollar total number for your capital projects estimate]. One project is classified as a capacity project, [Insert description of capacity project(s)], at a cost of $[Insert dollar total number for your capacity projects estimate]. [Insert number of projects] projects are classified as non-capacity projects at a proposed cost of $[Insert dollar total number for your non-capacity projects estimate]. (See Table [Insert table number]).

**4**. **Operating Impact of Service Capital Improvements.** The cost of operating the proposed capital improvement projects during the next five-year period is estimated at $[Insert total dollars] (See Table [Insert table number].).

**5.** **[Insert name of your collection system]** **[Insert year range you use]** **Capital Improvement Plan Projects Map Key.** The following pages show location maps of all Sewer Utility projects for the [Insert year range you use] Capital Improvement Plan cycle.

i. [Insert projects e.g. Force Main repair (2008-2010)]

*Continue with list, use list in table below for estimates of costs and budgets. If your capital plan includes the details, consider appending it instead.*

….

**Table** **[Insert table number]: Sources and Uses of Funds**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sources of Funds**  **(x $1,000)** | | | | | | | | | | |
| Sources of Funds | Expenditure  2007 | Expenditure 2008 | | 2009 | | 2010 | | 2011 | 2012 | 2013 |
| Existing Revenue | [Insert total dollars] | [Insert dollars] | | [Insert dollars] | | [Insert dollars] | | [Insert dollars] | [Insert dollars] | [Insert dollars] |
| Sewer Utility Fund |  |  | |  | |  | |  |  |  |
| Federal/State Grants |  |  | |  | |  | |  |  |  |
| Loan from General Fund |  |  | |  | |  | |  |  |  |
| Cash from Bond Financing |  |  | |  | |  | |  |  |  |
| Investment Income |  |  | |  | |  | |  |  |  |
| [Insert rows for others] |  |  | |  | |  | |  |  |  |
| Total Sources  Of Funds |  |  | |  | |  | |  |  |  |
| Operations and Maintenance Uses of Funds | | | | | | | | | | |
| Salaries | [Insert total dollars] | [Insert dollars] | [Insert dollars] | | [Insert dollars] | | [Insert dollars] | | [Insert dollars] | [Insert dollars] |
| Repair and Maintenance |  |  |  | |  | |  | |  |  |
| Supplies and Expenses |  |  |  | |  | |  | |  |  |
| Professional Services |  |  |  | |  | |  | |  |  |
| Contractual Services |  |  |  | |  | |  | |  |  |
| Depreciation |  |  |  | |  | |  | |  |  |
| Utilities |  |  |  | |  | |  | |  |  |
| [Insert rows for others] |  |  |  | |  | |  | |  |  |
| Subtotal: |  |  |  | |  | |  | |  |  |
|  |  |  |  | |  | |  | |  |  |
| Capital Uses of Funds | | | | | | | | | | |
| [Insert projects, e.g. "Force Main Repair (2008-2010)"] | [Insert total dollars] | [Insert dollars] | [Insert dollars] | | [Insert dollars] | | [Insert dollars] | | [Insert dollars] | [Insert dollars] |
| [Insert rows for others] |  |  |  | |  | |  | |  |  |
|  |  |  |  | |  | |  | |  |  |
|  |  |  |  | |  | |  | |  |  |
|  |  |  |  | |  | |  | |  |  |
| Debt Service |  |  |  | |  | |  | |  |  |
|  |  |  |  | |  | |  | |  |  |
| Subtotal: |  |  |  | |  | |  | |  |  |
| Total Uses of Funds: |  |  |  | |  | |  | |  |  |

This summary combines information found in the annual [Insert City/Town name or name of your department] Budget and the Capital Improvement Plan. It provides a single document for the [Insert name of any boards or commissions your department is overseen by], staff members, and the public to understand the scope, cost, funding, and status, of planned sewer improvement projects proposed to be undertaken by [Insert City/Town name or name of your department].

**11. SEWER SYSTEM PREVENTIVE MAINTENANCE PLAN UPDATES**

*It is important that your preventive maintenance plan remain current and reflect your actual program operation. Outlining how you will ensure the program described in this plan remains current and useful over time will help to make that happen.*

*Changes to your cleaning, inspection and assessment program, new or modified infrastructure, increased system demand, new or modified operations and maintenance protocols, or changed organizational structure, for example, will likely necessitate updates to your plan.*

*Several strategies can help you keep your plan up to date, but having a few set procedures will help ensure it remains current and useful. Examples of actions which could be used, include:*

*• Set aside a particular time to do your update,*

*• Obtain specific funding to carry out periodic reviews or participate in coordinating meetings,*

*• Check in with collection system staff, either individually or through meetings, at periodic intervals. Review your plan for effectiveness and identify potential areas for improvement that can be incorporated into your plan during the year.*

*• Set a final date for update.*

*• Prepare progress reports documenting effectiveness, potential changes, and/or a summary of program activities on a periodic basis,*

*• Solicit peer review by another city/town department or an outside collection system.*

# **a. Plan Update Process**

[Insert City/Town name or name of your department] will complete [Insert timeframe, e.g., "annual", "bienniel", "as-needed", etc.] reviews of our Preventive Maintenance program and this plan beginning in [Insert date, e.g., "January 2009"]. The review will consider the progress that has been made in developing and implementing our Preventive Maintenance Program, the results of our monitoring program described in Section b., below, 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 our Sewer Use Ordinance and Fats, Oils and Grease programs,
* Updates to our pump station inspection and maintenance program,
* Updates as we evaluate our collection system capacity and complete [Insert refrence to any plans that you described in Chapter 9, Capacity],
* Budget and Capital Planning updates,

* [Insert others]

As the sewer inspection history of any segment of pipe is retrievable electronically and the data is used to develop condition ratings, this aids in prioritizing future sewer rehabilitation projects, maintenance activities, and updating this plan. The latest version of our Preventive Maintenance Plan will be made available at [Insert where the plan is kept, and webpage reference, if applicable] and old versions will be collected and recycled.

**b. Monitoring, Measurement, and Program Modifications**

*A key reason for updating your plan is to improve its effectiveness. Therefore, a key element of updating the plan is measuring the effectiveness of your programs, including the reduction of SSOs.*

*Effectiveness should be measured by developing and tracking performance indicators on a regular basis. Performance indicators should be selected to meet the goals you laid out in Chapter 1.*

*Some examples of performance indicators include:*

*• Number of SSOs over the past 12 months, distinguishing between dry weather overflows and wet weather overflows*

*• Volume distribution of SSOs (e.g. number of SSOs < 100 gallons, 100 to 999 gallons, 1,000 to 9,999 gallons, > 10,000 gallons)*

*• Volume of SSOs that was contained in relation to total volume of SSOs*

*• SSOs by cause (e.g. roots, grease, debris, pipe failure, pump station failure, capacity, other).*

*• Number of stoppages over the past 12 months*

*• Stoppages by cause*

*• Average time to respond to an SSO*

*• Relationship of capacity-related SSOs to storm event return frequency*

*• Ratio of planned sewer cleaning to unplanned sewer cleaning*

*• Backlog of repair, rehabilitation, and replacement projects*

*• Customer complaints and/or feedback*

As noted in Chapter 1, [Insert City/Town name or name of your department] maintains complaint and blockage records in a [Insert "log", "spreadsheet", name of database, or combinations if you have more than one way that you track, etc.], maintains our records of cleaning and other preventive maintenance activities, and records problems (e.g., excessive debris, observed manhole defects) identified through regular sewer maintenance activities in our [Insert "forms attached in Appendix \_\_", "spreadsheet", name of database, to describe how you track, etc.].

The sewer inventory, mapping and maintenance database [Insert "currently under development" if you don't have it up and running as of this writing], discussed in Chapter 1, [Insert name of your program], tracks and utilizes records related to any sewer segment in our system. Using [Insert name of your program if you use computer tracking, otherwise describe your method of tracking complaints and followup], complaints and service are recorded and linked to preventive and reactive maintenance activities.

The information available in the [Insert name of the software program you use to track or link complaints, problems and maintenance follow up] and the SSO reporting system, are used to help measure the effectiveness of our program by tracking various parameters related to service calls and our maintenance and inspection activities. We also measure our effectiveness by comparing SSO trends from previous years and identifying system components that continually contribute to system failures. Specifically, we currently [or if you do not currently measure your effectiveness, Insert your plans for what you will be using to track and evaluate] track the following parameters with which to measure the effectiveness of this Plan and its effectiveness in reducing SSOs and meeting the goals we set (described in Chapter 1):

*[Edit the following to include what you will be using]*

* Number of SSOs per year
* Volume of SSOs per year
* Number of dry weather SSOs per year
* Number of SSOs per year by cause (e.g., roots, grease, pipe failure, I/I, pump failure or other deficiency, etc.)
* Response time to SSOs and other service calls (time from call received to first responder arriving on site)
* Length of gravity sewers cleaned annually
* Actual versus scheduled cleaning dates for gravity sewers
* Length of gravity sewers CCTV inspected annually
* Record of pump station maintenance work orders completed 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
* Service reliability as measured by [Insert how you measure, such as time for responding to complaints, repair backlog, environmental indicators that you use]
* Safety history/incidents
* Ratio of funds spent on preventive maintenance versus reactive and emergency response

This information will be assessed and reported to [Insert "our sewer commission" or the name of the board or annual meeting where you report] during our [Insert "annual update" or describe your reporting process] as we keep [Insert City/Town name] officials and coordinating departments up to date with our infrastructure work. Changes to this Preventive Maintenance Plan will address issues identified through this monitoring program and during our [Insert "annual update" or describe your reporting process] and review.

# **Appendix A: Sewer Overflow Response Plan**

# This document provides a template for a Sewer Overflow Response Plan. It contains response procedures and examples provided from a number of sources.

***[Please note: This section of the template has been based on the reference documents and does not include all potential emergencies or all potential responses to emergencies. The person(s) writing this plan must identify potential emergencies and choose the appropriate procedures for each situation. The attached responses can be used to assist in this. Modify them to fit your city/ town department, and customize the specific response procedures for each type of overflow that your system may have - adding details specific to your response needs and capabilities, adding other procedures that may be needed to meet the requirements of your system, and/or deleting those you do not need].***

*Many of the protocols in this document are derived from an appendix to the New England Interstate Water Pollution Control Commission (NEIWPCC) document “Optimizing Operation, Maintenance, And Rehabilitation of Sanitary Sewer Collection Systems,” developed in December 2003 with funding from the Environmental Protection Agency. Refer to that document for more emergency response information. You may also want your system to consider broader emergency response when adding details to this plan.*

*This plan should be completed and used, and then reviewed and adjusted at periodic intervals as needed for continued accurate communication of your procedures and contact information.*

*This plan should, in general, be available in the yard office or other building commonly accessible to, and frequented by, wastewater collection system personnel.*

*The plan should utilize the most current information on the collection system. For larger systems, a structured analysis, or risk assessment, should be made of the collection system, treatment plant, and community to identify vulnerable areas and determine the effect and relative severity to collection system operations, equipment and public safety and health, in the event of a failure. The risk assessment should concentrate on such factors as topography, weather, sewer system size, and other site-specific factors that reflect the unique characteristics of the system. Once the areas of vulnerability are known, appropriate plans can be put in place to ensure collection system operations continue for the duration of the overflow response.*

*As you complete this plan, clearly identify the steps your staff should take in the event of overflow situations. Include information on when to initiate and cease response operations. Be as specific as possible about your collection system and repair equipment. Instructions should be available that explain how to operate equipment or systems during a non-routine event when they are not fully inoperable but are not functioning as intended. To ensure safety of the public and the collection system staff, procedures for response plans should be understood and practiced by all personnel.*

*Procedures should be specific to the type of event that could occur. Keep detailed records of all past responses in order to constantly improve response training, as well as the method and timing of future responses. The ability to deal with SSOs depends on the knowledge and skill of the responding crews and the availability of the proper equipment. The crew should be able to rapidly diagnose problems in the field under stress and select the right equipment needed to correct the problem. If resources are limited, consideration should be given to mutual aid agreements and contracting with other departments or private entities for response in some emergency situations, such as an emergency that would exceed the capacity of your staff.*

# Working with the Template:

*In this template document, you will find instructions in Italics, and areas indicating* “[Insert …]” *(which are shaded gray in the electronic version) information that you should fill in following the instruction noted in the shaded line. When you have developed your information, delete the italics sections. Click on each shaded area and as you type your information into the* “[Insert” *area, it will be overwritten with your input.*

*Please be aware that completion of this template does not relieve a community or wastewater system of its responsibility to comply with all applicable federal, state, and local laws, regulations and/or applicable permits, and does not constitute a waiver or supersede the terms and conditions of any federal or state requirements or regulations regarding the operation and maintenance of a wastewater collection or conveyance system. This template is not an EPA or state guidance document and should not be relied upon to identify regulatory requirements. The community is solely responsible for ensuring that it takes the steps necessary to ensure compliance with all the applicable requirements of federal, state and local laws. The suggestions herein should not be construed to constitute EPA or state approval of any method or specific equipment or technology installed or utilized by a collection system.*

# **SEWER OVERFLOW RESPONSE PLAN**

**FOR**

[INSERT FACILITY OR SYSTEM NAME

[INSERT FACILITY LOCATION/ADDRESS

[Insert Date of Plan

[Insert you or your engineer's name

[Insert Address

[Insert town, state, zip

[Insert phone

[Insert fax

[Insert email

**SEWER OVERFLOW RESPONSE PLAN**

TABLE OF CONTENTS *(to be finalized with final document)*

SECTION page no.

# **1. RESPONSE INFORMATION** **[Insert #**

# **2. INTRODUCTION** **[Insert #**

# 

# **3. OVERVIEW** **[Insert #**

# **4. OVERFLOW NOTIFICATION PROCEDURE** **[Insert #**

# **5. RESPONSE TO OVERFLOWS** **[Insert #**

# **6. OVERFLOW REPORTING** **[Insert #**

**APPENDICES**

**APPENDIX 1 – Everbridge/NY-Alert Data Entry Helpful Information**

**APPENDIX 2 – Guidance on Estimating Sewer Overflow Volumes**

**1. RESPONSE INFORMATION**

##### RESPONSE COORDINATOR & ALTERNATE

[Insert Name of Superintendent or key person for contact

Plant - [Insert Telephone Number of Superintendent

Home - [Insert Home Telephone Number

[Insert Name of Next in Charge

Plant - [Insert Telephone Number of Next in charge

Home - [Insert Home Telephone Number

[Insert Information for others if needed

**GOVERNMENTAL RESPONSE UNITS**

1. [Insert City/Town Fire Department Tel. [Insert Telephone Number, usu. 911

2. [Insert City/Town Police Department Tel. [Insert Telephone Number, usu. 911

3. [Insert City/Town Ambulance Tel. [Insert Telephone Number, usu. 911

4. [Insert Emergency Responder 1-800- [Insert Telephone Number

5. [Insert City/Town Power Co. 1-800-[Insert Telephone Number

6. [Insert City/Town Medical Center [Insert Telephone Number

7. [Insert state and other agencies, e.g., "RI DEM"] [Insert Telephone Number (during business hours, and see Section 5, below)

[Insert Information for others if needed]

*In addition to this basic information, you should have a detailed map of your system and a plan for how to communicate if phones and radios don’t work. For example, arrange places to meet and designate less technical ways to share and distribute information.*

The 2013 Sewage Pollution Right to Know (SPRTK) requires untreated and partially treated sewage discharges to be reported by publicly owned treatment works (POTWs) and publicly owned sewer systems (POSSs) within two hours of discovery to NYSDEC. Sewage spills (overflows) must be reported using the NYSDEC approved Everbridge system.

**The first response step** when a Sanitary Sewer Overflow (SSO) occurs is to notify [Insert Name of Superintendent or key person for contact] – [Insert he or she] is responsible for managing the response and making key decisions. Their responsibility is to assess the situation and initiate a series of response actions based on the type and severity of the event. The table below identifies the key personnel who will be responding in emergency situations.

*[Edit the responsibilities as appropriate, in the table, below]*

Responsibilities Chart

## 

| **Name and title** | **Responsibilities during a SSO response** | **Contact numbers** |
| --- | --- | --- |
| [Insert Name of Superintendent or key person for contact  [Insert title, such as "Superintendent" | Responsible for overall management and decision making for the sewer collection system. Takes the lead for managing the response to a SSO, providing information to **regulatory agencies**, the public and news media.  Responsible for determining the need to contact Fire department (for response to toxic spills and containment booms, eg), local conservation department(s), and/or town officials. | Phone: [Insert phone number  Cell: [Insert phone number |
| [Insert Name of person in charge of operations | In charge of operating the collection system, performing inspections, maintenance and relaying critical information, assessing facilities, and providing recommendations to the [Insert title, such as "Superintendent". Responsible for organizing crews for response. | Phone: [Insert phone number  Cell: [Insert phone number |
| [Insert Name of person who will take incoming calls | Responsible for administrative functions in the office including receiving phone calls and keeping a log of events. Will provide a standard carefully pre-scripted message to those who call with general questions. Additional information will be released through the [Insert title, such as "Superintendent". | Phone: [Insert phone number |
| [Insert Name of Field Staff  Field Staff | Delivers emergency notices and supports collection system operator. | Phone: [Insert phone number  Cell: [Insert phone number |

## ***[Edit the following paragraphs to outline the procedure you want your staff to follow in recording the report of an overflow. Training for personnel who receive phone calls from the public is recommended to ensure the information is recorded accurately.]***

## **1. Recording the Report of Possible Sanitary Sewer Overflow (SSO)**

Generally, telephone calls from the public reporting possible sewer overflows/ basement back ups are received at the [Insert Appropriate Town Department details].

For phone calls reporting overflows and back ups, the [Insert Appropriate title such as "telephone operator" or "DPW dispatcher"] obtains all relevant information available regarding the overflow including:

a. Time and date of the call;

b. Specific location of the overflow;

c. Description of problem (e.g., what is overflowing, extent of spill, if the cause is obvious, etc.);

d. Time possible overflow was noticed by the caller;

e. Caller’s name and phone number;

f. Observations of the caller (e.g., odor, duration, back or front of property); and

g. Other relevant information that will enable the [Insert name of department] to quickly locate, assess and stop the overflow.

See Appendix [Insert appendix number (an RI DEM log as an example is an appendix to this template)] for the phone log used. This information is also recorded in an Initial Overflow Report (Ref. [Insert Appendix or Section for this information]) and the [Insert Appropriate title such as "telephone operator" or "DPW dispatcher"] notifies [Insert name of department]. See more detailed procedures in Sections 4 through 6, below.

## **2. Confirming Overflows**

A [Insert name of department] sewer response crew is dispatched by [Insert "Sewer Superintendent", Name of Superintendent or other title and name of dispatcher] to confirm the overflow (See Section 5, below).

## **3. Reporting Overflows**

The [Insert name of department] completes and electronically submits a Sewage Overflow Report using the Everbridge/NY-Alert notification platform within 2 hours of becoming aware of the sewer overflow and, if requested, provides the information by phone and/or e-mail to the [Insert state and other agencies, e.g., "RI DEM"] (and see Section 6).

# 

# **2. INTRODUCTION**

Our collection system is an integral part of the [Insert "City" or "Town"] of [Insert City/Town name]’s unseen infrastructure, taking sanitary wastes from residences, commercial establishments and industry to the [Insert name of treatment facility] on [Insert location of treatment facility, (eg, "Chestnut Street in Pleasantville")]. If the capacity of the collection system is exceeded, or if blockages occur, overflows may result. Untreated wastewater overflows that occur upstream of the treatment plant are called Sanitary Sewer Overflows (SSOs). SSOs are a threat to public health and the environment because the SSO may discharge pollutants such as pathogens, floatable materials, toxics, and other pollutants, all of which may impact public health, drinking water supplies, water quality and/or aquatic ecosystems.

**2.1 Goals**

The goal of this Sewer Overflow Response Plan (SORP) is to document [Insert City/Town name]’s plans for mitigatingor preventing potential emergency overflows whenever possible, to prepare[Insert City/Town name]’s personnel and responding departments to deal efficiently with the effects of such events, and to protect health, environment, and property.

Quick response to an SSO will minimize the overflow impacts on public health, water quality, the environment, and customer service. This SORP is designed to ensure that appropriate crews are immediately dispatched to all reported SSOs to stop the overflow as quickly as possible; to minimize the effects of the overflow on public health and the environment; to minimize the impact of the overflow on collection system operations; and to report the overflow to the appropriate regulatory agencies, and to the public when warranted. The objectives of this plan include controlling waste discharge and providing procedures for managing sanitary sewer overflows, preventing harm to public health and the environment, and satisfying regulatory and reporting requirements.

Additional objectives of the SORP are to: provide appropriate customer service, protect collection system personnel and the wastewater treatment plant, protect all parts of the collection system [Insert "and wastewater treatment plant", if applicable], and protect private and public property beyond the collection and treatment facilities.

This plan will be updated as necessary to reflect any changes in staffing or notification requirements, including contact numbers. It should and must be revised as insight and experience dictate.

This plan is prepared pursuant to [If you have a bylaw or permit, insert that information here and whether it is pursuant to or required by the bylaw/permit].

2.2 This SORP is organized into the following sections:

Overview (Description of Collection System)

Overflow Notification procedures

Response to Overflows

Overflow Reporting

# **3. OVERVIEW**

This section provides a general description of the [Insert "City" or "Town"] of [Insert City/Town name]’s collection system and critical facilities. Response personnel must be familiar with the collection system and its components to effectively execute the response procedures described in this plan. For further details on the collection system, crews are directed to our Preventive Maintenance Plan (PMP).

The [Insert "City" or "Town"] of [Insert City/Town name] has a population of approximately [Insert population] of which approximately [Insert percentage of population on the sewer system] percent are served by our collection system. The sewered area extends from [Insert descriptor of northern boundary of area served] to [Insert descriptor to encompass area served] as shown in Figure [Insert figure number]. The sewer system is divided into [Insert number of sub-areas (sewersheds or tributary areas)] areas, all of which feed into the [Insert treatment plant name and Town, if you are a satellite system] located on [Insert location of treatment plant (eg, "Chestnut Street in Pleasantville")]. The [Insert number of sub areas or "sewersheds" in your system] areas are: [Insert names or descriptors of sub-areas or sewersheds]. The collection system map provides detail in Figure [Insert figure number]. [Attach a map figure that shows the general layout and sub-divided areas of your collection system. This may be the same map used in designing your preventive maintenance program].

[Insert City/Town name]’s wastewater collection system includes the following components: approximately [Insert number of feet] linear feet of sanitary sewers; [Insert number of siphons] siphons; [Insert number of feet] linear feet of force main; and [Insert number of pumping stations] pumping stations. The system is comprised of components ranging in age from [Insert earliest known age for sewers] to [Insert most recent age for sewers]. Materials include [Insert description of materials such as vitrified clay pipe, asbestos cement, etc.]. The collection system is described in detail in the PMP which is available at [Insert location(s) where crews can access the PMP, and URL if it is on the web].

[For some activities and facilities, even a slight chance of failure is too great a threat. Typical critical facilities include for example, major interceptors, force mains and siphons, and pumping stations that serve hospitals. These facilities should be given special consideration when formulating your plans]

[Insert City/Town name]’s collection system contains several critical facilities. Depending on the specific critical facility, a sewer system failure could potentially impact [Insert those that apply such as: wetlands, drinking water supplies, parks or playgrounds, surface waters, basements or streets (flooding), and any other critical facilities e.g. shellfish beds]. Critical collection system facilities are described later in this section.

[It can be helpful to your response capabilities to have identified vulnerable areas up front. If you have insight or experience with areas in your system where problems are most likely to occur, put the information into the following paragraphs, amending as needed.]

**3.1 Specific Known Vulnerabilities**

Certain areas of [Insert City/Town name] are known to be more vulnerable to system blockages and overflows than others and require additional maintenance. These vulnerable areas include: the [Insert information about where the areas needing closer attention are located, such as "sewer line serving the Main Street restaurants downtown, between Elm and Oak']. In addition, [Insert background details on pipelines that are adjacent to vulnerable areas such as rivers or lakes potentially affected by overflows that you would want your crews or the public to be aware of] can potentially affect the [Insert information about local waters, such as river or streams' names, if applicable].

*[If you have historic flooding, edit the following paragraph to describe, otherwise, delete]*

[Insert details on historical flooding] has been the cause of some problems in the past. Advanced weather prediction is not always accurate and extreme precipitation can develop without adequate warning. High intensity storm events can also impact areas in the [Insert "city" or "town"] that are located above designated flood plains [Insert a description of areas subject to historical flooding].

Potential impact areas for each of the [Insert number of sewersheds or tributary areas] sub-areas of the collection system have been identified, with the following vulnerabilities:

[Insert a 'quick list' of vulnerable areas and impact areas for each of the sub-basins or sewersheds identified in your system. For example, your "Area 1" may be near a stream, while "Area 2" maybe impact shellfish beds.].

A review of past maintenance records and citizen complaints from [Insert beginning date for review] to [Insert date that review went through] indicates that [Insert types of problems shown in the review, eg. FOG, roots, etc.] have consistently contributed to the occurrence of SSOs in [Insert how many of your sub-areas areas have these problems] areas. [Insert City/Town name] has increased maintenance (as described in the PMP) in these areas in response to the problems identified.

*[Edit the following if you have identified areas, or use the tables from your Preventive Maintenance Plan and insert here]*

Based on this information, the following trouble spots have been identified as critical facilities within the collection system sub-areas.

Table [Insert number] *[insert additional rows or delete rows as needed (using the Table drop down menu to,> insert >row, or >delete >row)]*

|  |  |
| --- | --- |
| Collection System Sub-Area | Trouble Spot Location |
| [Insert your designation for sub-area] | [Insert location (e.g., Main Street Pump Station] |
|  |  |
|  |  |
|  |  |

*[Edit the following section if your system includes siphons, otherwise, delete]*

3.1.1 Siphons

A siphon, or depressed sewer, is a dip in a pipeline designed to pass under something, such as a stream or conduit. An inverted siphon is always full of wastewater under pressure and below the hydraulic grade line of the collection system. [Insert City/Town name]’s collection system includes [Insert number] siphons. Siphon locations are described in Table [Insert number]. A siphon is considered a critical facility because of their location near surface waters and under major transportation facilities.

Table [Insert number] Siphons *[insert additional rows or delete rows as needed]*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Siphon Location | Diameter (in) | Pipe Material | Year Built (/rehabbed) | Potential Impact Ares(s) |
| [Insert siphon location description] | [Insert diameter] | [Insert material] | [Insert year] | [Insert description so that your crews understand what will be affected] |
| [etc.] |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

3.1.2 Pump Stations

[Insert City/Town name] has [Insert number of pumping stations] pumping stations in [Insert number of sub-areas or sewersheds] of the collection system sub areas (see Table [Insert number]). Of the [Insert number of pumping stations] pumping stations, there are [Insert number of pumping stations that you consider are the critical ones] major pumping stations:

* [Insert list of critical pumping stations, where each is located, where its flow comes from and where it conveys it to. Add other details that you feel would best help your crews]

The [Insert number] other pump stations within the collection system primarily serve as lift stations with pumping capacities ranging from [Insert number] to [Insert number] MGD.

Table [Insert number] Pumping Station Details and Potential Impact Areas *[insert additional rows or delete rows as needed]*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Pumping Station Identification | Station Type (eg. Wet well/dry, submersible) | Max Flow (MGD) | Alarm system/ Emergency Power | Year Built /rehabbed | Potential Impact Area(s) (Insert description so that your crews understand what will be affected) |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

*[Edit the following section if your system includes force mains, otherwise, delete]*

3.1.3 Force Mains

The [Insert City/Town name] waste water collection system includes [Insert number] force mains with a total length of [Insert number] linear feet (lf). The force mains range in age from [Insert year of oldest] to [Insert year of youngest]. The size and material for each of the force mains are shown in Table [Insert number].

Table [Insert number] *[insert additional rows or delete rows as needed]*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sub area name | Force main Diameter (in) | Force main Length (lf) | Pipe Material | Year Built (and rehabbed) |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

[If you have rehabilitated or replaced any of your force mains, include a brief description of the work]

All force mains have been identified as critical facilities because of the large volume of flow that they carry. Some of these force mains are located near [Insert sensitive areas near force mains including both environmentally sensitive areas such as wetlands, and transportation critical areas such as interstates and railroads] which are considered to be potential impact areas. Failures along these force mains can result in extensive damage and/or inconveniences to the public. The force mains and impact areas are listed in Table [Insert number].

Table [Insert number] Force Main Potential Impact Areas *[insert additional rows or delete rows as needed]*

|  |  |  |
| --- | --- | --- |
| Location of Force Main | Pump Station | Potential Impact Area(s) |
| [Insert locational description of force main segment] | [Insert name of associated pump station] | [Insert brief description of potentially affected areas that you want your crews to be aware of] |
|  |  |  |
|  |  |  |
|  |  |  |

*[Insert details regarding any other critical facilities that you have identified in your collection system]*

Specific response procedures vary according to the type of facility where the emergency is occurring. Response procedures for each of the critical facilities identified in this section are specified in Section 5. The emergency response procedures reflect the types of facilities and the likely types of failures and vulnerabilities in our collection system. Notification response, Section 4, below, provides the process and contacts for reporting sewer overflows.

# **4. OVERFLOW NOTIFICATION PROCEDURE**

**4.1 Overview**

When an SSO or other collection system emergency occurs, a number of individuals must be notified. Depending on the size and severity of the problem, different notifications are needed. While minimum notification procedures are in place for all overflows, more specific notification procedures are required for more severe overflows. For example, a small, contained overflow with no impact to a water body or other sensitive area will have fewer notification requirements than an overflow that has discharged into surface water.

**4.2 Receipt of Information Regarding an SSO**

An overflow may be detected by [Insert City/Town name] employees or by others. [Insert name of department or system] is the primary department responsible for responding to SSOs. The [Insert Department ] is responsible for acting based on received phone calls or reports of possible sewage overflow from the wastewater collection system, and providing immediate response to investigate and/or correct the problem.

*[Reiterate here as much of the section on Recording the Report of Possible Sanitary Sewer Overflow (SSO) from pages 5-6 as you feel will be needed for your crews and the public, or simply refer to Section 1.]*

Generally, telephone calls from the public reporting possible sewer overflows are received at the [Insert Appropriate Town Department details]. Information is collected and dispatched as described in Section 1, Response Information.

*[etc.]*

[Insert name of department, or the specific person and position responsible] will confirm the overflow and implement measures to stop the overflow as noted in our procedures in Section 5, below.

[Insert name of department, or the specific person and position responsible] completes and electronically submits a Sewage Overflow Report using the Everbridge/NY-Alert notification platform within 2 hours of becoming aware of the sewer overflow and, if requested, provides the information by phone and/or e-mail to the [Insert state and other agencies, e.g., "RI DEM"].

.

The [Insert name of department] superintendent is responsible for reviewing, updating and submitting the final Sewage Overflow Report. Sewage Overflow Reports, clean up information and

[Insert other documentation of the overflows that you keep] are kept in [Insert your filing and document control system e.g. "[name] files in the Collection System Office" or "spreadsheets on the Local Area Network share drive"] and reviewed [Insert frequency, e.g. "annually"] for [Insert what you use the review for, e.g. "budgeting" "staffing recommendations", "to determine trouble spots and cleaning schedules", etc.].

Pump/lift station failures are monitored by [Insert if you have alarm system] and received by the [Insert name of department]. The [Insert position title] on duty immediately conveys all information regarding alarms to [Insert name to be contacted] to initiate the investigation.

* 1. **Notification Matrix**

The notification matrix is shown in Table [Insert Table number] to outline the responsibilities of staff for notification when a sanitary sewer overflow occurs. This is also presented in Figure [Insert Figure number] which provides a flow chart to help collection system staff and crews understand the notification process. *[Append a notification flow chart, if you have one, or delete reference to figure]*

# **5. RESPONSE TO OVERFLOWS**

Response procedures provide guidance for the evaluation, mitigation and correction of the conditions that are causing or contributing to an unpermitted discharge of untreated waste water. The primary objectives of these emergency response procedures are to provide standard protocols, minimize risk, and protect public health and the environment,

Emergency response procedures appropriate to the vulnerabilities, sensitive areas and critical facilities identified for [Insert name of department] have been developed. These procedures reflect best management practice.

The [Insert name of department] [Insert title (e.g., "supervisor" or "superintendent") and name of person] or [Insert title (e.g., deputy superintendent) and name of person who is alternate] dispatches sewer maintenance personnel with appropriate equipment to confirm and contain the overflow, and determine the cause. Crews and equipment are available to respond to any SSO locations. The [Insert Town/City Sewer Dept. name] currently has [Insert number] crew members available for response during the day shift ([Insert time : a.m. to : p.m. ) and [Insert number ] crew members during the evening shift ([Insert time : a.m. to : p.m. ). The [Insert name of department] relies on [Insert description of equipment (e.g., radio, telephone)] communication to dispatch personnel to the scene of the overflow.

While investigating emergencies the crew should maintain radio contact with the Dispatcher at all times to keep them informed of the progress and any problem(s). Upon completing an assignment, and before returning to the Yard, the crew should call the Dispatcher by radio for any other assignment or update.

*Consideration should be given on how you determine “on call” needs, add your criteria to the following:*

Additional maintenance personnel are placed “on call” by the [Insert title (e.g, superindentent)] in the event extra crews are needed.

*[At this point in preparing your plan from this template, you should consider including a figure to flowchart or summarize the Sewer Overflow Action Plan].*

**5.1 Preliminary Assessment**

Upon arrival at the reported sewer overflow site, and based on observations, the sewer response crew may request additional personnel, material, supplies, and equipment from the [Insert detail on who will provide additional needed material/personnel].

[Include any procedures that your personnel should take such as photographing, or if they need to get permission to enter private property]

In all cases, response crews report their findings, including possible damage to private and public property, to the [Insert title (e.g, superindentent)] immediately upon making their investigation. If [Insert title (e.g, superindentent)] has not received findings from the field crew within one (1) hour, the [Insert title (e.g, superindentent)] contacts the response crew to determine the status of the investigation.

The [Insert position title] will visit the site of the overflow, if possible, to ensure that provisions of this overflow response plan are met. The [Insert position title] is responsible for informing the [Insert Agency, e.g., "RI DEM"] of all SSOs within 24 hours of becoming aware of the release.

If hazardous substances are suspected in the overflow, personnel are to contact the Fire Department via [Insert number (often 911)] immediately.

**5.2 SSO General Equipment**

The following items are available to response crews. These items are stored [Insert where items are available, e.g. in each sewer department truck, or divide list into where the items are available to the crews ]. Personnel are responsible for ensuring supplies are appropriate and in working order and are responsible for obtaining additional supplies as needed. A full description of departmental staffing and equipment (including emergency equipment) is available in [Insert chapter/section of PMP with list].

[Edit the following listing to include what you have and add anything you want your crews to maintain]

**Job Site Safety Equipment:**

Ladder (extra heavy duty industrial with IA duty rating), traffic wand, traffic control devices such as flags and cones, flashing barricades, caution tape [Insert other equipment].

May Need: safety harness and lifeline, tripod, safety rope, gas detector, silt fencing, flag stands, barricades, and detour arrowboard, [Insert other equipment] .

**Construction Materials:**

Clean rags, tape, assorted hand tools (e.g., screwdrivers, wrenches, hammers, brooms, sledge hammers, pry bars), bucket with rope, assorted ropes, picks and shovels, Spray Paint. [Insert other equipment].

**Personal Safety Equipment:**

Hard hat, safety glasses, safety vests, gloves, rain suit, steel toed work and/or rubber boots, isopropyl alcohol, and ear protection, [Insert other equipment].

First Aid Kit, flashlight, waterless soap and hand towels, [Insert other equipment].

**Other:**

Sandbags, sand trap, log forms, camera and video, portable blower and sufficient hose, assorted mirrors, high intensity flash light, gas meters, dye, [Insert other equipment].

**Inspection:**

As with any vehicle or major equipment, the operator should perform a pre-use inspection before beginning work activities, [Insert other equipment].

**Crews are instructed to have and use the job site and personal safety equipment that is appropriate for each emergency situation.**

**Confined Space Entry:**

For permit required confined space entries, all personnel shall refer to the procedure in the Code of Federal Regulations, 29 CFR 1910.146. *If your state regulations have separate requirements, you should add that information here.*

**The following specific response procedures are contained in the following pages[[1]](#footnote-1):**

*[Edit the following specific procedures to include your equipment, staffing levels, and procedures]*

*Note: For each of these template entries, customize the response procedures for your situation and modify them as necessary to fit your city/ town department. You may need to add details specific to your response needs and capabilities, add additional procedures that may be needed to meet the requirements of your system and/or delete procedures that are not applicable.*

**PROBLEM: Sewer Blockage or Back up into Basement**

**PROBLEM: Overflowing Sewer Manhole Resulting from Surcharged Trunk Sewer (No backup into building)**

**PROBLEM:** **Cavities and Depressions in Streets and Lawns**

**PROBLEM:** **Partially or Totally Blocked Siphon**

**PROBLEM:Sewage Force-Main Break**

**PROBLEM:** **Sewer Main Break/Collapse**

**PROBLEM: Air Release and Vacuum Relief Valve Failure**

**PROBLEM: Waste Water Pump Station Alarms General Response Actions**

**PROBLEM:** **Pumping Station Failure Caused by Secondary Power Failure During Power Outage**

**PROBLEM:** **Pumping Station Failure Inside Valve Pit, pump or valve failure (submersible type application)**

**PROBLEM: Sewer Blockage or Back up into Basement** *[customize procedures for your situation, adding or deleting details or procedures to fit your city/ town department]*

**EMERGENCY PROCEDURES:**

* Dispatcher refers to sewer maps for location and to determine critical facilities and sewer sub-area to provide to dispatch crew. If the area of the complaint is served by a pump station, check to confirm whether any alarms from the pump station have been received.
* Dispatch the crew immediately to the complainant address with details. Crew notifies complainant/property owner(s) when they are on site.
* If the flow is questionable (not reasonable for the given service area) go to the upstream manhole to visually compare flows.
* If the flow from both manholes is reasonable for the area, notify the property owners that the problem is in their service lateral and to contact a plumber or sewer service contractor to relieve the blockage as described under ‘**Steps to be Taken By Property Owners When Sewage Back-Up Is Determined to be Due to Blockage In Private Lateral Connection’**. Provide homeowner with handout from [Insert department or description of hand out, or use the "Steps to be Taken by Porperty Owners...' as a handout]
* If the downstream manhole is full and there is a potential for overflow, immediately begin the set up for pumping around the blockage (see “Overflowing Sewer Manhole” procedure)
  + Request additional manpower and equipment as needed (e.g. excavating crew, bypass pumping equipment, etc.)
  + Set up pump out equipment and hoses from the upstream manhole to the nearest flowing manhole below the blockage.
* Continue checking manholes downstream until a dry manhole is found indicating a blockage upstream.
  + See “Overflowing Sewer Manhole” procedure for pumping around the blockage while the line is repaired
  + Note, if no blockage is found and the problem is attributable to a pump station problem refer to Pump Station responses.
* If vactor and jetter are available, jet line and have vactor clear. If not, install the proper size sandtrap in the downstream invert of the manhole before clearing the blockage to capture the debris.
* Remove the debris from the manhole and observe it to try to determine the cause of the blockage.
* Use the necessary equipment to relieve the blockage, either by jet flushing or power rodding (if jet flushing is not sufficient to clear the blockage, request staff to bring power rodding equipment).
* Notify supervisor and describe the blockage. The supervisor will notify the proper authorities and agencies (See responsibility chart).
* Cordon off the area if ponding occurs on the street or easement (public or private).
* Collect as much of the sewage as possible, disinfect according to policy (see [Insert where your policy is, or include a description here]), notify surrounding homes (superintendent notifies appropriate officials, as needed).
* Notify [Insert "the television crew" or vendor name for CCTV inspection, or if supervisor makes the call] to schedule a television inspection.
* If the blockage is in a public line, relieve the blockage, clean up the property owner’s basement as per policy on disinfecting. If blockage is determined to be in property owner’s lateral connection, direct property owner to [Insert what your policy is for handling homeowners' lines] to clear the line.
* Make out a report indicating the time of the call, a description of the problem, repair work done, personnel present and equipment used.
* If sewage overflowed the collection system, the [Insert name of department] completes and electronically submits a Sewage Overflow Report using the Everbridge/NY-Alert notification platform within 2 hours of becoming aware of the sewer overflow and, if requested, provides the information by phone and/or e-mail to the [Insert state and other agencies, e.g., "RI DEM"]. Submit a five-day written report of non-compliance to the Regional Water Engineer. Form can be found at <https://www.dec.ny.gov/docs/water_pdf/noncomprep.pdf>

**NOTES:**

1. When available, use collected debris to try to determine the cause of the blockage. Confirm removal of all debris from the manhole.
2. Record the water damage to all items in the basement. Record all actions taken (from start to finish) in log/record book, including equipment and personnel that were utilized.

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| **Sewer Blockage or Back up into Basement, Minimum Levels of Staffing (people): 2** | |
| **Minimum Emergency Equipment** | **Specialized Equipment** |
| * Jet flushing unit if available (sand trap) * Rodding machine & associated cleaning/cutting attachments (sand trap) * Standard harness and lifeline if applicable * Air blower with hose * Power vacuum * Portable pumps * Portable generators * Safety cones/barricades * Gas meter – for oxygen deficient, explosive or toxic gases * Confined space entry tripod and associated equipment | * Closed Circuit Television camera unit * Truck with hoist * Vactor unit * Power saw (circular) * Pipe cutter (hydraulic) * Sand trap |

**[***Edit the following or replace with your handout, customizing for your situation, adding or deleting details or procedures to fit your city/ town department]*

**[Insert department name]**

**STEPS TO BE TAKEN BY PROPERTY OWNERS WHEN**

**SEWAGE BACK-UP IS DETERMINED TO BE DUE TO BLOCKAGE IN PRIVATE LATERAL CONNECTION**

## **After the Collection System crew has checked the** **[Insert "city" or "town"] sewer for blockage and has found that the public sewer is not blocked, they will notify the property owner. It is** **[Insert City/Town name]’s** **[Insert "city" or "town"] policy that if the main sewer is clear then the property owner must hire a licensed plumber, drain layer, or sewer cleaner to free any blockage, which might exist in the private lateral. The property owner is responsible to pay for this activity.**

**NOTE: PROPER RODDING PROCEDURE GUIDELINE FOR PROPERTY OWNERS TO CLEAR PRIVATE LATERAL SEWER CONNECTION**

If the blockage is found in the portion of the sewer house connection located within private property, the owner must hire a licensed contractor to perform the necessary repair work, under permit and inspection from the [Insert department name].

The [Insert department name] requires proper rodding procedures. In cases where a property owner needs to free a blockage within their lateral, the plumber must use a 4” cutter at the end of the rod. If they can’t break through the blockage, they will then start using smaller cutters back up to 4”. If the plumber relieves the blockage, they must then rod the house connection to the main sewer line.

All repair work on the sewer house connection must be performed under permit issued by the [Insert department name] to a licensed contractor, and will be inspected by the local [Insert department name] personnel.

**WARNINGS:**

If the property owner, licensed plumber, drain layer or sewer cleaner does not call the [Insert department name] and request the public sewer line to be checked prior to rodding, the [Insert department name] will not assume liability if the problem is located in the public sewer line.

If there is a blockage, but no record of the house connection, the owner must prove where the blockage is located. This can be done by excavation or electronic locator in the presence of an inspector.

**PROBLEM: Overflowing Sewer Manhole Resulting from Surcharged Trunk Sewer (No backup into building)** *[customize procedures for your situation, adding or deleting details or procedures to fit your city/ town department]*

**EMERGENCY PROCEDURES:**

* The [Insert name of department] completes and electronically submits a Sewage Overflow Report using the Everbridge/NY-Alert notification platform within 2 hours of becoming aware of the sewer overflow and, if requested, provides the information by phone and/or e-mail to the [Insert state and other agencies, e.g., "RI DEM"]
* Dispatch the crew immediately to the problem location.
  + Refer to sewer maps for location of sewers (private lands, flow patterns, manholes, etc.) and determine if the area is served by a pump station before responding to the call.
* Go to the location of the overflowing manhole to assess the immediate danger to public health or the environment.
* Determine the location of the blockage by inspecting the downstream manholes until a dry manhole is found. Immediately begin the set up for pumping around the blockage
  + Request additional manpower and equipment as needed (e.g. excavating crew, bypass pumping equipment, etc.) or to help with evaluating options for pumping around the blockage.
  + Set up pump out equipment and hoses from the upstream manhole to the nearest flowing manhole below the blockage.
* Install the proper size sandtrap in the downstream invert of the manhole before clearing the blockage to capture the debris. Remove the debris from the manhole and assess it to try to determine the cause of the blockage.
* Use the necessary equipment to relieve the blockage, either by jet flushing or power rodding. If jet flushing is insufficient to clear the blockage, request [Insert staff or contractor or inter-town agreement info] to bring power rodding equipment.
* If it is imminent that the waste water will be released into wetlands, receiving waters or a drinking water supply watershed, contact [Insert who you call with septage or vactor to try to capture, include any details the crew will need] and notify supervisor, who will call in extra crew and coordinate emergency equipment. The supervisor will also notify the proper authorities and agencies including the fire department to set up flotation booms across streams, brooks, etc. if necessary. (See responsibility chart)
* Gather and remove sewage related debris and organic matter from the affected area.
* If the wastewater is in the streets/roads (public or private), use sand bags or [Insert other equipment you use] to contain the waste water to minimize any impact to public health or the environment.
* Sandbag nearby catch basin inlets or paved leak-offs to prevent the waste water from entering the drainage system and causing potential contamination to the receiving waters.
* Cordon off the area if ponding occurs.
* Collect as much of the sewage as possible, disinfect according to policy, notify surrounding homes (superintendent notifies appropriate officials, as needed).
* If the waste water jeopardizes a playground or park, cordon off the entire area. Close the park to the public until the issue has been remedied to the satisfaction of the local and state boards of health and the local park superintendent.
* Complete a report indicating the time of the call, description of the problem, repair work done, personnel present and equipment used.
* Submit a five-day written report of non-compliance to the Regional Water Engineer. Form can be found at <https://www.dec.ny.gov/docs/water_pdf/noncomprep.pdf>

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| **Overflowing Sewer Manhole, Minimum Levels of Staffing (people): 2-3** | |
| **Minimum Emergency Equipment** | **Specialized Equipment** |
| * Jet flushing unit if available (sand trap) * Rodding machine & associated cleaning/cutting attachments (sand trap) * Standard disinfectants * Safety harness and lifeline if applicable * Air blower with hose * Power vacuum * Portable pumps * Portable generators * Safety cones/barricades * Caution Tape * Gas meter-for oxygen deficient, explosive or toxic gases * Confined space entry tripod and associated equipment * Sand bags | * CCTV camera unit * Truck with hoist * Vactor unit * Power saw (circular) * Pipe cutter (hydraulic) * Caution tape * Sand trap * Floatation booms if necessary |

**PROBLEM:** **Cavities and Depressions in Streets and Lawns** *[customize procedures for your situation, adding or deleting details or procedures to fit your city/ town department]*

**EMERGENCY PROCEDURES:**

* When a call is received from the public, confirm the following:
  1. That the problem area is in fact a cavity or depression and not a missing or low manhole cover, gate box cover or catch basin grate.
  2. The location of the reported cavity and the name and address of the party making the call.
* If the caller indicates the problem is severe, extensive or obviously associated with the sewer or water system, investigate and barricade the condition if it appears appropriate to do so. Lights and barricades should be used if the situation is dangerous. Notify the water company immediately to aid in the cause investigation.
* When checking a depression over a main sewer, it is important to check the main sewer at both the upstream and downstream manholes adjacent to the depression to determine if there is a restriction of flow. If there is a blockage, it may indicate a possible main sewer break.
* If the cavity is a result of a sewer failure, refer to procedures for sewer main collapse and repair as appropriate.
* If it has been determined that it is a cavity or depression caused by other utilities (storm drain, water main, etc.), the crew should notify the [Insert responsible party for your streets in system, eg., DPW or Highway Department], and request that they take over the repair.
* The crew leader should thoroughly document the nature and extent of the impacts including the use of photographs and video footage where possible.
* Make out a report indicating the time of the call, a description of the problem, the repair work done, personnel present and equipment used.
* If sewage overflowed the collection system, the [Insert name of department] completes and electronically submits a Sewage Overflow Report using the Everbridge/NY-Alert notification platform within 2 hours of becoming aware of the sewer overflow and, if requested, provides the information by phone and/or e-mail to the [Insert state and other agencies, e.g., "RI DEM"]. Submit a five-day written report of non-compliance to the Regional Water Engineer. Form can be found at <https://www.dec.ny.gov/docs/water_pdf/noncomprep.pdf>

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| **Cavities and Depressions in Streets and Lawns , Minimum Levels of Staffing (people): 1** | |
| **Minimum Emergency Equipment** | **Specialized Equipment** |
| * Safety cones/barricades * Refer to emergency procedures for sewer break if confirmed | * + Caution tape |

**PROBLEM:** **Partially or Totally Blocked Siphon** [customize procedures for your situation, adding or deleting details or procedures to fit your city/ town department]

**EMERGENCY PROCEDURES:**

* Dispatch sewer crew to failing siphon immediately.
* *If you have double siphons and can divert flow to the parallel siphon, add to this procedure.*
* If sewage is discharging to the environment, follow instructions defined in “Overflowing Sewer Manhole Resulting from Surcharged Trunk Sewer” for reporting, containment and cleanup.
* Bring a high-velocity jet-flushing vehicle immediately to the site if a blockage is discovered.
* If the cause of a blockage is unknown, use a single port cutting nozzle attached to the jet-flushing machine.
* Insert the proper size sandtrap in the downstream invert of the downstream manhole to trap the debris causing the blockage.
* Using the high velocity jet-flushing, start flushing the siphon between 1000 and 1500 psi against the flow. Work the nozzle back and forth until minimal debris is observed in the down stream manhole.
* If the blockage is grease related, use [Insert descriptor for what you use, e.g. grease solvent] in accordance with policy. Care should be observed when working with chemicals. Refer to Material Safety Data Sheets (MSDS) prior to use.
* The crew leader should thoroughly document the nature and extent of the impacts including the use of photographs and video footage where possible.
* Make out a report indicating the time of the call, a description of the problem, the repair work done, personnel present and equipment used.

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| **Partially or Totally Blocked Siphon, Minimum Levels of Staffing (people): 4** | |
| **Minimum Emergency Equipment** | **Specialized Equipment** |
| * Jet flushing unit if available (sand trap) * Grease solvent, if needed * Standard disinfectants * Safety harness and lifeline if applicable * Air blower with hose * Power vacuum * Portable pumps * Portable generators * Safety cones/barricades * Gas meter-for oxygen deficient, explosive or toxic gases * Confined space entry tripod and associated equipment | * TV camera unit * Truck with hoist * Vactor unit * Caution tape * Sand trap * Floatation booms if necessary * Self Contained Breathing Apparatus (SCBA) |

**PROBLEM:Sewage Force-Main Break** *[customize procedures for your situation, adding or deleting details or procedures to fit your city/ town department]*

**EMERGENCY PROCEDURES:**

* If sewage is discharging to the environment, follow instructions defined in “Overflowing Sewer Manhole Resulting from Surcharged Trunk Sewer” for reporting, containment and cleanup.
* Dispatch a crew to the site to assess the situation, including determination of who and what might be affected and the immediate danger to the environment.
* Refer to sewer maps for location of sewers (private lands flow patterns, manholes, etc.) and determine the pump station associated and which critical facilities are in the area.
* Set up traffic cones and barricades as needed.
* Initiate measures to contain the sewer overflow, protect any streets, public areas, catch basin inlets, etc. that might be subject to flooding, and collect wastewater that has been discharged so as to minimize impact to public health and the environment.
* Determine if it will be possible to pump around the break, from the pump station wetwell to the force main discharge manhole or other accessible manhole, and if so, prepare to pump around the break as described below:
  + Request additional manpower and equipment as needed (e.g. excavating crew, bypass pumping equipment, etc.)
  + Set up pump out equipment and hoses from the wetwell to the nearest sewer discharge point.
  + Draw down the wet well as much as possible to maintain the low level.
  + Lock-out and tag-out (LOTO) the pumps in the pumping station.
* If pumping around the break is not possible, utilize the vactor truck or septage hauler ([Insert hauler contact information]) to draw down the wet well as much as possible and maintain a low level.
* Call in additional crews as necessary to help contain the sewer overflow. Set up flotation booms across streams, sandbag storm drains, etc., as necessary.
  + Check the tributary area to determine if the discharge will affect any receiving waters.
  + If it is determined that the receiving water may be affected, the supervisor should notify the proper authorities or agency.
  + If the wastewater is in streets/roads (public or private), contain the waste water to the extent possible with sandbags or [Insert other equipment you use].
  + Sandbag nearby catch basin inlets or paved leak-offs to prevent the wastewater from entering the drainage system and causing potential contamination to the receiving waters.
  + Cordon off the area if ponding occurs.
  + Collect as much of the sewage as possible, disinfect according to policy (see [Insert where your policy is, or include a description here]), notify surrounding homes (superintendent notifies appropriate officials, as needed).
  + If the wastewater jeopardizes a playground or park, cordon off the entire area. Close the park to the public until the issue has been remedied to the satisfaction of the local and state boards of health and the local park superintendent.
  + Gather and remove sewage related debris and organic matter from the affected area.
* Drain the force-main:
  + Close down the gate valve on the upstream side of the discharge check valve in the pumping station.
  + Open the check valve by hand and secure it in place.
  + Slowly bleed the force-main back into the wetwell by slowly opening the gate valve on the discharge side of the pump, but only to the point where the force-main stops leaking and there is enough room to make the repair. Constant communication must take place between the crew located at the break and the crew located at the pump station.
  + Close the gate valve and return the check valve to its normal operating position and then fully open the gate valve.
* Repair force main break as per policy.
* After the repair is complete, remove LOTO and return the pumps to normal operating position.
* Run the pump in the hand manual position to fill the force-main (Care must be taken during filling of force main – use only one pump during filling). Once completed, observe several pumping cycles before completely back-filling the excavation.
* Upon confirmation of adequacy of the repair, backfill the excavation (if necessary) and restore surface conditions to match existing conditions.
* While the crew is restoring the excavation, the crew leader should conduct a preliminary assessment of damage to private and public property. The crew leader should thoroughly document the nature and extent of the impacts including the use of photographs and video footage where possible.
* Make out a report indicating the time of the call, a description of the problem, the repair work done, personnel present and equipment used.

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| **Sewage Force-Main Break, Minimum Levels of Staffing (people): 4-5** | |
| **Minimum Emergency Equipment** | **Specialized Equipment** |
| * Portable bypass pumping units * Hoses * Standard disinfectants * Safety harness and lifeline if applicable * Air blower with hose * Power vacuum * Portable generators * Safety cones/barricades * Gas meter-for oxygen deficient, explosive or toxic gases * Confined space entry tripod and associated equipment | * CCTV camera unit * Truck wit hoist * Vactor unit or septage hauler * Power saw (circular) * Pipe cutter (hydraulic) * Caution tape * Sand trap * Floatation booms if necessary * Self Contained Breathing Apparatus (SCBA) |

**PROBLEM:** **Sewer Main Break/Collapse** *[customize procedures for your situation, adding or deleting details or procedures to fit your city/ town department]*

**EMERGENCY PROCEDURES:**

* If sewage is discharging to the environment, follow instructions defined in “Overflowing Sewer Manhole Resulting from Surcharged Trunk Sewer” for reporting, containment and cleanup.
* Dispatch a crew to location of break/collapse immediately while referring to the sewer maps for location of sewers (private lands flow patterns, manholes, etc.) to determine which critical facilities are in the area.
* Crew sets up signs, barricades, and/or barrels for traffic control and public safety, rerouting traffic as necessary and deploying traffic control measures such as police or flag person as needed.
* If it is a main line break, the Superintendent shall notify the appropriate authorities and town officials immediately.
* Request additional manpower and equipment as needed based on initial damage assessment (e.g. excavating crew, equipment to pump around the break, etc.)
* Pumping around the break from the upstream manhole to the downstream manhole may be required. If necessary, set up bypass pumping equipment. If not necessary, prepare for repairs while the pipe is flowing.
* Call in additional crews to set up flotation booms across streams, install sandbags, etc., as necessary. Unless special conditions exist, **pumping around the failed sewer main is a priority** before containing the overflow.
* Gather and remove sewage related debris and organic matter from the affected area.
* If the wastewater is in the streets/roads (public or private), use sand bags or [Insert other equipment you use] to contain the wastewater to minimize any impact to public health or the environment.
* Sandbag nearby catch basin inlets or paved leak-offs to prevent the waste water from entering the drainage system and causing potential contamination to the receiving waters.
* Cordon off the area if ponding occurs.
* Collect as much of the sewage as possible, disinfect according to policy, notify surrounding homes (superintendent notifies appropriate officials, as needed).
* If the waste water jeopardizes a playground or park, cordon off the entire area. Close the park to the public until the issue has been remedied to the satisfaction of the local and state boards of health and the local park superintendent.
* Determine the location of the break/collapse and make any necessary repairs. Use repair procedures consistent with policy. If the break is on the pipe length, then a repair can be made with a wrap-around sleeve. If the break is at the bell, then a bell-joint clamp may be used.
* Upon confirmation of adequacy of the repair by [Insert title of person who inspects, e.g. "the superintendent", or "the [city or town] engineer"], backfill the excavation (if necessary) and restore surface conditions to match existing conditions.
* To restore the sewer line to full capacity, the crew should remove any debris that may have entered and accumulated in the sewer line downstream and upstream from the break/collapse. The crew should clean the sewer line as described below.
* Install the proper size sandtrap in the downstream invert of the downstream manhole to trap any debris which may have accumulated in the sewer line.
* Using a high velocity jet-flushing vehicle, begin flushing from the downstream manhole against the flow to the upstream manhole.
* Repeat this procedure for several upstream and downstream pipe reaches.
* The crew leader should thoroughly document the nature and extent of the impacts including the use of photographs and video footage where possible.
* Make out a report indicating the time of the call, a description of the problem, the repair work done, personnel present and equipment used.

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| **Sewer Main Break/Collapse, Minimum Levels of Staffing (people): 4** | |
| **Minimum Emergency Equipment** | **Specialized Equipment** |
| * Portable bypass pumping units * Hoses * Jet flushing unit if available (sand trap) * Standard disinfectants * Safety harness and lifeline if applicable * Air blower with hose * Power vacuum * Portable pumps * Portable generators * Safety cones/barricades * Gas meter-for oxygen deficient, explosive or toxic gases * Confined space entry tripod and associated equipment | * CCTV camera unit * Truck with hoist * Vactor unit * Power saw (circular) * Pipe cutter (hydraulic) * Sand trap * Caution tape * Floatation booms and sand bags as necessary * Self Contained Breathing Apparatus (SCBA) |

**PROBLEM: Air Release and Vacuum Relief Valve Failure** *[customize procedures for your situation, adding or deleting details or procedures to fit your city/ town department]*

**EMERGENCY PROCEDURES:**

* If sewage is discharging to the environment, follow instructions defined in “Overflowing Sewer Manhole Resulting from Surcharged Trunk Sewer” for reporting, containment and cleanup.
* These valves require frequent inspection and maintenance. Their failure is often found during routine inspections. Both these types of valves may fail to operate reliably if grease is allowed to accumulate in the valve or on the operating mechanism.
* Inspection crew should inspect valves in accordance with the specific manufacturer’s recommendations.
* Attach fittings at the top and the bottom to permit back flushing of all valves upon initial installation or retrofit upon failure.
* Isolate the valve from the force-main by closing the shutoff valve attached to the force-main.
* To clean the internal components of the valve(s), attach a back-flushing hose to a pressurized water source using a quick disconnect coupling.
* Place a blow off discharge hose in a container to collect the back-flush water from the blow off valve. This is wastewater that should not be discharged onto the street or into the valve pit.
* Open the shutoff valve and back-flush the valve through the blow off valve at the bottom.
* If you are using a potable (drinking) water source, provide the system with an anti-siphon device or back flow to prevent contamination of the potable water.
* Make out a report indicating the time of the call, description of the problem, repair work done, personnel present and equipment used.

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| **Air Release and Vacuum Relief Valve Failure, Minimum Levels of Staffing (people): 3** | |
| **Minimum Emergency Equipment** | **Specialized Equipment** |
| * Hose with quick disconnect fitting and anti siphon device * Blow off discharge hose and waste container * Standard disinfectants * Safety harness and lifeline if applicable * Air blower with hose * Power vacuum * Portable pumps * Portable generators * Safety cones/barricades * Gas meter-for oxygen deficient, explosive or toxic gases * Confined space entry tripod and associated equipment | * CCTV camera unit * Truck with hoist * Vactor unit * Power saw (circular) * Pipe cutter (hydraulic) * Caution tape * Self Contained Breathing Apparatus (SCBA) |

**PROBLEM: Wastewater Pump Station Alarms General Response Actions**

[You will need to develop a trouble shooting guide for your pump stations to walk your crews through specifics associated with each station. Choose the appropriate procedures for your situation and modify them to fit your city/ town department.

*Various types of level sensors may be present in the pump station, including bubbler systems, float switches, transducers, or rod-type probes. Similarly various types of controls may be present for pump cycling including pneumatic systems, simple relays and/or computerized processors. The responding crew should be fully capable and trained in the proper function of each of these systems present within the municipality. Trouble shooting these controls is specific to the unit. Consequently, the O&M manual for the level sensor system and pump controls should be consulted during a failure.]*

**EMERGENCY PROCEDURES:**

* If sewage is discharging to the environment, follow instructions defined in “Overflowing Sewer Manhole Resulting from Surcharged Trunk Sewer” for reporting requirements.
* Send an individual to the station indicating an alarm as soon as possible for a Priority Alarm. **Responders should bring a detailed station-specific trouble-shooting guide with them for that particular station.** If serious trouble is found, call for additional assistance and keep an individual at the station until further instructions are received.
* Always check with the power company when an alarm goes on to see if there is a power outage in the area, although a power failure that has not been reported to the power company can occur at a pump station. The pole number nearest the station should be reported.
* Personnel called in to investigate pump station alarms shall respond to the station even if the alarm has cleared prior to their arrival. All alarm conditions are to be checked and logged. Use the following guidelines and follow confined space entry procedures if applicable:

**Wetwell/Drywell Type Stations**

* 1. Observe all safety precautions per training.
  2. Check the atmosphere within drywell with gas meter prior to entering.
  3. Upon entry, identity the storage capacity in the well. This will give some indication of the time available for response. If flooded, skip to pump-out steps under “Pumping Station Failure inside valve pit, pump or valve failure” procedure.
  4. Take your time entering the drywell. Never enter a flooded drywell.
  5. Note any unusual odors - i.e. burning electrical equipment or paint.
  6. Listen and note any unusual noises.
  7. Check for heat around pump motors and pump bearing housings. Note any which seem unusually hot.
  8. Observe every piece of equipment in the station. Note anything that looks out of place.
  9. Record all gauge readings including wet well level, hour meters, flow charts, on-off levels, psi gauges on pump, rpm (on VFD’s) and anything else that you feel is significant.
  10. Using available information and the trouble shooting guide, systematically run through the system. Use a process of elimination to identify the cause of the failure. Check the level controls, check pump operation using manual position, check pump output by pressing on check valve counterweight as defined in the trouble-shooting guide. Once the cause of the problem is isolated, engage mechanical or electrical disciplines for repairs.
  11. Emergency personnel should be absolutely certain that the cause of the pump station alarm or failure has been properly identified and corrected prior to leaving the station.
  12. Reset any/all alarm feature indicator lights.

**Submersible Type Stations**

1. Take all safety precautions per training.
2. Check the atmosphere within the wetwell with a gas meter prior to working over the top.
3. Note any unusual odors - i.e. burning electrical equipment, hot or smoking oil, or paint.
4. Listen for any unusual noises and note if pump(s) are running.
5. Observe every piece of equipment in the station (pay specific attention to the level control system). Note anything that looks out of place.
6. Record all gauge readings from the control panel including: wet well level, hour meters, flow charts, on-off levels, psi gauges on pump, rpm (on VHD’s) and anything else that you feel is significant.
7. Using available information and the trouble-shooting guide, systematically run through the system. Use a process of elimination to isolate the cause of the failure. Check level controls, check pump operation using manual position, check pump output by observing the check valve counterweight as defined in the trouble shooting guide. Once the cause of the problem is isolated, engage mechanical or electrical disciplines for repairs
8. Emergency personnel should be absolutely certain that the cause of the pump station alarm or failure has been properly identified and corrected prior to leaving the station.
9. Reset any/all alarm feature indicator lights.

* Check the O&M manual to trouble shoot the level sensor system and pump controls
* Pumps may be checked easily for operation by checking the arm of the check-valve in the discharge line of an operating pump. If it feels “spongy” (or soft) when downward pressure is applied with the palm of the hand, the pump is pumping. If a breaker is off and the pump motor is hot to the touch, DO NOT attempt to reset and start. If a pump motor is simply warm, one attempt to restart can be made. Turning the selector switch to manual will normally start a pump, and the check valve arm should move upwards. If the pump has lost prime or is lugged, the check valve will not open.

|  |  |
| --- | --- |
| **Wastewater Pump Station Alarms General Response Actions, Minimum Levels of Staffing (people): 2** | |
| **Minimum Emergency Equipment** | **Specialized Equipment** |
| * Gas meter-for oxygen deficient, explosive or toxic gases * Self Contained Breathing Apparatus (SCBA) * Harness and lifeline | * As applicable for trouble-shooting |

**PROBLEM:** **Pumping Station Failure Caused by Secondary Power Failure During Power Outage** *[customize procedures for your situation, adding or deleting details or procedures to fit your city/ town department]*

**EMERGENCY PROCEDURES:**

* If sewage is discharging to the environment, follow instructions defined in “Overflowing Sewer Manhole Resulting from Surcharged Trunk Sewer” for reporting requirements.
* Dispatch pump station crew to the pumping station immediately. The crew needs to bring the auxiliary generator for that specific station as a backup, assuming that repair to the dedicated generator cannot be made immediately.
* Upon entry, identify the storage capacity in the well. This will give some indication of the time available for response. If flooded, skip to pump-out steps under “Pumping Station Failure inside valve pit, pump or valve failure” procedure.
* Dispatcher shall request the assistance of the power company in restoring power to the station if necessary. Determine the estimated time of arrival of the power company crew and then notify the pumping station operators.
* As they approach the pumping station, the pumping station crew should check the overhead power lines for fuses that might have blown or down power lines. If the crew notices a blown fuse or down power line, identify the location and pole number(s), and notify the dispatcher to relay this information to the power company.
* Lock out and tag out (LOTO) the main line, disconnect (if applicable).
* Check all components of the dedicated generator to determine failure cause. Use the manufacturer-prepared trouble-shooting guide to aid in diagnosis. If it cannot be repaired immediately, connect the portable generator to the auxiliary power connection located outside the building. Examine plug type and ensure consistency. Use adapters as necessary.
* Go through the specific procedures for starting the generator to supply power to the station.
* Obtain the services of a qualified generator repair facility to address the dedicated generator failure.
* Once fully repaired, disconnect the portable generator and reconnect the dedicated unit. Operate the dedicated unit through several pump cycles. Check unit for regular exercise.

|  |  |
| --- | --- |
| **Pumping Station Failure Caused by Secondary Power Failure During Power Outage, Minimum Levels of Staffing (people): 2-3** | |
| **Minimum Emergency Equipment** | **Specialized Equipment** |
| * Harness and lifeline * Flash light * Emergency lighting * Portable generator * Gas meter-for oxygen deficient, explosive or toxic gases | * Power testing equipment |

**PROBLEM:** **Pumping Station Failure Inside Valve Pit, pump or valve failure (submersible type application)** *[customize procedures for your situation, adding or deleting details or procedures to fit your city/ town department]*

**EMERGENCY PROCEDURES:**

* If sewage is discharging to the environment, follow instructions defined in “Overflowing Sewer Manhole Resulting from Surcharged Trunk Sewer” for reporting requirements.
* Dispatch pumping station crew to the pumping station immediately.
* Prior to viewing the wetwell, measure the atmospheric conditions for sufficient oxygen and the presence of explosive or toxic gases.
* Upon arrival the crew should identity the storage capacity in the wetwell. This will give some indication of the time available for response. If flooded, skip to pump-out steps.
* Inspect the main controls looking for failure indications. Check processor to determine failure if applicable. If pump failure is determined, skip to wetwell inspection steps.
* Inspect the valvepit. Observe all valves and force mains. If flooded, arrange to pump out the valve pit. If failure within the valvepit is detected, skip to pump-out steps.
* Constantly monitor the atmospheric conditions while working in or above the wetwell. Inspect the wetwell. Check the wetwell floats or level control system, bar rack and pump volute area for clogging or other problems.

**Pump-Out Steps**

* If pump failure, determine if pump out is necessary. If unnecessary, skip to repair procedures.
* Pump the flow with portable pumps. Call additional crew to bring appropriate portable pump(s) including all required lengths of suction and discharge hose, to the pumping station if necessary. Upon arrival of the portable pump, connect the appropriate lengths of suction hose that will suspend all the way into the wetwell, and then connect enough discharge hose to pump into appropriate manhole or connection (if so equipped). Go through the procedures for starting the portable pump, and begin pumping.

**Repair Steps**

* Lock out and tag out (LOTO) the main line, disconnect (if applicable).
* Monitor the atmospheric conditions for sufficient oxygen and the presence of explosive or toxic gases. If safe, enter valve pit or wet well and inspect the piping and valves for cause of failure.
* Complete repairs to pipe, pump or valve as per policy. If permanent materials are not readily available, install temporary repairs until the permanent repairs can be completed.
* Restore facilities to normal and inspect other components of the force main and pumping system for signs of similar failure.
* Shut down portable pumping operation. Do not disconnect hoses until repair is checked for leaks. Operate pumps to check repair under pressure and normal operating conditions.
* If no leaks are observed, return pumps to normal conditions by removing LOTO. Monitor pumps to check lead/lag operations.
* Make out a report indicating the time of the call, description of the problem, the repair work done, personnel present and equipment used.
* File [Insert Agency, e.g., "RI DEM"] Overflow Notification Log and Overflow Report Form.

|  |  |
| --- | --- |
| **Pumping Station Failure Caused by Force-Main Break inside valve pit, pump or valve failure, Minimum Levels of Staffing (people): 2-4** | |
| **Minimum Emergency Equipment** | **Specialized Equipment** |
| * Harness and lifeline * Flash light * Emergency lighting * Portable pumps and hoses * Gas meter-for oxygen deficient, explosive or toxic gases | * Self Contained Breathing Apparatus (SCBA) |

**5.3 Emergency Support**

*[Programs for emergency support have been developed for the water and wastewater sector. Information can be found at* <http://www.awwa.org/Government/content.cfm?ItemNumber=3837>*. Agreements, formally known as Water/Wastewater Agency Response Networks (WARN), are developed to facilitate an effective and efficient flow of personnel and resources after an emergency. By adopting the WARN approach to mutual aid and assistance, drinking water and wastewater utilities in each state are able to sign a single agreement covering issues such as indemnification, workers’ compensation, and reimbursement. If you do not have an agreement with nearby municipalities and /or outside companies, consider developing one, but in the meantime, delete whichever of the following paragraphs do not apply]*

Addressing some problems may require resources beyond [Insert Town/City Sewer Dept. name] forces. This is particularly true of main line breaks where there is a risk of a significant sewer overflow. In these situations, [Insert Town/City Sewer Dept. name] may enlist the aid of [Insert "an emergency contractor" or name of Town "under our mutual aid agreement"]. [Insert Town/City Sewer Dept. name] maintains a general services agreement with several companies for situations that require the prompt reconstruction of sewer lines.

*[for emergency services contracts, edit the following:]*

These companies are capable of mobilizing construction equipment and personnel quickly to handle emergency assignments. The [Insert Town/City Sewer Dept. name] contract for emergency sewer repairs requires the contractor to respond to the site within [Insert timeframe] hours of notification to mobilize. This response time and the level of response will vary due to several factors, some are identified below:

• Location of the sewer repair in relation to the contractor’s equipment yard

• Scope of the repair, size of sewer, depth of sewer and volume of flow

• The size, type and availability of equipment and number of workers

• The time of day, day of the week and the proximity to a holiday

• Weather conditions, clear, rain, snow, extreme cold or heat

*[If you have a contractor for overflows, complete and include the following portion of the template]*

**Spill Contractor:** [Insert name of outside contractor and phone number]

In the event of a spill that cannot be controlled by the [Insert Town/City Sewer Dept. name] Response Team, [Insert name of outside contractor] will provide professional services for the removal and disposal of contaminated material. Also, in the event of a tank rupture, the tank will be repaired or replaced by [Insert name of outside contractor] per the direction of the [Insert Town/City name] Fire Department. The following is a list of other spill contractors:

[Insert listing of your contractors]

*[If you have a mutual aid agreement include the following information]*

**Mutual Aid Agreement**

Mutual Aid Agreements have been executed by the [Insert position and/or name of person who set up the agreement] with the following organizations to supply equipment, materials, and personnel in an emergency situation:

*[Edit the following details and lists to indicate with whom and what is available by mutual aid]*

[Insert Town and Deparment name] Public Works Department

Equipment, Materials, and Personnel

Dump trucks, flatbed trucks, backhoe

Portable pumps, auxiliary personnel

Contact: [Insert Position title and name]

Telephone: [Insert phone number for mutual aid]

[Insert Town and Deparment name] Fire Department

Equipment, Materials, and Personnel , ventilating fans

Contact: [Insert Position title and name]

Telephone: [Insert phone number for mutual aid]

# **6. OVERFLOW REPORTING**

**6.1 Overview**

The 2013 Sewage Pollution Right to Know (SPRTK) requires untreated and partially treated sewage discharges to be reported by publicly owned treatment works (POTWs) and publicly owned sewer systems (POSSs) within two hours of discovery to DEC. Sewage spills (overflows) must be reported using the NYSDEC approved Everbridge system.

* Log on <https://manager.everbridge.net/login>
* Complete and submit the online form.
* Submit a report each day of an ongoing event.
* Submit a report when the event has ended.
* Submit a five-day written report of non-compliance to the Regional Water Engineer. Form can be found at <https://www.dec.ny.gov/docs/water_pdf/noncomprep.pdf>

The information collected will also provide the [Insert name of Town and name of department] with valuable information that can be used to make informed decisions regarding collection system rehabilitation and replacement, scheduling, staffing, equipment needs, budgeting and updating this and other emergency response plans.

**6.2 Reporting Details**

*Edit the following to include the details you want to be sure that your staff capture*

• The dispatcher provides details on the time, location, description, and map locations of overflows

• The start time of the sewer overflow is determined by one of the following methods:

a. Date and time information received and/or reported to have begun and later substantiated by a sewer investigator or response crew;

b. Visual observation; or *[Include the following bullet point if you have a SCADA system that you will be using when reporting]*

c. Pump station and lift station flow charts and other recorded data. At major pump stations this information is available from the Treatment Plant SCADA System.

• The stop time of the sewer overflow is determined by one of the following methods:

a. When the blockage is cleared or flow is controlled or contained; or

b. The arrival time of the sewer investigator or response crew, if the overflow stopped between the time it was reported and the time of arrival.

• An estimation of the rate of sewer overflow is made by one of the following criteria (See Appendix [Insert number] for guidance on estimating sewer overflow volumes and flow rates):

a. Direct observations of the overflow; or measurement of actual overflow from the sewer main.

b. When the rate of overflow is known gallons per minute (GPM), the duration of the overflow is multiplied by the overflow rate; or when the rate of overflow is not known, the surrounding area is investigated for evidence of ponding or other indications of overflow volume.

• Visual observations should be recorded for any unusual observations

• Photographs and videotapes are taken at the event and response when possible.

• The nature and extent of any damage or impacts to public/private property are assessed.

• Repair crews provide a report indicating the time of the call, a description of the problem, the repair work done, personnel present and equipment used

Reports are kept in [Insert what you use as your recordkeeping system, whether a file a database or an excel spreadsheet] and evaluated [Insert how often, e.g., quarterly, annually] to determine patterns and trends and to provide input to our asset management program. *Add any details that you feel should be included in emergency response related to your asset management program.*

**6.3 Customer Satisfaction**

The [Insert who is responsible for follow up, e.g., supervisor, sewer investigator, or response crew] confirming the overflow follows up in person or by telephone with the citizen(s) reporting the overflow. The cause of the overflow and its resolution will be disclosed.

In the event of a longer term emergency response, the following table indicates who will be responsible for communicating with the public and the media:

**Designated spokesperson and alternates**

|  |  |  |
| --- | --- | --- |
| **Spokesperson** | **Alternate 1** | **Alternate 2** |
| [Insert name of primary spokesperson, and their position] | [Insert name of alternate spokesperson and their position] | [Insert name of alternate spokesperson and their position] |

**Appendix 1**

Everbridge/NY-Alert Data Entry Helpful Information

This is meant as a quick guide for municipalities and individual notifiers to use based on their circumstances.

**Resources & Tips**

Location of maps – write down where staff can find waterbody names.

**How to estimate volume/rate**

See Appendix 2 for SSO volume/rate estimating tools.

For CSO discharges, use the average discharge based on the data from the previous year. Use the additional instructions box for explanation of average calculation.

**Suggestions for Additional Instructions box to better inform public**

+ Explain calculation for CSO discharges

+ Long term solutions:

\* Preventive maintenance program adjusted

\* Enforcement against source

\* Inspect sewer lines with CCTV

\* Planned to be repaired/replaced by a certain date

\* Repaired defect

**Example descriptions for “Reason for Example descriptions for “Steps to**

**Discharge”-“Explanation of Reason” Contain the Discharge”**

+ Blockage + Nothing

\* Debris - general + Mitigated effects of spill

\* Debris - rags + Contained all or portion of spill

\* Grease deposition + Returned all spill to sanitary sewer

+ Other system

\* Blow off valve failure + Returned portion of spill to sanitary

\* Construction diversion failure Sewer system

\* Damage from construction + Vacuum truck

activities + Plugged downstream storm drains

\* Pump station failure + Excavation

\* Siphon Failure + Used sandbags or other containment

\* Vandalism barriers

+ Plugged catch basin inlets

+ Permitted CSO Discharge

**When do reports need to be updated?**

+ Every Day of an ongoing discharge

+ Any change to information that should go out to the public

**When do reports need to be closed?**

+ When the discharge has ended – termination notice

+ Can be done 7 days after the end of discharge

**Notifier Worksheet**

**Examples for use**

+ Very infrequent discharges – so you don’t forget user name and password and the required

information needed.

+ Frequent discharges at a single location – you have a format to refer to every time.

+ Modify to tell staff what information needs to be changed in a template.

**Notifier Data Entry Worksheet for Your City/Town/Village**

User Name:

Password:

Trouble getting into Everbridge/NY-Alert? Contact [NYAlertSupport@its.ny.gov](mailto:NYAlertSupport@its.ny.gov) or call

518 292-2249

**Location**

+ Use the map’s satellite feature to confirm the balloon placement.

+Create a table with known discharge locations’ latitude and longitudes.

**Discharge Information**

+ Start Date and Time

+ Actual/Estimated End Date and Time:

+ Calculated Duration:

+ Surface Water Name:

+ Potentially Impacted Public Areas:

\* Bathing Beach \* Other

\* Boat Launch \* Park

\* Drinking Water Intake \* Unknown

\* Fishing Area

+ System Components:

\* CSO \* Plant Headworks

\* Manhole \* Pump Station

\* Other \* Regulator

\* Pipe

+ Reason for Discharge:

\* Blockage \* System Capacity

\* Pipe Break \* Unknown

\* Power Outage \* Weather Conditions

\* Root Intrusion

+ Volume:

\* Actual \*Estimated

+ Rate:

\* Gallons \* Gallons per Minute (GPM)

+ Treated State:

\* Untreated

\* Partially Treated with Disinfection

\* Partially Treated without Disinfection

**Appendix 2**

Guidance on estimating sewer overflow volumes[[2]](#footnote-2)1

#### A variety of approaches exist for the estimation of the volume of a sanitary sewer overflow. This appendix documents methods that are often employed. Other methods are also possible. The person preparing the estimate should use the method most appropriate to the SSO using their judgment.

Method 1 “Visual Estimate”

#### The volume of very small spills can be estimated by imagining the amount of water that would spill from a 5-gallon bucket or 50 gallon barrel. If the spill is larger than the amount of liquid from a 50 gallon barrel, try to visualize how many barrels the standing water would fill and them multiply by the number of barrel volumes by 50. This method can be useful for contained spills that are not more than a couple of hundred gallons.

Method 2 “Measured Volume”

The volume of some small spills can be estimated using this method if it is not raining. The shape dimensions and depth of the spilled wastewater are needed to use this method. The shape dimensions are used to calculate the area of the spill and the depth calculates the volume.

1. Sketch the shape of the contained area of sewage

2. Measure or pace off the dimensions and add the dimensions to your sketch

3. Measure the depth in several locations and then average the depth for the spill. (If the shape and depth vary, break your sketch into sections and calculate the volume of each by repeating the steps below)

4. Convert the dimensions to feet (if they are not in feet to begin with)

5. Calculate the area using the following formulas (depending on the shape of the spill):

Rectangle Area = length X width

Circle Area = diameter X diameter X 0.785

Triangle Area = base X height X 0.5

6. To get the volume in cubic feet, multiply the area times the average of the depths you measured

7. Multiply the volume by 7.5 to convert to gallons

Method 3 “Duration and Flow Rate”

Calculating the volume of spills where it is difficult or impossible to measure the area and depth requires a different approach. In this method separate estimates are made of the duration (the elapsed time from the start of the overflow to the time the spill is stopped) of the spill and the flow rate.

Start time can be difficult to establish. Here are two approaches to estimating start time:

For very large overflows, changes in flow on a downstream flow meter can be used to establish the start time. Typically, the daily flow peaks are “cut off” of flattened by the loss of flow. This can be identified by comparing hourly flow data on the downstream flow meter.

Conditions at a spill site may change with time. Initially, there will be limited deposits of grease and toilet paper. After a few days to a week, the grease forms a light colored residue. After a few weeks to a month the grease turns dark. In the latter two cases the quantity of toilet paper and other materials of sewage origin increase in amount. These changes with time can be used to estimate the start time in the absence of other information.

Sometimes it is simply not possible to estimate the start time and the date that the overflow was first observed should be used on the form.

End time is usually much easier to establish. Field crews on site observe the “blow down” that occurs when the blockage has been removed. The end can also be observed in downstream flow meter readings.

Flow Rate:

One way to estimate flow rate is to look at changes in flow rates in the downstream flow meters to estimate how much of the flow rate was lost during the spill (this generally only works for large SSOs)

A second way to estimate flow rate is to base it on up-stream connections: Once the location of the spill is known, the number of upstream connections can be determined from records or your computerized system. Multiply the number of connections by 200 to 250 gallons per day per connection or 8-10 gallons per hour for each connection (or other flow rates that are consistent with your data for your connections).

Once duration and flow rate have been estimated, the volume of the spill is the product of the duration in hours (or days) times the flow rate in gallons per hour (or gallons per day).



#### *[The following pages provide forms and information that you can fill in and can use to supplement your plan. If you decide not to use these forms, remember to delete them from the template prior to saving it as your final plan]*

#### Service/repair notification list

|  |  |
| --- | --- |
| Electrician day | Electrician night |
| Electric Utility day | Electric Utility night |
| Plumber day | Plumber night |
| Pump Specialist day | Pump Specialist night |
| Soil Excavator day | Soil Excavator night |
| Equipment Rental day | Equipment Rental night |
| Other | Other |
| Other | Other |

**Notification procedures**

**Notifying collection system customers**

|  |  |
| --- | --- |
| **Who is Responsible:** |  |
| **Procedures:** |  |

**Alerting local law enforcement, state drinking water officials, and local health officials**

|  |  |
| --- | --- |
| **Who is Responsible:** |  |
| **Procedures:** |  |

**Contacting service and repair contractors**

|  |  |
| --- | --- |
| **Who is Responsible:** |  |
| **Procedures:** |  |

**Procedures for issuing a health advisory**

|  |  |
| --- | --- |
| **Who is Responsible:** |  |
| **Procedures:** |  |

**Other procedures, as necessary**

|  |  |
| --- | --- |
| **Who is Responsible:** |  |
| **Procedures:** |  |

***[Example:]* Power outage**

|  |  |
| --- | --- |
| **Assessment** | The [Insert Town/City Sewer Dept. name] system is vulnerable to power outages, experiencing an average of [Insert number] outages per year that last several hours. The system does not have a back-up generator but has a connection so that a generator can be rented and plugged into the system. Storage is able to hold the pump station flow for several hours until power is restored. |
| **Immediate actions** | 1. Assess whether the outage is likely to last more than 6 hours. If not, be on alert for changing conditions and monitor holding capacity. If yes, complete the following steps: 2. Call on availability of back-up generator at [Insert name] Rentals. 3. Call on septage hauler at [Insert name] and arrange to collect overflow while waiting for generator. 4. Obtain generator if available. 5. Connect generator to system and resume operations. 6. Implement overflow response actions to inform customers to cut back on water usage until power is restored. |
| **Notifications** | 1. Power Company – Let them know that a sewer collection system is experiencing an outage and the generator will be turned on until power is restored.  1. [Insert name] Rentals – Obtain generator. 2. Customers – cut back on water usage until power is restored. |
| **Follow-up actions** | 1. Turn off and disconnect back-up generator. 2. Return system to general power supply. 3. Inspect alarms and pumping facilities to ensure proper operation. 4. Return generator to [Insert name] Rentals. |

**Training and Rehearsals**

*[Any training should have a purpose, appropriately selected personnel, and qualified instruction and supporting materials.*

*Training can be conducted in a variety of ways, including attending training classes or bringing in experienced trainers for on-site training and exercises. On-site exercises with experienced trainers are very useful, as they involve activities that are specific to your own system. Personnel can practice emergency communications, isolating parts of the system, inspecting system components, and learning what to look for in case of a security breach. It is also important to train staff on risk communications or how to communicate with the media and customers during an emergency.*

*When planning training, consider your system’s size, the type and complexity of its components, staff needs, and operational needs. Periodic training reinforces previous efforts, as people often forget things that they don’t use very often. It also provides an opportunity to train new staff and learn about new problems, new techniques, and changes in equipment. Be aware of current and upcoming training topics, especially hot topics that tend to come around as a result of a specific event.]*

**Training**

Emergency response training is essential. [Insert Town/City Sewer Dept. name]’s training educates system personnel about emergency situations and resulting effects on our wastewater system, public health and environmental impacts, and also provides an opportunity to practice responses.

*Example:* **Training**

Staff position training needs and expectations.

|  |  |
| --- | --- |
| **Position** | **Training needs and expectations** |
| System Manager | Response communications, emergency response planning, issuing health advisories |
| System Operators | Response communications, emergency response planning, suspicious activity training |
| Field support | Response communications, suspicious activity training |
| Administrative Support | Response communications, emergency response planning |

**Emergency rehearsals**

*[Emergency rehearsals, sometimes referred to as “table-top exercises” are valuable tools to make sure employees are always prepared to respond. Ideally, rehearsals are set up by the system manager and are unannounced to employees. During these rehearsals, employees are required to conduct actual responses. They make phone or radio calls, perform inspections, respond to inquires, and do other tasks. Get assistance from partners such as local health or environmental jurisdictions and local emergency response people.*

*Practicing for an emergency is the only real way to thoroughly evaluate the emergency response plan and the system’s ability to implement it. The final step of a rehearsal is to evaluate and discuss the results. Conduct a staff meeting to go over the results and get input from those involved in the rehearsal. Then make modifications or set up training to be better prepared.]*

*Example:* **Emergency rehearsals**

Schedule for drills, tabletop exercises, and other ways to practice emergency response:

|  |  |  |  |
| --- | --- | --- | --- |
| **Event** | **Description** | **People and organizations involved** | **Date** |
| Rehearsal | Conduct actual emergency drill | System staff | Unannounced |
| On-site training drills | Conduct specific drills, i.e, communications, pipe line breaks, sampling with a professional trainer | System staff and professional trainer | May 20xx |

1. *Response procedures derived from the New England Interstate Water Pollution Control Commission (Boott Mills South , 100 Foot of John Street, Lowell, MA 01852-1124) “Optimizing Operation, Maintenance, And Rehabilitation of Sanitary Sewer Collection Systems,” developed in December 2003 with funding from the Environmental Protection Agency* [↑](#footnote-ref-1)
2. 1 Adapted from information in the following guidance and reporting document: http://www.swrcb.ca.gov/rwqcb2/news\_items/sso%20reporting%20requirements%20nov%2011%202004.pdf [↑](#footnote-ref-2)