

Sewer System Management Plan



SSMP

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AUTHORIZED REPRESENTATIVES

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INTRODUCTION

This Sewer System Management Plan (SSMP) has been developed by the City of Riverside (City) Public Works Department to comply with California State Water Resources Control Board Order No. 2006-0003-DWQ -- Statewide General Waste Discharge Requirements for Sanitary Sewer Systems (WDRs). On May 2, 2006, the State Water Resources Control Board adopted the WDRs requiring owners and operators of collection systems to apply for coverage and abide by its provisions and prohibitions. Its purpose is to prevent sanitary sewer overflows (SSOs) and establish uniform procedures for monitoring and reporting.

On October 13, 2006 the City applied for coverage under this order by submitting a Notice of Intent (NOI) to the State Water Board. On January 18, 2007 the City obtained an account on the State of California SSO Database (California Integrated Water Quality System [CIWQS]). This provides the City with a mechanism to report Sanitary Sewer Overflows (SSOs) in accordance with the WDRs. The WDRs also require the development and implementation of a Sewer System Management Plan (SSMP). A SSMP must include provisions to provide proper and efficient management, operation, and maintenance of sanitary sewer systems, while taking into consideration risk management and cost benefit analysis. Additionally, a SSMP must contain a spill response plan that establishes standard procedures for immediate response to an SSO in a manner designed to minimize water quality impacts and potential nuisance conditions.

System Description

The City owns and operates a sanitary sewer collection system (collection system) consisting of over 820 miles of sewer lines ranging in size from 4 inches to over 50 inches in diameter with some more than 120 years old. There are 198 pump stations located throughout the City that range in size from 100 gallons per minute (gpm) up to 2,000 gpm providing service to those areas of geographic need. Treatment is provided at the Regional Water Quality Control Plant (RWQCP), which provides preliminary, primary, secondary, and tertiary treatment for a rated capacity of approximately 40 million gallons per day (mgd). In addition to wastewater from the City's collection system, the City also provides wastewater treatment services for the Community Services Districts of Edgemont, Jurupa, and Rubidoux.

Document Organization

To fulfill the requirements of the WDRs, this SSMP contains 11 elements which detail the management, operation, and maintenance of all parts of the City's sanitary sewer system.

1. Goal
2. Organization
3. Legal Authority
4. Operations and Maintenance Program
5. Design and Performance Provisions
6. Overflow Emergency Response Plan
7. Fats, Oils, and Grease (FOG) Control Program
8. System Evaluation and Capacity Assurance Plan

- 9. Monitoring, Measurement, and Program Modifications
- 10. SSMP Program Audits
- 11. Communication Program

At the beginning of each elemental section the required contents (as defined in the WDRs) are outlined to inform the reader of the section contents. Following this introduction, each section contains the policies, practices, descriptions, and references used to address element requirements.

GOAL

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

This SSMP has been developed and is implemented with the intent of properly managing, operating, and maintaining all parts of the City's sanitary sewer system. The City has identified specific goals that it believes achievable through the implementation of the contents of this plan. With this regard, the SSMP establishes the following goals:

- 1. Minimize the frequency of SSOs**
- 2. Appropriately mitigate the impacts caused by SSOs**
- 3. Provide notifications and reports to all required regulatory agencies in a timely manner**
- 4. Effectively manage, operate, maintain, and improve the collection system**
- 5. Provide education and outreach to the general public to increase awareness of the sanitary sewer system, its function, and operation**

ORGANIZATION

The SSMP must identify:

- a) The name of the responsible or authorized representative as described in Section J of Order No. 2006-0003-DWQ – Statewide General WDR For Wastewater Collection Agencies.*
- b) The names and telephone numbers for management, administrative, and maintenance positions responsible for implementing specific measures in the SSMP program. The SSMP must identify lines of authority through an organization chart or similar document with a narrative explanation; and*
- c) The chain of communication for reporting SSOs, from receipt of a complaint or other information, including the person responsible for reporting SSOs to the State and Regional Water Board and other agencies if applicable (such as County Health Officer, County Environmental Health Agency, Regional Water Board, and/or State Office of Emergency Services (OES)).*

The administration and implementation of the SSMP is directed through the Sewerage Systems Division of the City of Riverside Public Works Department. The division's offices are located at:

Regional Water Quality Control Plant (RWQCP)
5950 Acorn Street Riverside, CA 92504
Phone: (951) 351-6140, Fax: (951) 351-6267

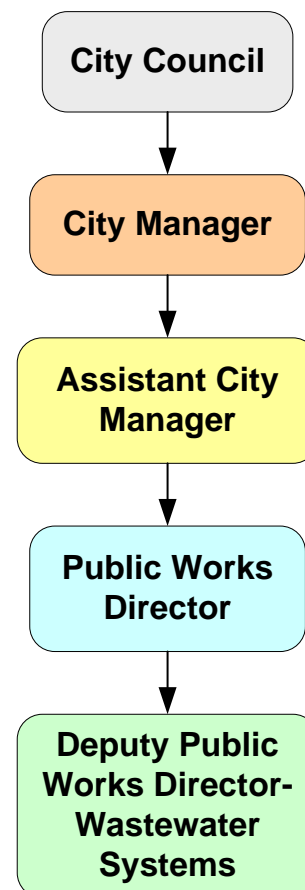
Authorized Representatives

The City has authorized certain individuals to serve as Authorized Representatives for all sanitary sewer related issues in the City. These representatives are authorized to sign and certify all reports required by the State WDRs and other information required by the State or Regional Water Board. These individuals are also authorized to electronically sign and certify reports made through CIWQS. The titles of these individuals are:

- Deputy Public Works Director – Wastewater Systems
- [Operations and Compliance Manager](#)
- [Field Operations Manager](#)
- Maintenance Operations Manager

The names and contact information of the individuals listed above can be found at the beginning of this document.

Figure 1 - Organization



Administrative and Maintenance Personnel

The Sewerage Systems Division of the Public Works Department employs over 100 individuals to manage, operate, maintain, and improve the sewer system. At the head of this division is the Deputy Public Works Director – Wastewater Systems who provides immediate oversight over all sanitary sewer related issues in the City. Figure 1 describes the organization by which the Deputy Public Works Director – Wastewater Systems receives direction from the City Council. There are several management, administrative, and maintenance positions working under the direction the Deputy Public Works Director – Wastewater Systems. Tables 1 and 2 below give the names and phone numbers of positions responsible for implementing the SSMP and the positions responsible for implementing specific elements of the SSMP, respectively. These tables are key components to the proper implementation of the SSMP and its effectiveness. A complete organizational chart identifying lines of authority for all Sewerage Systems Division Employees can be found here: <http://www.riversideca.gov/publicworks/sewer/org-chart.pdf>

Table 1 - Responsible Positions

Position	Phone Number
City Attorney	(951) 826-5567
Public Works Director/ City Engineer	(951) 826-5341
Emergency Services Coordinator	(951) 826-6187
Deputy Public Works Director – Wastewater Systems	(951) 351-6183
Public Works Senior Engineer, Sewer Design	(951) 826-5706
Principal Engineer, RRWQCP	(951) 826-5409
Field Operations Manager	(951) 351-6007
Operations and Compliance Manager	(951) 351-6080
Wastewater Resources Analyst	(951) 351-6310
Environmental Compliance Supervisor	(951) 351-6011
Senior Environmental Compliance Inspectors	(951) 351-6145
Environmental Compliance Inspectors	(951) 351-6145
Wastewater Operations Superintendent	(951) 351-6276
Collection Systems Supervisor	(951) 351-6195
Laboratory Manager	(951) 351-6016
Wastewater Collections Scheduler	(951) 351-6191
Sr. Wastewater Collection System Technician	(951) 351-6140
Wastewater Collections System Crew Leaders	(951) 351-6140
Wastewater Collections System Technicians	(951) 351-6140
Wastewater Mechanical Supervisor	(951) 351-6140
Fleet Operations Manager	(951) 351-6157
Operations Supervisors	(951) 351-6140
Senior Operators	(951) 351-6140
Operations Dispatchers	(951) 351-6140
Public Works Administrative Analysts	(951) 351-6140

Table 2 - Responsible Staff for SSMP Elements

Element	Responsible Staff
I. Goals	<ul style="list-style-type: none"> Deputy Public Works Director – Wastewater Systems Wastewater Operations Managers
II. Organization <ol style="list-style-type: none"> Name of the Responsible or authorized representative(s) Names and telephone numbers of management, administrative, and maintenance positions Chain of communication for reporting SSOs 	<ul style="list-style-type: none"> Deputy Public Works Director – Wastewater Systems Operations and Compliance Manager Field Operations Manager
III. Legal Authority <ol style="list-style-type: none"> Prevent illicit discharges to the collection system Require that sewers and laterals be properly designed and constructed Ensure access to the collection system Limit discharge of FOG and other debris that may cause blockages Enforcement of Ordinance 	<ul style="list-style-type: none"> City Attorney Public Works Director Deputy Public Works Director – Wastewater Systems Operations and Compliance Manager Field Operations Manager Environmental Compliance Supervisor Senior Environmental Compliance Inspectors Environmental Compliance Inspectors
IV. Operations and Maintenance Program <ol style="list-style-type: none"> Maintain current map of collection system and storm drain system Describe routine and preventative operation and maintenance of collection system Develop a rehabilitation and replacement plan. (See SSMP Plan Chapter specifics) Develop and implement a training program Provide equipment and training parts inventories 	<ul style="list-style-type: none"> Deputy Public Works Director – Wastewater Systems Field Operations Manager Collection Systems Supervisor Wastewater Collections Scheduler Sr. Wastewater Collection System Technician Wastewater Collections System Crew Leaders Wastewater Collections System Technicians Wastewater Mechanical Supervisor Fleet Operations Manager
V. Design and Performance <ol style="list-style-type: none"> Design, construction and specification standards for installation and rehabilitation of new and existing sewers. Procedures and standards for the inspection of new or rehabilitated sewers and appurtenances. 	<ul style="list-style-type: none"> Public Works Director/City Engineer Principal Engineer-RRWQCP Public Works Senior Engineer, Sewer Design Deputy Public Works Director – Wastewater Systems
VI. Overflow Emergency Response Plan <ol style="list-style-type: none"> Notification procedures for regulatory agencies Response and mitigation procedures Staff and contractor training Emergency operations Containment and monitoring plans 	<ul style="list-style-type: none"> Public Works Safety Officer Deputy Public Works Director – Wastewater Systems Operations and Compliance Manager Field Operations Manager Wastewater Operations Superintendent Environmental Compliance Supervisor Laboratory Manager Collection System Supervisor Senior Wastewater Collection System Technician Wastewater Collections System Crew Leaders Wastewater Collections System Technicians Operations Supervisors Senior Operators Operations Dispatchers

Element	Responsible Staff
VII. Fats, Oils, and Grease (FOG) Control Program <ol style="list-style-type: none"> Identification of "hot spot" areas of collection system Identification of food service businesses in "hot spot" areas of collection system Administrative controls (permits) for potential grease dischargers Requirement to install grease removal equipment Encouragement to use BMPs to reduce grease discharges Periodic inspections Enforcement actions Public Education 	<ul style="list-style-type: none"> Field Operations Manager Operations and Compliance Manager Environmental Compliance Supervisor Senior Environmental Compliance Inspectors Environmental Compliance Inspectors Wastewater Operations Manager Wastewater Mechanical Supervisor (Collections)Wastewater Collections Scheduler Sr. Wastewater Collection System Technician Wastewater Collections System Crew Leaders Wastewater Collections System Technicians
VIII. System Evaluation and Capacity Assurance Plan <ol style="list-style-type: none"> Capacity evaluation Identification of capacity needs Project schedule 	<ul style="list-style-type: none"> Public Works Senior Engineer, Sewer Design Deputy Public Works Director – Wastewater Systems Field Operations Manager Collection Systems Supervisor
IX. Monitoring, Measurement, and Plant Modifications <ol style="list-style-type: none"> Maintain records and data Monitor implementation of SSMP Assess the success of preventive maintenance program Update program elements Identify and track SSO trends 	<ul style="list-style-type: none"> Deputy Public Works Director – Wastewater Systems Operations and Compliance Manager Field Operations Manager Wastewater Resources Analyst Collection Systems Supervisor Environmental Compliance Supervisor Wastewater Collections Systems Scheduler
X. SSMP Program Audits <ol style="list-style-type: none"> Person responsible for the Audit Scope of the Audit Audit work product Schedule for the Audit, minimum every two years 	<ul style="list-style-type: none"> Operations and Compliance Manager Field Operations Manager Wastewater Resources Analyst Collection Systems Supervisor Environmental Compliance Supervisor
XI. Communication Program <ol style="list-style-type: none"> Notification that an SSMP is being prepared. Website use is suggested 	<ul style="list-style-type: none"> Operations and Compliance Manager Field Operations Manager Environmental Compliance Supervisor Collection Systems Supervisor Public Works Administrative Analysts

SSO Chain of Communication

The City of Riverside utilizes a systematic approach to SSO response and notification. From receipt of a complaint or observation to cleanup of a verified spill, various positions are responsible to ensure that proper procedures are followed. A complete description of spill response is found in the Overflow Emergency Response Plan maintained by the City. In summary, SSO communication begins with a call to Wastewater Operations Dispatchers who dispatch a staff member to respond. Upon arrival, the staff member will relay information back to Dispatch who will send out Agency email notifications to responsible positions as defined in this section. Notifications to various other agencies are made by dispatch as required depending on the nature of the SSO. One of the Authorized Representatives may perform other notifications for Category 1 SSOs.

LEGAL AUTHORITY

Each Enrollee must 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 (examples may include I/I, stormwater, chemical dumping, unauthorized debris and cut roots, etc.);*
 - b) Require that sewers and connections be properly designed and constructed;*
 - c) Ensure access for maintenance, inspection, or repairs for portions of the lateral owned or maintained by the Public Agency;*
 - d) Limit the discharge of fats, oils, and grease and other debris that may cause blockages, and*
 - e) Enforce any violation of its sewer ordinances.*
-

The City's legal authority is comprised of several documents and codes that enable the City to protect its sewer system from harmful discharges and activities. Among the documents and codes used are the Riverside Municipal Code (RMC), City of Riverside Standard Drawings for Construction, Greenbook Standard Specifications for Public Works Construction, Uniform Plumbing Code, and City easements. The following summarizes the City's legal authority:

Illicit Discharges

RMC Sections 14.12.335 PROHIBITED WASTE DISCHARGES and 14.12.345 LIMITATIONS ON WASTEWATER STRENGTH provide legal authority to prevent illicit discharges to the sewer system. These sections include prohibitions against the discharge of any material or waste that could harm the collection system, POTW, or jeopardize the safety of the City's collection system personnel. RMC Section 14.12.385 STORMWATER DIVERSION provides the City authority to restrict or prohibit the discharge of storm water into the collection system.

Design and Construction

Sewers and sewer connections are required to meet the criteria contained in the Public Works Department's "Criteria for Sewer Facility Design", City Standard Drawings for Sewer Line Construction, Greenbook Standard Specifications for Public Works Construction, latest edition, and the latest City approved edition of the Uniform Plumbing Code. RMC Section 14.12.260 INTERCEPTOR REQUIREMENTS provides design and construction criteria for interceptors installed within the City.

Access

The City has secured sewer easements to ensure access for maintenance, inspection, or repairs of City owned collection systems on private property and for portions of the lateral owned or maintained by the City. The City has a variety of methods for obtaining easements to construct and maintain sewer lines

through private property:

1. Acquisition of the easement through voluntary purchase from the owner
2. Acquisition through condemnation for a sewer line easement
3. As a condition of development, the property owner is requested to dedicate or grant an easement to the City for sewer line installation

These easements permit the City to conduct periodic and scheduled sewer line cleaning to prevent SSOs. If there is a problem in a sewer line in an area where the City has been unable to acquire a sewer easement, the City's Code Enforcement Division has the authority to order the house vacated due to lack of sewer services.

FOG Discharge

RMC Chapter 14.12 has several sections that contribute to the limitation of discharges of fats, oils, greases and other debris that may cause blockages in the collection system. These include:

- § 14.12.255 GRAVITY SEPARATION INTERCEPTORS
- § 14.12.260 INTERCEPTOR REQUIREMENTS
- § 14.12.270 INTERCEPTOR MAINTENANCE
- § 14.12.275 RESTAURANTS
- § 14.12.305 USE OF AND DAMAGE TO CITY EQUIPMENT OR FACILITIES
- § 14.12.335 PROHIBITED WASTE DISCHARGES
- § 14.12.345 LIMITATIONS ON WASTEWATER STRENGTH
- § 14.12.360 PRETREATMENT OF INDUSTRIAL WASTEWATER
- § 14.12.375 PROHIBITED DISCHARGE OF RECOVERED PRETREATMENT WASTE

RMC Chapter 14.12, in its entirety, can be found here: <http://www.riversideca.gov/municode/pdf/14/14-12.pdf>

Enforcement

The Environmental Compliance Section enforces Section 14.12 of the RMC through its federally approved pretreatment inspection program. This program helps reduce illicit discharges including discharges of fats, oils, and grease (FOG). Other Public Works personnel ensure that sewers are properly designed, constructed, and that access to the sewer system is available.

OPERATIONS AND MAINTENANCE PROGRAM

The SSMP must include those elements listed below that are appropriate and applicable to the Enrollee's system:

- 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 stormwater conveyance facilities;*
- b) Describe routine preventive operation and maintenance activities by staff and contractors, including a system for scheduling regular maintenance and cleaning of the sanitary sewer system with more frequent cleaning and 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;*
- c) Develop a rehabilitation and replacement plan to identify and prioritize system deficiencies and implement short-term and long-term rehabilitation actions to address each deficiency. The program should include regular visual and TV inspections of manholes and sewer pipes, and a system for ranking the condition of sewer pipes and scheduling rehabilitation. Rehabilitation and replacement should focus on sewer pipes that are at risk of collapse or prone to more frequent blockages due to pipe defects. Finally, the rehabilitation and replacement plan should include a capital improvement plan that addresses proper management and protection of the infrastructure assets. The plan shall include a time schedule for implementing the short- and long-term plans plus a schedule for developing the funds needed for the capital improvement plan;*
- d) Provide training on a regular basis for staff in sanitary sewer system operations and maintenance, and require contractors to be appropriately trained; and*
- e) Provide equipment and replacement part inventories, including identification of critical replacement parts.*

Operation and maintenance activities in the City of Riverside are performed regularly and are enabled through technology. The City of Riverside maintains a detailed database containing information on all aspects of the sewer system. Each manhole, pump, line segment, etc. is designated as an asset and assigned an identification number (asset ID). This information is used to aide operations and maintenance staff in their efforts to clean the entire sewer system every 18 months.

In addition to regular cleaning, the City maintains up-to-date maps and a rehabilitation and replacement plan. It also provides regular training for staff and maintains equipment and replacement part inventories. All of these are components of the operations and maintenance program and help ensure a properly maintained sewer system.

Sewer Maps

The City maintains a GIS based mapping system that provides up-to-date maps of the sanitary sewer system showing all gravity line segments and manholes, pumping facilities, pressure pipes and valves,

and stormwater conveyance facilities. This system has the functionality to access all information related to any sewer asset and can be used to make printed maps as necessary.

Past maps, including architectural, engineering, and construction drawings (blueprints) are stored electronically on a central computer system. This includes historical blueprints that have been scanned and new construction submittals. All paper originals are stored in a fireproof archive vault.

Preventive Maintenance

Collections System staff perform a variety of operations and maintenance activities to ensure the reliable performance of the collection system. Sewer lines are cleaned of roots, debris, grease, etc. at varying intervals. Sewer cleaning is performed by using high pressure hydro-jetting equipment, specialized root cutters, and other equipment. As cleaning is performed, Collections System staff also perform visual inspections of manholes to check for evidence of surcharge, vandalism, structural damage, and other conditions of concern. The Collection System's goal is to clean the entire system every 18 months.

Collection System cleaning is accomplished through the implementation of a work order based system which provides staff a daily scheduled cleaning route. After a section has been cleaned, collections crews complete a cleaning record which includes the following information:

- Date and time of cleaning
- Method of cleaning
- Names of collections workers
- Location and cause of any blockage
- Recommendation of necessary further actions

Upon completion of the day's activities, all cleaning information and work orders are returned to Collection System offices for entry into the database.

Another integral part of the City's preventive maintenance program involves regularly inspecting each of the City's 198 sewer pump stations. Each station is monitored daily through SCADA with additional on-site inspections being performed regularly. These inspections allow collections crews to visually check for any signs of abnormal activity and respond accordingly.

In addition, 17 of the pump stations are equipped with telemetry communication abilities enabling the stations to be monitored on a continuous basis. Any abnormalities are reported and addressed in a timely manner. In the event of a power outage, the two largest pump stations are equipped with backup diesel generators and 9 others have auxiliary power ports to which a portable generator can be connected.

Rehabilitation and Replacement Plan

The City's Rehabilitation and Replacement Plan is centered on several processes including regular CCTV inspections. Collection system personnel and contractors perform CCTV inspections and rate pipes according to the NASSCO Pipeline Assessment and Certification Program (PACP). This standard provides consistency and uniformity in the sewer line inspections and increases confidence in resulting

data. It provides a mechanism whereby sewer lines are rated. Sewer lines are rated on a scale of 1 to 5 per PACP standards:

- Grade 1 - Acceptable structural condition
- Grade 2 - Minimal collapse risk
- Grade 3 - Collapse unlikely in near future
- Grade 4 - Collapse likely in foreseeable future
- Grade 5 - Collapsed or collapse imminent

When a deficiency is identified, a work request is sent to Engineering staff to determine an appropriate remedy. This is typically done for lines rated at Grades 4 or 5. Engineering staff investigate the problem, determine the urgency, and identify actions to resolve the issue. If the problem is designated an emergency, necessary resources and personnel are procured in a timely manner. If it is not an emergency, the pipeline repair/replacement is scheduled within the next year in conjunction with other projects. Engineering staff attend regular Utility Coordination Meetings to coordinate construction between sewer, street, and utility projects.

Funding of rehabilitation and replacement projects is another integral part of the Rehabilitation and Replacement Plan. While budget amounts change from year to year based on the expected projects for each year, the Capital Improvement Program (CIP) budget contains funds for miscellaneous sewer repairs. Within the CIP budget, the line item 'Collection System Replacement – Maintenance' and 'Collection System Upgrades' contain varying amounts of funds each year to address unplanned rehabilitation and replacement. Other planned projects are specified as line items of the CIP budget.

Training

Collections systems personnel receive several trainings to enhance their job knowledge, skills, and abilities. These trainings include:

- SSO/Emergency Response
- Sewer Cleaning
- Forklift Operation
- HAZWOPER Training
- Lockout/Tagout Procedures
- Confined Space Entry and Rescue
- General Safety – PPE
- Traffic Control
- Pipe Repair
- Public Relations
- Pump Station Operations and Maintenance
- CCTV and trench shoring

All training is recorded in a training database maintained by the City.

Equipment and Replacement Parts

The Collection Systems Section utilizes several vehicles and equipment to maintain the sewer system. Among the vehicles in operation are:

- Two high pressure hydro-jet trucks. One of which has 1,200 feet of hydro hose for maintenance in easements, alleys, and other areas with accessibility challenges
- Seven hydro/vac trucks with high pressure sewer line cleaning and vacuum capabilities
- One Closed-Circuit Television (CCTV) van with the ability to inspect laterals and sewer lines from three to thirty-six inches. Each is also equipped with the necessary equipment to create a DVD of the sewer inspection
- One trailer mounted mongoose hydro-jetter for laterals, easements, and main line cleaning
- Two 10-yard dump trucks
- One stake-bed utility trucks
- Two backhoe loaders
- Two bobcat loaders
- One safety utility trailer
- One pole camera used to probe manholes and inspect sewer lines upstream and downstream from a manhole location

A variety of replacement parts are retained for collections equipment. These parts include nozzles, whip hoses, reel hose, and high pressure valves. Certain collections crew members are trained to perform high pressure hose repairs. All other repairs are performed at the City's vehicle maintenance facility, including scheduled preventive maintenance.

DESIGN AND PERFORMANCE PROVISIONS

- 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; and*
 - b) Procedures and standards for inspecting and testing the installation of new sewers, pumps, and other appurtenances and for rehabilitation and repair projects.*
-

Design Criteria and Standard Construction Design

The Public Works Department, Engineering Division is responsible for capital sewer projects that include repair, replacement, and new installation of sanitary sewer systems, pump stations, and other appurtenances. All design and construction is subject to the approval of the City Engineer. To facilitate and streamline the approval process, the City has developed design guidelines for construction of sewer projects which are contained in the City's *Standard Drawings for Construction* and the *Sewage Lift Station and Force Main Guidelines*. These design guidelines can be found here: <http://www.riversideca.gov/publicworks/drawings.asp>. In addition to these standard drawings, the City uses the Greenbook Standard Specifications for Public Works Construction and the Uniform Plumbing Code for guidance on sewer design.

In addition to specific design guidelines, the Riverside Municipal Code provides general direction on where and how sewer lines should be installed. For example Section 13.12.040 SEWER requires sewer mains to be “laid at such depth that the top of such mains shall not be less than six feet below the established grade of the street.” It also requires sewer mains to be laid a “minimum of five feet from the centerline of the street on the northerly or easterly side thereof.”

These documents and guidelines set forth various sewer construction requirements that ensure the proper function of the sewer system. When plans are submitted to engineering staff, they are closely reviewed for sewer line sizing, depth, clearances, manhole spacing, etc. As the review process progresses, plans meeting all required specifications will be approved for project construction. When construction is not approved, affected parties are notified of the plan discrepancies.

Inspection and Testing

While installing new sewers, pumps, and other appurtenances, testing and inspection of the new sewer system is performed to ensure quality installation. The City employs several Public Works Construction Inspectors who, among other things, inspect the installation of public works projects. Private sewer systems are inspected by Building and Safety Inspectors from the Community Development Department. Inspectors use the Greenbook Standard Specifications for Public Works Construction and the Uniform Plumbing Code to ensure sewer systems are installed properly. They use inclinometers, air tests, water tightness tests, video surveillance and other tests to inspect sewer installation.

When new manholes are installed, they are visually inspected to determine if there are any conditions which are characteristic of inflow or infiltration (I/I). Video pole cameras are used in hard to see areas to aide in the I/I evaluation. Furthermore, all new sewer lines are televised after installation is complete. This video and additional inclinometer testing help determine if sewer systems have been built according to design specifications.

OVERFLOW EMERGENCY RESPONSE PLAN

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 California 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 United States 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 of Riverside has created several documents to ensure it utilizes a systematic approach to SSO response and notification procedures. Sewer Division staffs continually review these documents in an effort to constantly improve public and environmental health. While the paragraphs below provide summaries of the required elements of this section, specific processes are contained in the Overflow Emergency Response Plan maintained by the City.

Notification and Response Procedures

SSO Communication follows a defined procedure to ensure that all SSOs are reported and responded to in an appropriate manner. Within this process, primary responders (usually a collection systems or operations crew member) are notified of potential spills and respond to the location in question. Upon arrival, the staff member will relay information back to Dispatch who will send out Agency email notifications to responsible positions as defined in this section. Notifications to various other agencies are made by dispatch as required depending on the nature of the SSO. One of the Authorized Representatives may perform other notifications for Category 1 SSOs. Concurrent with notification procedures, primary responders work to correct the problem and minimize its affects. A complete overview of this process is contained in the Overflow Emergency Response Plan maintained by the City.

Training

The City of Riverside provides regular training on the Overflow Emergency Response Plan for all personnel involved in overflow response. In these trainings, the plan is reviewed and discussed to ensure proper procedures are understood. Real life experiences and scenarios are shared and reviewed to enhance training sessions.

Emergency Operations

Aside from those emergency procedures outlined in the preceding, other procedures such as traffic control and crowd control may be necessary in the event of a major sewer overflow. Collections systems crews are equipped with traffic cones, barricades, caution tape and other items that enable the control of traffic and crowds during minor events. In the event of a major spill, other Public Works crews, law enforcement, and fire personnel may be contacted to assist in emergency operations. These crews are experienced in closing lanes or streets, establishing detour routes, crowd control, and other emergency operations.

Minimize Impacts

The Overflow and Emergency Response Plan is designed to ensure that all reasonable steps are taken to contain and prevent the discharge of sewer overflows to waters of the United States. While the proper implementation of this plan will prevent most discharges to waters of the United States, there are situations when these waters become affected. Should this occur and if receiving water monitoring is necessary, the receiving water is evaluated and sampled in accordance with City's Water Quality Monitoring Program.

FOG CONTROL PROGRAM

Each Enrollee shall evaluate its service area to determine whether a FOG control program is needed. If an Enrollee determines that a FOG program is not needed, the Enrollee 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 control program to reduce the amount of these substances discharged to the sanitary sewer system. This plan shall include the following as appropriate:

- a) An implementation plan and schedule for a public education outreach program that promotes proper disposal of FOG;*
- 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;*
- c) The legal authority to prohibit discharges to the system and identify measures to prevent SSOs and blockages caused by FOG;*
- 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;*
- e) Authority to inspect grease producing facilities, enforcement authorities, and whether the Enrollee has sufficient staff to inspect and enforce the FOG ordinance;*
- f) An identification of sanitary sewer system sections subject to FOG blockages and establishment of a cleaning maintenance schedule for each section; and*
- 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.*

The City of Riverside has determined it benefits from a FOG source control program and has implemented various policies and practices in an attempt to limit FOG disturbances to the sewer system. This program is administered by the Environmental Compliance (EC) Section and Collections System staff.

Public Education

Public education and outreach is performed through a variety of activities primarily performed by the EC Section. This section participates in many local events each year to educate the public about FOG and other sewer related issues. These events are usually sponsored by local agencies such as the Riverside Police Department, Chamber of Commerce, United Way, and others. During these events, EC staff members show the effects of FOG using demonstrations and personal interaction. While the general public receives education through local events, the EC Section also educates business owners while conducting inspections of restaurants. EC staff conduct inspections at all restaurants in the City on a regular basis. During these inspections, they check drains, grease interceptors, waste oil containers,

records, etc. to verify compliance with local ordinances. These activities provide an opportunity to educate business owners about FOG and its effect on the sewer system.

Throughout all of the EC Section's interactions, a variety of promotional items are available for distribution. The City also includes informational inserts in residents' sewer bills and displays FOG messages on a billboard at the 91 freeway near the University exit. Examples of promotional items and informational materials distributed can be found here: <http://www.riversideca.gov/publicworks/sewer/pub-ed-handouts.asp>.

FOG Disposal

As mentioned above, EC Inspectors visit restaurants, kitchens, and other known FOG producing facilities on a regular basis to verify compliance with municipal codes. During these visits, facility records including waste oil disposal and grease interceptor maintenance are checked to ensure proper disposal of FOG. In addition, EC Inspectors provide education and offer educational materials that inform how to properly dispose of FOG.

Legal Authority

The City has established legal authority to prohibit discharges of FOG to the sanitary sewer system. This is accomplished through several municipal codes, primarily Section 14.12.335 PROHIBITED WASTE DISCHARGES which explicitly prohibits grease and other viscous materials from entering the sewer system. In addition to this prohibition, Section 14.12.275 RESTAURANTS requires users to separate FOG to the maximum extent practicable for off-site disposal. This section also requires restaurants seek a determination from the EC Section on whether or not a grease interceptor must be installed. Finally, Section 14.12.270 INTERCEPTOR MAINTENANCE requires users to properly maintain their interceptors utilizing the 25% rule and establishing other standards to the regular interceptor cleaning process.

Requirements for Grease Removal Devices

As mentioned in the previous section, Section 14.12.275 of the Riverside Municipal Code mandates that restaurants shall not “discharge wastewater from such restaurant to the POTW without first receiving a written determination from Director, and complying with such determination, of the POTW interceptor requirements.” This determination is made as users complete and submit a discharge survey that defines the probable impact the restaurant will impose on the sewer system. Interceptors are to be sized and designed in accordance with the Uniform Plumbing Code with a minimum size of 750 gallons. Additional interceptor requirements including accessibility, tee, and sample box requirements are found in Section 14.12.260 INTERCEPTOR REQUIREMENTS.

In addition to sizing and installation requirements, the municipal code gives requirements for interceptor maintenance. Section 14.12.270 INTERCEPTOR MAINTENANCE requires that interceptors are properly maintained at all times. An interceptor is not considered to be properly maintained, if for any reason the interceptor is not in good working condition or if the operational fluid capacity has been reduced by more than twenty-five percent by the accumulation of floating material, sediment, oil or

grease, or other liquids that have limited or no solubility in water. This section prohibits the use of “enzymes, proteins, or other materials that emulsify, suspend, or dissolve oil and grease.” It also requires that when cleaned, “the entire contents of the interceptor from all chambers and sample box shall be removed.”

Section 14.12.230 RECORD KEEPING requires users to “keep records of waste hauling, reclamations, wastewater pretreatment, monitoring device recording charts and calibration reports, effluent flow, and sample analysis data, on the site...” Records must be kept onsite for a minimum of three years.

Authority to Inspect

Section 14.12.215 INSPECTION provides the authority to inspect businesses in order to ascertain if all municipal code requirements are being met. This section requires users to provide access and have personnel available who are knowledgeable of all facility processes. The EC Section administers the inspection program. EC is comprised of six EC Inspectors (I and II), two Senior EC Inspectors and an EC Supervisor. This diligent staff is sufficient to inspect and enforce the FOG ordinance.

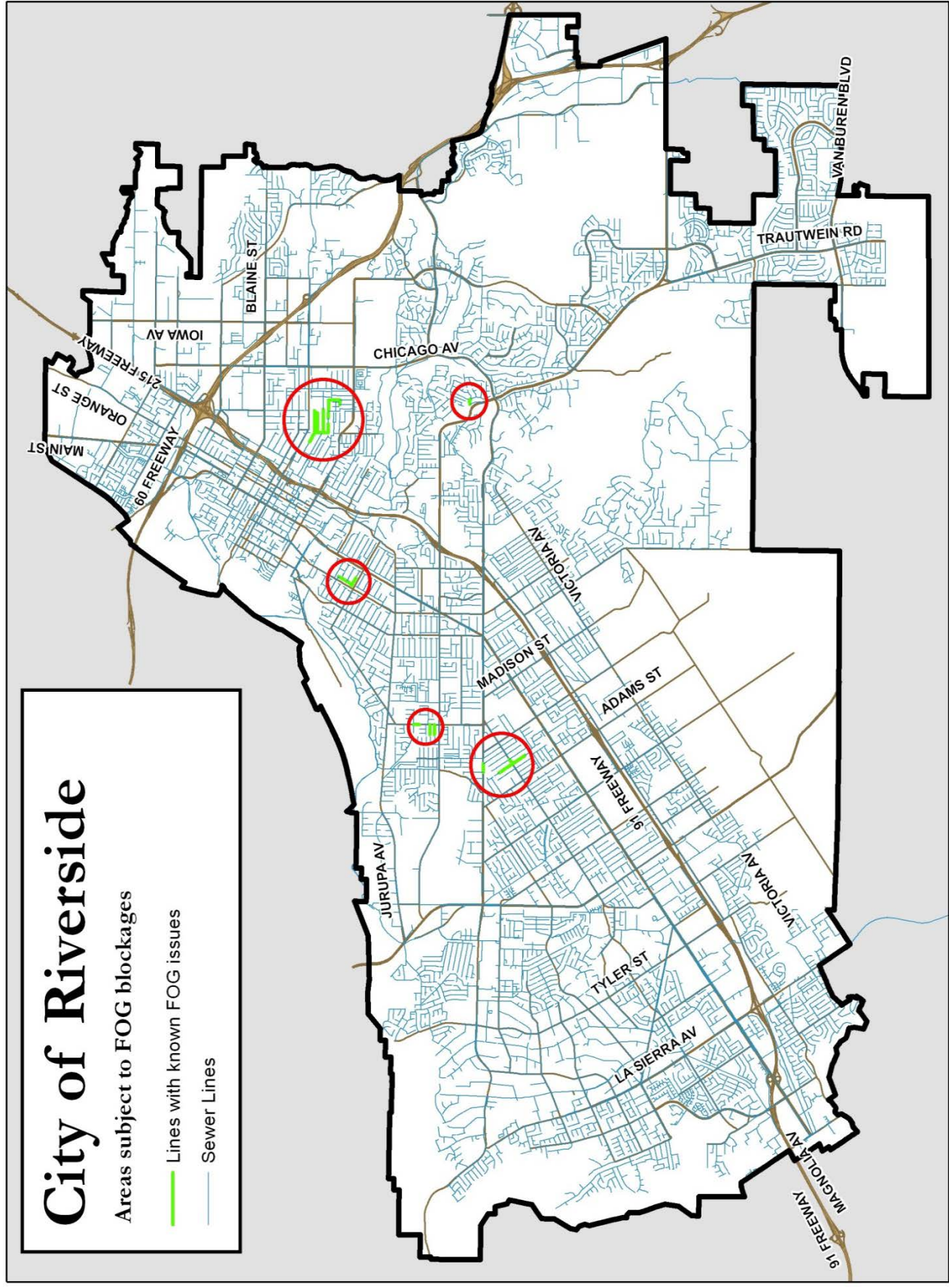
FOG Problem Areas and Maintenance Schedule

Several areas throughout the City have been identified as being subject to FOG blockages. These areas are identified in Figure 2. To help prevent sewer line blockages in these areas, operations and maintenance crews clean these lines every month. This enhanced cleaning schedule helps to keep these sewer sections properly maintained.

Source Control for Problem Areas

As detailed in this element, the City’s multi-faceted source control program consists of inspections, public education and other activities. When problems in commercial/retail areas are identified, EC staff increase efforts in these areas in an attempt to locate specific causes of the problem. As mentioned, the City also includes informational flyers in residents’ sewer bills.

Figure 2 - Areas Subject to FOG Blockages



SYSTEM EVALUATION AND CAPACITY ASSURANCE PLAN

The Enrollee shall prepare and implement a capital improvement plan (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:

- a) 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 from 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 the major sources that contribute to the peak flows associated with overflow events;*
- b) Design Criteria: Where design criteria do not exist or are deficient, undertake the evaluation identified in (a) above to establish appropriate design criteria; and*
- c) Capacity Enhancement Measures: The steps needed to establish a 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/I reduction programs, increases and redundancy in pumping capacity, and storage facilities. The CIP shall include an implementation schedule and shall identify sources of funding.*
- d) Schedule: The Enrollee shall develop a schedule of completion dates for all portions of the capital improvement program developed in (a)-(c) above. This schedule shall be reviewed and updated consistent with the SSMP review and update requirements as described in Section D. 14.*

In 2008, the City prepared a planning document for facility planning for the RWQCP and collection system called the Wastewater Collection and Treatment Facilities Integrated Master Plan. This plan was developed to continue to reliably provide wastewater treatment to the City as wastewater flows and the community's population continue to grow. This 2008 Wastewater Integrated Master Plan identifies and plans for expansion and replacement needs through the year 2025. This document can be found at: <http://www.riversideca.gov/publicworks/sewer/masterplan-wastewater.asp>

As part of this study, flow data was collected from various areas of the sewer system and modeled to identify capacity related deficiencies. Deficient pipes were assigned to one of three different priority levels:

- Priority "A" – The pipes listed within this priority are currently deficient and are flowing more than 90% full under maximum flow condition. These pipes need immediate replacement.

- Priority “B” – The pipes listed in this priority would be flowing more than 90% full in the future under maximum flow conditions. These pipes need evaluation as new development takes place in the tributary area. Flow monitoring of the pipes within 5 years might be considered and the priority ranking re-evaluated.
- Priority “C” – The pipes listed under this priority would be flowing between 75% and 90% full in the future under maximum flow conditions. Periodic flow monitoring or visual inspection should be considered for these pipes every five years.

It is important to note that these studies and the assigned priority levels were made in the years 2002 to 2006, in a time of relative economic prosperity. Projections may have been based on expected growth that may not be realized on the anticipated timetable. Despite this, the CIP schedule moves forward with the assigned priority levels. Pipes with priority level “A” are given the highest priority while levels “B” and “C” follow in that order. A lesser priority project may be considered for construction in advance of its previously determined time if a higher priority project is close enough in proximity as to enable a significant savings in cost and public disturbance.

In February 2014, the City released its latest Capital Improvement Program and Rate Development Study outlining projects and funding requirements through Fiscal Year 2018/19. This document provides capacity enhancement measures and a schedule for the listed CIP projects. It can be found at: <http://www.riversideca.gov/publicworks/sewer/pdf/2014-CIP-Rate-Study.pdf>

MONITORING, MEASUREMENT, AND PROGRAM MODIFICATIONS

The Enrollee shall:

- a) Maintain relevant information that can be used to establish and prioritize appropriate SSMP activities;*
 - b) Monitor the implementation and, where appropriate, measure the effectiveness of each element of the SSMP;*
 - c) Assess the success of the preventative maintenance program;*
 - d) Update program elements, as appropriate, based on monitoring or performance evaluations; and*
 - e) Identify and illustrate SSO trends, including: frequency, location, and volume.*
-

The SSMP and the programs described therein are continually reviewed to monitor and measure the performance of the sewer system. This review, in conjunction with the SSMP Program Audits element, is used to identify the strengths and weaknesses of current programs and modify them as found necessary.

Maintain Information

To monitor and measure the SSMP's effectiveness, the City maintains detailed records of the sewer system and its maintenance. Records of line cleaning, televising, SSO's, and other pertinent information provide the necessary data required to identify areas of concern. Among the data tracked are:

- Miles of sewer line cleaned
- Miles of sewer line inspected
- # of service requests completed
- # of SSOs
- Causes of SSOs
- Locations of SSOs
- Quantity spilled
- Repair replacement of sewer lines
- Public Education events/activities

Detailed information relevant to specific sewer lines, manholes, or other assets is also maintained. Databases enable quick access to CCTV videos, SSO details, dates of specific line cleanings, and much more.

Monitor Implementation of SSMP

The City's robust database management system facilitates the process by which each element of the SSMP is measured for its effectiveness in fulfilling the goals of the SSMP. This process is performed in conjunction with the biannual audit. Key statistics for a designated time period are reviewed and compared to various sewer issues including SSO's. Further detail of this process is shown in the proceeding sections.

Assessment of Preventive Maintenance Program

As outlined in the Operations and Maintenance Program Element, the preventive maintenance program is a critical component of the SSMP on which its effectiveness is dependent. The processes described in that element are tracked and recorded as outlined in the preceding. When the necessary data is gathered and reviewed, it is then used to assess the success of the preventative maintenance program. This assessment is primarily done in conjunction with the biannual program audit. The audit is described in the following SSMP element and includes both quantitative and qualitative analysis of SSMP program elements.

Program Elements

Program audits evaluate the SSMP's effectiveness and explore opportunities which can lead to improvement of the sewer system. When an opportunity for improvement is found and it is determined there will be limited negative impact on other aspects of the sewer system, then the corresponding SSMP element is updated with the changes. Recommendations on program changes are included in the audits.

SSO Trends

Identifying trends in SSOs can be extremely valuable and help to identify problem areas. The City's database includes detailed information about SSOs including their location, volume, cause, response time, notifications, etc. Through analysis of the database as well as analysis using GIS mapping software, SSO trends can be identified that can uncover unknown issues with the sewer system. Much of this analysis is described and detailed in program audits. When trends are found, changes in practices including revisions to the operations and maintenance schedule can be made to reduce future SSOs.

SSMP PROGRAM AUDITS

As part of the SSMP, the Enrollee shall conduct periodic internal audits, appropriate to the size of the system and the number of SSOs. At a 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 requirements identified in this subsection (D.13), including identification of any deficiencies in the SSMP and steps to correct them.

The use of program audits is a valuable tool to assess the performance of the SSMP and to determine if any improvements or changes must be made. Audits are conducted ~~biannually with one covering the time period of January 1st to June 30th and the other covering from July 1st to December 31st~~ biennially.

Audits include the productivity measures and informational data described in the Monitoring, Measurement, and Program Modifications Element. This data is sorted and reviewed so as to offer a clear representation of SSMP processes. In addition, audits contain a narrative discussion of SSMP elements and the progress made in the attainment of the provisions of each. This discussion facilitates responses to two questions essential to the audit:

1. Are the goals, requirements, and performance targets outlined in the SSMP attained through current activities and processes?
2. Are the goals, requirements, and performance targets, as they are currently outlined in the SSMP, sufficiently adequate to fulfill the provisions and prohibitions of the WDRs?

According to answers to these two questions, the SSMP is updated and revised as necessary.

The final work product derived from the audit process is a summary of organization changes, operations and maintenance activities, FOG inspections, CIP projects, public education events, and other pertinent activities and systematic changes. This summary consists of narrative, graphical, and cartographic descriptions and information as well as recommendations on further progress.

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 Enrollee shall also create a plan of communication with systems that are tributary and/or satellite to the Enrollee's sanitary sewer system.

The City of Riverside utilizes an informative communication program designed to provide the public with information and enable them to comment on all facets of the sewer system. This is accomplished through the publication of various sewer system documents on the City's website. These can be found at <http://www.riversideca.gov/publicworks/sewer/>. Viewers of any sewer related information can contact the Sewer Division by phone or email and ask questions and provide feedback on any aspect of the sewer system.

The Sewer Division also offers tours of the Wastewater Treatment Plant where treatment plant processes are shown and information is shared about other aspects of the collection system. These tours also allow the general public to ask questions and comment on any aspect of the sewer system.

The Environmental Compliance Section also performs significant public education and outreach throughout the City. They participate in several events sponsored by local agencies such as the Riverside Police Department, Chamber of Commerce, United Way, and others. During these events, EC staff members communicate the effects of discharging FOG, pharmaceuticals, and other substances to the sewer system. EC staff members have a variety of promotional items available for distribution. Examples can be found here: <http://www.riversideca.gov/publicworks/sewer/pub-ed-handouts.asp>

In addition to the above, the City also communicates with the public by including informational inserts in residents' sewer bills and displaying sewer-related messages on a billboard at the 91 freeway near the University exit. The Sewer Public Benefit Program is another program providing a method of communication to the businesses and the public. This program initiated an environmental public awareness campaign targeting businesses. It provides an incentive to install technology to reduce the volume and/or loading from the business to the sewer collection system. Information about the program can be found here: <http://www.riversideca.gov/publicworks/sewer/incentive-industrial.asp>

The City of Riverside communicates with other sewerage agencies on a regular basis. The City regularly meets and communicates with the Community Services Districts of Jurupa, Rubidoux, and Edgemont to discuss any pertinent issues regarding their or the City's sewer systems. Other neighboring cities including Corona, Norco, Jurupa Valley, Moreno Valley, and the County of Riverside are contacted regarding a variety of topics as need dictates. All of these agencies are invited to view the City's website and documents found there and ask questions or provide comments through phone or email.