2009
Sewer System Management Plan

Activities to Manage the Wastewater Collection System Effectively

City of Milpitas
455 East Calaveras Blvd.
Milpitas, CA 95035
www.Milpitas.ca.gov
(408) 586-3000

2009 Sewer System Management Plan

Revised by City of Milpitas
Utility Engineering Staff
July 31, 2009

Approved by Milpitas City Council on August 18, 2009

City of Milpitas
455 East Calaveras Blvd.
Milpitas, CA 95035
www.Milpitas.ca.gov
(408) 586-3000

Sewer System Management Plan

City of Milpitas

Certificate of Compliance

This certification is included to ensure compliance with the State Water Resource Control Board, General Order 2006-0003-DWQ.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision. The information submitted is to the best of my knowledge and belief, true, accurate, and complete.

Name: _____

Greg Armendariz

Title: City Engineer

Date: _____

TABLE OF CONTENTS

Chapter 1 **Goals** 1

Chapter 2 **Organization** 2

2.1 Roles & Responsibilities 2

2.2 Chain of Communication: SSO Reporting 4

Chapter 3 **Legal Authority** 7

Chapter 4 **Operation & Maintenance Program** 8

4.1 Collection System Maps 8

4.2 Preventative Maintenance 8

4.3 Rehabilitation & Replacement Plan 9

4.4 Training Schedule 11

4.5 Contingency Equipment & Replacement Inventories 11

Chapter 5 **Design & Performance Provisions** 12

Chapter 6 **Overflow Emergency Response Plan** 13

Chapter 7 **FOG Control Program** 14

7.1 Outreach 14

7.2 FOG Disposal 14

7.3 Legal Authority 15

7.4 Grease Removal Devices 15

7.5 Restaurant Inspections 15

7.6 Sanitary Sewer System FOG Blockages 16

7.7 FOG Source Control Measures 16

Chapter 8 **System Evaluation and Capacity Assurance Plan** 17

8.1 Capacity Assessment 17

8.2 Capacity Enhancement Measures 18

8.3 System Evaluation & Capacity Assurance Plan 18

8.4 Schedule of Completion 19

Chapter 9 **Monitoring, Measurement & Program Modification** 20

9.1 SSMP Activity Prioritization 20
9.2 Implementation & Effectiveness 21
9.3 Assessment of Preventive Maintenance Program 21
9.4 Program Updates 21
9.5 Trends: Frequency, Location & Volume 21

Chapter 10 SSMP Program Audits 24

Chapter 11 Communication Program 25

Appendices

Appendix A State Water Recourse Control Board General Order 2006-0003-DWQ
Appendix B ABAG Sanitary Sewer Overflow and Backup Response Plan
Appendix C Milpitas Municipal Code, Title VIII, Chapter 2
Appendix D Sanitary Sewer Facilities Map
Appendix E Sanitary Sewer Pipe Ages Map
Appendix F Sanitary Sewer Pipe Materials Map
Appendix G Five-Year Capital Improvement Program
Appendix H Excerpt from City of Milpitas *Engineering Plans and Map Procedures and Guidelines*
Appendix I Excerpt from City of Milpitas *Standard Specifications for Sanitary Sewers*
Appendix J Excerpt from City of Milpitas *Standard Drawings*

Tables and Figures

Table 2-1: SSMP Elements & Responsibilities 4
Table 2-2: City SSO Contact List 6
Table 9-1: Causes of SSOs 24

Figure 2-1: SSMP Organization Flowchart 3
Figure 2-3: SSO Chain of Communication Flow Chart 7
Figure 9-1: Annual Volume of SSOs, 2004-2009 24
Figure 9-2: Location of SSOs, Map of Milpitas 25

ABBREVIATIONS

ABAG	Association of Bay Area Governments
BACWA	Bay Area Clean Water Agencies
BMP	Best Management Practice
CIP	Capital Improvement Program
FOG	Fat, Oils, and Grease
GIS	Geographical Information System
GRD	Grease Removal Device
I/I	Inflow/Infiltration
NOI	Notice of Intent
RWQBC	San Francisco Bay Regional Water Quality Control Board
SSMP	Sewer System Management Plan
SSO	Sanitary Sewer Overflow
WARN	Water Agency Response Network
WPCP	San Jose/Santa Clara Water Pollution Control Plant

GLOSSARY

Bay Area Clean Water Agencies (BACWA)	The San Francisco Bay Area Joint Powers Authority is comprised of wastewater treatment and collection system agencies. The BACWA vision is to: Develop a region-wide understanding of the watershed protection and enhancement needs through reliance on sound scientific, environmental and economic information, and ensure that this understanding leads to long-term stewardship of the San Francisco Bay Estuary.
Blockage	A build up of debris in the sewer that stops the flow of wastewater and allows the water to back up behind the blockage, sometimes causing an overflow. Also called a **stoppage**.
City	The City of Milpitas.
Geographical Information System (GIS)	A database linked with mapping, which includes various layers of information used by government officials. Examples of information found on a GIS can include a sewer map; sewer features such as pipe location, diameter, material, condition, last date cleaned or repaired. The GIS also typically contains base information such as streets and parcels.
Inflow/Infiltration (I/I)	Inflow is generally considered to be extraneous water that enters the system as a direct result of a rain event, such as through improper connections to the sanitary sewer, through flooded manhole covers, or through defects in the sewer. Infiltration is generally considered to be extraneous water that enters the sewer system over longer periods of time, such as groundwater seepage through cracks in the sewer. While it is impossible to control all I/I, it is certainly desirable to reduce I/I when cost-effective.
Lateral	The portion of sewer that connects a home or business with the main line in the street. Laterals are owned and maintained by the property owner.
Regional Water Quality Control Board (RWQCB)	The San Francisco Bay Regional Water Quality Control Board (also known as RWQCB). Its mission is to preserve, enhance and restore the quality of California's water resources, and ensure their proper allocation and efficient use for the benefit of present and future generations.
Sanitary Sewer Overflow (SSO)	Any overflow, spill, release, discharge or diversion of untreated or partially treated wastewater from a sanitary sewer system. SSOs include: Overflows or releases of untreated or partially treated wastewater that reach waters of the United States; Overflows or releases of untreated or partially treated wastewater that do not reach waters of the United States; and Wastewater backups into buildings and on private property that are caused by blockages or flow conditions within the publicly owned portion of a sanitary sewer system.
State Water Resource Control Board (SWRCB)	The umbrella agency responsible for implementation of State laws.

1 GOALS

Section 1

The goal of the SSMP is to provide a plan and schedule to properly manage, operate, and maintain all parts of the sanitary sewer collection system. This will help reduce and prevent SSOs, as wells as mitigate any SSOs that do occur.

The City of Milpitas is located in northeastern Santa Clara County between the Cities of San Jose and Fremont. It comprises 13 square miles of residential, commercial, industrial, agricultural and recreational land uses, roughly oriented around the intersections of SR 237 with I-880 on the west and I-680 on the east. It has a residential population of approximately 65,000 and hosts a number of High Tech electronic research, development and manufacturing facilities typical of the Silicon Valley.

The City of Milpitas owns and operates its municipal sewer collection system consisting of 175 miles of gravity pipe and 5 miles of force main. The system also includes two pump stations: the Venus Station which lifts sewer out of a low-lying Pines neighborhood and the Main Sewer Pump Station which pumps all City sewage through dual 2.5 mile force mains to the San Jose/Santa Clara Water Pollution Control Plant (WPCP) located in San Jose at 700 Los Esteros Road for treatment.

The City of Milpitas has prepared this Sewer System Management Plan (SSMP) to comply with the State Water Resource Control Board (SWRCB) General Order 2006-0003-DWQ (see Appendix A). The SSMP provides a plan and schedule to properly manage, operate, and maintain all components of the municipal sanitary sewer system. Since the City has proactively planned for adequate capacity and performed aggressive preventive maintenance over the past several years, it already has a low incidence rate of sanitary sewer overflows (SSOs) of less than two per 100 miles of sewer. This SSMP documents past activities and provides guidance to maintain a low SSO rate, as well as mitigate any SSOs that do occur.

The City's SSMP goals are to:

- Properly manage, operate, and maintain all components of the sewer collection system;
- Provide adequate capacity to convey base and peak flows;
- Minimize the frequency and severity of SSOs;
- Reduce and mitigate the impact of SSOs;
- Protect the physical structures of the sanitary sewer system and the efficient functioning of its component parts;
- Improve opportunities to recycle and reclaim treated effluent and wastewater sludge;
- Prevent the introduction of pollutants into the sanitary sewer system that may pass through or interfere with the treatment works of the San Jose/Santa Clara Water Pollution Control Plant (WPCP); and
- Inform the public about the value of the vital infrastructure in protecting public health and the environment and its needs to keep it functioning effectively and efficiently.

2 ORGANIZATION

Section 2

2.1 SSMP Roles & Responsibilities

SSMP must identify:

A. Name of the responsible or authorized representative as described in section J (pg. 19) of this order.

B. Names & numbers for management, administrative, and maintenance positions responsible for implementing specific measures of SSMP. SSMP must identify lines of authority through an organization chart or similar document with a narrative explanation.

The City Engineer, Principal Civil Engineer for Utilities, and Senior Maintenance Supervisor for Utilities, all with the City of Milpitas Department of Public Works, are authorized to serve as legally responsible officials for the purposes of certifying the component of this plan and for reporting SSOs in the California Integrated Water Quality System electronic database.

Figure 2-1 shows the City's organization chart and City staff who manage all sanitary sewer activities within the City, whether it be reporting SSOs, analyzing capacities of the sanitary sewer system, or maintaining sanitary sewer facilities.

City Council – Approves operating budgets and capital improvement program, enters agreements on behalf of the City.

City Manager – City's executive officer. Oversees and coordinates works of all departments.

City Attorney – City's legal counsel. Advises on content of sewer ordinances, coordinates ordinance adoption, provides legal interpretations, serves in enforcement actions.

City Engineer – Establishes sewer system plans strategy, leads and assigns duties of engineering staff, prepares budgets, oversees work of outside contractors to perform services, oversees capital improvement program, and may serve as public information officer.

Dispatch – Department of Public Works call center during business hours and Milpitas Police Department after hours.

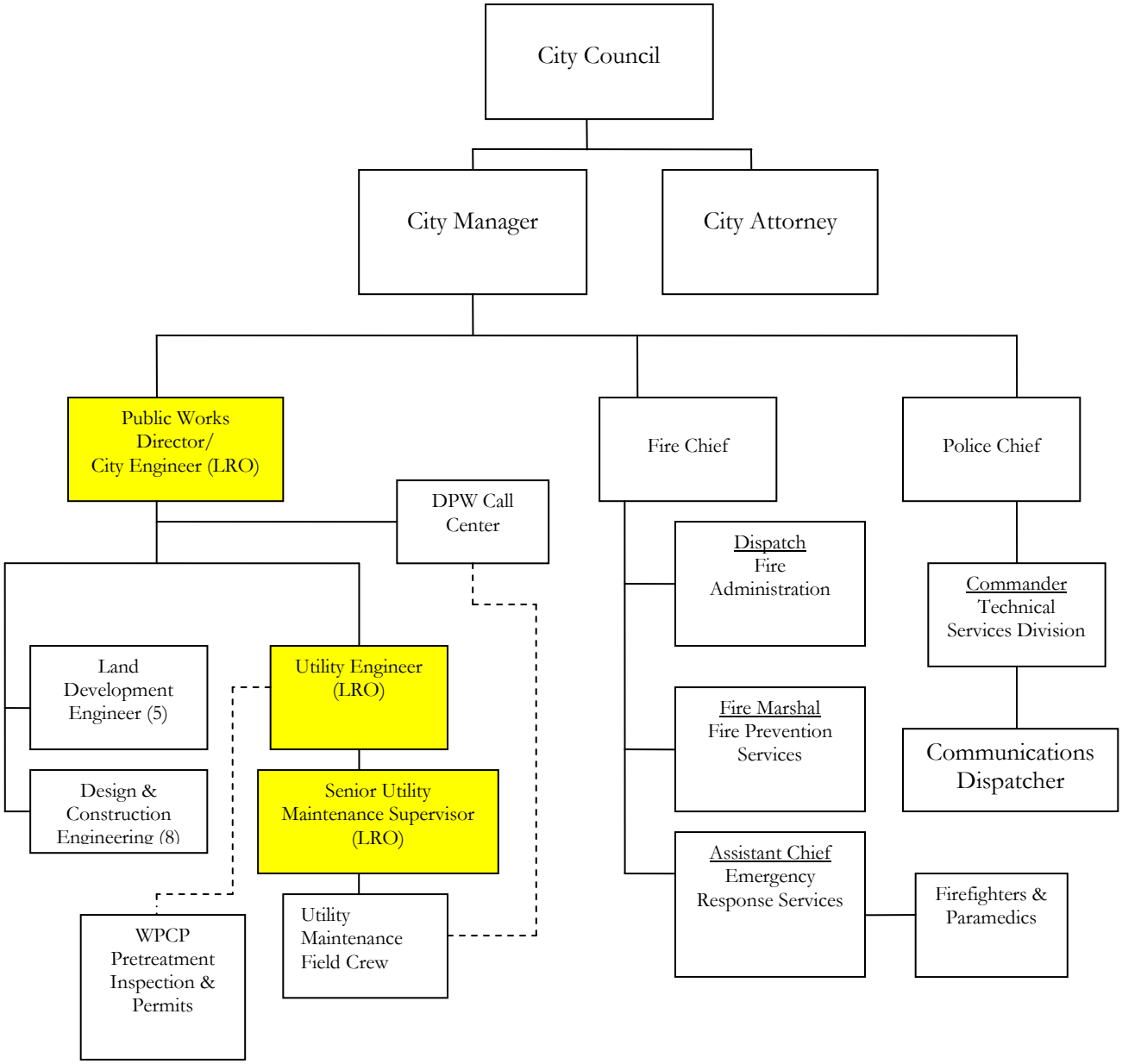
Utility Engineer – Oversees and prepares wastewater collection system planning documents, documents new and rehabilitated assets, proposes rate analysis reports and staff recommendations, and coordinates development and implementation of SSMP.

Senior Utility Maintenance Supervisor – Manages field operations and maintenance activities, provides relevant information to management, prepares and implements contingency plans, leads emergency response, investigates and reports SSOs, and trains field crews. (See section 2.3: Chain of Communication: SSO Reporting).

Maintenance Field Crew – Perform preventive maintenance activities, mobilize and respond to notification of stoppages and SSOs (mobilize sewer cleaning equipment, by-pass pumping equipment, and portable generators).

WPCP – Provides pre-treatment program inspection and permitting to ensure compliance of the WPCP operations with its NPDES discharge permit.

Figure 2-1: SSMP Organization Flowchart



The Utility Engineer has primary responsibility for the SSMP to ensure it is current. The Utility Engineer and Senior Utility Maintenance Supervisor are responsible for implementation of various elements within this SSMP as delineated in Table 2-1 below.

Table 2-1: SSMP Elements & Responsibilities

`	**SSMP Chp.**	**Utility Engineer** Kathleen Phalen 408 586-3345	**Senior Utility Maintenance Supervisor** Stephan Smith 408 586 2640
Goals	1	√	
Organization	2	√	
Legal Authority	3	√	
Operations and Maintenance Program	4		√
Design and Performance Provisions	5	√	
Overflow Emergency Response Plan	6		√
FOG (Fats, Oils, Grease) Control Program	7	√	√
System Evaluation and Capacity Assurance Plan	8	√	
Monitoring, Measurement, and Plan Modifications	9	√	√
SSMP Audits	10	√	
Communication Program	11	√	√

2.2 Chain of Communication: SSO Reporting

The SSMP must identify:

C. Chain of communication for reporting SSOs, from receipt of complaint or other information, including persons responsible for reporting SSO to the State and Reg. Water Board and other agencies if applicable (such as County Health, County Environmental Health Agency, Reg. Water Board &/or OES).

SSO reports are routed to the City's Public Works Dispatch during normal business hours. After hours reporting comes through the City's 9-1-1 emergency system. The City's Standard Operating Procedure describes roles and responsibilities of various City Departments in response to reported spills of an unknown nature. The utility maintenance field crew is using the Association of Bay Area Governments (ABAG) Overflow and Back-up Response Plan for detailed response and clean-up guidelines for sanitary sewer overflows. This plan identifies the chain of communication for responding to, and reporting SSOs. The Senior Utility Maintenance Supervisor has primary responsibility to insure that the City responds appropriately and all notifications are made. The table of contents and selected excerpts from the ABAG Overflow and Back-up Response Plan are included in Appendix B and are discussed in Section 6.

Table 2-2 contains the City's SSO Contact List.

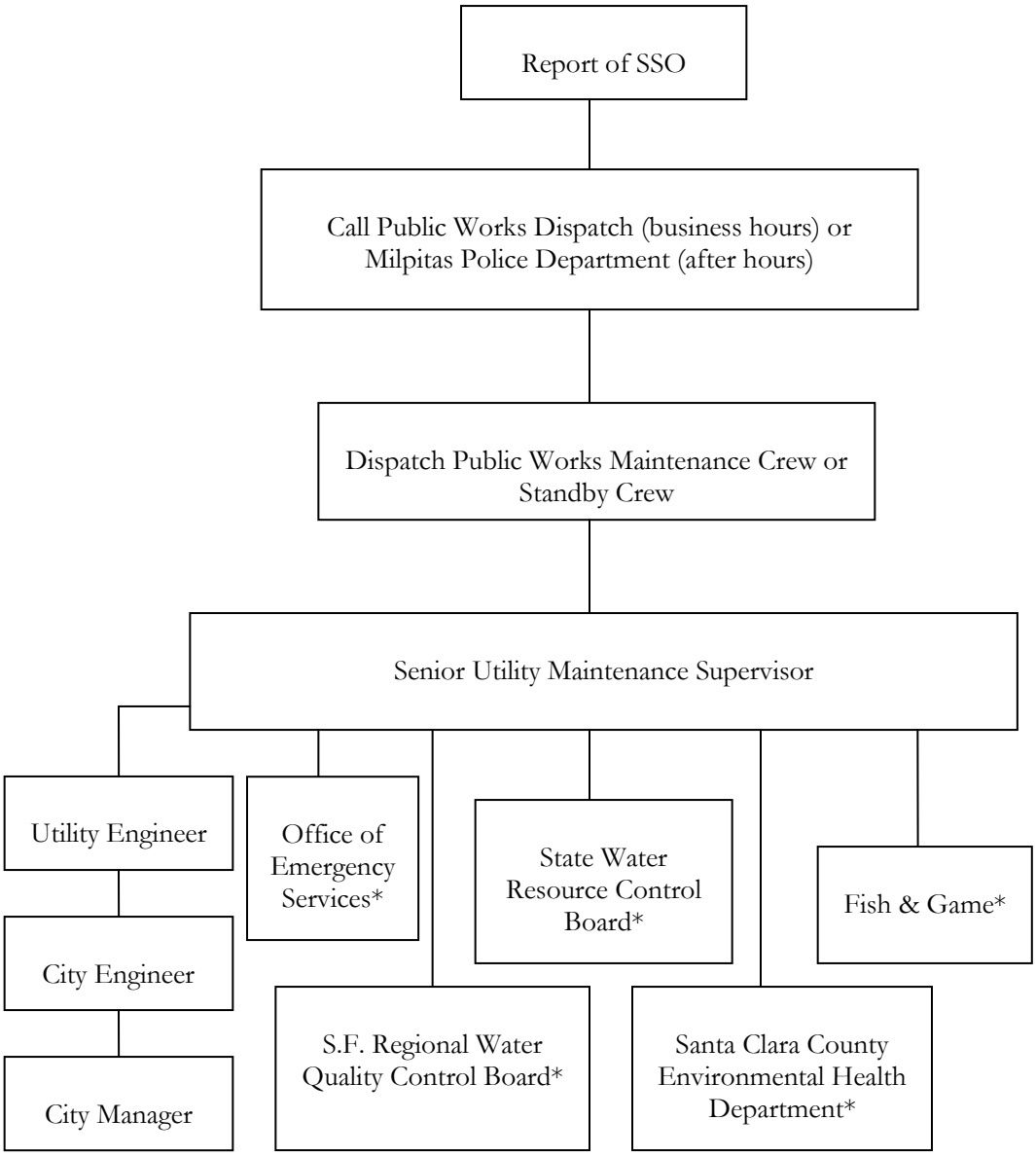
Table 2-2: City SSO Contact List

Names	Business Hours	After Hours
Greg Armendariz, City Engineer	408-586-3317 408-586-2603	408-422-4759
Kathleen Phalen, Utility Engineer	408-586-3345	408-592-7804
Stephan Smith, Senior Utility Maintenance Supervisor	408-586-2640	408-690-3605
Public Works Dispatch	408-586-2600 408-586-5600 (8:00 a.m. – 5:00 p.m.)	911 or 408-586-2400

The Senior Utility Maintenance Supervisor is responsible for both SSO clean-up and notification of outside agencies.

Figure 2-3 identifies the City's Chain of Communication in the event of an SSO. Information on notification of outside agencies is shown in Appendix B.

Figure 2-3: SSO Chain of Communication Flow Chart



*The Senior Utility Maintenance Supervisor is has the primarily responsibility to make the electronic reports of SSOs to CIWQS within the States reporting guidelines. These are within 2 hours for a Category 1 spill of 1,000 gallons or more or reaching surface waters, or within 30 days after the end of the calendar month if less than 1,000 gallons and fully captured. In his absence, the Utility Engineer will make the necessary reports, or if both staff are absent, the City Engineer will make the reports.

3 LEGAL AUTHORITY

Section 3

The City has enrolled in the State's general sanitary sewer overflow program for its sewer collection system as required by Order 2006-0003-DWQ. Use of the City's sanitary sewer system is regulated by the Milpitas Municipal Code, Title VIII, Chapter 2 (see Appendix C), which is sufficient to comply with the General Order. The City Engineer is responsible to establish design criteria, and implement and enforce use regulations.

Requirement: Demonstrate, through sanitary sewer system use ordinances, service agreements, or other legally binding procedures, that it possesses the necessary legal authority to:

a. Prevent illicit discharges into its sanitary sewer system (I/I, storm-water, chemical dumping, unauthorized debris and cut roots, etc);
b. Require that sewers and connections be properly designed;
c. Ensure access for maintenance, inspection or repairs for portions of the lateral owned /maintained by Public Agency;
d. Limit the discharge of FOG and other debris that may cause blockages, and
e. Enforce any violation of its sewer ordinance.

The following is a partial list of sanitary sewer ordinance sections:

Section 2.15	Drainage and Unpolluted Water Connections Prohibited
Section 5.10	Pretreatment by Owner
Sections 5.11-5.29	Specific requirements on wastewater discharge constituents.
Sections 5.38-49	Specific requirements on customer wastewater discharge permits, reports, and inspections.
Section 5.50	Permit Revocation
Section 5.54	Civil Penalties
Section 11.01	Design Standards
Section 12.05	Violation Unlawful
Section 12.06	Termination of Service and Disconnection of Facilities
Section 13.01	Maintenance by City
Section 13.02	Maintenance by User

In addition, the City's agreement with the San Jose/Santa Clara Water Pollution Control Plant (WPCP) allows the City to discharge Milpitas sewage into the WPCP for treatment and disposal. WPCP Source Control Inspectors issue Industrial Wastewater Discharge Permits, perform inspections, and monitor effluent quality. The Milpitas sewer collection system is considered to be a satellite system to the WPCP.

4 OPERATION & MAINTENANCE PROGRAM

Section 4

The City operates and maintains its sewer collection system effectively. Elements of the Operation and Maintenance Program (O&M) include asset mapping, prevention activities, replacement plan and financing, training, and parts inventory. These elements are described in more detail in this section.

4.1 Collection System Maps

The SSMP must include those elements listed below that are appropriate and applicable.

A. Maintain an up-to-date map of the sanitary sewer system, showing all gravity line segments and manholes, pumping facilities, pressure pipes and valves, and applicable storm-water conveyance facilities;

The sanitary sewer system service area lies entirely within the City of Milpitas. The City Geographical Information System (GIS) includes sanitary sewer information such as pipe location, diameter, material, condition, and length. The GIS also contains base information such as streets and parcels. The City's sewer plat maps are generated directly from the GIS. The sanitary sewer collection system includes over 170 miles of sewer mains, two force mains, and two pump stations. The City's storm sewer system is completely separate and is not included in this Plan. The following maps can be found in this plan:

Appendix D Sanitary Sewer Facilities Map
Appendix E Sanitary Sewer Pipe Ages Map
Appendix F Sanitary Sewer Pipe Materials Map

4.2 Preventive Maintenance

Requirement:

B. Describe routine preventive operation & maintenance activities by staff & contractors, including a system for scheduling regular maintenance and cleaning of the sanitary sewer system with more frequent cleaning & maintenance targeted at known problem areas. The Preventative Maintenance (PM) program should have a system to document scheduled and conducted activities, such as work orders;

A good preventive maintenance program is an important component in keeping a system in good repair and preventing excessive infiltration/inflow (I/I), service interruptions, and system failures, which can result in SSOs. A preventive maintenance program also protects the capital investment in the collection system.

The City's preventive maintenance activities include the following:

- Scheduled weekly cleaning for problem areas or areas with frequent stoppages. Other areas receive cleaning on a monthly, annual or 18-month schedule.
- Proactively repair or replace problem areas with structural deficiencies in the City's CIP (see Section 8.3 for additional discussion).
- Root control in areas that are known to have recurring SSOs or premature structural damage due to root intrusion.
- Investigate and resolve customer complaints upon notification 24 hours a day.
- Periodic cleaning of force mains to maintain pump station efficiency and prevent backups.
- Keep maintenance activity records to support appropriate analysis and reporting.
- Weekly cleaning of one problem siphon, and quarterly cleaning of all other siphons.
- Use of closed circuit video system for investigation as needed.

4.3 Rehabilitation & Replacement Plan

The City completed a Utility Depreciation Study in 2002. This study established a pipe replacement program

Requirement:
C. Develop a rehabilitation & replacement (R/R) plan to identify & prioritize system deficiencies & implement short- & long-term rehab actions to address each deficiency. Program should include regular visual & TV inspections of manholes, sewer pipes, and a system for ranking the condition of sewer pipes & scheduling rehab. R/R should focus on sewer pipes that are at risk of collapse or prone to more frequent blockages due to pipe defects. R/R should include a Capital Improvement Plan addressing proper management and protection of the infrastructure assets. Include a time schedule for implementing short-& long-term plans plus a schedule for developing the funds needed for Capital Improvement Plan.

based upon pipe material and age. The first pipe replacement project has been included in the Five-Year Capital Improvement Program (CIP). A more detailed analysis is needed to confirm actual pipe conditions and needed corrective actions. See section 8.3 for more discussion on the Capital Improvement Program. A systematic inspection program is one component for keeping a system in good repair and preventing excessive I/I, service interruptions, and system failures, which can result in SSOs.

The City's inspection activities include the following:

- Routine inspections of the collection system facilities, including pump stations.
- Inspections based on customer complaints and/or SSOs.
- Periodic flow monitoring for capacity analysis.
- Condition assessments based on pipe age.
- Maintenance of records to support appropriate analysis and reporting.

Construction on the City's Main Lift Station Replacement project was completed in Spring 2009. This station serves the entire City and has a wet weather capacity of 45 mgd. At the beginning of the project the design team prepared a Functionality and Operation Report (Winzler and Kelly November 7, 2005). Functional

requirements were developed for each process, including the comminutors, pump selection, wet well design, valve vault, force main, control building and garage, wet well ventilation, odor control, electrical system, instrumentation and controls, on-site SCADA and communications, site improvements and cathodic protection.

Rehabilitation of the Venus Pump Station was completed in March 2009. This small satellite station serves about 1,200 homes. The work includes sandblasting and coating the wet well, replacement of pumps, control panel and access hatch, installation of alarms and a manual electric transfer switch.

The City's sewer utility is a self-supporting enterprise. Revenues derived from sewer rates and other sources, including reserves, must be sufficient to cover all operating and capital expenditures each year. The City aims to roughly balance its budgets each year. Fund reserves generated in surplus years are typically used to make up any revenue shortfalls in deficit years.

The City has evaluated several aspects of the sanitary sewer system's fiscal needs. The Sewer Master Plan has identified pipe deficiencies and treatment capacity shortfalls that must be mitigated to meet build-out conditions. The Utility Depreciation Study identified the age and materials of the collection system and established a long term replacement schedule. The Financial Utility Master Plan incorporated the proposed Master Plan projects and replacement needs and developed a cash flow scenario for a 20 year period. The City of Milpitas has demonstrated its commitment to provide and operate a functional sewer collection system with sufficient capacity monitoring, measurement & program modifications.

The City's rate structure conforms to the State Water Resources Control Board (SWRCB) revenue program guidelines that require each customer or class to pay sewer rates in proportion to the cost of service received. Milpitas customer rates are allocated based on estimated wastewater flows and strengths. Sewer rates are adopted by City Council via ordinance. The sewer enterprise maintains four separate funds. Each of these funds is treated as a separate accounting entity.

Sewer Fund – This is the main operating fund of the sewer enterprise. The fund is used to pay for all operating and maintenance costs for wastewater collection and treatment, and for ongoing capital and replacement projects as budgeted each year. The primary source of revenue is sewer service charges.

Sewer Capital Improvement Program (CIP) Fund – Each year the City sets aside the full cost of capital improvements approved that year by transferring money to the CIP fund. These funds are fully committed to specific CIPs that were budgeted in past years. The CIP fund typically carries a significant balance that is reserved for the remaining costs of projects approved in prior years but still under construction.

Treatment Plant Construction Fund – This fund is generally used to fund capital improvements at the regional treatment plant or within the City's collection system. The main source of revenues for this fund is treatment plant connection fees and sewer connection fees collected from new development. This fund may also be used to finance the acquisition of additional capacity in the wastewater treatment plant.

Sewer Infrastructure Fund – This fund was established in 2000/01 to build reserves to offset the future costs to replace facilities reaching the end of their useful lives. The main source of revenue for this fund is transfers from the sewer fund.

Expenses typically fall into four categories: City operations, City capital improvements, WPCP operations, or WPCP capital improvements. The Milpitas City Council has established target reserve levels for the Sewer Fund.

4.4 Training Schedule

Requirement:
D. Provide training on a regular basis for staff in sanitary sewer system operations & maintenance, and require contractors to be appropriately trained

The City's utility maintenance crews have been trained by the Senior Utility Maintenance Supervisor. General safety discussions are conducted monthly. The following topics are reviewed annually: personal protective equipment, vehicle safety, hydro-flushing equipment, and confined space. The Senior Utility Maintenance Supervisor may acquire CWEA certification in the next year or two. The City is also planning to develop written standard operating procedures in the next couple of years.

4.5 Contingency Equipment & Replacement Inventories

Requirement:
E. Provide equipment and replacement part inventories, including ID of critical replacement parts.

Contingency equipment is kept in inventory to minimize equipment/facility downtime in the event of an unplanned failure. This includes replacement parts for pumps, motors, pipes, and vehicles, and appropriately maintained emergency response equipment and accessories to allow utility maintenance crews to effectively respond to incidents and efficiently perform routine maintenance. Without an adequate inventory of replacement parts, the City may experience high volume and/or extended overflow events in the event of a breakdown or malfunction. The City has installed a dedicated back-up generator at the Main Lift Station. A transfer switch was recently installed at the Venus Pump Station to accommodate a portable generator. The City also has bypass pumps and hoses in the event of a large scale failure. The City can obtain equipment and material from the following vendors, contractors, and other agencies in the event of a large-scale failure.

Ed Walsh Company
West Coast Steel Plate
Preston Pipelines
Koffler Mechanical
Water Agency Response Network (WARN) Agencies

5 DESIGN & PERFORMANCE PROVISIONS

Section

5

Requirement:
A. Design and construction standards and specifications for the installation of new sanitary sewer systems, pump stations and other appurtenances; and for the rehabilitation and repair of existing sanitary sewer systems.
B. Procedures and standards for inspecting and testing the installation of new sewers, pumps, and other appurtenances and for rehabilitation and repair projects.

5.1 Design & Construction

The City has standards for design installation, rehabilitation and repair, inspection, and testing of new and rehabilitated facilities in the following documents.

Engineering Plans and Map Procedures and Guidelines, Section VIII - Provides design criteria for new and rehabilitated sewers and connections. See Appendix H.

Standard Specifications for Sanitary Sewers – Provides technical requirements for new and rehabilitated sewers and connections. See Appendix I.

Standard Drawings - Provides technical requirements for new and rehabilitated sewers and connections. See Appendix J..

These standards are available as hard copy documents and on the City's web page.

6 OVERFLOW EMERGENCY RESPONSE PLAN

Section 6

Requirement:: Each enrollee shall develop and implement an overflow emergency response plan that identifies measures to protect public health and the environment. At a minimum, this plan must include the following:

A. Proper notification procedures so that the primary responders and regulatory agencies are informed of all SSOs in a timely manner;
B. A program to ensure an appropriate response to all overflows;
C. Procedures to ensure prompt notification to appropriate regulatory agencies and other potentially affected entities (e.g. health agencies, Regional Water Boards, water suppliers, etc.) of all SSOs that potentially affect public health or reach the waters of the State in accordance with the MRP. All SSOs shall be reported in accordance with this MRP, the CA Water Code, other State Law, and other applicable Regional Water Board WDRs or NPDES permit requirements. The SSMP should identify the officials who will receive immediate notification;
D. Procedures to ensure that appropriate staff and contractor personnel are aware of and follow the Emergency Response Plan and are appropriately trained;
E. Procedures to address emergency operations, such as traffic and crowd control and other necessary response activities; and
F. A program to ensure that all reasonable steps are taken to contain and prevent the discharge of untreated and partially treated wastewater to waters of the US and to minimize or correct any adverse impact on the environment resulting from the SSOs, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the discharge.

The City worked with ABAG to develop its "City of Milpitas Sanitary Sewer Overflow and Backup Response Plan". The Table of Contents and selected excerpts are included in Appendix B. Each utility maintenance vehicle has a copy of the entire plan and has a laminated SOP for field response.

The purpose of the Response Plan is to ensure that City personnel follow established guidelines in responding, relieving, cleaning and decontaminating sanitary sewer overflows and backups which may occur within the City service area in order to safeguard public health and the environment. The Response Plan also includes guidelines so that notification and reporting is made to the appropriate local, state and federal authorities. The Senior Utility Maintenance Supervisor has primary responsibility to insure that the City responds appropriately and all notifications are made.

7 FOG CONTROL PROGRAM

Section 7

Requirement: Each Enrollee shall evaluate its service area to determine whether a FOG control program is needed. If an agency determines that a FOG program is not needed, the agency must provide justification for why it is not needed. If FOG is found to be a problem, the enrollee must prepare and implement a FOG source

Fats, oil, and grease (FOG) is a common cause of sewer system blockages that could result in SSOs. The City works with Santa Clara County and WPCP to insure restaurants have properly-sized and properly-maintained grease removal devices. Restaurants may be required to subscribe to a tallow service. In addition, the City has provided outreach materials for residents.

The City has evaluated its SSOs and found that over the past three years, only 12 SSOs resulted from FOG incidents and these were associated with residential neighborhoods and were non-reoccurring. This low rate is considered evidence of successful FOG management. These data are shown in Table 9-1 in Chapter 9. Therefore the City concludes that a FOG program is not needed, but is desirable. This chapter is includes the desirable FOG management programs the City will undertake to keep FOG incidents low.

7.1 Outreach

Requirement:
A. An implementation plan and schedule for a public education outreach promoting proper disposal of FOG;

The City periodically provides outreach to the community through a variety of methods, including mailers, newspaper advertisement, and the City website. Regional efforts result in articles in the area newspapers and radio spots to promote proper disposal of FOG. Various outreach pieces are available to distribute information about FOG issues. Grease Management Best Management Practices (6 fact sheets – Grease Trap Maintenance, Grease Interceptor Maintenance, Maintenance Documentation, Power-Operated Grease Removal Devices, Chemicals, Enzymes and Bacteria, Vapor/Ventilation Hood Cleaning, and a poster – Managing Fats, Oils, & Grease, "It's Easier Than You Think") are available to inspectors and plan check staff to distribute to restaurant owners and operators.

7.2 FOG Disposal

Requirement:
B. A plan and schedule for the disposal of FOG generated within the sanitary sewer system service area. This may include a list of acceptable disposal facilities and/or additional facilities needed to adequately dispose of FOG generated within a sanitary sewer system service area.

Fats, oils, and grease from non-residential sites can be disposed of:

A. Hauled by tallow companies;

B. Hauled by other licensed companies (possible component for bio-diesel fuel);

C. WPCP is investigating the conversion of an existing facility to accept FOG. This may be a possible future option.

7.3 Legal Authority

Requirement:
C. The legal authority to prohibit discharges to the system and identify measures to prevent SSOs and blockages caused by FOG;

The Milpitas Municipal Code, Title VIII, Chapter 2 (see Appendix C) governs dischargers' use of grease traps and digesters and regulates the discharge of illegal materials. Section 5.16 prohibits grease, oils, and fats discharge into the sanitary sewer, and Section 5.28 discusses installation and maintenance of oil and grease removal devices. Sections 5.03 and 5.49 identify the City Engineer and WPCP Director as having enforcement authority.

7.4 Grease Removal Devices

Requirement:
D. Requirements to install grease removal devices (such as traps or interceptors), design standards for the removal devices, maintenance requirements, BMP requirements, record keeping and reporting requirements;

The City of Milpitas has adopted discharge limits for fats, oils, and grease into the sanitary sewer system. The Milpitas Building Department requires food service facilities to demonstrate that the WPCP has approved the grease interceptor size prior to issuance of building permits. San Jose's Environmental Engineering staff determines the requirements for grease removal devices (GRD). The size and type of GRD required is determined based upon the facility's potential for discharging grease in the wastewater. The size of the restaurant, the cooking and cleaning equipment installed, and the number of meals served, are some of the factors considered in order to determine the standard required GRD size. Requirements range from a small grease trap beneath the pot sink to a large in-ground grease interceptor.

Staff may discuss Best Management Practices (BMPs) and distribute information to restaurant representatives during the plan check, including kitchen practices to minimize the discharge of grease into the sewer system, maintenance tips for grease traps and interceptors, and record keeping requirements. Plumbing inspectors verify the installation and connections of the GRD.

The plan review process also involves a GRD certification. This certification involves the restaurant representative signing an acknowledgement of GRD requirements. Some of the requirements acknowledged in the certification is the minimum acceptable cleaning frequency for the type of GRD being required, an on-site maintenance schedule, cleaning instructions, and cleaning records and receipts.

7.5 Restaurant Inspections

Requirement:
E. Authority to inspect grease producing facilities, enforcement authorities, and whether the Enrollee has sufficient staff to inspect and enforce the FOG ordinance;

The Milpitas Fire Department Prevention Division is responsible for commercial inspections including those with hazardous materials, those having filed a "Notice of Intent" (NOI), restaurants with grease interceptors, and businesses conducting more hazardous-type operations. Inspection frequency ranges from an annual basis to State mandated minimums, and are completed by two divisions within the department. The

Suppression Division inspects occupancies with low or minimum hazards, such as office complexes and commercial type operations. Food facilities, including restaurants, are inspected at the State minimum frequencies unless the occupancy is on a more frequent inspection schedule due to its operations and need for a life-safety inspection, or continuous violations make it necessary to increase visits.

On an annual basis during hazardous material inspections, inspectors are observant of BMPs outlined in the City's Urban Runoff Program and they document violations the businesses need to address on the Divisions Inspection Form. Once every three years, the Prevention Division conducts a comprehensive inspection to more fully enforce the Urban Runoff Program, including reviewing the site for its storage, use and disposal practices of fats, oils and grease. Inspectors use a "check-list" prepared by the Santa Clara Valley Urban Runoff Pollution Prevention Program when completing inspections and reviewing business' maintenance records, record keeping and reporting procedures.

To assist businesses to comply, inspectors provide various brochures and booklets such as "Good Practices To Protect Our Creeks and Bay – Guidelines for Restaurants, Grocery Stores, Cafeterias, Bakeries and Delicatessens," posters on "Good Cleaning Practices", and storm drain stencils imprinted with "No Dumping Flows To Bay". Some of these items are available in multiple languages for those individuals where English is not the primary language. The Fire department believes that education is the key to compliance and works with businesses to this end. If a higher level of enforcement is necessary, available options include issuing citations, and action by the City Attorney.

The Prevention Division works cooperatively with the San Jose/Santa Clara Water Pollution Control Plant and the Santa Clara County Health Department when violations or concerns are found that are not within the Fire department's jurisdiction or responsibility. Additionally, County Health conducts quarterly inspections of food facilities, which are helpful to ensure continuing compliance to Program requirements.

7.6 Sanitary Sewer System FOG Blockages

Requirement:
F. An identification of sanitary sewer system sections subject to FOG blockages and establishment of a cleaning maintenance schedule for each section;

The Public Works Maintenance Division follows a preventative maintenance schedule for areas of the sewer systems that have experienced problems with FOG or other blockages. Preventative maintenance consists of flushing or jetting sewers that accumulate sediment or grease on a biweekly or monthly basis.

7.7 FOG Source Control Measures

Requirement:
G. Development and implementation of source control measures for all sources of FOG discharged to the sanitary sewer system for each section identified in F above

Source control is an effective method to minimize FOG in the sanitary sewer collection system. The WPCP has implemented a grease trap program for restaurants, which are the largest potential FOG source. In addition, outreach materials are periodically distributed to residents.

8 SYSTEM EVALUATION & CAPACITY ASSURANCE PLAN

Chapter 8

Requirement: Prepare and implement a CIP that will provide hydraulic capacity of key sanitary sewer system elements for dry weather peak flow conditions, as well as the appropriate design storm or wet weather event. At a minimum, the plan must include:

8.1 Capacity Assessment

Evaluation: Actions needed to evaluate those portions of the sanitary sewer system that are experiencing or contributing to an SSO discharge caused by hydraulic deficiency. The evaluation must provide estimates of peak flows (including flows from SSOs that escape form the system) associated with conditions similar to those causing overflow events, estimates of the capacity of key system components, hydraulic deficiencies (including components of the system with limiting capacity) and major sources that contribute to the peak flows associated with the overflow events;

Capacity assessment evaluates if adequate capacity exists in all portions of the collection system and that downstream portions that will receive wastewater from new connections can handle additional flow. Prepared capacity assessments include:

- The 2004 Sewer Master Plan Revision was completed in August 2004 (Raines, Melton & Carella, Inc.).
- A Sewer Master Plan Update is currently underway and is anticipated to be adopted in 2009 (RMC Water and Environment).

The 2004 Sewer Master Plan Revision incorporates a sound methodology to provide wastewater volume estimates. The methodology starts with land use zoning for each parcel and develops average base wastewater generation flows for each type of zoning. Several site-specific large users, such as manufacturing facilities, have been included as "point loads". Wet-weather monitoring provided data for groundwater infiltration and rainfall-dependent infiltration/inflow estimates. The total wastewater discharge is calculated to be the sum of the base wastewater flow multiplied by a peaking factor, plus groundwater infiltration, plus rainfall-dependent infiltration/inflow. In addition, multiple scenarios were developed using assumed land use changes over time. Sewer Master Plans are typically updated when significant changes in land use occur. The Update that is currently underway incorporates proposed land use change scenarios from the recently adopted Transit Area Specific Plan and possible General Plan Amendments not previously envisioned. The wastewater discharge data from these scenarios is entered into the Hydra sewer system hydraulic model to identify collection system deficiencies. Sewer system improvements, such as parallel or replacement pipes, are then determined.

In addition to collection system capacity, the City of Milpitas must contract for wastewater treatment capacity. The City of Milpitas is a tributary agency to the San Jose/Santa Clara Water Pollution Control Plant. In 2006, the City increased its treatment capacity from 12.5 million gallons per day (mgd) to 13.5 mgd. Preliminary Update results indicate that the City will need 14.2 mgd to meet the highest intensity land use scenario in 20 years. At the time of this writing, the City is purchasing 0.75 mgd capacity from Cupertino

Sanitary District, bringing the total available treatment capacity to 14.25 mgd. Treatment capacity consists of four components: flow, biochemical oxygen demand (BOD), suspended solids, and ammonia. Since Cupertino Sanitary District does not have excess BOD, the City is acquiring three of the four components. The City will monitor the discharge and procure adequate BOD treatment capacity as needed. The capacity can be obtained from the regional treatment plant by a number of methods including:

- Purchase additional capacity when the treatment plant is expanded.
- Purchase rights to use excess capacity held by other tributary agencies.
- Adopt mutual agreements with other tributary agencies use of excess capacity when needed.
- Pursue other regional solutions.

8.2 Capacity Enhancement Measures

B. Design criteria: where design criteria do not exist or are deficient, undertake the evaluation identified in (a) to establish appropriate design criteria.

Design criteria have been established in the City's Sewer Master Plan Updates to determine estimated wastewater volume. These criteria include base wastewater flow generation factors, peak factors, groundwater infiltration, and rainfall dependent inflow.

Additional design criteria are contained in the City's *Engineering Plans and Map Procedures and Guidelines* (see Appendix H). These criteria focus on the sewer collection components and include pipe material, velocity, manhole spacing, easements, minimum diameter, and pretreatment requirements.

8.3 System Evaluation & Capacity Assurance Plan

Requirement:
C. Capacity Enhancement Measure: The steps needed to establish short- and long- term CIP to address identified hydraulic deficiencies, including prioritization, alternatives analysis, and schedules. The CIP may include increases in pipe size, I/II reductions programs, increases and redundancy in pumping capacity, and storage facilities. The CIP shall include an implementation schedule and shall identify sources of funding.

The CIP is a comprehensive five-year plan of capital improvement projects for the City of Milpitas (see Appendix G). Capital improvement projects are purchases or construction of capital assets including streets, park developments or upgrades, the acquisition of land, major construction of public facilities, and major repair/rehabilitation of City infrastructure and facilities. Only funding for current year projects is appropriated by City Council on an annual basis. Funding is projected for subsequent years for planning purposes. The CIP is reviewed annually to allow for necessary adjustments. Sewer system capital projects are typically generated from three sources: the Sewer Master Plan, Utility Depreciation Study, and operational deficiencies.

The 2004 Sewer Master Plan Revision (RMC, August 2004) identifies improvements to the sanitary sewer system resulting from identified capacity deficiencies based upon land use. A list of recommended capital improvement projects to correct potential wet-weather conveyance deficiencies under existing, near and long-term conditions are summarized on Table 7-1 and page 7-2 of the Master Plan. These recommendations include budget estimates and general scheduling targets for project implementation.

Preliminary results from the Update identify several collection system capacity improvements that will be needed over the next several years due to the higher density Transit Area Specific Plan land uses. In September 2008, the Milpitas City Council adopted a Transit Area Development Impact Fee to pay for these improvements. Developers may be required to install projects adjacent to their developments. These projects may not be included in the CIP.

The City completed a Utility Depreciation Study in 2002. This study established a pipe replacement program based upon pipe material and age. The first pipe replacement project has been included in the five-year CIP.

The City has operated a sewer collection system since the 1950's. Since 1975, the City has pumped its wastewater through a two-mile long force main to the WPCP for treatment. In the last several years, the City has spent several millions of dollars on major sewer facility improvements. One project constructed a parallel force main to provide additional capacity and redundancy. The City recently rehabilitated the Venus Way Pump Station and completed construction of the replacement Main Lift Station with sufficient capacity to meet the City's build out needs.

Operational deficiencies are typically due to structural settlement, such as sags. Several years ago many sewer lines with unusually high maintenance requirements were confirmed with the City's video inspection program to have structural deficiencies. These sites receive more frequent flushing and have been targeted for repairs as part of the Sewer Deficiency Program. Since its inception, $4.9 million has been allocated to the Sewer Deficiency Program.

8.4 Schedule of Completion

Requirement:
D. Schedule: Develop a schedule of completion dates for all portions of the CIP developed in A.-C. This schedule shall be reviewed and updated consistent with the SSMP review and update requirements (D-14).

Annually, the City reviews proposed capital projects to verify project scope and priority. Collection system projects are prioritized based upon physical condition and capacity. The capital program is then adjusted accordingly. A proposed five year schedule of projects is shown in Appendix G.

The SSMP is a living document, to be continuously updated to ensure that it contains current information. The Utility Engineer shall be responsible for reviewing and updating this plan every five years, and more frequently as needed.

9 MONITORING, MEASUREMENT & PROGRAM MODIFICATIONS

Chapter 9

9.1 SSMP Activity Prioritization

Requirement:
The enrollee shall:
A. Maintain relevant information that can be used to establish and prioritize appropriate SSMP activities;

Program effectiveness is most commonly measured by the frequency of SSO occurrences. Prioritization of SSMP elements is based upon each element's likelihood of reducing SSOs. The City's operation and maintenance program are the most important SSMP element since daily activities and response have a direct impact on reducing SSOs. The results are immediately apparent.

City staff track the following performance indicators to monitor the effectiveness of this plan:

- 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 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.
- Ratio of planned sewer cleaning to unplanned sewer cleaning.
- Plans developed for, or implementation of, activities to target specific problems identified, such as roots, structural deficiencies, or fats, oil, and grease (FOG).

Other elements, such as hydraulic studies and the resulting capital improvement program may take years to implement. The resulting impact on SSOs is long-term.

9.2 Implementation & Effectivness

Requirement:
B. Monitor the implementation and, where appropriate, measure the effectiveness of each element of the SSMP;

The City has implemented all elements of this SSMP. The elements are effectively minimizing SSO occurrences.

9.3 Assessment of Preventive Maintenance Program

Requirement:
C. Assess the success of the preventative maintenance program;

The Milpitas preventive maintenance program has been in place for many years. It includes weekly maintenance at some sites. This attention to system operations has resulted in a very low rate of SSOs, as seen in Figure 9-1, which is the program's goal.

9.4 Program Updates

Requirement:
D. Update program elements, as appropriate, based on monitoring or performance evaluations;

The Utility Engineer shall review and update Program elements as needed, but at a minimum, will review and revise the Program at the State's requirement of every five years.

9.5 Trends: Frequency, Location & Volume

Requirement:
E. Identify and illustrate SSO trends, including frequency, location, and volume.

The City maintains records on SSOs. Figure 9-1 shows the frequency and volume of SSOs by year. Table 9-1 shows the SSOs causes. Figure 9-2 shows the location of SSOs in Milpitas. From these data, it is apparent that the City experiences a very low SSO rate.

Figure 9-1: Annual Volume of SSOs, 2005 – 2008

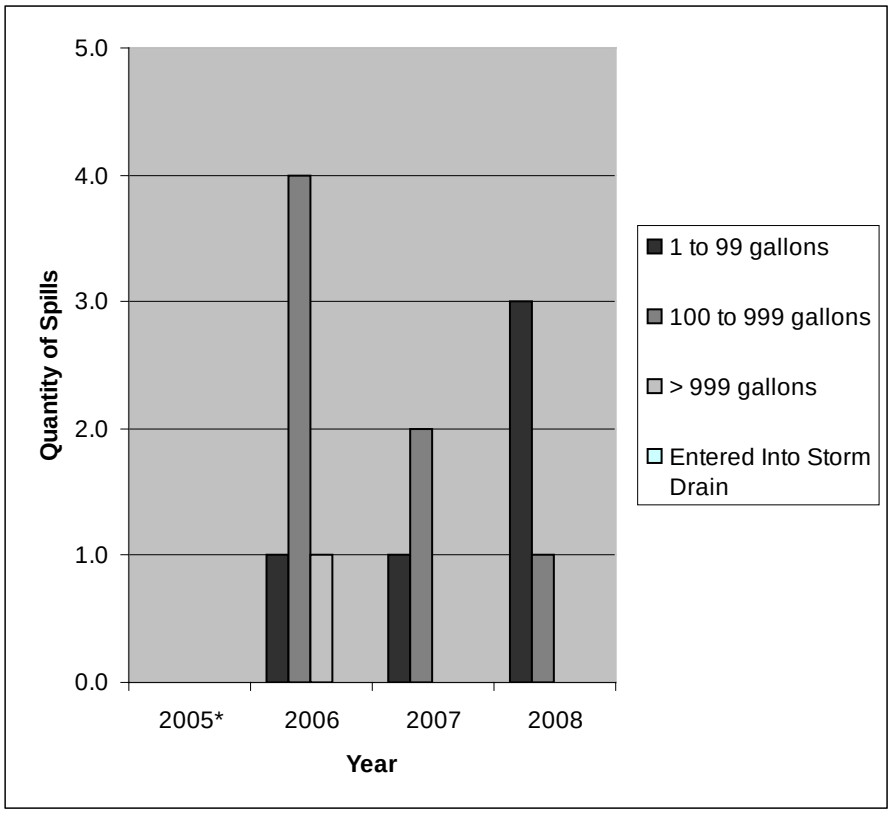


Table 9-1: Causes of SSOs, 2006 – 2008

Causes of SSO	Number	Percent of Total
Blockage:		
Roots	0	0%
Fats, Oil & Grease	12	92%
Debris	1	8%
Debris from Laterals	0	0%
Vandalism	0	0%
Animal Carcass	0	0%
Construction Debris	0	0%
Multiple Causes	0	0%
Subtotal for Blockage	13	100%
Infrastructure Failure	0	0%
Inflow & Infiltration	0	0%
Electrical Power Failure	0	0%
Flow Capacity Deficiency	0	0%
Natural Disaster	0	0%
Bypass	0	0%
Cause Unknown	0	0%
Total	13	100%

**The exact number and cause of blockages in 2005 are not currently known. However no SSOs exceeded 100 gallons and all were 100% contained.*

INSERT SSO LOCATON MAP

10 SSMP PROGRAM AUDITS

Chapter 10

Every two years the Utility Engineer shall conduct an audit of the SSMP program. The purpose of the audit is to evaluate the effectiveness of the SSMP.

Requirement: As part of the SSMP, enrollee shall conduct periodic internal audits, appropriate to the size of the system and number of SSOs. At minimum, these audits must occur every two years and a report must be prepared and kept on file. This audit shall focus on evaluating the effectiveness of the SSMP and the Enrollee's compliance with the SSMP req's. identified in this subsection (D-13, PG.10), including identification of any deficiencies in the SSMP and steps to correct them.

Effectiveness is most commonly measured by the frequency of SSO occurrences. If SSOs have occurred, the audit shall include:

- SSO cause
- Method to prevent future SSO
- Review whether response is appropriate
- Propose changes to process or SSMP

At this time, the rate of SSOs is very low. When an SSO occurs, the Utility Engineer and the Senior Utility Maintenance Supervisor discuss its cause, its location, and the adequacy of the crew's response to correct the problem, contain the spill and clean up the site. The City is not experiencing recurring problems that would indicate an underlying flaw in the public's use of the system, the condition of the infrastructure, or the crew's response.

11 COMMUNICATION PROGRAM

Chapter 11

The City will effectively communicate with the public and other agencies about the development and implementation of the SSMP and continue to address any feedback.

REQUIREMENT: COMMUNICATION PROGRAM
The Enrollee shall communicate on a regular basis with the public on the development, implementation, and performance of its SSMP. The communication system shall provide the public the opportunity to provide input to the Enrollee as the program is developed and implemented.

The SSMP will be presented to the City Council at a Fall 2009 public meeting. Upon adoption, it will be placed on the City's website. The community's primary impact is their discharge of fats, oils, and grease. As discussed in Chapter 7, the City will periodically provide public outreach materials. The City will also work with regional agencies, such as WPCP and Bay Area Clean Water Agencies, to produce and distribute other outreach materials as appropriate.

Appendix A

State Water Resource Control Board

General Order 2006-0003-DWQ

Appendix B

ABAG Sanitary Sewer Overflow and Backup Response Plan

Appendix C

Excerpts from Milpitas Municipal Code, Title VIII, Chapter 2

Appendix D

Sanitary Sewer Facility Map

Appendix E

Sanitary Sewer Pipe Ages Map

Appendix F

Sanitary Sewer Pipe Materials Map

Appendix G

Five-Year Capital Improvement Program

Appendix H

Excerpt from City of Milpitas

Engineering Plans and Map Procedures and Guidelines

Appendix I

Excerpt from City Of Milpitas

Standard Specifications for Sanitary Sewers

Appendix J

Excerpt from City of Milpitas *Standard Drawings*