SANITATION DISTRICTS OF LOS ANGELES COUNTY

Sewer System Management Plan (SSMP)

February 2019

GRACE ROBINSON HYDE
Chief Engineer and General Manager

LOS ANGELES COUNTY SANITATION DISTRICTS *Converting Waste Into Resources*	SEWER SYSTEM MANAGEMENT PLAN CHANGE LOG

Los Angeles County Sanitation Districts
SSMP Change Log

Date	SSMP Element	Description of Change/Revision Made	Change Authorized By:
10/2023	4.2.2.1	Updated Line and Siphon Cleaning Scheduling	Asst. Departmental Engineer
		Activities	

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Introduction

On May 2, 2006 the State Water Resources Control Board (SWRCB) adopted Order No. 2006-003 (Order) which established General Waste Discharge Requirements (WDRs) for all publicly owned or operated sanitary sewer systems within the State of California. The WDRs require that owners and operators of sewer collection systems: 1) report sanitary sewer overflows (SSOs) in the California Integrated Water Quality System (CIWQS), an electronic reporting system developed by the SWRCB, and 2) develop and implement a Sewer System Management Plan (SSMP) with the goal of reducing sanitary sewer overflows (SSOs). In short, the SSMP is a document that details how a specific sewer collection system is operated, maintained, repaired, and funded.

On July 30, 2013, SWRCB adopted Order No. WQ 2013-0058-EXEC amending the monitoring and reporting procedures listed in the original Order (Amendments).

The SSMP developed by the County Sanitation Districts of Los Angeles County (Sanitation Districts) is organized into 11 chapters to parallel the requirements included in the WDRs. Each section or subsection of each chapter addresses the individual elements of the SSMP.

The Sanitation Districts' first SSMP was certified in May 2009. The WDRs require that the SSMP be updated and recertified a minimum of once every 5 years. The SSMP was updated and recertified in February 2014. The SSMP was revised in October 2015 to address February 2015 audit findings. This SSMP was revised in October 2018 to update current practices and contact information.

1 Goal

Chapter 1 of this SSMP addresses the requirements included in Subsection D.13.(i) of the Order. The requirements state:

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

1.1 SSMP Goal

The goal of the Sanitation Districts' SSMP is four-fold and ensures that:

- Collection system facilities are properly managed, operated, and maintained to eliminate preventable sanitary sewer overflows (SSOs);
- Response measures are in place and that all feasible steps are taken to mitigate the impacts of SSOs to public health and the environment when they occur;
- Reporting procedures are in place to notify the appropriate regulatory and health authorities of SSOs within the required time frames; and
- SSO events, mitigation measures, and corrective actions are documented.

1.2 Levels of Service

To measure performance of the above goals, levels of service have been established for each Sanitation District and each Joint Outfall System. The levels of service are:

- Zero (0) preventable SSOs per 100 miles of sewer per year;
- Less than 5 odor complaints per year;
- Complete 100% of scheduled preventative maintenance work per year; and
- Respond to the scene of an SSO within 1 hour of notification.

2 Organization

Chapter 2 of this SSMP addresses the requirements included in Subsection D.13.(ii) of the Order. The requirements state:

Organization: *The SSMP must identify:*

(a) The name of the responsible or authorized representative as described in Section J of this Order;

(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)).

2.1 Description of Organization

The Sanitation Districts are a confederation of 24 independent special districts that serve the wastewater and solid waste management needs of approximately 5.6 million people in Los Angeles County (County). The Sanitation Districts' service area covers approximately 850 square miles and encompasses 78 cities and unincorporated territory within the County. Within the Sanitation Districts' service area, there are approximately 9,500 miles of sewers that are owned and operated by the cities and county that are tributary to the Sanitation Districts' wastewater collection system. The Sanitation Districts own, operate, and maintain approximately 1,400 miles of sewers - ranging from 8 to 144 inches in diameter - that convey approximately 510 million gallons per day of wastewater to 11 wastewater treatment plants. Included in the Sanitation Districts' wastewater collection system are 48 active pumping plants located throughout the County. The Sanitation Districts' service area includes sewer systems located within the Los Angeles County Basin, the Santa Clarita Valley, and the Antelope Valley.

The Sanitation Districts' wastewater collection systems are maintained out of three centralized maintenance facilities described below. Attachment 2.1 shows these facilities and their maintenance coverage areas.

- Compton Field Office (City of Compton): Responsible for maintaining the Southern Service Area bounded by the I-5 Freeway to the north, by the City of Los Angeles to the northwest, by the Pacific Ocean to the west and south, and Orange County to the east. This facility is assigned to the Wastewater Collection Systems Section.

- San Gabriel Valley Field Office (City of West Covina): Responsible for maintaining the Northern Service Area bounded by the San Gabriel Mountains to the north, by the Cities of Glendale and Los Angeles to the west, by the I-5 Freeway to the south, and by San Bernardino County to the east. This facility is assigned to the Wastewater Collection Systems Section.

- Palmdale Water Reclamation Plant (City of Palmdale): Responsible for maintaining the Desert Service Area bounded by the Santa Clarita and Antelope Valleys. This facility is assigned to the Water Reclamation Plants Section.

The number of active operation and maintenance staff assigned to the Sanitation Districts' sewer collection system is updated annually to the California Integrated Water Quality System (CIWQS). CIWQS is a SWRCB computer system used to track information about environmental interests including the electronic reporting requirements of the WDRs.

Of the 24 independent special districts, 19 own and operate over one mile of sewer and are registered in CIWQS per the WDRs. Seventeen of the 24 independent special districts have joined together to share a regional, interconnected sewerage system called the Joint Outfall System, which includes sewers that cross multiple districts. The Joint Outfall System owns and operates over one mile of sewer and is registered in CIWQS per the WDRs. These districts and the Joint Outfall System, and their Waste Discharger Identification (WDID) numbers are listed below.

1. WDID: 4SSO11386, District 01
2. WDID: 4SSO11387, District 02
3. WDID: 4SSO11388, Joint Outfall System
4. WDID: 4SSO11389, District 03
5. WDID: 4SSO11390, District 04
6. WDID: 4SSO11391, District 05
7. WDID: 4SSO11392, District 08
8. WDID: 6SSO11393, District 14
9. WDID: 4SSO11394, District 15
10. WDID: 4SSO11395, District 16
11. WDID: 4SSO11396, District 17
12. WDID: 4SSO11397, District 18
13. WDID: 4SSO11398, District 19
14. WDID: 6SSO11399, District 20
15. WDID: 4SSO11400, District 21
16. WDID: 4SSO11401, District 22
17. WDID: 4SSO11402, District 28
18. WDID: 4SSO11403, District 29
19. WDID: 4SSO11404, South Bay Cities
20. WDID: 4SSO11405, Santa Clarita Valley

2.2 Authorized Representative

As described in Section J of the Order, all reports required by the Order and other submittals required by the State or Regional Water Board shall be signed and certified by a person designated as either a principal executive officer or ranking elected official, or by a duly authorized representative of that person. An individual is a duly authorized representative only if (a) the authorization is made in writing by the person designated as either a principal executive officer or ranking elected official; and (b) the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity.

The Chief Engineer and General Manager of the Sanitation Districts is responsible for signing and certifying all reports required by the Order, as well as other submittals required by the State or Regional Water Board. As indicated in Attachment 2.2, the Chief Engineer and General Manager has authorized any individual occupying the positions of Supervising Engineer, Section Head, Assistant Department Head, or Department Head in the Technical Services Department, and any individual occupying the positions of Section Head or Department Head in the Wastewater Management Department, as duly authorized representatives for any submittal to the Regional Board related to Sanitation Districts' facilities.

For purposes of electronic reporting of SSOs, an electronic signature and accompanying certification, as provided by the CIWQS, the electronic reporting system developed by SWRCB, meet this certification requirement.

2.3 Organizational Charts and Contact Information

An organizational chart for the Sanitation Districts is included as Attachment 2.3. The Wastewater Collection Systems Section and Water Reclamation Plants Section of the Wastewater Management Department are responsible for implementing the measures included in this SSMP. Organization tables for the Wastewater Collection Systems and the Water Reclamations Plants Sections, including names and contact information, are included as Attachment 2.4.

The Engineering Department is responsible for maintaining the measures included in Chapter 5, Design and Performance Provisions. An organization table for the Office Engineering Department, which includes names and contact information, is included as Attachment 2.5.

The Industrial Waste Section of the Wastewater Management Department is responsible for implementing the measures included in Chapter 7, Fats, Oils, and Grease (FOG) Control Program. An organization table for the Industrial Waste Section, which includes names and contact information, is included as Attachment 2.6.

The Reuse and Compliance Section of the Technical Services Department is responsible for maintaining measures included in Chapter 9, Monitoring, Measurements, and Program Modification, and Chapter 10, SSMP Program Audits. An organization table for the Reuse and Compliance Section, which includes names and contact information, is included as Attachment 2.7.

2.4 Chain of Communication for SSO Reporting

Once any Sanitation Districts' employee receives a complaint or information regarding a potential SSO event, that employee immediately notifies the Sanitation Districts' Long Beach Main Central Alarm Center (CAC) as outlined in Attachment 2.8. The CAC phone number is listed as the emergency contact number on information disseminated to the public (e.g. brochures), on the Sanitation Districts' website, and on signs at each collection system facility, thus, the CAC also receives emergency and complaint phone calls directly from the public and other agencies. The CAC personnel then follow a Notifications Flow Chart (Attachment 2.9) to ensure all necessary agencies are contacted and informed of the SSO. In response to an SSO event, the Wastewater Collection Systems Section and Water Reclamation Plants Section immediately implement a Sanitary Sewer Overflow Response Plan (Response Plan), which is further discussed in Section 6.2.

3 Legal Authority

Chapter 3 of this SSMP addresses the requirements included in Subsection D.13.(iii) of the Order. The requirements state:

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, storm water, 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 Sanitation Districts' legal authority to operate, maintain, and manage its sewer system is derived from the County Sanitation District Act, California Health and Safety Code, §§4700 through 4859 and exercises authority conferred by law that includes but is not limited to Health and Safety Code, §§5400 through 5474, and California Government Code, §§54725 through 54740. The Sanitation Districts have organized much of their authority into the *County Sanitation Districts of Los Angeles County Wastewater Ordinance (Wastewater Ordinance)* available at www.lacsd.org. The most recently amended version of this document was completed on July 1, 1998. Table 3.1 provides the source of the Sanitation Districts' authority for each of the items required in Section D.13.(iii) of the Order.

Table 3.1 – Sanitation Districts' Sewerage System Legal Authority

SSMP Required Functions	Sanitation Districts' Legal Authority
Prevent illicit discharges into its sanitary sewer system (examples may include I/I, storm water, chemical dumping, unauthorized debris and cut roots, etc.).	Wastewater Ordinance §§305 and 406
Require that sewers and connections be properly designed and constructed.	Wastewater Ordinance §§302, 303, and 308; California Health and Safety Code §4762.1
Ensure access for maintenance, inspection, or repairs for portions of the lateral owned or maintained by the Sanitation Districts.	Wastewater Ordinance §§301, 302, 303, and 308; California Health and Safety Code §4762.1
Limit the discharge of fats, oils, and grease and other debris that may cause blockages.	Wastewater Ordinance §§304 and 406
Enforce any violation of its sewer ordinances.	California Government Codes §§54739 and 54740; California Health and Safety Code §§4762.1 and 4766

4 Operation and Maintenance Program

Chapter 4 of this SSMP addresses the requirements included in Subsection D.13.(iv) of the Order. The requirements state:

Operation 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 storm water 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.

4.1 Collection System Mapping

The Sanitation Districts utilize Geographic Information System (GIS) and hard copy maps of its wastewater collection system for daily operations. These mapping systems are described below.

- Geographic Information System (GIS): The Sewerage Facilities GIS Program was developed in-house by the Sanitation Districts, and provides a map-driven geographical interface to sewerage data. The GIS is a powerful tool used daily by Sanitation Districts' staff. Besides Sanitation Districts' sewers, GIS provides staff access to a variety of location specific data, including non-Sanitation Districts sewers from other local agencies, storm drain alignments, topographic maps, aerial photos, industrial waste connections, and locations of historical SSOs. The GIS is kept up-to-date by a dedicated GIS Group that maintains data licenses and works with other Sanitation Districts' Departments to modify, add, and delete data as it changes.

- Los Angeles County Thomas Guide Sewer Atlas: The atlas is a Thomas Guide map book of the Sanitation Districts' collection system shown on clear overlays. The overlays provide the alignment of the sewers, the names of the sewers and pumping plants, and the contract drawing number under which the sewer was constructed. These maps are used mainly in the field or in the event that GIS is unavailable. The Sanitation Districts also use an atlas with storm drain information printed onto the Thomas Guide sheets. It is updated periodically by Los Angeles County Department of Public Works.
- Sewer Maintenance Map Books: These maps show the collection system facilities and are created from Sanitation Districts' GIS information. The Sewer Maintenance Map Books are organized by individual Sanitation District and are used to locate collection system facilities when a computer is not available. The map books detail the Sanitation Districts' sewer alignments, including siphon locations and manholes, in relation to a street base layer. The map books are updated periodically by Sanitation Districts' staff, including a comprehensive update in 2015.

4.2 Preventative Maintenance (PM) Program

4.2.1 Work and Asset Management System

The Sanitation Districts currently utilize a Work and Asset Management System (WAM) developed by Oracle to schedule and document maintenance and repair of its wastewater collection system. WAM is a Work Order System that can selectively schedule Preventative Maintenance (PM) activities or reactively schedule Work Orders (WO). The PM schedule identifies all routine sewer maintenance tasks such as line cleaning, closed circuit television inspection, and pumping plant maintenance. For each PM task, the frequency, crew, number of workers, expected hours, and month of the year the task is scheduled is provided. On the first of each month, a report is generated and distributed to the crews showing the PM tasks due that month. This allows the Sanitation Districts' Supervisor and crew leader to prioritize the tasks to be done for that month. This information is updated in WAM to capture PM history for each asset.

Each WO identifies and tracks work, other than scheduled PM tasks, that is required to maintain the collection system. Work can be written by an individual to identify repairs or other items requiring labor beyond what is performed under a PM task. Each WO describes the problem and is routed for supervisor approval and crew assignment. After the work is completed, WAM itemizes the labor and material costs for account tracking.

4.2.2 Operations and Maintenance Programs

The Sanitation Districts conduct a number of operations and maintenance activities to help achieve its SSMP goals. A list of these programs is as follows:

4.2.2.1 Collection System Operations and Maintenance

- Line Cleaning: The Sanitation Districts use a variety of devices to line clean such as winch bags and combination hydraulic/vacuum units. Cleaning frequencies are established based on several factors including sewer diameter, flow rates, maintenance history (presence of roots, grease, debris, etc.), CCTV inspection data and prior operational issues. Large diameter sewers are cleaned on a case-by-case basis. Cleaning frequencies are documented in the WAM System and are adjusted when new problems are discovered. Each line cleaning job, or set-up, is evaluated as it is accomplished and the schedule is modified as needed. Job notes, such as traffic concerns or special equipment requirements, are documented in WAM. Problem cleaning areas such as root intrusion or grease accumulation are scheduled and performed more frequently to ensure sewer flow and prevent overflows.

- Line Checking: Sewer reaches that are not cleaned or inspected during routine maintenance activities are visually checked for anomalies at least once every two years. These topside inspections check for structural condition of manholes, and normal wastewater flows and/or anomalies.
- Siphon Cleaning: Siphon cleaning frequencies are established based on several factors including sewer diameter, flow rates, maintenance history, and prior operational issues. Each cleaning job, or set-up, is evaluated as it is accomplished and the schedule is modified as needed. Bag cleaning and combination hydraulic/vacuum units are the two main methods used.
- Manhole Cover Adjustment: Manhole cover adjustments are performed on an as needed basis to replace broken or worn manhole frames and covers to protect public safety.

4.2.2.2 Pumping Plant Operations and Maintenance

- Pumping Plant Operations: The Sanitation Districts operate and maintain 48 pumping plants throughout its wastewater collection system (46 pumping plants are maintained by WCS, Castaic pumping plant is maintained by WRP Section, and the Lomita Pumping Plant is maintained by JWPCP). Pumping Plant Operators (PPOs) are responsible for the inspection and operation of the Sanitation Districts' pumping plants. Stationary Mechanics and Electrical/Instrumentation (E/I) Technicians perform preventive maintenance and repairs.
- Pumping Plant Maintenance: All of the Sanitation Districts' pumping plants are maintained in accordance with schedules maintained in WAM. WAM coordinates schedules and tracks all routine maintenance tasks. The Work Order module of WAM is used to identify and track repairs or other maintenance activities that require labor beyond what is performed under a PM task. PPOs, Stationary Mechanics, and E/I Technicians perform the pumping plant maintenance tasks.
- Pumping Plant Visits: All pumping plants operated by WCS are visited multiple times per week by PPOs, with most being visited every day. The frequency of visits is generally determined by the location and complexity of the pumping plant. JWPCP visits the Lomita Pumping Plant and staff from the WRP Section's Valencia Water Reclamation Plant visits the Castaic Pumping Plant.
- As part of their routine visits, the PPOs follow standard inspection procedures that include inspection of major assets including pumps, piping, valves, electrical equipment, and force mains. Normal operation of the plant is confirmed and any deficiencies that would require follow up work are noted. Any necessary follow up work is entered and scheduled in WAM.
- An emergency manual has been developed for each pumping plant. The emergency manual documents procedures that would be followed upon the onset of an emergency such as pump or force main failure. A copy of the emergency manual is posted at each pumping plant and distributed to various personnel that could be involved with emergency response.
- All pumping plants can be remotely monitored and operated through a Supervisory Control and Data Acquisition (SCADA) System. The SCADA system can be accessed at the Long Beach Main Central Alarm Center (CAC), the Compton Field Office, and the Joint Administration Building (located in Whittier). The CAC is continuously staffed by PPOs who have primary responsibility to monitor the performance of the

plants in real time through the SCADA system and, as necessary, remotely operate the plants to respond to alarms or abnormal conditions.

- Pumping plants without a gravity bypass have back up emergency generators that automatically start up in response to a power failure and are capable of returning the pumping plant to operation. Standard operation and maintenance procedures include exercising the generators, typically on a monthly basis, to assess proper function.
- The pumping plants are generally designed[1] for uninterruptible operation through features such as redundant pumps, redundant force mains, and backup generators. Nevertheless, the Sanitation Districts maintain additional back up pumps, generators, and piping at the Compton Field Office, San Gabriel Valley Field Office, and the Palmdale WRP that could be dispatched to a pumping plant to assist with emergency response.

4.2.2.3 Odor and Corrosion Control

- Carbon Canisters: Fiberglass canisters filled with activated carbon are installed just below the manhole cover to control the emission of odorous gas in sensitive areas. As venting sewer headspace air passes passively through the activated carbon, the odorous constituents of the air are removed before it is discharged to the atmosphere.
- Mobile Odor Scrubbers: The Sanitation Districts use trailer-mounted mobile odor scrubbers to provide odor control at sewer rehabilitation work sites. These units are designed to treat 2,500 – 3,000 cubic feet per minute of sewer headspace air. Each mobile odor scrubber consists of an engine-driven low-velocity blower, carbon filter tank, appurtenant piping, gages, and electrical equipment.
- Stationary Carbon Scrubbers: The Sanitation Districts maintain five stationary odor control stations. The purpose of the odor control stations is to maintain a negative pressure on the sewer line or pumping plant wet well and to draw sewer headspace air through activated carbon filters before release to the atmosphere. The stations generally consist of motor-driven blowers, carbon filter chambers, electrical switchboards, and associated piping.
- Ferrous Chloride Treatment: The Sanitation Districts operate five ferrous chloride addition stations. Ferrous chloride is added continuously to regional sewers to control sulfides in the wastewater and thus control hydrogen sulfide that causes sewer odors and corrosion. Ferrous chloride addition stations generally consist of chemical storage tanks, chemical metering valves or pumps, electrical control panels, and associated piping.
- Caustic Shock Dosing Treatment: To supplement its ferrous chloride treatment, the Sanitation Districts use sodium hydroxide (caustic) shock dosing treatments. Caustic shock dosing controls sulfide by raising sewage pH to inactivate bacteria that reduce sulfate to sulfide and cause odors and corrosion.
- Crown Spray Program: The Crown Spray Process is used to control sulfide corrosion in concrete sewers. The process involves spraying the non-submerged surfaces of the sewer with high pH magnesium hydroxide slurry. The high pH slurry neutralizes the sulfuric acid formed on the sewer crown and inactivates sulfur oxidizing bacteria.

4.2.2.4 Collection System Monitoring

- Closed-Circuit Television (CCTV) Inspection: The Sanitation Districts perform CCTV inspection of all in-service, non-submerged gravity sewers to assess the physical

[1] The design features of each pumping plant are assessed on a case-by-case basis. For example, some plants do not require emergency generators because they have the ability to gravity bypass flow if the operation of the pumping plant is interrupted.

condition of the sewer pipe and appurtenances and to support maintenance of the collection system.

- Physical Inspection: Collection system structures, concrete pipes, and manholes susceptible to corrosion are inspected on an as-needed basis to determine their physical condition. During physical inspections, observations and measurements of a structure's condition are recorded.
- Flow Monitoring: The Sanitation Districts measure dry weather flow at representative manholes in each trunk sewer on a three to five-year frequency depending on the remaining capacity, overflow experience, and population growth within the tributary area. Non-regional sewers that serve small drainage areas, or that are not subject to regional flow increases, are monitored as needed.

4.3 Rehabilitation and Replacement Program

The Sanitation Districts maintain a Rehabilitation and Replacement Program to: 1) ensure the timely repair of sewer facilities in imminent danger of failure or blockage; 2) provide for the long range rehabilitation or replacement of obsolete or aging assets; and 3) improve system performance and reduce spills caused by pipe defects or mechanical failures. The Rehabilitation and Replacement Program uses data from the Sanitation Districts' closed-circuit television (CCTV) inspection and flow monitoring programs, as well as feedback from regular maintenance activities, to prioritize and schedule the rehabilitation and replacement projects. A Report of Recommended Facility Improvements is prepared annually to summarize the status of all damaged, deteriorated, or near capacity sewerage facilities. The report includes prioritization of projects based on condition severity using a Priority Rating system. Priority Rating 1 and 2 are typically recommended for repair within 5 and 10 year time periods, respectively. Priority 3 sewers are monitored. Projects to address the repair needs for sewer or pumping plant assets identified in the Report of Recommended Facility Improvements for each Sanitation District are budgeted in the Capital Improvement Plan (CIP). The CIP is updated annually and identifies short term and long term projects which are scheduled within the next 20 years based on their priority rating. Additional information on the Sanitation Districts CIP and revenue program is included in Attachment 4.1.

4.4 Training Program

The Sanitation Districts provide technical and safety training on a regular basis for its collection system operations and maintenance staff. Formalized components of this training program include monthly technical and safety meetings, annual SSO response training, and training manuals for the various aspects of operations and maintenance activities. Informal components include "hands-on" training and tailgate meetings.

Safety training and supporting resources are centralized and managed by the Environmental Health and Safety (EH&S) Section. The EH&S Section maintains a Training Matrix that defines required safety training programs and training frequencies for each employment classification and is responsible for updating the Training Matrix on a monthly basis.

The Sanitation Districts require contractors to be appropriately trained. Prior to performing any work within Sanitation Districts' facilities, a contractor must submit copies of an Injury and Illness Prevention Program, as well as any other specialized safety programs (e.g., Confined Space Entry, etc.), for Sanitation Districts' review and acceptance. The EH&S Section is responsible for reviewing the contractor's safety programs. Contractors involved in sewer repair, rehabilitation and replacement projects that involve flow bypass are also required to submit for review and approval a Flow Bypass Plan and an Emergency Spill Response Plan in accordance with the Sanitation Districts' Standard Specifications. These plans are enforced by Sanitation Districts' field staff administering the contract and require the contractor to have redundant pumping systems

that are continuously monitored to prevent overflows. If an overflow were to occur, the Emergency Spill Response Plans include notification and spill response procedures to limit the impact of accidental spills.

4.5 Equipment and Replacement Part Inventories

4.5.1 Vehicles and Equipment

Each maintenance facility is assigned vehicles and equipment to perform day-to-day operations and maintenance activities as well as equipment for emergencies. Equipment inventories are maintained in the Sanitation Districts' WAM System. Emergency response equipment lists are kept at each maintenance facility and are updated periodically as needed.

4.5.2 Replacement Parts

Parts and materials for sewer maintenance are housed at each maintenance facility and in the Sanitation Districts' stock rooms located throughout its service area. Major pumping plant parts such as emergency bypass connection fittings are stored at each plant. Stock of regularly used parts and supplies for equipment and vehicles is maintained in the WAM System. A minimum and re-stock quantity for each spare part and material is defined in WAM. Once the inventory item reaches its minimum quantity, the stockroom or warehouse coordinator replenishes that item to its re-stock quantity. This procedure ensures all critical parts/equipment are available when needed.

5 Design and Performance Provisions

Chapter 5 of this SSMP addresses the requirements included in Subsection D.13.(v) of the Order. The requirements state:

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.

5.1 Design and Construction Standards and Specifications

The Sanitation Districts have established standards and guidelines to ensure that its wastewater collection system facilities are properly designed and constructed. These facilities include, but are not limited to, gravity sewers, force mains, pumping plants, and other related items. In addition, the Sanitation Districts have developed standards and guidelines to govern the rehabilitation and repair of existing wastewater collection system facilities.

Design guidelines for the construction and rehabilitation of gravity sewers, force mains, and other appurtenances include, but are not limited to, environmental record searches, alignment selection, hydraulic analysis, capacity, pipe design, survey, substructure verification, and soil testing. Specific criteria have been established for zoning, friction coefficients, minimum and maximum slopes and velocities, manhole spacing, and materials.

Similarly, the Sanitation Districts has developed design guidelines for the construction and upgrade of pumping plants. Most of the pumping plants are considered "uninterruptible" facilities, meaning that continuous operation of the facilities is a critical part of the Sanitation District's sewerage system. As a result, the design criteria for the pumping plants have been developed to allow for adequate redundancy of key features such as pumps, power supply, and force mains to ensure that continuous operation is maintained. The design guidelines also include the installation of telemetry infrastructure that allows for real time, remote monitoring and control of the pumping plants from a centralized location (typically, the Long Beach Main Central Alarm Center). Among other standards, the design criteria for selecting pumps conform to the standards of the Hydraulic Institute (HI) and the American National Standards Institute (ANSI). In addition, the design guidelines incorporate operational considerations to allow for safe, efficient operation and maintenance of the pumping plants. For example, easy opening vault hatches, stable work platforms, and adequate lighting are included in the design of the pumping plants to allow for safe worker access to critical infrastructure for routine and non-routine maintenance activities. Lastly, the design guidelines include upgrades to enhance security measures such as security cameras, adequate lighting to the interior and exterior of pumping plants, fencing around pumping plants, and personnel emergency pushbuttons.

For each design project, the Sanitation Districts develop Contract Documents that are specifically tailored for that facility. For sewer projects, the Sanitation Districts rely heavily on the latest *Standard Specifications for Public Works Construction* (*Standard Specifications*) and the Sanitation Districts' *Amendments to the Standard Specifications for Public Works Construction* (*Amendments*). Drawing details of commonly used items in Sanitation Districts' projects are contained in its *Standard Drawings for Construction*. A copy of the Sanitation Districts' latest *Amendments* and *Standard Drawings for Construction* is available at www.lacsd.org. In addition, facility design and construction requirements incorporate a number of industry accepted standards including, but not limited to:

- American Society of Mechanical Engineers (ASME) Standards;
- American National Standards Institute (ANSI) Standards;
- American Society for Testing and Material (ASTM) Standards;
- American Water Works Association (AWWA) Standards;
- Hydraulic Institute Standards (HIS);
- American Concrete Institute (ACI) Standards;
- National Electric Code (NEC);
- Los Angeles County Building, Fire and Mechanical Codes;
- State of California Industrial Safety Orders; and
- All applicable State and Federal regulations.

To further assure that wastewater collection facilities are properly designed and constructed, design of all project drawings, by both in-house and outside consultants, follow an established review procedure. Licensed engineers supervise and/or perform all facility design. Project drawings are checked and reviewed by licensed Sanitation Districts' engineers prior to approval for construction. All Contract Drawings are stamped and signed by licensed engineers.

Recordkeeping procedures have been established to track all incoming and outgoing correspondence, shop drawings submittals, extra work and change orders. Once a project has been awarded, the Sanitation Districts adhere to a rigorous shop drawing submittal and approval process for all equipment and material required by the Special Provisions. Factory testing of critical mechanical equipment is also required to confirm specified performance criteria are met or exceeded.

5.2 Inspection and Testing Procedures and Standards

The Sanitation Districts have established procedures for the inspection of new construction, as well as facility repair and rehabilitation projects. These projects include, but are not limited to, construction of new sewers, force mains and pumping plants; repair and rehabilitation of existing sewers; upgrade of existing pumping plants; and appurtenant work associated with wastewater conveyance and treatment facilities.

For each new construction or repair project, the Sanitation Districts enforce the requirements of its Contract Drawings and Special Provisions, as well as any specifications and standards referenced therein. These documents contain specific requirements for the quality of materials, acceptable construction methods, inspection and testing procedures, and criteria for acceptance of the project. Full-time inspection of a project typically begins at the time materials are being fabricated. Sanitation Districts' engineering and inspection staff, or an independent inspection/testing laboratory approved by the Sanitation Districts, is present at the manufacturing facility to ensure that materials being supplied comply with the contract requirements. Inspection staff is present at the construction site to oversee the actual construction. Prior to final acceptance of a project, the interior of the completed facilities is inspected for deficiencies and functional testing is performed to verify operational integrity. Any noted deficiencies are corrected, and then reviewed and approved by licensed engineers before the Sanitation Districts accept completion of the project and allow activation of the facility. The Sanitation Districts maintain "As Built" drawings of all completed projects.

6 Sanitary Sewer Overflow Response Plan

Chapter 6 of this SSMP addresses the requirements included in Subsection D.13.(vi) of the Order. The requirements state:

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 the 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.

6.1 Sanitary Sewer Overflow Response Goals

Upon receiving a report of a suspected overflow, Sanitation Districts' staff responds as follows:

- Immediate notification is made to the Sanitation Districts' Long Beach Main Central Alarm Center (CAC).
- A determination is made whether the overflow could involve Sanitation Districts using sewerage facility maps and other resources. If it is possible that Sanitation Districts facilities are involved, staff immediately mobilizes primary responders and notifies regulatory agencies.
- If it is not possible that Sanitation Districts' facilities are involved, staff determines the probable responsible party and refers the matter to them for response.
- If Sanitation Districts' facilities are possibly involved, primary responders are mobilized to the scene within one-hour of notification of an overflow to assess the situation. If the primary responders confirm that an SSO involving Sanitation Districts' facilities is in progress, all necessary equipment, vehicles, and crews are dispatched to the scene or recalled to the field offices to assist with overflow relief, containment and clean-up

activities. If the overflow was not caused by a problem within the Sanitation Districts' system, the responsible agency and regulatory agencies are promptly notified.

Once it has been determined that Sanitation Districts' facilities are involved in the overflow, Sanitation Districts' goals regarding overflow response are to:

- Prevent the overflow from reaching the storm drain, if possible;
- Limit public access to the overflow area to prevent public contact with wastewater and any areas contaminated by wastewater;
- Stop the overflow as soon as possible;
- Contain the overflow as close as practical to the overflow location to prevent or minimize any environmental impact;
- Recover the overflow and return it to the sewer system;
- Clean up the area contaminated by the overflow;
- Gather and compile pertinent information pertaining to the overflow, coincident with response efforts, and notify appropriate regulatory agencies of the overflow and response status as soon as practical; and
- Conduct investigations to determine the probable cause of the overflow, document the events during the overflow and response activities, and identify and implement measures to prevent recurrence.

6.2 Sanitary Sewer Overflow Response Plan

The Sanitation Districts have established a standard procedure for reports of sewage spills that has been distributed to all Sanitation Districts' staff (see Attachment 2.8). Among other things, the procedure dictates that staff must immediately contact the Sanitation Districts' Long Beach Main Central Alarm Center (CAC) upon becoming aware of a potential sewage spill. Accordingly, the CAC is continuously staffed 24 hours per day and staff at the CAC are trained to: a) receive relevant information from the person reporting the possible overflow (e.g., location, time of onset, estimate of flow, contact information for complainant); b) assess whether it is possible that Sanitation Districts' facilities are involved in the possible overflow; c) dispatch Sanitation Districts' personnel to investigate or contact outside agencies if Sanitation Districts' facilities are not involved; and d) begin required notifications to regulatory agencies. These procedures are summarized in a *Notifications Flow Chart* (see Attachment 2.9) that is posted at the CAC and periodically updated. Once the Sanitation Districts receive a complaint or information regarding an SSO event, the responsible section (Wastewater Collection Systems Section or Water Reclamation Plants Section) is immediately notified. In response to an SSO event, the responsible section immediately implements its *Sanitary Sewer Overflow Response Plan (Response Plan)*. The *Response Plan* provides goals and guidance for the response measures necessary to minimize impacts to public health and the environment in the event of a sanitary sewer overflow. The *Response Plan* is included as Attachment 6.1 and references and incorporates other documents including the *Notification and Reporting Procedures for Sewage Spills, Recycled Water Spills, and Noncompliant Conditions* and the *Procedure for Internal Notification and Sampling in Case of Sewage Spills*. These documents are continuously maintained and distributed to staff responsible for overflow response activities.

The *Procedure for Internal Notification and Sampling in Case of Sewage Spills* specifies that authorized Sanitation Districts' personnel report SSO events to the State and Regional Water Board and other agencies, as applicable (e.g., County Health Officer, County Environmental Health Agency, State Office of Emergency Services, etc.).

The *Sanitary Sewer Overflow Spill Volume Estimation Procedure* outlines the main methods the Sanitation Districts' personnel use to estimate the volume of an SSO (see Attachment 6.2). This estimated volume is reported to the SWRCB through CIWQS.

In compliance with the Statewide Waste Discharge Requirements for Sanitary Sewer Systems and applicable NPDES permits, the Sanitation Districts has developed an SSO Water Quality Monitoring Program, which will be used to assess impacts from SSOs spilled to surface waters. The Water Quality Monitoring Program includes the following required elements:

1. Protocols for water quality monitoring;
2. Methods to account for spill travel time in the surface water and scenarios where monitoring may not be possible (e.g. safety, access restrictions, etc.);
3. A requirement that all water quality analyses for ammonia and bacterial indicators to be performed by an accredited or certified laboratory; and
4. Calibration standards for monitoring instruments and devices.

After becoming aware of an SSO spilled to surface waters, the Sanitation Districts will conduct daily water quality sampling at representative locations for the following constituents: a) ammonia; b) total and fecal coliform; c) Escherichia coli (if fecal coliform tests positive; and d) enterococcus. The sampling results will be submitted to the State and Regional Water Quality Control Boards as part of the required SSO Technical Report.

6.3 Training on Sanitary Sewer Overflow Emergency Response Plan

Training on standard procedures for response to sanitary sewer overflows occurs at least once per year and has been integrated into the annual training schedule for the WCS Section and the WRP Section's Palmdale Water Reclamation Plant personnel. At this training, all staff that could be called on to respond to a sanitary sewer overflow are reminded of equipment and materials available for containment/cleanup activities (e.g., sandbags, back up pumps, piping), preventing public contact with sewage through the use of traffic and crowd control, and regulatory requirements to contain and prevent discharge of sewage. Additionally, staff is reminded that they must immediately contact the Sanitation Districts' Long Beach Main Central Alarm Center (CAC) upon becoming aware of a potential sewage spill. The written procedures for overflow response that are contained in the *Sanitary Sewer Overflow Response Plan* and associated documents are presented and discussed.

Personnel stationed at the CAC often receive the first report of a possible SSO. As such, additional training for these personnel is conducted that focuses on: a) obtaining relevant information from the person reporting the SSO (e.g., start time, location, amount of flow); b) determining if it is possible that Sanitation Districts' facilities could be involved; c) immediately disseminating information on possible SSOs to affected agencies and key Sanitation Districts' staff; and d) directing necessary resources to the site of the reported SSO to assess the field conditions. The training also covers the standard phone and email scripts that have been developed to assist these personnel in making the initial notifications regarding an SSO.

6.4 Construction Contracts

Construction activity involving Sanitation Districts' sewerage facilities can increase the risk of possible SSOs. These additional risks can arise from construction activity that impacts sewerage assets such as limiting the pumping capacity of a pumping plant, removing sewer assets from service, or requiring flow bypasses/diversions. As a result, the special provisions for construction projects that may impact sewerage infrastructure includes means to minimize the risk of SSOs during construction. Typical requirements in the special provisions include:

- The contractor is required to submit all bypass and diversion plans for Sanitation Districts' review.
- A five-day clear weather forecast (i.e., no rain is forecast for five consecutive days) is required prior to starting many projects that limit the capacity of sewerage assets.
- The contractor is required to submit an Emergency Spill Response Plan (ESRP) for any construction-related bypass/diversion. Through the ESRP, the contractor certifies that they have proper equipment and trained personnel available to respond to SSOs resulting from the construction activities.
- The contractor is required to contact the CAC immediately upon becoming aware of an SSO.

In addition, Sanitation Districts' personnel develop Overflow Action Plans (OAP) in advance of the start of critical construction projects. The OAP contains information relevant to SSO response such as likely sewage flow path, optimum containment locations, and required SSO response equipment. This OAP is distributed to staff so that response activities in the event of an SSO can begin more expeditiously.

6.5 Notification for SSOs

Upon receiving a report of a possible SSO involving Sanitation Districts' facilities, personnel at the CAC immediately begin notifications to responsible agencies and key Sanitation Districts' staff. The first notification is typically an email that has the following general format and has *"Notification of a Potential Sewer Spill"* in the subject line:

> *This is (BLANK) with the Los Angeles County Sanitation Districts' Central Alarm Center.*
>
> *The Sanitation Districts have received a report of a potential sewer spill at the intersection of (STREET) and (STREET) in the city of (CITY).*
>
> *Sewerage system personnel will investigate.*
>
> *If you need to reach this alarm center please call (562)437-6520 or (562)437-1881*
>
> *This email certifies notification of the potential discharge has been given by telephone or by this email to: The Los Angeles County Department of Public Health, California Emergency Management Agency, Los Angeles and Lahontan Regional Water Quality Control Boards, City of Long Beach Department of Health and Human Services, City of Vernon Health and Environmental Control, and Pasadena Public Health Department.*

As noted in the body of the email, the distribution list includes: The Los Angeles County Department of Public Health, California Emergency Management Agency, Los Angeles and Lahontan Regional Water Quality Control Boards, City of Long Beach Department of Health and Human Services, City of Vernon Health and Environmental Control, and Pasadena Public Health Department. In addition to the email, the responsible section will make a follow up phone call to the Los Angeles County Department of Public Health.

Once Sanitation Districts' personnel arrive on scene, they attempt to confirm the report of an SSO and determine if Sanitation Districts' facilities are involved. If no SSO is found or it does not involve Sanitation Districts' facilities, a follow up email is sent to the same distribution list indicating the circumstances. If the SSO involves another entity's facilities, this entity is contacted so that they can begin response activities. If Sanitation Districts' facilities are involved, follow up notifications are made to various agencies based upon on the location of the SSO and the severity of the event.

7 Fats, Oils, and Grease (Fog) Control Program

Chapter 7 of this SSMP addresses the requirements included in Subsection D.13.(vii) of the Order. The requirements state:

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.

7.1 Public Education Outreach Program

The Sanitation Districts maintain a wastewater collection and conveyance system that receives wastewater flow from approximately 9,500 miles of tributary sewers that are owned and operated by local cities and Los Angeles County (County). The local cities and County are responsible for business licenses and regulations on food service establishments (FSEs). The Sanitation Districts work directly with these local agencies and encourage their development of fats, oils, and grease (FOG) programs and ordinances.

In cooperation with the California Restaurant Association (CRA), the Sanitation Districts produced a multi-language (English, Spanish, and Chinese) best management practices (BMPs) poster. A second version of the BMPs poster was produced in cooperation with the CRA, Los Angeles County Department of Health Services (DHS) and Los Angeles County Department of Public Works (LADPW) and includes information on storm water and surface water issues. As part of the Sanitation Districts' ongoing public outreach activities, LADPW distributes the BMPs poster to all new and existing permitted FSEs within their jurisdiction and DHS distributes the poster to all restaurants contracted under their Stormwater Program. Printed and electronic copies of the BMP poster are also distributed to cities and municipalities upon request.

The Sanitation Districts have developed a training program that is available to city and County sewerage system management and maintenance personnel. The training program specifically addresses the following topics:

- Basic elements needed in a local grease control ordinance;
- How to inspect FSEs;
- BMPs to be used by restaurants;
- Sewer overflow reporting obligations;
- Proper cleaning procedures to be followed if grease deposits are detected in local sewers;
- Where to dispose of grease and the availability of local rendering companies; and
- Review of grease trap and grease interceptor devices.

Additionally, the Sanitation Districts participated in a special California FOG (Cal FOG) work group, comprised of several cities and sanitation districts. Documents and grease control guidelines prepared by the Sanitation Districts were incorporated into their website *http://calfog.org* for public access. These include a model Grease Control Ordinance and fact sheets for Best Management Practices for *Fats, Oils and Grease; Managing Food Materials*; *Restaurant Oil and Grease Rendering*; and *Considerations in Establishing a Municipal Oil and Grease Program*.

7.2 Removal and Disposal of FOG from the Sewer Collection System

FOG in the wastewater collection system is either broken up and conveyed downstream to the Sanitation Districts' treatment plants, or recovered and taken to a treatment plant for dewatering and later disposal at a landfill.

7.3 Legal Authority to Prohibit FOG Discharges to the Sewer Collection System

In 1972, the Sanitation Districts adopted a *Wastewater Ordinance* which provides the legal authority to enforce Sanitation Districts' local requirements, as well as all appropriate state and federal regulations.

The Sanitation Districts' Industrial Waste Section regulates grease discharges from industrial sources in accordance with Section 406 of the Wastewater Ordinance. Section 406(D) prohibits the discharge of "any solids or viscous substances of such size or in such quantity, condition, or nature that they may cause obstruction to flow in the sewer…" and Section 406(I) prohibits the discharge of "any waste containing excessive quantities or concentrations…of dispersed biodegradable oils, fats and grease, such as lard, tallow or vegetable oil."

These narrative prohibitions are supplemented with a vigorous program to minimize the discharge of FOG to the sewer. FOG can contribute to sewer flow obstructions, and thus control of FOG is essential for overflow prevention. As previously mentioned, while the Sanitation Districts maintain a regional collection and conveyance system, it does not maintain local sewers and laterals. These are the responsibility of local jurisdictions within the Sanitation Districts' service area. FSEs are the primary sources of FOG and discharge directly into local sewers.

Industrial facilities that have the potential to discharge excessive quantities of FOG have been subject to requirements in individual permits. The Sanitation Districts currently regulate FSEs with wastewater flows greater than 500 gallons per day and regulate facilities with lesser flows if it is determined that they are capable of discharging excessive quantities of FOG. These regulations are included in industrial wastewater discharge permits issued in conjunction with local agencies responsible for the administration of the tributary collection system. Food processing facilities that are permitted by the Sanitation Districts and whose

wastewater could contribute to grease blockages are evaluated on a case-by-case basis and are usually assigned a FOG limit of 500 mg/L, based on best professional judgment. Occasionally, facilities are also required to install additional pretreatment equipment such as a dissolved air flotation unit.

7.4 Requirements to Install Grease Removal Devices, Design Standards for the Removal Devices, Maintenance Requirements, BMP Requirements, Records Keeping and Reporting Requirements

Local sewers and laterals, which connect to the Sanitation Districts' sewer lines, are the responsibility of the city or County agencies. The large majority of FSEs within the Sanitation Districts' service area discharge directly to these local sewers and laterals. Section 4762.1 of the California Health and Safety Code provides the Sanitation Districts the authority to require the local cities to implement a sewer maintenance program for its sewers and laterals that meets the Sanitation Districts' specifications.

7.5 Inspection and Enforcement Authorities

In the event of a blockage of an unknown source of oil and grease, an industrial waste inspector will investigate the incident, identify any responsible industrial dischargers and, together with the Sanitation Districts' engineering staff, evaluate the need for on-site treatment equipment and imposition of appropriate FOG limits. Repeat offenders who are unwilling to correct the problem can be referred to the Los Angeles County District Attorney or the Sanitation Districts' attorney for civil or criminal action.

7.6 Identification and Maintenance of Sewer System Sections Subject to FOG Blockages

The Sanitation Districts draw data from its operation and maintenance programs to identify those sanitary sewer system sections subject to FOG blockages. Based on this information, the Sanitation Districts modify line cleaning and monitoring frequencies where needed. Those sections identified as FOG problem areas are assigned a more frequent line cleaning and monitoring schedule.

7.7 Development and Implementation of Source Control Measures

For direct dischargers to the Sanitation Districts' collection system, the Industrial Waste Section issues industrial wastewater discharge permits. In the event of a blockage of an unknown source of FOG, an industrial waste inspector will investigate the incident, identify any responsible industrial dischargers and, together with the Sanitation Districts' engineering staff, evaluate the need for on-site treatment equipment and imposition of appropriate FOG limits. Repeat offenders who are unwilling to correct the problem can be referred to the Los Angeles County District Attorney or the Sanitation Districts' attorney for civil or criminal action.

8 Sewer System Evaluation and Capacity Assurance Plan (SSECAP)

Chapter 8 of this SSMP addresses the requirements included in Subsection D.13.(viii) of the Order. The requirements state:

***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.

8.1 Sewer System Evaluation and Capacity Assurance Plan (SSECAP)

The Sanitation Districts have maintained a Sewer System Evaluation and Capacity Assurance Plan (SSECAP) since the 1950's. The SSECAP is comprised of several programs, annual reports, and a Capital Improvement Plan (CIP) that are designed to evaluate sewer system capacity and prioritize and budget relief projects for key sewer system components.

As part of the SSECAP, the Sanitation Districts have invested approximately $138 million over the past 10 years to increase the system's hydraulic capacity. The Sanitation Districts' sewer system has sufficient capacity to handle peak dry weather flows. There are also no pump stations that currently pose a risk of capacity related overflows. Since the SSMP was implemented in 2006, the Sanitation Districts have completed the upgrade of the Castaic Pumping Plant and the Western Ave Pumping Plant. These are the only pump stations that have been identified as requiring relief.

8.2 Evaluation

The Sanitation Districts evaluate sewer capacity utilizing data collected from the flow monitoring program, experience with overflows or near overflows during wet weather, the potential for planned developments that could significantly reduce sewer capacity, and hydraulic modeling.

The dry weather flow monitoring program includes over 2,600 gauging locations throughout the sewer network. These locations are monitored for a 1-2 week period every 3-5 years depending on the potential for growth within a tributary area of the sewer. Peak dry weather flow is measured at representative manholes in each trunk and Joint Outfall sewer and is plotted on charts known as Clearance Diagrams. Clearance Diagrams graphically present the clearance between the existing peak dry flow and pipe capacity under non-pressurized conditions. Clearance Diagrams provide a conservative estimation of pipe capacity since the actual pipe capacity is higher under surcharged (pressurized) conditions. Clearance Diagrams are then reviewed to determine where capacity restrictions exist as part of the capacity assessment program.

The wet weather flow monitoring program includes approximately 50 gauging locations where sewers are reaching capacity during wet weather and/or where sewers have overflowed or nearly overflowed in the past. These locations are continuously monitored from October to April every year. Remote alarm sensors are also utilized in various locations to notify personnel when the water surface rises above a predetermined level so that measures can be taken to prevent overflows.

Sewers with dry peak flow depths near or above 70% of the diameter, or where a sewer has overflowed or nearly overflowed during wet weather, are studied in detail through flow analysis and field investigation to determine if the higher levels are caused by sewer blockage, structural failure, unusually high discharges by industrial users, or continued growth in the area. The cleaning history and feedback from other programs including line checking, sulfide monitoring, crown spray, and closed circuit television inspection are also reviewed.

Sewers are then ranked based on the capacity rating system described below.

Rating	Description
A	Peak dry weather flow depth is at or above 90% pipe diameter, and flows are continuing to increase. The sewer overflows or nearly overflows during wet weather.
B	Peak dry weather flow depth is at 80 to 90% pipe diameter; or peak flow depth is below 80% pipe diameter but flows are increasing rapidly; or peak flow depth is at or above 90% pipe diameter, but flows have not changed in years.
C	Peak dry weather flow depth is at 70 to 80% pipe diameter.

Sewers with a capacity rating of “A” are recommended for relief. Sewers with a capacity rating of “B” or “C” are monitored annually and biennially, respectively. The ratings are re-evaluated based on the most recent flow measurement and prioritized accordingly. Some sewers can remain at a “B” or “C” priority for an extended period of time, if flows in the area tributary to the sewer do not significantly increase.

There are also sewers where the existing hydraulic conditions may not warrant immediate or near-term relief; however, the sewer may need relief in the distant future due to additional projected flow from pending developments. Depending on the estimate of the maximum flow anticipated from development projects and the remaining capacity in the sewer, a separate classification “Development Impact” is assigned to these sewers and they are rated as either “A”, “B”, or “C”. Priority “A” rankings are assigned to sewers where development is impending or where the estimated flow from the proposed development substantially exceeds available sewer capacity. Priority “B” rankings are assigned to sewers where the proposed development can

cause the peak flow depth to exceed 80% of the pipe diameter. Priority "C" rankings are assigned to sewers where the proposed development can cause a peak flow depth to exceed 70% of the pipe diameter.

Sewers that have been assigned an "A", "B", or "C" ranking are added to the capital improvement plan (CIP) and included in the annual Report of Recommended Facility Repairs.

8.3 Design Criteria

The Sanitation Districts have a long-established set of design criteria used for designing sewers. Each sewer construction project undergoes a comprehensive investigation to determine ultimate peak flows using an area study based on land use and population projections, and a separate industrial source flow based on the sum of Industrial Wastewater discharge permit flows. The ultimate design peak flow, including storm flow data, if necessary and if available, are used to determine the size of new, relief or replacement sewers. The Sewer Design Guidelines, as described in Chapter 5 of this SSMP, are maintained by the Engineering Department and undergo periodic review and updates to incorporate the latest advances in design and construction techniques.

8.4 Capacity Enhancement Measures

Sewer capacity is enhanced by constructing relief projects and/or implementing measures to reduce flow from infiltration/inflow (I/I). Through hydraulic condition assessment, population and development forecasts, and hydraulic modeling, sewers with hydraulic capacity concerns are identified, rated, included in the *Report of Recommended Facility Repairs* and added to the CIP. Sewers that have been identified with a capacity rating "A" are recommended for relief to the Engineering Department to begin design and are included in the short-term CIP. Sewers that have a capacity rating of "B" or "C" are re-evaluated annually based on the most recent data and are included in the long-term CIP.

As part of the annual update of the *Report of Recommended Facility Repairs*, the Sanitation Districts evaluates new relief projects to determine the project's criticality in terms of its consequence and likelihood of failure. Based on this examination, projects are prioritized and added to the CIP as either a short-term or long-term project. Projects and their estimated costs are added to the CIP throughout the year as needs are identified. Additional information regarding the Sanitation Districts CIP and Revenue Program is included in Attachment 4.1. Relief projects can include construction of a parallel sewer, replacement with a larger diameter sewer, and/or projects that increase or provide redundant pumping capacity. The design of a relief sewer normally takes a minimum of 14 months, the bidding process takes two to three months and the average construction duration is approximately 8 months. Thus it takes approximately two years to design and construct a typical relief sewer with some projects taking much longer depending on the scope of the project and obstacles to be overcome such as easement issues and/or construction moratoria imposed by cities. The Sanitation Districts have been able to maintain a high level of quality in the construction of its infrastructure by performing the design and construction management work in-house.

Infiltration and inflow reduction measures include reviewing flow data to identify where I/I is a significant source of flow and investigating the causes by using closed caption television inspection, installing additional flow meters, and/or direct field observations during wet weather. The majority of the sewer system within the Sanitation Districts' service area is comprised of local sewers outside the Sanitation Districts purview and as such, the Sanitation Districts can exert little direct control over sources of I/I from local sewers that are tributary to their sewerage system. Nevertheless, it is the Sanitation Districts' philosophy that limiting the amount of I/I that enters into the sewerage system is a best practice to minimize overflows and sewage conveyance and treatment costs.

If the I/I source is identified as originating from tributary sewers, the Sanitation Districts work closely with satellite agencies to investigate sources of inflow, offer technical assistance in evaluating potential solutions to reduce I/I, and follow up to make sure the reduction measures have been implemented. One example of

this collaborative effort involved working with the Los Angeles County Public Works Department (LADPW) to seal and/or replace manhole covers that are subject to submergence during wet weather. These areas were identified using a GIS shape file of unmet drainage needs provided by LADPW and comparing it with the Sanitation Districts' GIS database.

8.5 Schedule

Sewers that have been identified with a capacity rating of "A", "B", or "C" are listed below in Table 8-1. There are four projects listed with an "A" ranking in the table below. These four projects are described in more detail below. One of the projects has already been recommended for relief while the other three projects are awaiting further development prior to being recommended for relief. As described previously, sewers with a "B" or "C" ranking will continue to be monitored to determine when or if relief will be necessary.

The Soledad Canyon Section 4 trunk sewer has been recommended for relief but the precise scope of this project has not been determined. This sewer project was recommended due to the flow increase anticipated from the Vista Canyon development which is in its initial stages of construction. The Sanitation Districts will continue to refine the scope of the project once the flow and development data has been review and verified.

The Worsham Creek Relief Section 1 trunk sewer is listed due to the plans for future development of the Uptown Whittier area. If discussions with the City indicate flows are increasing as projected and are substantiated with Sanitation Districts flow measurements, then design will begin in the next two years and should be completed in the next 5 years.

The Prairie Avenue trunk sewer is listed due to the flow increase anticipated from the Hollywood Park Redevelopment project. The developer's consultant submitted an area study which indicates the projected peak flow from the site will utilize all or nearly all of the available capacity of the sewer. The Sanitation Districts will continue to monitor the flow annually.

The South Inglewood-Orange Avenue trunk sewer is listed due to the sewer anticipated to be at or over capacity when ultimate flow conditions are reached. This sewer will also be affected by the aforementioned Hollywood Park Redevelopment project. The Sanitation Districts will continue to monitor the flow annually.

Table 8-1: Scheduled Relief Sewer Projects

Facility	Project Scope	Ranking	Estimated Design and Construction Time Frame (Year)
Soledad Canyon Relief Trunk Sewer Sec 4	Development Impact (Relief)	A	2018-2022
Worsham Creek Relief Trunk Sewer Sec 1	Development Impact (Relief)	A	2019-2022
Prairie Avenue Relief Trunk Sewer	Development Impact (Relief)	A	2020-2023
South Inglewood-Orange Avenue Relief Trunk Sewer	Development Impact (Relief)	A	2020-2023
J.O. “B” Unit 9B and 9C Relief	Relief	B	2022-2027
J.O. “B” Unit 9A, 9B, 9C, and 1B Structures Retrofit with Pressure Covers	Relief	B	2023-2026
Walnut Creek Trunk, Sections 1 and 2	Relief	B	2023-2026
J.O. "A" Unit 1A LBWRP Int. Sludge Gravity Sewer	Relief	B	2024-2027
Victoria Street Trunk	Relief	B	2024-2027
J.O. “B” Unit 6J Phase III	Development Impact (Relief)	B	2028-2033
28th Street Trunk	Relief	C	2024-2027
Castaic Relief Phase II	Relief	C	2025-2028
J.O. "A" Unit 8 Sec 1 Relief	Relief	C	2027-2029
Trunk "B"	Development Impact (Relief)	C	2027-2029
Washington Boulevard Trunk	Relief	C	2027-2029
Trunk "E"	Development Impact (Relief)	C	2027-2031
55th Street West Relief Phase II	Relief	C	2028-2030
J.O. “B” Unit 6J Phase II	Development Impact (Relief)	C	2028-2030
45th Street East Trunk (Palmdale Interceptor)	Development Impact (Relief)	C	2028-2031
Castaic Relief Phase III	Relief	C	2028-2031
East Rosecrans Ave TS, Section 1	Relief	C	2028-2031
El Nido TS	Relief	C	2028-2031
Joint Outfall H - Unit 5A Phase I	Relief	C	2028-2031
North Torrance TS	Relief	C	2028-2031
Raymond Avenue TS	Relief	C	2028-2031
West Torrance TS	Relief	C	2028-2031
North Torrance Extension TS	Relief	C	2029-2032
South Park Ave Trunk	Relief	C	2029-2032
Joint Outfall B - Unit 5A	Relief	C	2030-2033
Valencia Trunk	Relief	C	2030-2033
Joint Outfall H - Unit 5A Phase II	Relief	C	2031-2034

The primary goal of the Sanitation Districts’ SSECAP has been and will remain the protection of public health and the environment. The Sanitation Districts have always placed high priority on capacity assurance and are committed to the timely completion of improvements to its collection system and to the achievement of all possible reductions in the number and volume of overflows from its collection system.

9 Monitoring, Measurement, and Program Modifications

Chapter 9 of this SSMP addresses the requirements included in Subsection D.13.(ix) of the Order. The requirements state:

***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.

(e) Identify and illustrate SSO trends, including: frequency, location, and volume.

9.1 Maintain Relevant Information to Establish and Prioritize SSMP Activities

Relevant data for all work performed to meet the goals of this SSMP are currently captured in the Sanitation Districts' WAM System. Primarily, this data consists of Preventative Maintenance (PM) schedules and Work Order System records. WAM provides scheduling and tracking capability to ensure required work is completed. Crews are able to look ahead and plan work and are alerted to close work orders, thereby ensuring that work assigned to an asset is not missed. In addition, the Sanitation Districts thoroughly document SSO events. The information documented during these events has been incorporated into an SSO Database and SSO location information is available as a layer in the Sanitation Districts' Geographical Information System.

The Sanitation Districts also document potential surcharge conditions in WAM. Where these surcharge conditions occur as a result of a blockage in the sewer, crews are dispatched to investigate the cause of the blockage using CCTV and, as necessary, clean the sewer to clear the blockage. If required, the frequency of line cleaning or CCTV inspection is adjusted based upon these reports of surcharged conditions to prevent re-occurrence that could lead to an SSO. The Sanitation Districts document and characterize these potential blockages using the WAM Service Request and Work Order modules. Sanitation Districts' staff is directed to document the following information for all confirmed surcharge events: a) location of the blockage, b) cause of the blockage, c) remedial actions taken to clear the blockage, and d) change in frequency of PMs to prevent re-occurrence of the blockage. The WAM system can be queried to identify sewer reaches that are cleaned more frequently than a normal schedule, along with the notes identifying the cause for the schedule adjustment.

9.2 SSMP Implementation and Effectiveness

Routine reports created from the information stored in WAM enable the Sanitation Districts to monitor and measure performance. Performance Indicators (PIs) are used to compare the Sanitation Districts' performance with other agencies, and thereby measure the effectiveness of the program elements of the SSMP. These PIs include, but are not necessarily limited to:

- Number of SSOs Per 100 Miles of Collection System Per Year
  - Total
  - Non-Preventable
  - Preventable
  - Wet weather capacity-related
  - Discharging to waters of the United States
- Volume of SSOs Per 100 Miles of Collection System Per Year
  - Total
  - Non-Preventable
  - Preventable
  - Wet weather capacity-related
  - Discharging to waters of the United States
- Breakdown of Causes of SSOs
- Breakdown of SSOs by District
- Percent of Scheduled PM Work Accomplished

9.3 Assess the Success of the Preventative Maintenance Program

The Sanitation Districts consider its PM program to be successful when a minimum of 90% of the scheduled PM work specifically related to preventing SSOs, such as cleaning activities and line checking, is completed annually and the PIs for number and volume of SSOs per 100 miles of collection system per year meet or exceed those PIs for agencies with similarly-sized collection systems. Regardless of the performance of other agencies with similarly-sized collection systems, the Sanitation Districts have established a goal of no more than one (1) SSO per 100 miles of collection system per year and zero (0) preventable SSOs per 100 miles of collection system per year.

9.4 Updating SSMP Program Elements

Based on the above monitoring and performance evaluations, the program elements of the SSMP will be updated or modified, as appropriate. At a minimum, the SSMP will be updated every five (5) years and include any significant program changes. In accordance with Subsection D.14 of the Order, the updated SSMP will be re-certified by the Sanitation Districts' Chief Engineer and General Manager or authorized representatives and be presented to the Sanitation Districts' Board of Directors for approval at a public meeting. The Sanitation Districts' authorized representative will also complete the certification portion in the online electronic reporting database, CIWQS, by checking the appropriate milestone box, printing and signing the automated form and sending the signed form to the State Water Resources Control Board Division of Water Quality, Attn: SSO Program Manager, P.O. Box 100, Sacramento, CA 95812.

9.5 Identify and Illustrate SSO Trends

With the use of the SSO Database, the Sanitation Districts are able to readily identify and illustrate SSO trends, including frequency, location, and volume. In addition, since each SSO event includes one or more corresponding manhole locations, the Sanitation Districts can readily plot these locations using its GIS-based Sewerage Facilities System. These plots can be used to identify hot spots within the Sanitation Districts' collection systems.

10 SSMP Program Audits

Chapter 10 of this SSMP addresses the requirements included in Subsection D.13.(x) of the Order. The requirements state:

***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 the subsection (D.13), including identification of any deficiencies in the SSMP and steps to correct them.*

10.1 SSMP Program Audit

In accordance with the WDR, the Sanitation Districts will conduct an internal audit every two (2) years. The audit will use data collected as part of *Chapter 9: Monitoring, Measurement, and Program Modifications* and performance indicators to: 1) evaluate the effectiveness of the Sanitation Districts' SSMP; 2) ensure compliance with WDR requirements; and 3) identify and correct SSMP deficiencies.

Key collection system performance indicators will include number and type of SSOs, completed CCTV and line cleaning footages, SSO trends, and employee safety. The most recent report of the audit will be available electronically via the Sanitation Districts' website and in hard copy (upon request).

11 Communication Program

Chapter 11 of this SSMP addresses the requirements included in Subsection D.13.(xi) of the Order. The requirements state:

***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.

11.1 Communication

The Sanitation Districts will provide the general public and other agencies, with status updates on the development and implementation of the SSMP and consider comments made by them. The Sanitation Districts may utilize various forms of media (e.g., letters, newsletters, brochures, annual reports, notices in newspapers, and the Sanitation Districts' website) as well as regional utility meetings, and FOG meetings with member agencies to convey this information.

11.2 SSMP Availability

Copies of the SSMP are maintained in the Sanitation Districts' Joint Administrative Office, as well as at the Compton Field Office, San Gabriel Valley Field Office, and Palmdale Water Reclamation Plant. An electronic copy of the SSMP is posted on the Sanitation Districts' website. The document shall also be made readily available to Regional Water Quality Control Board (Regions 4 and 6) representatives upon request.

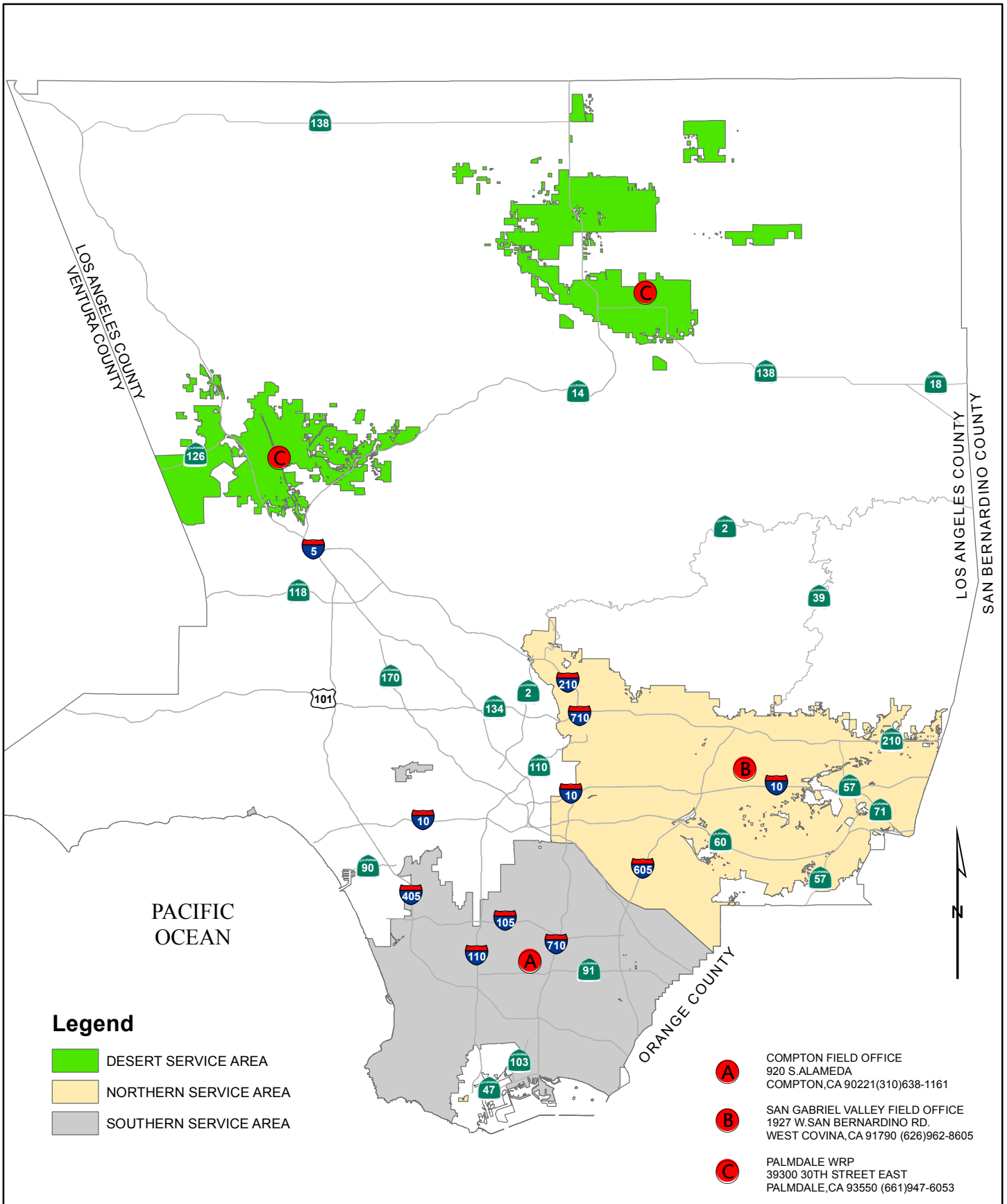
List of Attachments

Attachment Number	Document Title	Document Number
Attachment 2.1	County Sanitation Districts Sewer Maintenance Service Areas	N/A
Attachment 2.2	Signatory Letter	1190052
	Mission Canyon Landfill Notice of Termination	4770470
	Palos Verdes Landfill Notice of Termination	4770462
	Spadra Landfill Notice of Termination	4770467
Attachment 2.3	Sanitation Districts of Los Angeles County Organization Chart	N/A
Attachment 2.4	Wastewater Management Department (Wastewater Collection Systems and Water Reclamation Plant Section)	N/A
Attachment 2.5	Engineering Department Overview	N/A
Attachment 2.6	Wastewater Management Department (Industrial Waste Section)	N/A
Attachment 2.7	Technical Services Department (Reuse and Compliance Section)	N/A
Attachment 2.8	Reports of Sewage Spills	3599143
Attachment 2.9	Long Beach Main Spill Notify Chart	970276
Attachment 4.1	Districts Revenue Program	3462626
Attachment 6.1	Sanitary Sewer Overflow Response Plan	2838662
Attachment 6.2	Sanitary Sewer Overflow Spill Volume Estimation	4778050
	Spill Volume & Computation Form Package	3209618

List of Referenced Documents

Document Title	Document Number
Procedures for Clean-Up Activities After Sewage Spill to Pervious Land Areas	3434942
Procedures for Sampling and Internal Notification in Case of Sewage Overflows	3434940
Collection System Overflow Notification Procedures and Sewage Overflow Response Summary	3434941
Resolution Delegating to Chief Engineer and General Manager Authority to Effectuate Repair of Deteriorated or Damaged Sewers	2149023

Attachment 2.1



COUNTY SANITATION DISTRICTS
SEWER MAINTENANCE SERVICE AREAS

Attachment 2.2

Certified 7004 1160 0000 6972 9679

COUNTY SANITATION DISTRICTS
OF LOS ANGELES COUNTY

1955 Workman Mill Road, Whittier, CA 90601-1400
Mailing Address: P.O. Box 4998, Whittier, CA 90607-4998
Telephone: (562) 699-7411, FAX: (562) 699-5422
www.lacsd.org

STEPHEN R. MAGUIN
Chief Engineer and General Manager

February 9, 2009
File No: 31-370-04.4A

Ms. Tracy Egoscue, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 W. 4th St., Suite 200
Los Angeles, CA 90013

Dear Ms. Egoscue:

Duly Authorized Representatives for Districts' Submittals
Regarding the NPDES Reporting Program

The purpose of this letter is provide an updated authorization for employees of the Sanitation Districts of Los Angeles County (Sanitation Districts) that serve as duly authorized representatives for submittals to the California Regional Water Quality Board, Los Angeles Region (Regional Water Board) or the California State Water Resources Control Board (State Water Board) related to the NPDES permits for the Districts' facilities listed in Table 1 (see attached) and other related Districts' operations. Per this letter, I hereby authorize any individual occupying the positions of Supervising Engineer, Supervising Environmental Scientist, Section Head, Assistant Department Head, or Department Head in the Technical Services Department, and any individual occupying the positions of Section Head or Department Head in the Wastewater Management Department, as duly authorized representatives for any submittal to the Regional Board related to these Sanitation Districts' facilities.

If you have any questions concerning this letter, please contact Ms. Ann T. Heil at (562) 908-4288, extension 2803.

Very truly yours,

Stephen R. Maguin

SRM:RT:ajh:lmb
Attachment

cc: Ms. Dorothy Rice, Executive Director, State Water Resources Control Board

DOC# 1190052

Table 1 – List of Sanitation Districts Facilities

Name of Facility	*NPDES Permit Number*
Joint Water Pollution Control Plant	CA0053813
Long Beach Water Reclamation Plant	CA0054119
Los Coyotes Water Reclamation Plant	CA0054011
Pomona Water Reclamation Plant	CA0053619
San Jose Creek Water Reclamation Plant	CA0053911
Saugus Water Reclamation Plant	CA0054313
Valencia Water Reclamation Plant	CA0054216
Valencia Water Reclamation Plant Stage IV	CAG994004
Whittier Narrows Water Reclamation Plant	CA0053716
Calabasas Landfill	CAS000001
Commerce Refuse-to-Energy Facility	CAS000001
Downey Area Recycling & Transfer Facility	CAS000001
~~Mission Canyon Landfill~~	~~CAS000001~~
~~Palos Verdes Landfill~~	~~CAS000001~~
Puente Hills Landfill	CAS000001
Puente Hills Materials Recovery Facility	CAS000001
Scholl Canyon Landfill	CAS000001
South Gate Transfer Station	CAS000001
~~Spadra Landfill~~	~~CAS000001~~

Facilities that are crossed out are no longer being operated. See the three following Notice of Termination letters for each facility.

03/25/2015

Robert Asgian
Los Angeles County Sanitation Districts
PO Box 4998
Whittier CA 90607

WDID Number: 4 19I006189

Mission Canyon Landfill

Review Date: 03/25/2015

NOT Effective Date: 03/20/2015

APPROVAL: NOTICE OF TERMINATION (NOT) OF COVERAGE UNDER THE GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY (INDUSTRIAL GENERAL PERMIT) ORDER NO 2014-0057-DWQ, NPDES NO. CAS000001

The Los Angeles Regional Water Quality Control Board approved the Notice of Termination (NOT) for the WDID and facility name referenced above. As of 03/25/2015 coverage under the General Permit for Discharges Associated with Industrial Activity (Industrial General Permit) is terminated. Should site conditions change such that coverage under the Industrial General Permit is again necessary, submittal of new Permit Registration Documents (PRDs) is required to obtain a new WDID number.

Please note, if applicable invoice(s) are unpaid when the NOT is approved, the unpaid invoice(s) are required to be paid in full. If you have any questions regarding fees, please contact the Fee Branch at (916) 341-5247 or email fee_branch@waterboards.ca.gov

If you have any further questions, please contact your local Regional Water Board at 213-576-6600.

Sincerely,
Ejigu Solomon

Los Angeles Regional Water Quality Control Board

07/24/2015

Bob Asgian
Los Angeles County Sanitation Districts
PO Box 4998
Whittier CA 90607

WDID Number: 4 19I006194

Palos Verdes Landfill

Review Date: 07/24/2015

NOT Effective Date: 05/05/2015

APPROVAL: NOTICE OF TERMINATION (NOT) OF COVERAGE UNDER THE GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY (INDUSTRIAL GENERAL PERMIT) ORDER NO 2014-0057-DWQ, NPDES NO. CAS000001

The Los Angeles Regional Water Quality Control Board approved the Notice of Termination (NOT) for the WDID and facility name referenced above. As of 07/24/2015 coverage under the General Permit for Discharges Associated with Industrial Activity (Industrial General Permit) is terminated. Should site conditions change such that coverage under the Industrial General Permit is again necessary, submittal of new Permit Registration Documents (PRDs) is required to obtain a new WDID number.

Please note, if applicable invoice(s) are unpaid when the NOT is approved, the unpaid invoice(s) are required to be paid in full. If you have any questions regarding fees, please contact the Fee Branch at (916) 341-5247 or email fee_branch@waterboards.ca.gov

If you have any further questions, please contact your local Regional Water Board at 213-576-6600.

Sincerely,
Orlando Gonzalez

Los Angeles Regional Water Quality Control Board

04/29/2016

Kristen Ruffell
Los Angeles County Sanitation Districts
1955 Workman Mill Road
Whittier CA 90601

WDID Number: 4 19I006190

Spadra Landfill

Review Date: 04/29/2016

NOT Effective Date: 11/18/2015

APPROVAL: NOTICE OF TERMINATION (NOT) OF COVERAGE UNDER THE GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY (INDUSTRIAL GENERAL PERMIT) ORDER NO 2014-0057-DWQ, NPDES NO. CAS000001

The Los Angeles Regional Water Quality Control Board approved the Notice of Termination (NOT) for the WDID and facility name referenced above. As of 04/29/2016 coverage under the General Permit for Discharges Associated with Industrial Activity (Industrial General Permit) is terminated. Should site conditions change such that coverage under the Industrial General Permit is again necessary, submittal of new Permit Registration Documents (PRDs) is required to obtain a new WDID number.

Please note, if applicable invoice(s) are unpaid when the NOT is approved, the unpaid invoice(s) are required to be paid in full. If you have any questions regarding fees, please contact the Fee Branch at (916) 341-5247 or email fee_branch@waterboards.ca.gov

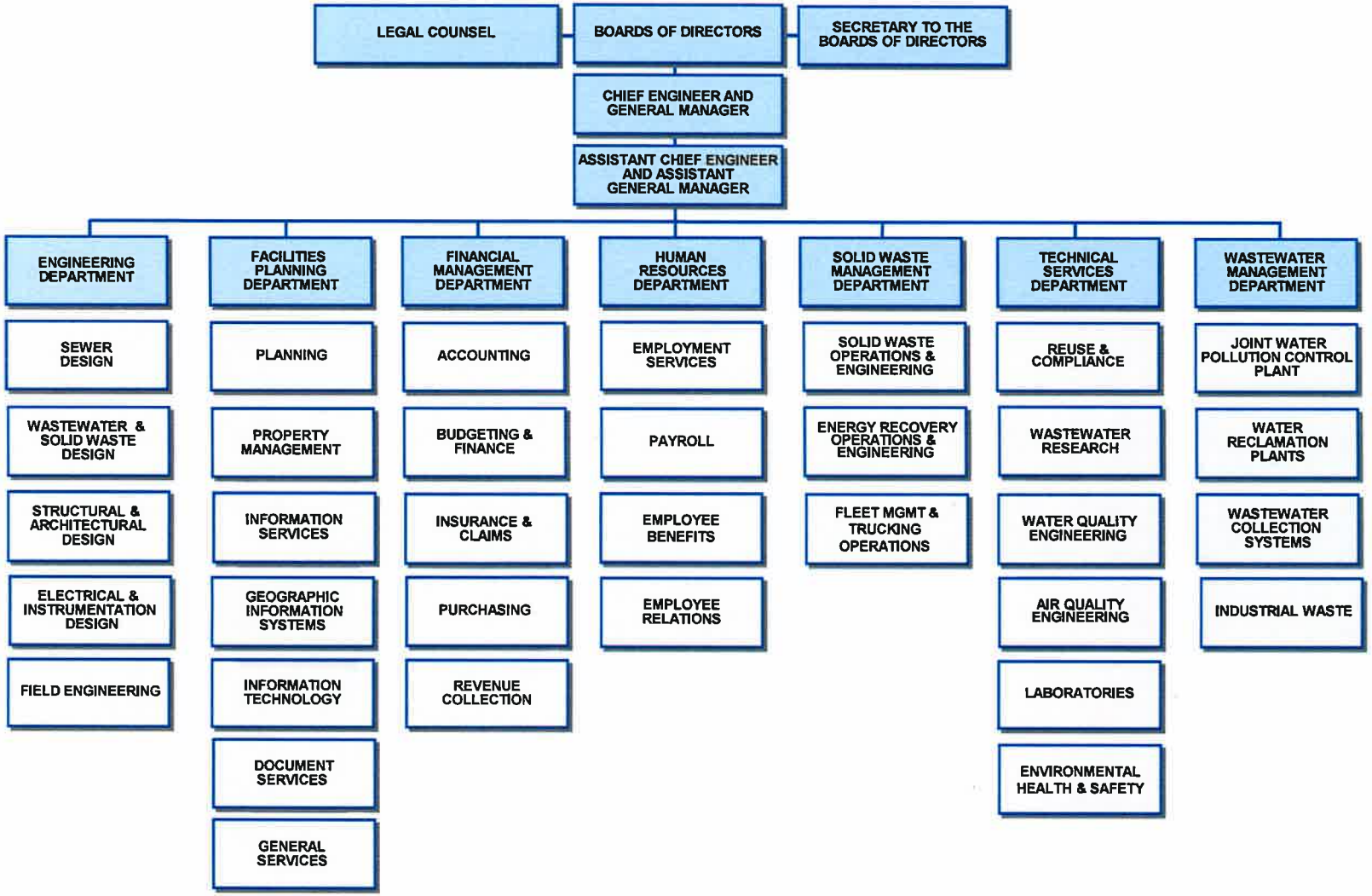
If you have any further questions, please contact your local Regional Water Board at 213-576-6600.

Sincerely,
Luz Vargas

Los Angeles Regional Water Quality Control Board

Attachment 2.3

Sanitation Districts of Los Angeles County Organization Chart

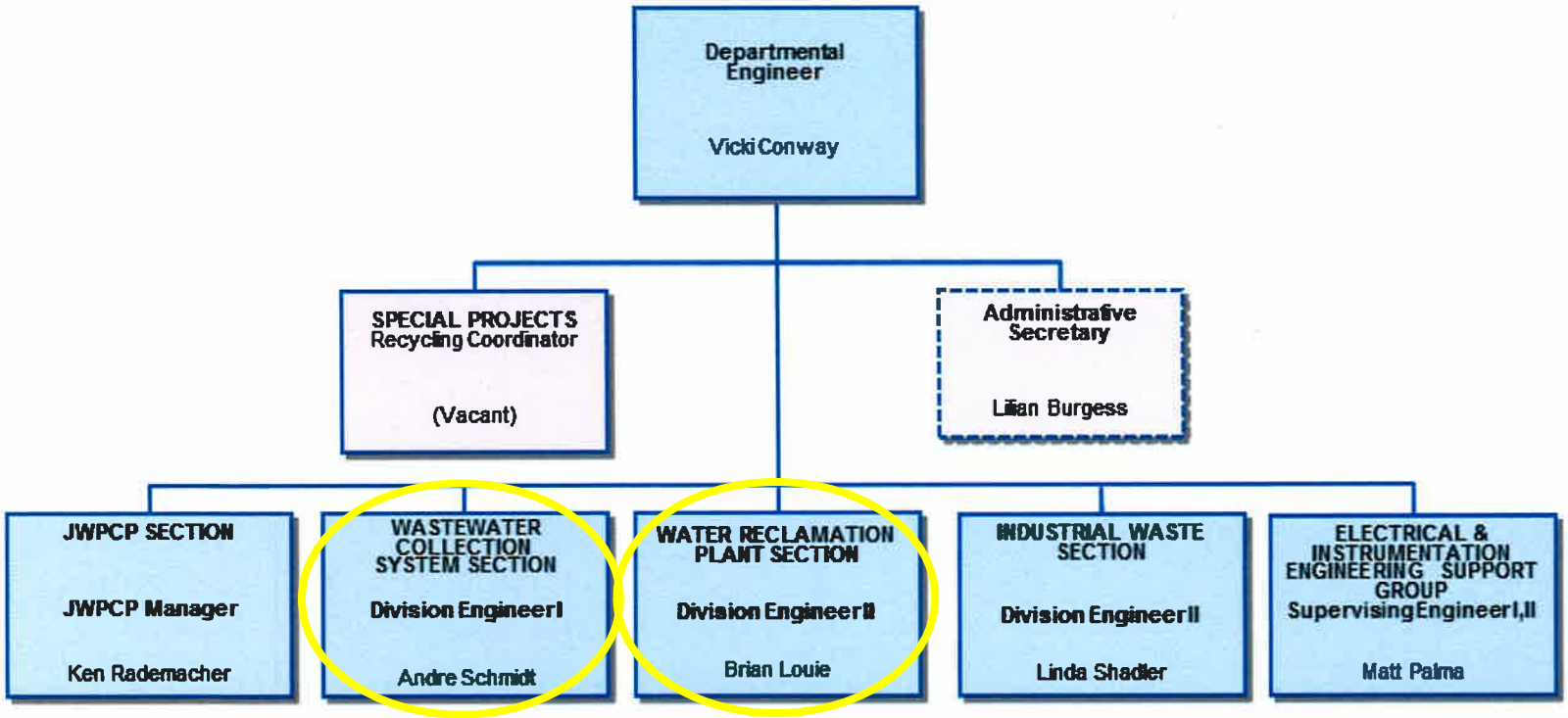


4/4/2018

Attachment 2.4

Wastewater Management Department

Authorized staffing as of 5-18



SSMP - Organization Contact Information

Wastewater Management Department

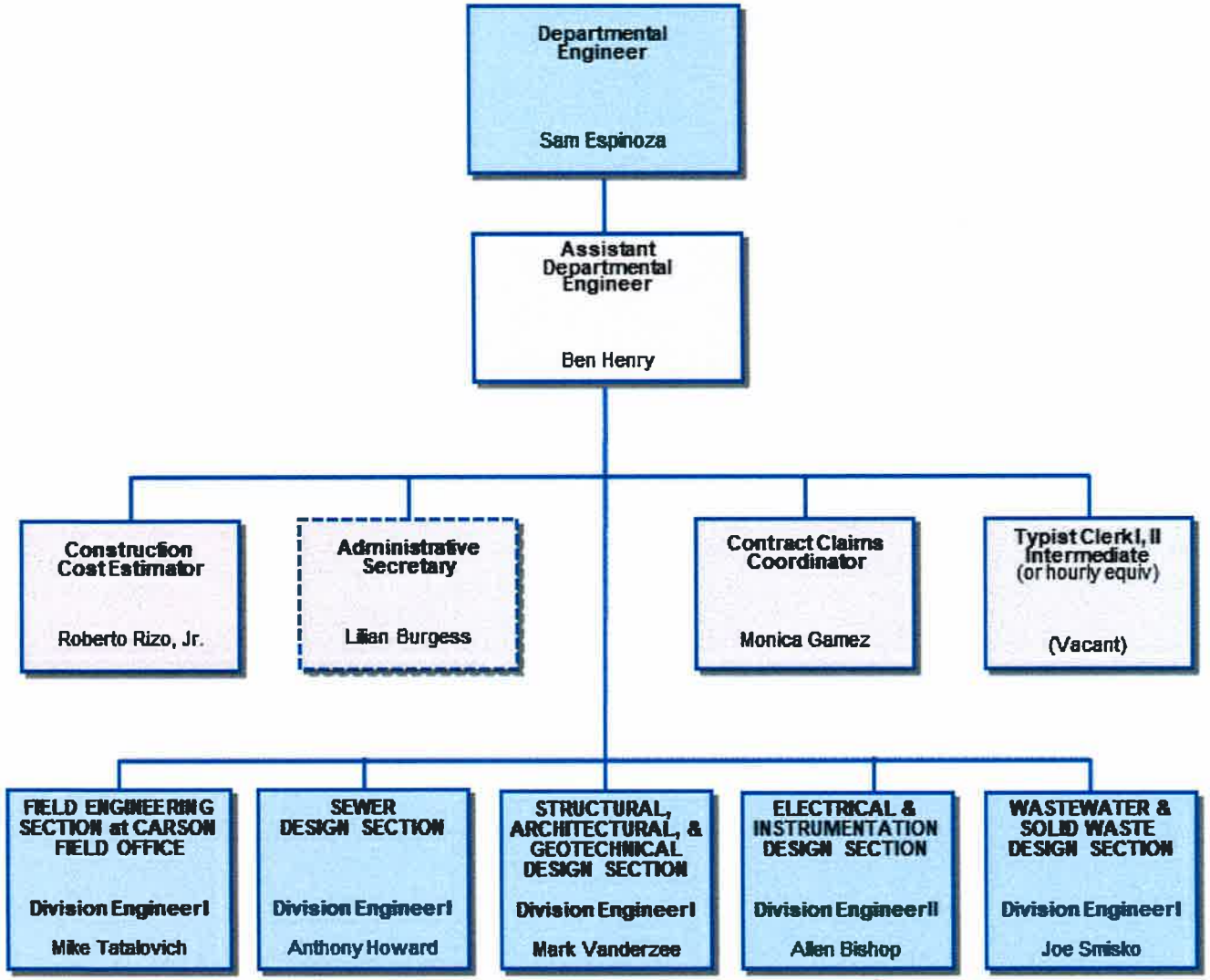
Position	Name	Telephone Number
Departmental Engineer	Victoria Conway	(562) 699-7411 ext. 1701
Wastewater Collection Systems Section		
Wastewater Collection Systems Manager	Andre Schmidt	(310) 638-1161 ext. 6803
Water Reclamation Plants Section		
Division Engineer	Brian Louie	(562) 699-7411 ext. 3502
Industrial Waste Section		
Division Engineer	Linda Shadler	(562) 699-7411 ext. 2902
Joint Water Pollution Control Plant		
JWPCP Manager	Ken Rademacher	(310) 834-9013 ext. 5245

Attachment 2.5

Engineering Department Overview

All Offices at JAO, unless noted

Authorized staffing as of 9-18



SSMP - Organization Contact Information

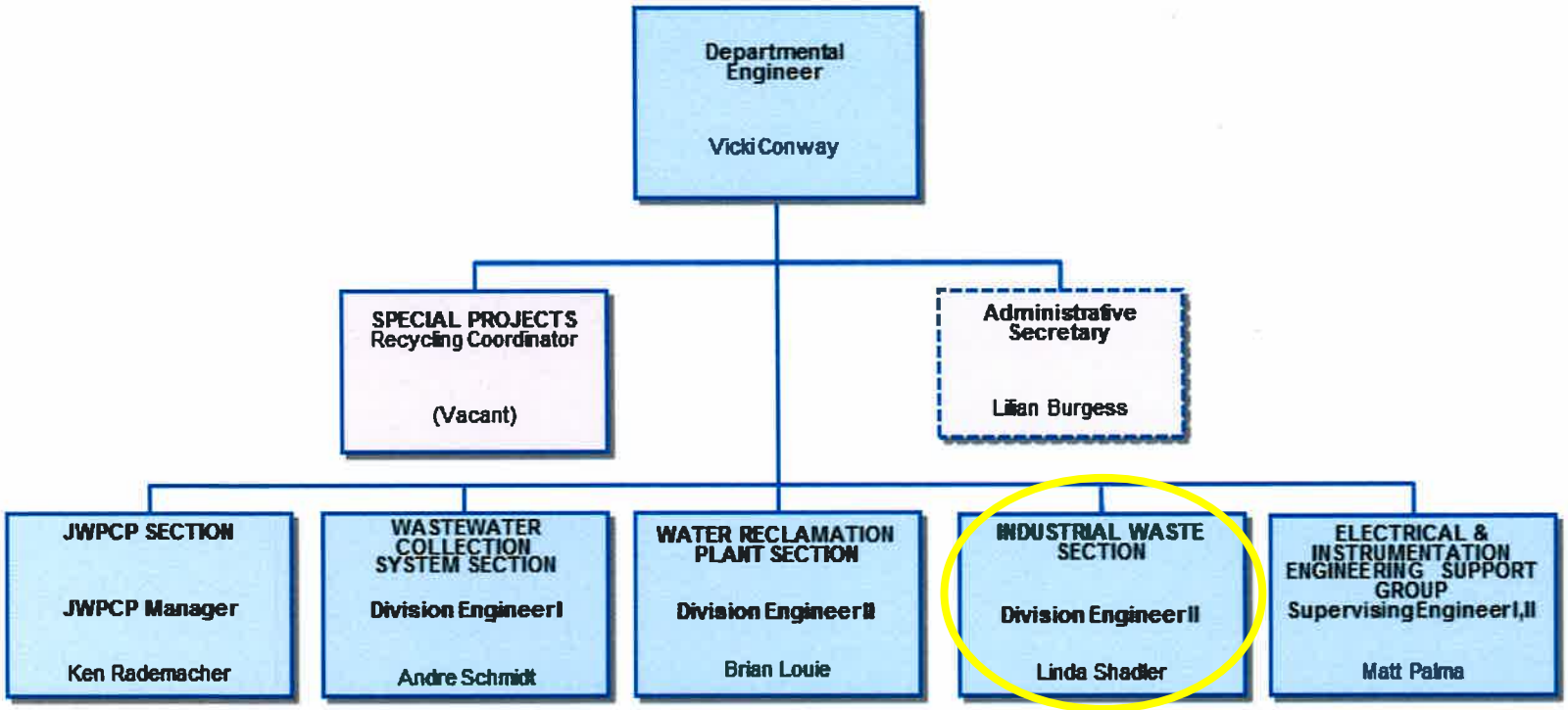
Engineering Department

Position	Name	Telephone Number
Departmental Engineer	Samuel Espinoza	(562) 699-7411 ext. 2101
Assistant Departmental Engineer	Ben Henry	(562) 699-7411 ext. 2167
Sewer Design Section		
Division Engineer	Anthony Howard	(562) 699-7411 ext. 1602
Wastewater & Solid Waste Design Section		
Division Engineer	Joe Smisko	(562) 699-7411 ext. 2105
Structural & Architectural Design Section		
Division Engineer	Mark Vanderzee	(562) 699-7411 ext. 2000
Electrical & Instrumentation Design Section		
Division Engineer	Allen Bishop	(562) 699-7411 ext. 2200
Field Engineering Section		
Field Engineering Manager	Mike Tatalovich	(562) 699-7411 ext. 1601/5812

Attachment 2.6

Wastewater Management Department

Authorized staffing as of 5-18



SSMP - Organization Contact Information

Wastewater Management Department

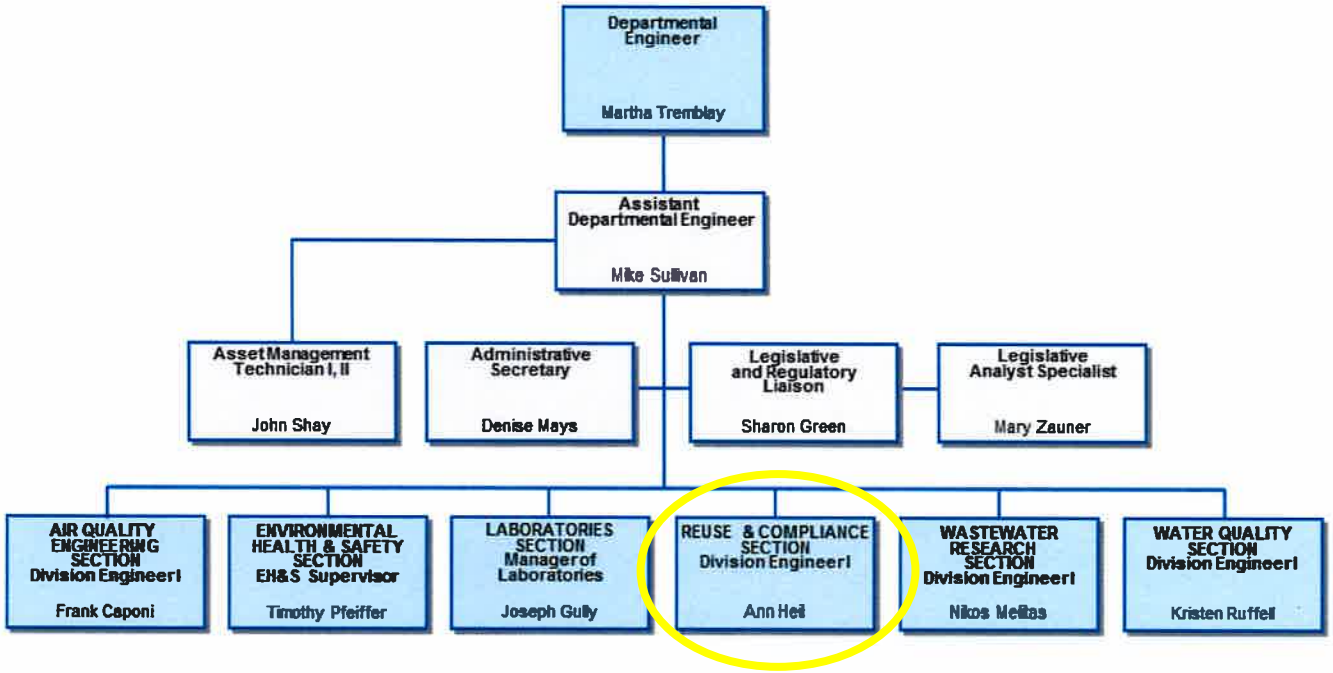
Position	Name	Telephone Number
Departmental Engineer	Victoria Conway	(562) 699-7411 ext. 1701
Wastewater Collection Systems Section		
Wastewater Collection Systems Manager	Andre Schmidt	(310) 638-1161 ext. 6803
Water Reclamation Plants Section		
Division Engineer	Brian Louie	(562) 699-7411 ext. 3502
Industrial Waste Section		
Division Engineer	Linda Shadler	(562) 699-7411 ext. 2902
Joint Water Pollution Control Plant		
JWPCP Manager	Ken Rademacher	(310) 834-9013 ext. 5245

Attachment 2.7

Technical Services Department Overview

(All offices at JAO)

Authorized staffing as of 12-17



SSMP - Organization Contact Information

Technical Services Department

Position	Name	Telephone Number
Departmental Engineer	Martha Tremblay	(562) 699-7411 ext. 2502
Assistant Departmental Engineer	Mike Sullivan	(562) 699-7411 ext. 2501
Air Quality Engineering Section		
Division Engineer	Frank Caponi	(562) 699-7411 ext. 2460
Environmental Health and Safety Section		
EH&S Supervisor	Timothy Pfeiffer	(562) 699-7411 ext. 1355
Laboratories Section		
Manager of Laboratories	Joseph Gully	(562) 699-7411 ext. 3001
Reuse and Compliance Section		
Division Engineer	Ann Heil	(562) 699-7411 ext. 2801
Wastewater Research Section		
Division Engineer	Nikos Melitas	(562) 699-7411 ext. 2816
Water Quality Section		
Division Engineer	Kristen Ruffell	(562) 699-7411 ext. 2826

Attachment 2.8

SANITATION DISTRICTS OF LOS ANGELES COUNTY

GRACE ROBINSON HYDE
Chief Engineer and General Manager

Memorandum

Date: February 1, 2016

To: All Districts' Employees

From: Grace Robinson Hyde GRH
Chief Engineer and General Manager

Subject: **Reports of Sewage Spills**

The Sanitation Districts have a regulatory requirement to immediately report sewage spills to the Los Angeles County Department of Public Health (Public Health). The Long Beach Main Alarm Center, which is staffed 24-hours a day, has been designated by the Sanitation Districts to receive sewage spill reports and relay the information to Public Health. It is, however, recognized that various Sanitation Districts' staff may receive sewage spills reports from the public because they may be unaware of how to reach the appropriate Section within the Sanitation Districts. Because of this, it is imperative that any sewage spill observed by or reported to a Sanitation Districts' employee be immediately relayed to the Long Beach Main Alarm Center.

Any Sanitation Districts' employee who observes a sewage spill event or receives a sewage spill report via telephone or other forms of communication from the public, or other agencies and cannot transfer the call or information to a live person at the Long Beach Main Alarm Center shall document the following:

1. The location of the spill (i.e., the address, or the intersection, and the city);
2. The reporting party's name and phone number (if the reporting party is willing to provide this information); and
3. The time the call was received.

This information shall be immediately relayed to the Long Beach Main Alarm Center at (562) 437-6520 or (562) 437-1881. Failure by the Sanitation Districts to notify Public Health of a sewage spill could result in civil penalties against the agency.

Department Head Administrative Secretaries and telephone operators should have received training for sewage spill reporting procedures. If you have any questions regarding training or would like to request training for additional staff, please contact Denise Springer at extension 1706. If you have any questions regarding Spill Reporting Procedures, please contact Andrew Hall at extension 2803.

#3599143

Attachment 2.9

SANITATION DISTRICTS' ENGINEERING SPILL NOTIFY FLOW CHART

DOC#970276 **Revised: November 2018**

A report of potential spill received by a Sanitation Districts' employee. (Note: Whoever receives the call must log the date and time the call was received, the location of the event, and the caller's contact information.

⇩

The employee who received the call must immediately notify LB Main at 562-437-6520 or 562-437-1881.

⇩

Long Beach Main staff follow a separate flow chart (see back side). [DOC# 970276]

⇩

WCS/WRP* NEXT STEP Does the spill involve a Districts' facility?

NO

A ⇨ The potential spill turned out not to be a spill. WCS or WRP staff send follow up email to SpillNotify@lacsd.org (see B below).
END OF INVESTIGATION & RESPONSE

B ⇨ If the spill involves another agency or private party, LB Main staff notifies the other agency or party of the spill. WCS or WRP staff sends a follow-up email to SpillNotify@lacsd.org:

"The Los Angeles County Sanitation Districts have completed an initial investigation of the potential sewer spill at the intersection of _____ in the City of _____(or other description of the location). As follow-up to the e-mail sent to your office on [provide date and time], we have determined that Districts' facilities were not involved in this event, and that no further action is required on our part. This matter has been referred to _____ for resolution." **END OF INVESTIGATION**

YES

⇩

Within 15 min of confirmation of an LACSD spill, contact LA County Department of Health Services at (213) 974-1234 and provide information on spill location, volume, status (ongoing/stopped), and if the spill reached surface waters. Obtain Ticket Number for records.

Within 2 hours of becoming aware of any spill that is a Category 1 SSO greater than or equal to 1,000 gallons spilled to or that may reach a surface water, notify the California Office of Emergency Services (Cal-EMA) at (800) 852-7550. Obtain Control Number for records.

Required telephone notifications per WCS Spill Notification Procedures include: 1) Regional Water Quality Control Board (for a spill that did, or may, reach Waters of the State or have public exposure); and 2) a follow up call to Cal-EMA. Additionally, if the spill entered Orange, San Bernardino, Kern, or Ventura Counties, the WCS or WRP Section shall send an additional certification email within 24 hours to the Los Angeles RWQCB identifying any additional agencies that were notified stating:

"This is _____ with the Los Angeles County Sanitation Districts. Sewerage system personnel are investigating a potential sewer spill at _____ the intersection of _____ in the city of _____ which has potentially travelled outside the County of Los Angeles. If you need to reach the alarm center please call (562) 437-6520.

This email certifies notification of the potential spill has been given by telephone to The (insert county name) County Department of Public Health."

Provide courtesy notification to cities affected by spill or containment activities using contacts in DOC# 3474313 .

* WRP Section is responsible for potential spills in Santa Clarita and Antelope Valleys; WCS is responsible for all others.

LONG BEACH MAIN SPILL NOTIFICATION FLOW CHART

DOC # 970276

Revised: November 2018

START
Long Beach Main receives a potential spill phone call

STEP 1: Gather Potential Spill Information
Fill out Spill Notification Worksheet (DOC# 2708488)

STEP 2: Determine if Districts' Facilities are Possibly Involved
Is there a District's sewer in the Spill Location vicinity or is there a chance that District's facilities are involved?
(See Spill Location Helpsheet [DOC# 2943337] for instructions on how to use GIS to identify location)

NO

The Districts DO NOT have facilities in the vicinity and there is NO CHANCE that the Districts are involved.
1. Call the likely City or County agency that is involved and report the spill to them.
2. Send out email (see below).
3. Create Service Request and record all collected information and follow up actions.
4. Close out Service Request.

END OF INVESTIGATION & RESPONSE

YES

DURING BUSINESS HOURS

1. Joint Outfall System Spills: Contact Compton & San Gabriel staff in the order listed until you reach someone.
2. Santa Clarita and Antelope Valley (SCV/AV) Spills: Contact Water Reclamation Plants Staff in the order listed until you reach someone.
3. Send out email (see below).
4. Create Service Request and add Service Request # to Spill Notification Worksheet. **END OF SCV/AV RESPONSE**
5. Remain Available for Assistance

AFTER HOURS

1. Joint Outfall System Spills: Dispatch outside PPO to immediately investigate spill.
2. Santa Clarita and Antelope Valley (SCV/AV) Spills: Contact Water Reclamation Plants Staff in the order listed until you reach someone.
3. Send out email (see below)
4. Create Service Request and add Service Request # to Spill Notification Worksheet. **END OF SCV/AV RESPONSE**
5. Once spill is confirmed, contact WCS Staff in the order listed at left until you reach someone.
6. Remain Available for Assistance

JOINT OUTFALL SYSTEM
COMPTON & SAN GABRIEL VALLEY OFFICES
EMERGENCY CONTACT INFORMATION

NAME	CELL PHONE	WORK EXT.
1st Doug Walton:	(310) 713-0227	x 6820
2nd Rick Pearce:	(310) 710-1394	x 6822
3rd Brian Pivovaroff:	(310) 433-3404	x 6821
4th Bill Balas:	(310) 909-3964	x 6215
5th Darrell Hatch:	(562) 360-2145	x 6808
6th Andre Schmidt:	(562) 360-0456	x 6803

CALL IF HELP IS NEEDED

SANTA CLARITA AND ANTELOPE VALLEYS
WATER RECLAMATION PLANTS SECTION
EMERGENCY CONTACT INFORMATION

NAME	CELL PHONE	WORK EXT.
1st Mike Goodreau:	(661) 433-5888	x 6902
2nd Mark Weaver:	(661) 305-3645	x 6705
3rd Dale Goebel:	(661) 433-0085	x 6918
4th Derek Holland:	(661) 902-3789	x 6907
5th Jerry Reece:	(661) 505-3782	x 6703

EMAIL NOTIFICATION INSTRUCTIONS

LB Main staff sends a certification email to SpillNotify@lacsd.org requesting delivery and read receipts. An email is prewritten for (1) a possible Districts' spill, or (2) NOT a Districts' spill. Fill in the following three pieces of information into the email:

1) Your Name;
2) Street Intersection of the spill, and;
3) City that the spill is located in.
4) If it is NOT a Districts' spill, also fill in the City or Agency the spill was referred to.

The LB Main computer will receive two confirmation emails indicating where the notification email was sent. DO NOT DELETE. These emails are WCS's proof of notification. Long Beach Main's responsibilities are met.

Attachment 4.1

DISTRICTS' REVENUE PROGRAM

A major consideration in proposing any capital construction program is the cost and impact it would have on both existing and future users. The Sanitation Districts have developed a comprehensive revenue program to address these issues. In general, this means a program, including appropriate ordinances, to allocate costs and collect revenues as needed from the users of the wastewater management system to ensure sufficient revenues for the construction and subsequent operation of facilities.

The Districts first addressed the issue of a revenue program in the May 1979 *Report on the Future Revenue Program of the Sanitation Districts of Los Angeles County*. This report has been updated numerous times as subsequent facilities plans were submitted to the State Water Resources Control Board (SWRCB) in conjunction with State Revolving Fund (SRF) loan applications. In summary, these reports recommended a revenue program based on maximum utilization of existing sources of revenue, supplemented by revenues from two additional programs: the Service Charge Program and the Connection Fee Program. Historically, existing sources of revenue included ad valorem taxes, grants and loans, investment income, contracts, industrial waste surcharge, and annexation fees. The two new programs (Service Charge Program and the Connection Fee Program) were made necessary as a consequence of the reduction in ad valorem taxes following the adoption of Proposition 13, the California Property Tax Initiative.

Key elements of the **Service Charge Program** include:

- Existing users are charged for operation and maintenance (O&M) and upgrade capital costs.
- Charges are based on usage of the system (estimated by user category and facility size).
- Charges are based on a combination of flow and strength (chemical oxygen demand and suspended solids).
- Dischargers may receive a rebate based on demonstrated water usage below the estimated loading of their particular user category.
- Charges are collected as a specific lien on the property tax bill.

Key elements of the **Connection Fee Program** include:

- New users or existing users who significantly increase their discharge are charged a one-time fee for the incremental cost of expanding capital facilities to accommodate the new discharge.
- Charges are based on the anticipated usage of the system (estimated by user category and facility size).
- Charges are based on a combination of flow and strength (chemical oxygen demand, and suspended solids).

Capacity improvement projects necessitated by increased flows from new development are funded through the Districts' Connection Fee Program. Each District has implemented a Master Connection Fee Ordinance which establishes the structure and mechanism for levying and collecting connection fees. Connection fees are levied upon all dischargers who either are connecting to the sewerage system for the first time or who are significantly increasing their level of discharge. The program is designed such that each user pays for the cost of constructing the capacity required to accommodate the user's anticipated discharge. In this way, existing users will not be obligated to subsidize new users as they enter the system. Anticipated discharge is measured

in terms of flow and strength (chemical oxygen demand and suspended solids), and based on loadings per unit of usage (for residential and commercial users) or by an engineer's evaluation of the actual facility (for industrial waste users). The connection fee rate is based on the estimated cost of constructing an incremental expansion of the sewerage system. All connection fees are placed in a separate Capital Improvement Fund and are only withdrawn to pay for expansion-related capital projects or to make interfund loans to pay for other capital projects as provided in the Master Connection Fee Ordinance.

Budgetary Process

Each District's budget consists of three major categories: (i) operation and maintenance, (ii) capital, and (iii) debt service. Costs within the first two categories can be further subdivided into two sub-groups: those related to the operation and ownership of joint facilities and those related to a District's individually owned and operated facilities. For those Districts that are members of the Joint Outfall System, the vast majority of these costs are joint. With respect to the outlying Districts, almost all the costs are individual costs and any joint costs are those pertaining to joint administration of the Districts.

O&M Budget

Operation and maintenance budget estimates are prepared each year by the Districts' staff members based upon historical information and projected changes in the sewerage facilities or requirements for the upcoming fiscal year. As many of the costs (e.g., pumping and chemicals) are directly related to flow, projections of the anticipated flows at each facility are made concurrently. Staffing requirements and changes in salaries and wages are also incorporated into the budget. These figures are projected over 20 years, and anticipated changes or other anomalies are incorporated.

Capital Budget

Capital budget estimates for the collection system are based on the Report of Recommended Facility Improvements, which is updated annually. Projects for each Sanitation District are rated and scheduled in the Capital Improvement Plan (CIP) based on priority.

For the treatment plants, recommended Capital improvements to various treatment plants are based on operational considerations and scheduled based on priority. Costs and estimated schedules are developed and the projects are included in the CIP.

Debt Service

Debt service consists of the annual interest and principal payments on both bonds and SRF loans. Each year these amounts are adjusted to include any new bonds or loans that may have been issued or incurred during the previous year. Adjustments are also made for any bonds or loans that may have been retired during the previous year.

Once all the costs (operations, maintenance and capital, including debt service) have been identified, joint costs are apportioned to the respective Districts. The apportionment is based on the proportionate usage, as measured by total sewage units in each District. The apportioned joint costs

are then added to each District's individual costs (including debt service) to determine that District's total budget.

The known revenue sources are identified after budget expenditures are projected. The Districts' primary revenue sources (other than service charges and industrial waste surcharges) include the Districts' share of ad valorem taxes, investment income, and contract revenue. To the degree that there are expansion-related capital projects, the capital improvement fund (accumulated connection fees) will also be utilized as a revenue source. Bond and SRF loan proceeds are used as a revenue source to offset capital expenses if they are available; the corresponding debt service will be included as an expense in subsequent years. The remaining difference between the expenditures and known revenues equals the amount of supplemental revenue that must be collected through the user charge program. The user charge rate is equal to the required supplemental revenue divided by the total number of equivalent users (sewage units) in the District. This process is repeated for each year of the planning period, and adjustments are made for to stabilize rates. Transfers to and from each District's Designated Reserves may occur each year depending on whether there is a net surplus or deficit when comparing the expenses and revenues above.

Every year each District's Board of Directors is presented with a preliminary budget and projected service charge rates. If a rate increase is recommended, individual mailed notices are sent to every property owner which comply with to the terms of Proposition 218 informing them of a scheduled public hearing. As described herein, after the public hearing and review by the Directors, the Board of Directors sets the service charge rates by ordinance. If no rate increase is proposed, the Board of Directors need only consider the adoption of a resolution for the continuation of the collection of the service charge on the tax roll. In June each Board of Directors is presented with a final budget (including any revisions to its preliminary budget) for its consideration and approval. At the same time, pursuant to California law, each District's Board of Directors must adopt an appropriations limit relating to the proceeds of taxes.

Attachment 6.1

SANITATION DISTRICTS OF LOS ANGELES COUNTY

SANITARY SEWER OVERFLOW RESPONSE PLAN

INTRODUCTION

The primary goal of the Sanitation Districts' sewer maintenance program is the protection of public health and the environment. An effective system-wide management program has to encompass the response measures necessary to minimize any public health and environmental impact when overflows do occur. To accomplish this, the Sanitation Districts operate a two-pronged response to overflows that directs efforts to stop the overflow simultaneously with efforts to contain and recover the wastewater discharged. Quick response to emergency situations has prevented many releases of wastewater to receiving waters.

OVERFLOW RESPONSE GOALS

The Sanitation Districts' goals regarding overflow response are:

1. Respond to the scene within one hour of notification of an overflow and assess the situation. Promptly notify the responsible agency if the overflow is not from a Sanitation Districts facility.
2. Prevent the overflow from reaching the storm drain, if possible.
3. Limit public access to the overflow area to prevent public contact with wastewater and any areas contaminated by wastewater.
4. Stop the overflow as soon as possible.
5. Completely contain the overflow as close as practical to the overflow location to prevent or minimize any environmental impact.
6. Completely recover the contained overflow and return it to the sewer system.
7. Clean up the area contaminated by the overflow.
8. Repair damaged facilities that caused or contributed to the overflow.
9. Gather and compile pertinent information pertaining to the overflow, simultaneous with response efforts, and notify appropriate regulatory agencies of the overflow and response status as soon as practical.
10. Conduct investigations to determine the probable cause of the overflow, document the events during the overflow and response activities, estimate the approximate volume of the overflow, and identify and implement measures to prevent recurrence.

SANITARY SEWER OVERFLOW RESPONSE PLAN

NOTIFICATION, INVESTIGATION AND MOBILIZATION

The Sanitation Districts maintain a continuously staffed Central Alarm Center at its Long Beach Main Pumping Plant. When a report of an SSO is received, the on-duty operator asks for pertinent information, such as, the caller's name, address and phone number, the overflow location and a description of the overflow. This information is transmitted immediately to the first responder. Reports of overflows to the Central Alarm Center are logged into an asset management database as a service request.

The following occurs upon receipt of notification of a potential overflow:

- *Determination if Sanitation Districts' Facilities Could be Involved* – Staff makes a determination of whether the overflow could involve a Sanitation Districts facility using sewerage facility maps and other resources. If it is possible that Sanitation Districts' facilities are involved, staff immediately mobilizes primary responders and notifies regulatory agencies as detailed below.
- *Dispatch of Personnel to Investigate* – If it is possible that Sanitation Districts Facilities could be involved, a Sanitation Districts representative is immediately dispatched[1] to the location of the reported overflow to investigate.
- *Overflow Notification* – Procedures are initiated in accordance with spill notify chart (SSMP Attachment 2.8**)**
- *Dispatch of Staff and Equipment* – When the initial report indicates with high likelihood that a wastewater overflow has been caused by a problem with a Sanitation Districts' facility, scheduled work is stopped and all necessary equipment, vehicles, and crews are dispatched to the location of the SSO or they are recalled to the field offices to support with overflow relief, containment and clean-up activities. During non-workday hours, staff members are contacted and directed to report to their work site for instructions.
- *Notification of Sewer Agencies* - When staff determines from the initial report or from the reports from the first responder in the field that an overflow is not related to Sanitation Districts' facilities, the potentially responsible agency is notified. Actual dispatch of staff and equipment occurs only after the on-site investigation indicates that the overflow was caused by a problem with a Sanitation Districts' facility.
- *Notification of Management Personnel* - Appropriate management personnel are notified (if they have not already been notified) and any personnel necessary for office support of the field response are mobilized.

1 Staff are available to investigate reports of an SSO on a 24-hour per day, 7-day per week basis.

RESPONSE

The overflow response is directed in the field by supervisors and/or managers who are trained and experienced in responding to overflows with additional operations, maintenance, and engineering staff available for support. Although each overflow event is unique, the Sanitation Districts respond to most overflows in a somewhat standardized fashion:

- Several crews are sent to the scene, each under the direction of a lead worker or supervisor.
- One crew is responsible for corrective action needed to stop the overflow.
- Another crew is responsible for containment, recovery and cleanup of the spill.
- Personnel from the above two crews and/or separate crewmembers are responsible for excluding the public/traffic from the area affected by the overflow.

The individual steps involved in the response to a wastewater overflow event include the following:

1. Corrective Action and Site Control
2. Containment and Recovery
3. Cleanup
4. Sampling
5. Notification and Reporting
6. Post-Cleanup Activities, Mitigation, and Spill Prevention

1. <u>Corrective Action and Site Control</u>

   Upon arriving at the overflow location, concurrent actions taken by the various crews are:

   - Prevent Public Access - Access to the immediate area of the overflow is restricted to minimize potential impacts to public health by redirecting pedestrian and automobile traffic away from the overflow through the use of traffic cones, caution tape, barricades, or local law enforcement.

     Sanitation Districts' personnel assess the extent of the overflow and its potential impacts to the public health. This process involves determining if any private property owners/residents may be exposed to raw sewage, making direct contact with private property owners/residents who have been or may be directly affected by the overflow, advising private property owners/residents of the potential health hazards associated with contact with raw sewage, and identifying prudent measures to be taken by private property owners/residents, such as vacating the property, to prevent contact with the overflow.

     Simultaneous efforts include determining the path and final destination of the sewage spill and potential exposure to the public. If wastewater from the overflow is ponding in a location that can be isolated, then Sanitation Districts' personnel set up barricades to prevent public access. Traffic control is set up to prevent vehicles from entering locations where the overflow has contaminated public or private streets. Sanitation

Districts' personnel direct pedestrians and automobile traffic away from the path and final destination of the overflow. The Sanitation Districts cooperate with local law enforcement and public works officials to ensure that public exposure to the overflow is minimized and to ensure spill site security.

- Prevent Wastewater Entry to Storm Drain System - When possible Sanitation Districts' personnel, contain and recover the overflow in the immediate vicinity of the overflow before it enters a storm drain catch basin. Measures to effect such containment include damming the overflow path with sandbags in the street gutter and recovering the impounded water with a vacuum truck or jet vactor, or using sandbags to divert the overflow back into a nearby sewer manhole.

- Stop Overflow - The cause of the overflow is investigated and the necessary corrective action is taken to stop the overflow and/or correct the condition that caused the overflow if the overflow has already stopped.

  Typical corrective actions to stop a sewer overflow include:

  - Clearing a pipe blockage with a jet vactor,
  - Removing debris from a manhole,
  - Upstream flow diversion,
  - Bypass of wastewater around the blockage using vacuum trucks or pumps, and
  - Bypass and repair of damaged pipe.

  Corrective actions to stop an overflow caused by pumping plant or force main failure include:

  - Restoring power by use of engine driven electrical generators,
  - Bypass of the pumping plant and repair or replacement of pumps or electrical switchgear, and
  - Bypass and repair of a damaged force main.

Bypass pumping is typically accomplished by the use of portable pumps and hoses to convey flow around the blocked or damaged sewer, the inoperative pumping plant or the damaged force main. The Wastewater Collection Systems Section maintains an Overflow Response Trailer, which is equipped with portable pumps and hoses of various sizes, fittings, and tools and is designed to bypass flows of up to 450 gallons per minute. Larger trailer-mounted engine driven pumps are used to bypass higher flows. Vacuum tankers can also be used to draw wastewater from upstream of the affected area and discharge back to the system downstream of the affected area. When possible, diversions are used to redirect a portion or all of the wastewater around the affected area in the system.

Many of the Sanitation Districts' pumping plants are specially configured to facilitate installation and operation of emergency bypass pumps in the event the normal sewage pumps are inoperable. The emergency bypass pumps are typically portable pumps sized to handle peak wastewater flow

from the plant. The bypass pump can be connected to the force main or to a temporary above ground force main. The bypass pump can be powered by a portable electrical generator, if necessary.

Emergency Procedures Manuals specific to each Sanitation Districts' pumping plant are issued to and available as references for operations, maintenance, and engineering staff. The manuals provide comprehensive information on the proper response to pumping plant failures and potential overflows. Available information includes proper response to power failure, high wet well level, telemetry system failure, control system failure, procedures to bypass the plant and force main, and emergency overflow response information including low manhole location, storage time in the tributary sewer system, and containment location and estimated travel time to the containment location. Contingency plans for force main leaks and failures are incorporated into the individual manuals.

When a damaged gravity sewer or force main pipe causes an overflow, emergency repairs are immediately initiated. The Sanitation Districts' Wastewater Collection Systems Section (or Water Reclamation Plants Section) will obtain assistance from Sanitation Districts Field Engineering Section, who will hire and manage a contractor to perform the repairs based upon established guidelines.

2. Containment and Recovery

Containment and recovery of the overflow should occur as close as possible to the site of the overflow, preferably in the street curb and gutter, to minimize the length of the storm drain system affected by the wastewater. In some cases, the overflow enters the storm drain system prior to arrival of the Sanitation Districts first response personnel due to the urban nature of most of the Sanitation Districts' service area. In some cases, engineering, supervisory and/or management staff identify the most practical containment location in the storm drain system downstream of the overflow. In the selection of the best containment location, staff must consider many factors, including:

- The time the overflow started,
- The overflow route through the storm drain system,
- The time needed to install a containment dam,
- The travel time for the overflow to reach the containment location,
- Safe access to the containment location for personnel and equipment, and
- The availability of a nearby sewer with sufficient capacity into which recovered wastewater can be returned.

Once a suitable containment location is identified, the crew responsible for containment performs the following:

- Deploys a sandbag containment dam or otherwise prevents the flow of wastewater and contaminated street runoff into the storm drain system, and
- Deploys vacuum trucks or portable pumps and piping, as necessary to return the contained wastewater, dry weather runoff, and clean up water back to the sewer system.

3. Cleanup

After the overflow has been stopped, the following steps are taken:

- Recover Locally Impounded Wastewater – All locally impounded wastewater is recovered with a vacuum truck or jet vactor and returned to the sewer system
- Collect Wastewater Debris - All visible debris of wastewater origin from the overflow location(s), street(s), curb and gutters, and the overflow runoff path is physically removed.
- Flush Affected Area – Overflow location(s), street(s), curb and gutters, and the runoff path are flushed with potable water. The flush water is also recovered and returned to the sewer system.
- Flush Storm Drain and Conduct Dye Study – When possible or needed, additional potable water is used to flush the overflow runoff path within the storm drain system. When appropriate, this flush water is marked with a nontoxic, visible dye. Arrival of the dye at the containment location establishes the actual travel time to the containment location. Recovery of the dye confirms completion of spilled wastewater and flush water recovery.

In cases where an overflow affects pervious surfaces, the Sanitation Districts perform clean up in accordance with its *Procedures for Clean-Up Activities After Sewage Spill to Pervious Land Areas*.

Private properties impacted by overflows or backups within the Sanitation Districts system are cleaned up by a professional restoration company dispatched by the Sanitation Districts. The Sanitation Districts' Insurance and Claims Coordinator handles claims for property damage.

4. Sampling

Samples should be taken of overflows whenever possible by the first responder. Whenever there is a possibility that an overflow may reach receiving waters, samples are taken to evaluate the potential impact on water quality. Samples should be drawn from the location(s) most likely to be impacted by the overflow and also from a location or locations that can be used to establish background water quality. Wastewater Collection Systems Section and Reuse and Compliance Section engineers determine the appropriate number and location of samples. The Microbiology Laboratory Supervisor at the Joint Water Pollution Control Plant (JWPCP) is contacted and

informed as to when the samples will be delivered to the laboratory, so that bacterial testing can begin immediately. Samples are taken by Engineering Technicians who have been trained in proper sampling techniques. The samples are analyzed for ammonia, total coliform, fecal coliform, *Escherichia coli* (if fecal coliform tests positive), *Enterococcus*, and other constituents that may be appropriate based on the nature of the receiving water and the spilled wastewater. The laboratory results are compared with background levels of the receiving waters. Because it takes approximately 24 hours for the bacterial analyses, a second round of sampling is conducted within 24 hours of the first unless full containment and recovery of the overflow can be confirmed. If sample results indicate elevated levels in receiving waters, sampling is continued until the results of two consecutive sets of bacteriological monitoring indicate a return to background levels. Detailed sampling procedures are described in the Sanitation Districts' *Procedures for Sampling and Internal Notification in Case of Sewage Overflows*.

5. Notification and Reporting

The Sanitation Districts are required to report wastewater overflows to various regulatory agencies, including the appropriate Regional Water Quality Control Board, the County Department of Health Services, and the State Office of Emergency Services. All overflows are reported to the State Water Resources Control Board using the California Integrated Water Quality System (CIWQS) as required by the Monitoring and Reporting Program for Order No. 2006-003, "Statewide General Waste Discharge Requirements for Sanitary Sewer Systems." The reporting requirements under this program vary according to location of the overflow and the amount of wastewater spilled. Sanitation District' document *Collection System Overflow Notification Procedures and Sewage Overflow Response Summary* guide staff for notification and reporting procedures for different categories of overflows. National Pollution Discharge Elimination System (NPDES) permits for water reclamation plants and wastewater treatment plants downstream of an SSO contain additional reporting requirements. The Sanitation Districts' Technical Services Department Reuse and Compliance Section assists in evaluation of reporting requirements and preparation of written reports.

6. Post-Cleanup Activities, Mitigation, and Spill Prevention

Once clean up of an overflow is complete, the incident must be reviewed and any appropriate measures to prevent recurrence must be implemented. Follow-up CCTV inspection is performed when an overflow was caused by a blockage to verify complete removal of the material causing the blockage. If the overflow was avoidable by preventative maintenance, then maintenance activities should be added or adjusted as necessary. An example is to increase the frequency of line cleaning where heavy grease build-up has caused an overflow to occur, while source control efforts are reviewed. If the overflow was caused by factors generally outside the Sanitation Districts' control, such as vandalism, steps are still taken to minimize recurrence such as strengthening security by locking down manhole covers, and increasing area surveillance, and requesting neighborhood assistance in reporting vandalism, as practical.

Regardless of the size or type of overflow, all overflows are investigated thoroughly. Following the investigation the Sanitation Districts documents and includes the following as part of the

Sanitation Districts' internal spill records:

- Time, date, duration, and events of the overflow
- Probable cause of the overflow
- Spill volume estimation as described in the Sanitation Districts' document *Sanitary Sewer Overflow Spill Volume Estimation*
- Discharge route and containment location map
- Clean up activities
- Pipe age, size, and material
- Measures to prevent recurrence

Policies and procedures are upgraded as appropriate to prevent recurrence of accidental spills due to procedural errors by Sanitation Districts' staff and contractors. Sanitation Districts' personnel administering contract sewer repair, rehabilitation and replacement projects are required to enforce contract provisions. Especially important is enforcing the Contractors' approved *Emergency Spill Response Plans*, which are intended to prevent and limit the impact of accidental spills, and the Contractors' *Bypass Pumping Plans*, which are required when contract work requires sewage to be bypass pumped. These plans include provisions for the following:

- Redundant piped-up bypass systems,
- Constant monitoring of water levels in pump suction or upstream manholes during bypass operations,
- Surcharge limitations during bypass operations,
- Sealing of storm drain catch basins, and
- On-site availability of vacuum trucks.

EMERGENCY RESPONSE PERSONNEL AND EQUIPMENT

The Sanitation Districts maintain resources to respond to emergencies, including power failure, mechanical and electrical equipment breakdown, sewer blockage, pipe failure, and vandalism. The urgency and seriousness of any wastewater overflow results in the full commitment and availability of all staff in the Wastewater Collection Systems Section to respond. Additional Sanitation Districts' personnel are utilized for specialized assistance as needed. Contractors with emergency response capabilities are also used to assist in emergencies as needed.

Personnel

An emergency contact list is maintained which includes the home phone number of all employees in the Wastewater Collection Systems Section. All supervisors and managers in the Wastewater Collection Systems Section are assigned cell phones and pagers and are accessible 24-hours a day, 7 days a week. The Wastewater Collection Systems Section is generally divided into two groups - Operations & Maintenance and Engineering. The Operations & Maintenance Group is further divided into subgroups – Sewer Maintenance, Pumping Plant Operation & Maintenance, Engineering Technicians, and Electrical and Instrumentation Technicians.

When needed, the Sanitation Districts' Field Engineering Section supervises emergency work performed by contractors. A list of pre-qualified emergency response contractors is maintained. Contractors can be retained to perform emergency repair work on a time and materials basis under the emergency authority granted the Chief Engineer and General Manager by the Sanitation Districts' Boards of Directors. This emergency authority is granted for each incident and is described in the document, *Resolution Delegating to Chief Engineer and General Manager Authority to Effectuate Repair of Deteriorated or Damaged Sewers*, which was adopted by the Sanitation Districts' various Boards of Directors in 1993 and amended by several of the Boards in 1995.

Emergency Equipment

In addition to the normal compliment of equipment utilized by the Sanitation Districts for maintenance and repair of the sewerage system, specific items are maintained for use during emergency conditions. Such equipment includes:

- Jet vactor to clear pipe blockages.
- Portable engine driven electrical generators for use at pumping plants during power outages.
- Vacuum tankers to transport flow around blockages or to remove wastewater from a containment location in a street or storm drain.
- Submersible pumps for use as emergency pumps to bypass wastewater around a pipe blockage or a malfunctioning pumping plant.
- Pre-filled sand bags, flat bed and boom trucks for use in establishing containment dams.
- Front loaders for emergency earth moving operations.
- Portable engine driven centrifugal pumps (trash pumps) to bypass wastewater around pipe blockages and remove wastewater from storm drain channel containment locations.
- Hoses and lightweight quick connecting piping in various sizes for use in bypass pumping.
- Pipe repair clamps, inflatable sewer plugs, and other miscellaneous pipe repair parts.
- Water trucks for use in clean up operations.
- Portable lights, air compressors, centrifugal blowers, and other miscellaneous equipment.

TRAINING

Training of Wastewater Collection Systems Section, Water Reclamation Plant Section, and Palmdale WRP personnel in the goals and procedures of this SSORP is accomplished in annual emergency response classroom training. Each training sessions requires staff to complete a checklist to record pertinent information regarding the various procedures completed during a spill response. On-the-job training is administered to subordinate staff, by experienced supervisors and lead workers, during and following actual overflow events to further reinforce the annual training and to analyze event specific issues. Lastly, appropriate staff is trained on collecting overflow water quality samples for clean-up and reporting purposes.

Attachment 6.2

SANITATION DISTRICTS OF LOS ANGELES COUNTY

SANITARY SEWER OVERFLOW SPILL VOLUME ESTIMATION PROCEDURES

This document outlines the three main methods used by the Sanitation Districts to estimate the volume of a sanitary sewer spills. Staff will prepare a spill volume estimate utilizing the most appropriate method or combination of methods with best information available for each sewer spill.

All sanitary sewer overflow spill volumes are estimated using the Sanitation Districts' *Spill Volume & Computation Form Package* included in these procedures. The package includes the most applicable forms, worksheets and spreadsheets to estimate spill rates and volumes. Staff should gather detailed information about the sanitary sewer overflow and choose one or more of estimation methods to best calculate the spill volume. Below is a brief description of each estimation method:

1) Visual Estimation: This method is used for smaller spills of short duration. Staff make their best estimate of how many containers (e.g. 1 gallon jugs, 5 gallon buckets, or 55 gallon drums) are required to capture the spill. The corresponding number of containers and respective volumes are summed up to calculate the spill volume.

2) Area-Volume Estimation: This method is used to estimate spill volumes for medium to large spills that have stopped and where wastewater has ponded. Staff use the included *Area-Volume Estimation* worksheet to sketch the spill area shape and measurements are confirmed using a measuring tape or wheel. Staff can then separate the larger area into smaller squares, rectangles, or triangles to more easily calculate area. The smaller areas are added up to provide the overall spill area. Staff also measure spill depth, which is then multiplied by the overall spill area, to calculate the spill volume.

3) Flowrate Estimation: This method is generally used for medium to large spills that have already flowed or are actively flowing from a sewer or manhole. Flow rate data can be acquired from multiple sources. The flowrate results are multiplied by the spill duration to obtain the total estimated spill volume. The following methods are used for estimating flowrate:

a. Flow Monitoring Data: The Sanitation Districts regularly monitor flow in its sewers. Staff look to see if recent flow data near a spill area is available to represent the flowrate from a spill event. If no recent flow data is available, staff may deploy monitoring equipment after a spill to more accurately estimate the flowrate.
b. Manhole Pick-hole and Manhole Ring Flowrate Estimation: Staff use pictures or field measurements to estimate the water height flowing out of the manhole pick-hole and gap between the manhole cover and ring. This data is then input into a spreadsheet titled *Flowrate from Manhole Pick-hole and Manhole Ring* to estimate the flowrate and spill volume using the spill start and end times. The spreadsheet uses hydraulic orifice equations to estimate the flows.
c. Street Gutter Flowrate Estimation: Staff measure and/or estimate the water depth, the flow path width, and the street slope. This information is then used to fill out the spreadsheet titled *Street Gutter Flowrate Estimate* to estimate the flowrate and then the spill volume using the spill start and end times. The spreadsheet uses a Manning's hydraulic equation to estimate the flows.
d. Manhole Flowrate Visual Estimation: Staff may sometimes estimate the flowrate coming from a manhole based on pictures or eyewitness accounts by referencing the *Manhole Flowrate Visual Estimation*. The guide shows pictures of a standard 24-inch manhole with a simulated spill rates using potable water. Staff compare pictures or spill descriptions to these pictures to better estimate spill flowrates.

General Information of SSO for Volume Estimations

Date Notified _____

Time Notified _____

Name of Sewer or Pumping Plant _____

_____

Manhole Number (if applicable) _____

_____

Estimated SSO Start Date _____ Time _____

Estimated SSO End Date _____ Time _____

Estimated Duration of spill (minutes) _____

Spill Description _____

_____

_____

_____

Circle/Highlight Impatcted Surface type

Asphalt Concrete Soil

Landscape Building Other: _____

Visual Estimation Worksheet

Use best judgement on how many containers will the capture the spill using the table below
*Fill out yellow filled cells and all other numbers will calculate

Container Type	Number of containers	Volume of Container (Gallon)	Estimated Volume
1 Gallon jug		1	0
5 Gallon Bucket		5	0
55 Gallon Drum		55	0
		Estimated Total Volume	**0** Gallons

Area - Volume Estimation Worksheet

Circle Surface Type

Asphalt Concrete Soil

Landscape Building Other: _____

1. Draw/Sketch outline of spill footprint
2. Draw as many squares/rectangles needed to cover entire spill area
3. Estimate percentage of spill each square/rectangle encompasses

For stain on concrete use depth of 0.0026'
For stain on asphalt use depth of 0.0013'

	Length (ft)		Width(ft)		Average Depth (ft)		% wet (in decimal)		Conversion from ft^3 to gallons	Estimated Volume
Area 1	_____	x	_____	x	_____	x	_____	x	7.48	_____
Area 2	_____	x	_____	x	_____	x	_____	x	7.48	_____
Area 3	_____	x	_____	x	_____	x	_____	x	7.48	_____
Area 4	_____	x	_____	x	_____	x	_____	x	7.48	_____
Area 5	_____	x	_____	x	_____	x	_____	x	7.48	_____
Area 6	_____	x	_____	x	_____	x	_____	x	7.48	_____
Area 7	_____	x	_____	x	_____	x	_____	x	7.48	_____

Estimated Total Volume [ ] Gallons

Flowrate from Manhole Pick-hole and Manhole Ring Worksheet

Spill flowrate and volume determination based on flow out pick-hole or opening		
Diameter of pick-hole or opening	1	inches (typically pick-hole is 1 inch)
Height of water out of pick-hole/opening		inches
Flowrate per pick-hole/opening (gpm)	0	gpm
# of pick-holes/openings	2	(typically have 2 pick-holes on manhole)
Total flowrate (gpm)	0	gpm
Duration of spill (minutes)		minutes
Total flow (gallons)	0	gallons
Calculations		
Area (A)	0.005451389	ft^2
Height in feet (h)	0	ft
Flowrate (Q) (cfs)	0	cfs
$Q = 0.639*A*(2*3.2*h)^{(1/2)}$		

Spill flowrate and volume determination based on flow from around the ring of a MH cover		
Diameter of MH	24	inches (our manhole covers typically are 24 inches or 36 inches
Gap between Frame and cover	0.0625	inches (Based on half of a 1/8" gap) (typically do not change this value)
Height of water around Cover		inches
Flowrate from ring/gap (gpm)	0	gpm
Total flowrate (gpm)	0	gpm
Duration of spill (minutes)		minutes
Total flow (gallons)	0	gallons
Calculations		
Gap Area Between MH Ring and Cover	0.032793511	ft^2
Flow Rate (Q) (cfs) ring/gap	0	cfs
Flow Rate (Q) (gpm) ring/gap	0	gpm
$Q = 0.639*A*(2*3.2*h)^{(1/2)}$		

ESTIMATED TOTAL VOLUME		
Total flow (gallons) (Pick-hole + Gap)	0	gallons

*Fill out yellow filled cells and all other numbers will calculate

Street Gutter Flowrate Worksheet

Spill flowrate and volume determination based on flow in gutter along curb		
Depth of flow at curb face (inches)		inches
Extension of flow into street/gutter (inches)		inches
Slope of gutter/street		
Flow rate (gpm)	#DIV/0!	gpm
Duration of spill (minutes)		minutes
Total flow (gallons)	#DIV/0!	gallons
Calculations		
Area of flow (bxh/2) (A)	0	ft^2
Parameter (b+h) (P)	0	ft (assume base length of triangle equals hypotenuse of cross section flow)
Hydraulic Radius (R = A/P)	#DIV/0!	ft^2
Slope (S)	0.00%	
Flowrate (Q) (cfs)	#DIV/0!	cfs
$Q = 1.49/0.014*A*R^{(2/3)}*S^{0.5}$		

*Fill out yellow filled cells and all other numbers will calculate

Manhole Flowrate Visual Estimation

1. Compare Picture of SSO Manhole with pictures below

*Sanitation Districts used potable water at set flow rates to pump through a 24" manhole and cover.
Notice that the top row are pictures of unsealed manholes and the bottom row are pictures of sealed manholes.

UNSEALED MANHOLES

10 GPM | 20 GPM | 50 GPM | 100 GPM | 150 GPM

SEALED MANHOLES

10 GPM | 20 GPM | 50 GPM | 100 GPM | 150 GPM

*The pictures are from DOC # 2932015 titled *WCS OVERFLOW ESTIMATION METHOD*

2. Estimate which picture best describes the spill. If the flow coming out of the manhole appears to be in between two of the pictures, use the pictures to determine a flow rate that is in between.

Estimated SSO Flow Rate: _____ GPM

Estimated Spill Duration: _____ Minutes

Estimated Total Spill Volume: _____ Gallons

Useful Conversions Sheet

inches	to	feet
1/8	=	0.01
1/4	=	0.02
3/8	=	0.03
1/2	=	0.04
5/8	=	0.05
3/4	=	0.06
7/8	=	0.07
1	=	0.08
2	=	0.17
3	=	0.25
4	=	0.33
5	=	0.42
6	=	0.50
7	=	0.58
8	=	0.67
9	=	0.75
10	=	0.83
11	=	0.92
12	=	1.00

1 ft^3 = 7.48 gallons

1 CFS = 449 GPM

1 ft = 12 inches

Wet Stain on a Concrete Surface - For a stain on concrete, use **0.0026'** (1/32"). For a stain on asphalt use **0.0013'** (1/64"). These were determined to be a reasonable depth to use on the respective surfaces through a process of trial and error. A known amount of water (one gallon) was poured onto both asphalt and concrete surfaces. Once the Area was determined as accurately as possible, different depths were used to determine the volume of the wetted footprint until the formula produced a result that (closely) matched the one gallon spilled. 1/32" was the most consistently accurate depth on concrete and 1/64" for asphalt. This process was repeated several times.