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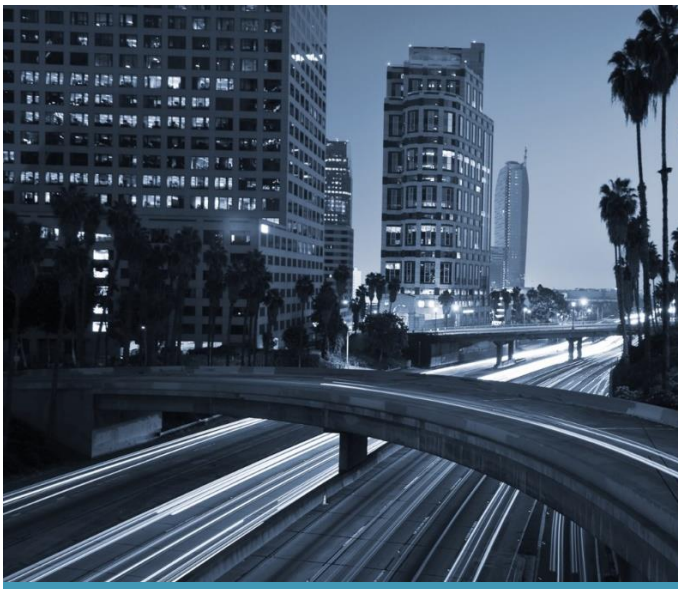

Sewer System Management Plan

Version 3.0

City of Los Angeles

LA Sanitation & Environment

Los Angeles, California
January 25, 2019

Revision Log

Date Approved	Version	Change Summary	Authorized By
	3.0		

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Figures

Attachments

The following documents are available on the internet at www.lacitysan.org/ssmp.

ID	Title	Owner	SSMP Element
A1	Documentation of Board of Public Works (Governing Board) Approval	WESD	Element 1 – Goal and Overview
A2	State Water Resource Control Board, Statewide General Waste Discharge Requirements for Sanitary Sewer Systems	WESD	Element 1 – Goal and Overview
A3	List of Satellite Agencies	FMD	Element 1 – Goal and Overview
B1	Directory of Positions Responsible for Collection System Management	WESD	Element 2 - Organization
B2	SSMP Program Implementation Organization Chart	WESD	Element 2 - Organization
C1	Rules and Regulations Governing Disposal of Industrial Wastewater into the Publicly Owned Treatment Works of the City of Los Angeles	IWMD	Element 3 – Legal Authority
D1	Wastewater Capital Improvement Program (latest version)	FMD	Element 4 – O&M Program; Element 8 – System Evaluation and Capacity Assurance Plan
D2	Capital Improvement Program (CIP) Project Prioritization Criteria Definitions	FMD	Element 4 – O&M Program; Element 8 – System Evaluation and Capacity Assurance Plan
F1	Response and Reporting Procedures for SSOs and Sewer or Stormwater Contamination	CWNCD & CWSCD	Element 6 – Overflow Emergency Response Plan
G1	Referral and Enforcement Response Procedures for FOG Discharges Resulting in a Sanitary Sewer Overflow	IWMD	Element 7 – FOG Control Program
G2	Standard Operating Procedures for FOG Inspections in Industrial Facilities	IWMD	Element 7 – FOG Control Program
G3	Enforcement Response Plan and Enforcement Response Guide	IWMD	Element 7 – FOG Control Program

Acronyms

Acronym	Definition
BCE	Business Case Evaluation
BMPs	Best Management Practices
BOD	Biological Oxygen Demand
CCTV	Closed-Circuit Television
CEQA	California Environmental Quality Act
City	City of Los Angeles
CS	Collection system
CIWQS	California Integrated Water Quality System Project
CWNCD	Clean Water North Collection Division
CWSCD	Clean Water South Collection Division
d/D	The ratio of the depth of flow (d) in a sewer pipe to the diameter (D) of the pipe
DPW	Department of Public Works
EMPAC	Enterprise Maintenance Planning and Control
ERP	Enforcement Response Plan
FAST	Field Automation Sanitation Trucks
FMD	Financial Management Division
FOG	Fats, Oils, and Grease
FSE	Food Service Establishment
FY	City of Los Angeles's Fiscal Year (July 1 through June 30)
GIS	Geographic Information System
GPD	Gallons per day
IWMD	Industrial Waste Management Division
LABOE	Los Angeles Bureau of Engineering
LABCA	Los Angeles Bureau of Contract Administration
LASAN	Los Angeles Sanitation & Environment
MIKE URBAN	A GIS-based hydrodynamic modeling software
MWS	Municipal Water District
NEIS	Northeast Interceptor Sewer
NEPA	National Environmental Policy Act
NOV	Notice of Violation
PDWF	Peak Dry Weather Flow

Acronym	Definition
PIMS	FOG Permitting Information Management System
SIIP	Stormwater Inflow and Infiltration Prevention
SMD	Sewer Maintenance District
SPT	Strategic Planning Team
SSMP	Sewer System Management Plan
SSO	Sanitary Sewer Overflow
SWRCB	State Water Resources Control Board
WCIP	Wastewater Capital Improvement Program
WDID	Waste Discharger Identification
WESD	Wastewater Engineering Services Division
WDRs	Statewide General Waste Discharge Requirements for Sanitary Sewer Systems (Order No. 2006-0003)

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1 Goal and Overview

The City of Los Angeles LA Sanitation & Environment (LASAN) has prepared this Sewer System Management Plan (SSMP) for the City's three collection systems: Hyperion System, Terminal Island System, and Los Angeles Regional System (Harbor Gateway). LASAN prepared this SSMP pursuant to the State Water Resources Control Board (SWRCB) May 2, 2006, Waste Discharge Requirements (WDRs) and amendments thereto, and the Board of Public Works approved it at a public hearing in February 2019.

The Board of Public Works had previously approved the original SSMP in February 2009 and a five-year update in February 2014, as required by the WDRs. This SSMP represents the City's succeeding five-year update. **Attachment A1** includes documentation of approval by the Board of Public Works. **Attachment A2** includes SWRCB WDRs.

Pursuant to the WDRs, the City conducts a biennial audit of its SSMP and updates the SSMP as appropriate. This SSMP was prepared upon completion of the most recent SSMP Program Audit dated January 25, 2019.

By agreements, the City accepts, conveys, and treats wastewater from 29 municipal satellite agencies. Because the City does not own, operate, fund, or control the collection systems of these communities and they are not included under the NPDES permit conditions of the City's treatment facilities, it is assumed that these satellite agencies will be required to apply for permit coverage under the WDRs and develop and implement their own SSMPs.

A pdf copy of this SSMP is available on the internet at:

https://www.lacitysan.org/ssmp

1.1 Goal

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

The long-standing City policy as affirmed by the City Council on December 7, 1956, provides the basis for and guides the actions of operating departments and bureaus in protecting the waters of the City and the region.

> *"It is the policy of the City of Los Angeles to provide and maintain facilities for the treatment and disposal of sewage which shall be, at all times, adequate in capacity and adequate for protection of the public health and public interest in this and neighboring communities including maintenance of the beaches and coastal waters in an attractive condition suitable for recreational and other beneficial uses*

equal to or better than the conditions specified by the State agencies having control over the subject water."

Further, the Mayor's strategic plan for the City has established the following goals that either directly or indirectly relate to collection system operations:

Executive Directive 5 - Emergency Drought Response: LASAN's infrastructure planning process includes the assessment and prioritization of major capital renewal projects for our sewer system, as well as planning for potential disasters by updating our preparedness plans to consider our power supply at critical locations.

Executive Directive 7 – Sustainable City Plan: The Plan includes a goal for reducing the number of annual sewer spills to fewer than 125 by 2017, 100 by 2025 and 67 by 2035. It also includes goals for water conservation that may impact sewer operations.

Consistent with the City policy and its mission to protect public health and the environment, the LASAN has adopted and is dedicated to achieving the following broad objectives:

- *Repair, rehabilitate, replace, and upgrade system components as/when needed;*
- *Provide sufficient sewage capacity to accommodate current and projected flows;*
- *Eliminate all preventable dry-weather overflows;*
- *Eliminate wet-weather overflows from all storm events less severe than or equal to 10-year design storm;*
- *Maintain an effective SSO response plan to mitigate any SSOs that do occur in a timely manner;*
- *Control corrosion and minimize odor releases; and*
- *Provide operational reliability and flexibility.*

These objectives correspond with the State General Waste Discharge Requirements (WDRs) provisions which require Enrollees to maintain all parts of the system, provide adequate capacity to minimize sewer overflows, and maintain a plan to respond to and mitigate overflows when they do occur.

By tying into broader City goals, LASAN's objectives create line-of-sight within the organization. The collection system operating plans and metrics are developed in line with these objectives.

Organizational line-of-sight is described in *Element 9 Monitoring, Measurement and Program Modifications*.

Figure 1-1: Organizational Line-of-Sight

This SSMP documents how the City's collection system practices are integrated toward the achievement of the City and LASAN objectives.

1.2 System Overview

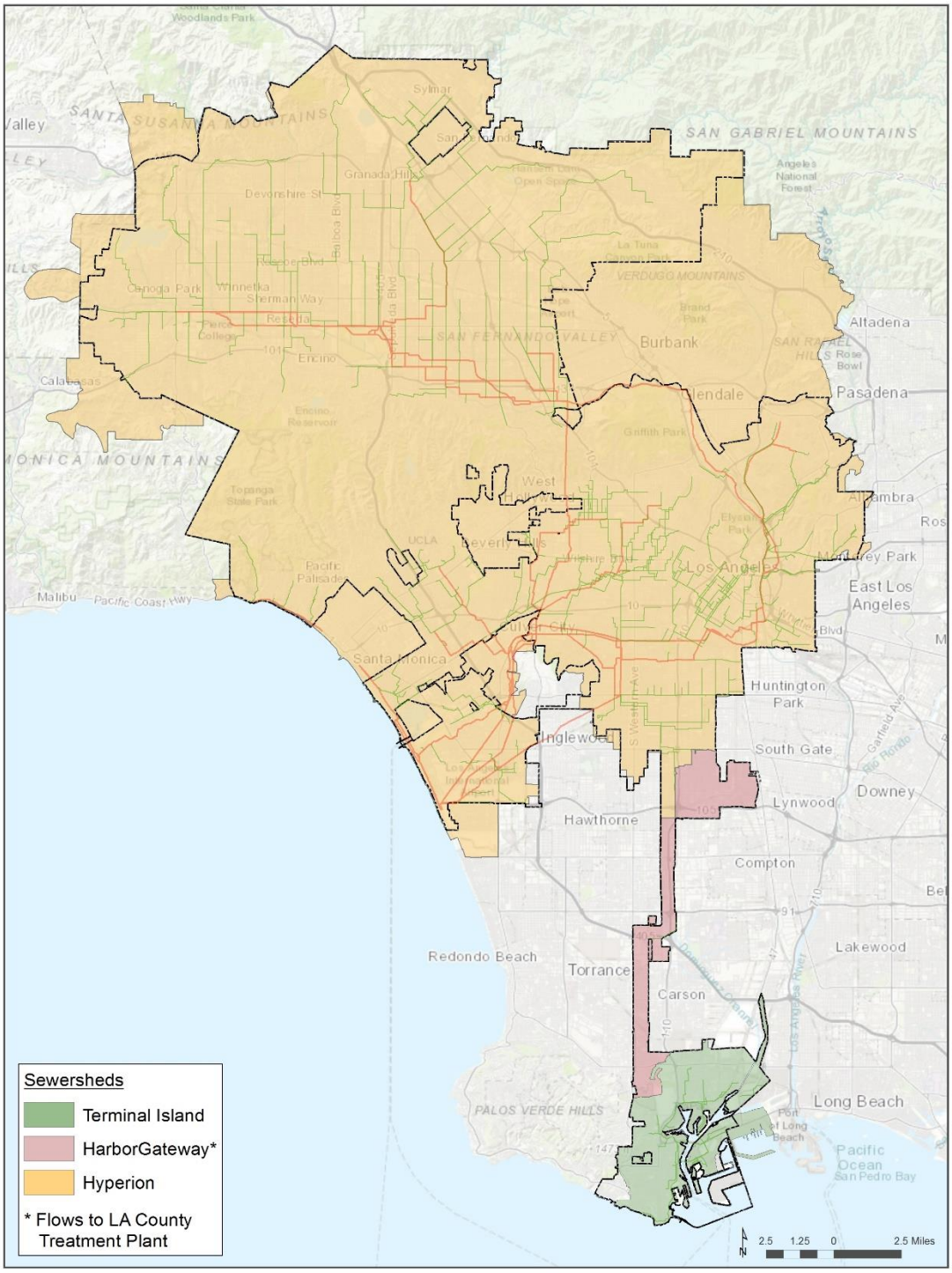
The three collection systems owned and operated by the City of Los Angeles convey wastewater via approximately 6,439 miles of gravity mains, 33 miles of force mains, and 46 pumping plants. Currently, an average wastewater flow rate of approximately 272 million gallons per day (MGD) is generated in the System. The three collection systems also convey the flows of 29 satellite agencies to plants for treatment. **Table 1-1** provides a summary of the collection system assets for each collection system. **Figure 1-2** shows the geographic area of each collection system. This SSMP applies to all three collection systems operated and owned by the City of Los Angeles. All three systems are operated in the same manner, using the same plans, equipment, protocols and operating organization. **Attachment A3** lists the satellite agencies for which LASAN conveys flows.

Table 1-1: Summary of Collection System Assets

Collection System	CIWQS WDID[1]	Gravity Mains (miles)	Force Mains (miles)	Wastewater Conveyed (MGD)	Treatment Facility
Hyperion	4SSO10450	6,043	20	260	Hyperion
Terminal Island	4SSO10491	295	12	12	Terminal Island
Regional	4SSO10502	101	1	0.26	County Sanitation Districts' Joint Water Pollution Control Plant
Unified System		6,439	33	~272	

[1] CIWQS WDID is the Waste Discharger Identification Number assigned to each of the City's collection systems in the SWRCB California Integrated Water Quality System (CIWQS) database.

Figure 1-2: City of Los Angeles Collection Systems



1.2.1 Summary of Operating Requirements

Table 1-2 summarizes the WDRs and associated monitoring and reporting requirements under which the collection systems operate that are addressed by this SSMP[2]. All agencies that own and operate collection systems greater than one mile in length must comply with these requirements.

Table 1-2: Summary of WDRs and Monitoring and Reporting Program Requirements

Requirement	Description	Applies to
D.3-5, 7	SSO prevention, response, and control	Element 4, Operation and Maintenance Program; Element 6, Overflow Emergency Response Plan; Element 7, FOG Control Program; Element 8, System Evaluation and Capacity Assurance Plan
D.8-9	System operations and maintenance, adequate resource allocation, appropriate training, knowledge, and abilities	Element 4, Operation and Maintenance Program
D.10	Adequate capacity for base, peak, and wet weather flows	Element 8, System Evaluation and Capacity Assurance Plan
D.11, 13-14	SSMP requirement, content, update and certification	All Elements of SSMP
D.12	Use of qualified professionals for engineering and geological evaluations and judgments	Element 5, Design and Performance Provisions
Monitoring and Reporting Requirements	SSO reporting and notification; water quality monitoring; change log	Element 6, Overflow Emergency Response Plan; Water Quality Monitoring Plan; SSMP Revision Log

1.3 SSMP Overview

This SSMP is in full compliance with the WDRs and meets the following objectives:

a) Properly fund, manage, operate and maintain, with adequately trained staffs and/or contractors possessing adequate knowledge, skills, and abilities as demonstrated through a validated certification program at all times, all parts of the collection system owned and/or operated by the discharger.

[2] Summarized from the *SWRCB Order No. 2006-0003-DWQ Statewide General Waste Discharge Requirements for Sanitary Sewer Systems*, Section D "Provisions".https://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2006/wqo/wqo2006_0003.pdf

b) Provide adequate capacity to convey base flows and peak flows, including flows during wet weather events, to the minimum design criteria as defined in the discharger's System Evaluation and Capacity Assurance Plan (a required component of the SSMP), for all parts of the collection system owned and/or operated by the discharger.

c) Take all feasible steps to stop and mitigate the impact of SSOs in the collection system owned and/or operated by the discharger.

The City achieves the above objectives by implementing a comprehensive sewer infrastructure asset management program that is documented in the following 11 SSMP elements:

1. Goal
2. Organization
3. Legal Authority
4. Operation and Maintenance Program
5. Design and Performance Provisions
6. Overflow Emergency Response Plan
7. FOG Control Program
8. System Evaluation and Capacity Assurance Plan
9. Monitoring, Measurement, and Program Modifications
10. SSMP Program Audits
11. Communication Program

This SSMP integrates documentation of numerous collection system management programs into one formal document. These programs are described in greater detail in a variety of documents, which are referenced in this SSMP when appropriate.

References for Further Information

- *City Charter, City of Los Angeles, City Council Resolution of December 7, 1956*
- *LASAN's Strategic Plan, latest version*

2 Organization

2.1 Overview

The City is governed by the Mayor, who serves as the City's chief executive, and 15 full-time Council Members. The Mayor and the City Council authorize the necessary funding for the collection system.

The Board of Public Works, a full-time Board, whose members are appointed by the Mayor and confirmed by the City Council, serves as the "governing body" for the Department of Public Works and the City's three collection systems. The collection systems are organized and managed under the Department's Clean Water Program. The Department of Public Works reports directly to the Mayor.

The Department of Public Works has five bureaus, three of which participate in the various functions of collection system management: the bureaus of Sanitation, Engineering, and Contract Administration. LASAN is responsible for advance planning, financial management, and operation and maintenance of the collection system. The City of Los Angeles Bureau of Engineering (LABOE) is responsible for capital improvement project design; bid and award; construction management; facility start-up and optimization; issuance of permits for lower private laterals which run in public right-of-way; and develops standards and specifications for the collection system. The City of Los Angeles Bureau of Contract Administration (LABCA) provides inspection for construction contracts for work done in public right-of-way and enforces contract and permit compliance.

2.2 Authorized Representative

The City has designated a primary Legally Responsible Official (LRO) pursuant to Section J., REPORT DECLARATION, of the State General Waste Discharge Requirements (Order No. 2006-0003). The City has also designated secondary LROs as a backup in the event the primary LRO is on leave or unavailable. Below is the contact information for the LROs.

Primary LRO

Mr. Efrain Gonzalez, Division Manager

Clean Water South Collection Division (CWSCD)

2714 Media Center Drive

Los Angeles, CA 90065

(323) 342-6002

Efrain.Gonzalez@lacity.org

Secondary LROs

Mr. Brian McCormick, Sanitation Wastewater Manager II

Clean Water South Collection Division (CWSCD)

2714 Media Center Drive

Los Angeles, CA 90065

(323) 342-1577

Brian.McCormick@lacity.org

Mr. Paul E. Blasman, Sanitation Wastewater Manager II

Clean Water North Collection Division (CWNCD)

2714 Media Center Drive

Los Angeles, CA 90065

(323) 342-6040

paul.blasman@lacity.org

2.3 Positions Responsible for Specific Measures of the SSMP

2.3.1 Positions Responsible

A list of responsible positions is provided in **Table 2-1**. They may be reached by dialing the toll free number 311, or (213) 485-2121 if calling from outside the Los Angeles areas. The operator will transfer the call to the intended office. Additionally, **Attachment B1** contains the names currently filling each position, and telephone number.

Table 2-1 Positions Responsible for SSMP

Org. Unit	Position	Responsibilities
LASAN Executive Management	LASAN Director Chief Financial Officer Assistant Director, One Water Assistant Director, Technical Services	• Final oversight of all programs • Leadership of strategic plan, goals

Org. Unit	Position	Responsibilities
LASAN, Clean Water North Collection Division	Division Manager (LRO) Sanitation Wastewater Manager II Sanitation Wastewater Manager II	• Operation and Maintenance Programs • Overflow Emergency Response • Monitoring, Measurement and Program Modifications for O&M
LASAN, Clean Water South Collection Division	Division Manager (LRO) Sanitation Wastewater Manager II (LRO) Sanitation Wastewater Manager II	• Operation and Maintenance Programs • Overflow Emergency Response • Monitoring, Measurement and Program Modifications for O&M
LASAN, Wastewater Engineering Services Division	Division Manager Senior Engineer, Water Resources Planning Senior Engineer, Collection System Planning Senior Engineer, Regulatory Compliance Environmental Engineer, SSMP Audits and Updates	• System Evaluation and Capacity Assurance Plan • Monitoring, Measurement and Program Modifications for Capital Improvements • GIS and Mapping • Communication Program
LASAN, Industrial Waste Management Division	Division Manager Senior Engineer, Industrial Waste Pretreatment Program Senior Engineer, FOG Engineering Chief Environmental Compliance Inspector, Industrial Users Chief Environmental Compliance Inspector, FOG	• FOG (FOG) Control Program: permitting, outreach, and inspection • Implementation of Legal Authority
LASAN, Financial Management Division	Division Manager Senior Engineer, WCIP Senior Management Analyst, Financial Services	• Budget and Financial Support for Capital Improvement and O&M Programs • Sewer Charge Administration • Contracts with Satellite Agencies

Org. Unit	Position	Responsibilities
LASAN, Information and Controls System Division	Division Manager	• Administration and support of information management systems.
LABOE Executive Management	City Engineer Deputy City Engineer, Clean Water Infrastructure Program Deputy City Engineer, Development Services and Permits Program	• Design and Performance Provisions
LABOE, Wastewater Conveyance Engineering Division	Division Engineer	• Sewer Rehab/Replacement Planning, Design, Bid & Award
LABOE, Wastewater Conveyance Construction Division	Division Engineer	• Sewer Rehab/Replacement Construction Management
LABOE, Land Development and GIS Division	Division Engineer Senior Engineer, Permits Senior Engineer, GIS Section GIS Supervisor, NavigateLA	• Development review • Utility connection permitting and review • GIS and NavigateLA
LABCA Executive Management	Director Assistant Director Division Chief, Wastewater Construction	• Contract compliance
Department of Building and Safety	General Manager	• Uniform Plumbing Code enforcement • Los Angeles Municipal Code Sewer Ordinance enforcement for work on private properties

2.3.2 Lines of Authority

Attachment B2 includes an SSMP Program Implementation organization chart showing the lines of authority for the positions responsible for the management of the collection system and implementation of the SSMP. Due to the size of the service area and the complexities of its operations, LASAN recently divided operational management responsibilities of the City's collection system into two branches with equal authority and responsibility, the Clean Water North Collection Division (CWNCD) and Clean Water South Collection Division (CWSCD). **Table 2-2** describes how this change is reflected in the organization.

Table 2-2 Matrix of Responsibility for Collection System Operations

	Clean Water North Collection Division (CWNCD)	Clean Water South Collection Division (CWSCD)
Division Manager	Barry Berggren	Efrain Gonzalez
LRO and Back-up	Barry Berggren, Efrain Gonzalez, Brian McCormick	Barry Berggren, Efrain Gonzalez, Brian McCormick
Secondary Sanitary System	Reseda North Hollywood Watershed North	West LA South LA Hollywood Watershed South Central LA
After-hours and emergency response	Reseda Citywide Emergency Response	West LA South LA Watershed South
Other	Primary Sewers Prop O/Green Infrastructure Engineering Support	Pumping Plants Facilities Maintenance Odor Control

2.4 SSO Reporting Chain of Communication

Both CWNCD and CWSCD follow procedures that provide for effective notification of each Category of SSOs through a clear and step-by-step method, as described further in *Element 6 Overflow Emergency Response Plan* and the associated *Response and Reporting Procedures for Sanitary Sewer Overflows and Sewer or Stormwater Contamination*. The policies and procedures for SSO reporting are reviewed and updated at appropriate intervals to ensure that they remain current and in full compliance with all regulatory and legal requirements. These reporting procedures are described in Element 6: Overflow Emergency Response Plan and included in **Attachment F1**.

References for Further Information

- *Sanitary Sewer Overflow Response and Reporting Procedures, latest version*

3 Legal Authority

3.1 Overview

The California State Constitution provides in Article 11, Section 7 that “A county or city may make and enforce within its limits all local, police, sanitary, and other ordinances and regulations not in conflict with general laws.” The City of Los Angeles Charter, Section 101 specifies the Powers of the City. It states that “The City of Los Angeles shall have all powers possible for a Charter City to have under the constitution and laws of this state as fully and completely as though they were specifically enumerated in the Charter, subject only to the limitations contained in the Charter.”

The Los Angeles Charter and Administrative Code, Article V, Sec. 580 (a) gives the Department of Public Works the powers and duties to design, construct, excavate and maintain streets and public works improvements including but not limited to bridges, public parkways and rights-of-way, sanitary sewers and storm drains, water and sewer treatment facilities, landfills and public rights-of-way lighting facilities owned by the City.

More specifically, the City possesses the necessary legal authority to meet the WDRs through the City of Los Angeles Municipal Code (LAMC) and the City of Los Angeles Board of Public Works Rules and Regulations. **Table 3-1** summarizes these authorities and relates them to elements of the SSMP that are impacted or utilize these authorities. Specific legal authorities are described in more detail in the elements that follow.

Table 3-1: Legal Authorities Summary

Requirement	Reference in Municipal Code	Reference in Rules and Regulations	Related SSMP Element
PREVENT ILLICIT DISCHARGES			
Prevent illicit discharges into the wastewater collection system	Sec 64.25; Sec 64.30.B Sec. 64.30.C.1.(a) Sec. 64.30.C.1.(b) Sec. 64.30.C.1.(l).(4)	Sec. 3	N/A
Limit the discharge of FOG and other debris that may cause blockages	Sec 64.30.B.1.(a).(3); Sec 64.30.B.2.(a) Sec. 64.30.C.1.(a) Sec. 64.30.C.1.(b) Sec. 64.30.C.1.(l).(4)	Sec. 11.A Sec. 11.B	7. FOG Control Program
Control infiltration and inflow (I/I) from private service laterals	Sec 64.25; Sec 64.30.B.1.(12) Sec. 64.30.C.1.(l).(4) Section 1101.2 (Los Angeles City Plumbing Code)	Sec. 3	8. System Evaluation and Capacity Assurance Plan
PROPER DESIGN AND CONSTRUCTION			
Require that sewers and connection be properly designed and constructed	Sec. 64.11; Sec. 64.11.1 Sec. 64.12 Sec. 64.17		5. Design and Performance Provisions
ACCESS TO LATERALS			
Ensure access for maintenance, inspection, or repairs for portions of the service lateral owned or maintained by the Agency	The City does not own or maintain any portion of the lateral.		4. Operation and Maintenance Program
FOG SOURCE CONTROL			
Requirements to install grease removal devices (such as traps or interceptors)	Sec. 64.30.C.1.(d).(11) Sec. 64.30.C.1.(l).(2)		7. FOG Control Program
Design standards for the grease removal devices	Sec. 64.30.C.1.(l).(4)	Sec. 11.F	7. FOG Control Program 5. Design and Performance Provisions
Maintenance requirements, BMP requirements, record keeping and reporting requirements for grease removal devices	Sec. 64.30.C.1.(l).(4)	Sec. 11.B Sec. 11.F Sec. 11.H	7. FOG Control Program
Authority to inspect grease producing facilities	Sec. 64.30.C.1.(b).(21)		7. FOG Control Program
ENFORCEMENT			
Enforce any violations of its sewer ordinances	Sec. 64.30.C.2 Sec 64.30.C.5.(c) Sec 64.30.E		7. FOG Control Program 5. Design and Performance Provisions

3.1.1 Authority to Prevent Illicit Industrial Waste Discharges into the Collection System

The City implements the industrial waste pretreatment requirements set forth in the United States Environmental Protection Agency's Standard Pretreatment

Implementation Requirements for Municipal NPDES Permits (40 CFR Section 403.8) in the manner specified in the LAMC, Section 64.30, as more specifically described herein. The pretreatment standards are applied to individual industrial users through Industrial Wastewater Permits issued to the users, which specify the limits at which an industrial user may discharge to the public system for things like Biological Oxygen Demand (BOD) and FOG, which are prohibited.

The LAMC Section 64.30 provides the legal authority to implement provisions specified under Part 40 CFR Section 403.8(f)(1), which provides the basis for each procedure under 40 CFR Section 403.8(f)(2), as follows:

> *"General Provisions - The City, pursuant to LAMC Section 64.30, commonly referred to as the Industrial Waste Control Ordinance (Ordinance) regulates industrial wastewater discharges into the Publicly Owned Treatment Works (POTW). Section 64.30 (A)(2) sets forth the objectives of the Ordinance. The objectives are met through a permit and inspection program administered under the jurisdiction of the Board of Public Works (Board) to ensure City compliance with all applicable State and Federal laws. The Director of the Bureau of Sanitation (Director) under the jurisdiction of the Board is given the authority to administer, implement and enforce the provisions of the Ordinance. The Ordinance gives the Board and the Director the power, jurisdiction, and supervision over places of discharge of wastewater into the POTW, necessary to adequately enforce and administer all applicable State and Federal laws. Section 64.30(A)(3) of the Ordinance states "This section shall apply to all dischargers within the City of Los Angeles and to all persons outside the City of Los Angeles who discharge to the City's POTW except as otherwise provided herein, the Director of the LASAN under the jurisdiction of the Board of Public Works shall administer, implement and enforce the provisions of this section."*

The City's Industrial Wastewater Permit is the control mechanism employed in applying pretreatment standards to industrial users: Section 64.30(A)(3) of the LAMC provides for the regulation of dischargers to the Publicly Owned Treatment Works (POTW) through the issuance of Industrial Wastewater Permits containing specific discharge requirements and through enforcement of general discharge prohibitions. It also authorizes monitoring and enforcement activities, imposes reporting requirements on specific permittees, and sets fees for the recovery of program costs.

An Industrial Wastewater Permit must be issued before any entity may discharge into the POTW. The LAMC Section 64.30 (C)(1)(a) states "No person shall discharge industrial wastewater to the POTW without permission as provided in an Industrial Wastewater Permit. The permit shall not be issued until determination has been made by the City's Board of Public Works that the wastewater to be discharged shall not violate any provisions of this Code, the Board's Rules and Regulations, the water quality objectives for receiving waters established by the California Water Quality Control Board, Los Angeles Region,

or any applicable federal or state statutes, rules or regulations. Such determination shall be made from the information set forth in the application for permit." Sect 64.30(B) specifies the conditions and prohibitions placed on Industrial Wastewater Permits. Industrial Wastewater Permits may deny or condition new or increased contribution of pollutants, or changes in the nature of pollutants to the POTW by industrial users where such conditions do not meet applicable pretreatment standards and requirements or where such conditions would cause the POTW to violate its NPDES Permit.

The LAMC Section 64.30(B)(3) specifies conditions on the Industrial Wastewater Permits that require compliance with applicable pretreatment standards and requirements by industrial users. Industrial Wastewater Permits incorporate pretreatment standard limitations based on such standards and requirements. It provides that upon the promulgation of mandatory National Categorical Pretreatment Standards (NCPS) for any industrial category, the NCPS, if more restrictive than limitations otherwise imposed under the Ordinance, shall apply, and that a discharger shall comply with applicable NCPS as set forth in 40 CFR Part 401 et seq. Section 64.30(C)(1) includes a statement which states that the granting of the permit shall not relieve the discharger from the responsibility for compliance with all provisions of the Ordinance. All other general pretreatment standards and prohibitions and local limits developed to implement the general and specific standards are included as permit conditions.

3.1.2 Discharges from Tributary/Satellite Agencies

There are twenty-nine contributing jurisdictions (8 cities and 21 agencies) that discharge wastewater into the City's POTW. The City has sewage disposal contracts with all contributing jurisdictions including the Cities of Beverly Hills, Burbank, Culver City, El Segundo, Glendale, La Canada Flintridge, San Fernando, and Santa Monica. The sewage disposal contract requires the contract cities to ensure compliance with federal, state and local regulations, including pretreatment regulations. Section VI.B.1 makes regulatory liability a cost of the Amalgamated System and therefore proportionally chargeable to the City of Los Angeles and the contract cities and agencies, if this liability results from the construction or operation of the Amalgamated System (treatment plants and large trunk sewers). This liability may be related to industrial waste enforcement inside the contract cities and agencies. The sewage disposal contract allows the City to enter an agency's or contract city's jurisdiction if: (1) the federal or state government require the City of Los Angeles to establish a program, prepare a study, or undertake some other action, and (2) the action would require Los Angeles to enter the agency's or contract city's jurisdiction, and (3) the agency or contract city fails to take action that results in liability that is payable from the Amalgamated System (which means that the liability must also result from the City's operation of the Amalgamated System).

Contract cities and agencies will pay any fines resulting from their failure to comply with state or federal requirements. The term of an agency's or city's

agreement will revert to a month-to-month relationship eventually leading to removing its wastewater from the City of Los Angeles' system if the agency is in default for more than 90 days. The sewage disposal contract also allows the City to sue for specific performance if a contracting city or agency defaults or breaches the agreement.

3.1.3 Prevention of Illicit Discharge and Infiltration/Inflow

The LAMC prohibits connections of storm drains, downspouts, area drains, storm sewer connections and other sources that could contribute infiltration and/or inflow to the public system, either directly or through lateral connections. The ordinances also provide for the inspection of new and rehabilitated private sewer laterals and mainline sewers to ensure that installation meets the City's performance standards and prevent infiltration. The ordinances also provide for enforcement actions for noncompliance.

Plumbing on private properties is under the jurisdiction of the Department of Building and Safety. The LAMC and Section 1101.2 of the Los Angeles City Plumbing Code prohibit the connection of storm water or surface water drains to sanitary sewers.

In an effort to achieve better compliance with this requirement, on June 12, 2001, the City Council approved a motion, Council File 01-1055, authorizing the Department of Building & Safety and LASAN to bring properties into compliance. Sanitation and Building & Safety jointly implemented measures to detect and eliminate sources of infiltration and inflow through a program titled Sewer Infiltration and Inflow Prevention (SIIP) Program. The program was designed to reduce the impacts from unauthorized discharges from roof drains, area drains, parking lot drains, and downspouts. An estimated average extraneous flow of 8 million gallons per day was eliminated from the system during the duration of the SIIP Program. Since the program formally ended, no significant increases in infiltration and inflow have been observed.

Currently in the Hyperion Collection System, dry weather urban runoff is diverted from storm drains into the City sewers and conveyed to the Hyperion Treatment Plant for treatment. This is to protect groundwater, inland surface water, bays, estuaries, and the ocean from pollutants present in urban runoff that could reach these waters. The Hyperion Treatment Plant's current National Pollutants Discharge Elimination System (NPDES) Permit provides for this diversion. Originally, dry weather urban runoff diversion was only during the period of April 1 to October 31. However, since 2009, dry weather urban runoff has been diverted year-round to conform to the compliance schedule for bacteria concentrations contained in the Santa Monica Bay Beach Dry-Weather Bacteria Total Maximum Daily Load (TMDL) regulation (Resolution No. 02-004 and Resolution No. 2002-022, adopted by the Los Angeles Regional Water Quality Control Board). There is no dry weather runoff diversion to the Donald C. Tillman, the Los Angeles-Glendale, or the Terminal Island Water Reclamation Plants There is no wet weather flow diversion to any plants.

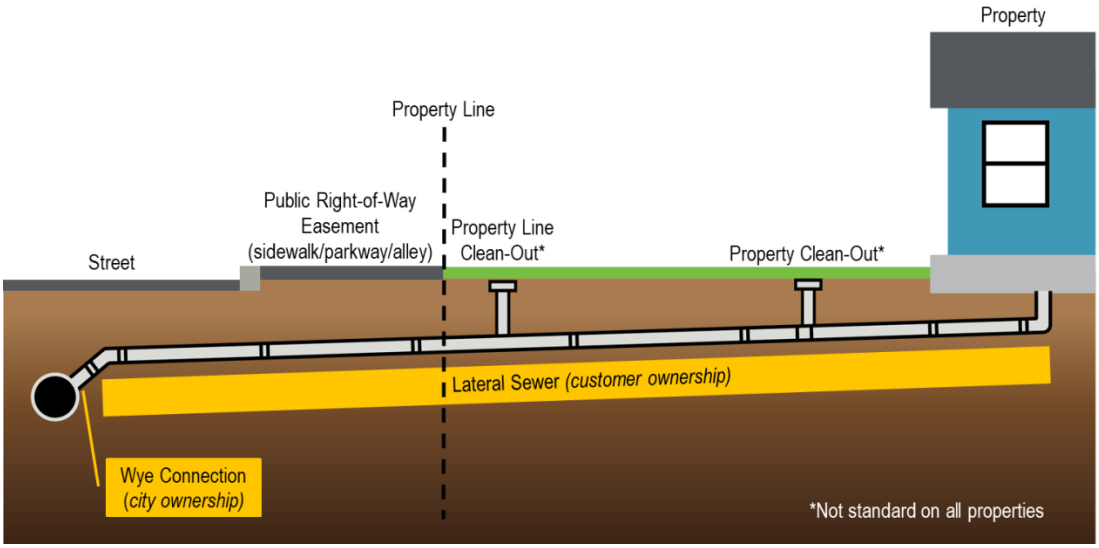
3.2 Authority to Require Proper Design and Construction of Sewers

LAMC Chapter VI, Article 4 – Sewers, Watercourses, and Drains (Section 64.00) codifies the City's policy for the design and construction of sewers and connections. The LAMC requires that all sewers constructed in the City comply with LABOE's standard plans, specifications, policies and practices. These standards are continuously updated to incorporate new materials and construction methods to ensure that the completed installations meet construction and performance standards. Service connections must be designed and constructed to meet the Los Angeles City Plumbing Code. The Department of Public Works' LABCA enforces construction and performance standards for projects in the public right-of way. *Element 5 Design and Performance Provisions* provides more detail on the City's standards and specifications.

3.3 Authority to Ensure Access to Publicly Owned Portion of Lateral

The City does not own or maintain private lateral sewer lines which are the pipes that connect buildings to public mainline. Property owners are responsible for proper installation, operation, and maintenance of laterals, including laterals on the City-owned easement. The City owns the wye structure which connects the lateral to the mainline. Property owners are required to obtain permits from the Department of Building & Safety for work on private properties and the Department of Public Works for work in the public right-of-way.

Figure 3-1 Schematic of City- vs. Privately-Owned Sewer Components



3.4 Authority to Limit the Discharge of FOG and other Debris

LAMC Section 64.30.B.1(a) states “Except as expressly allowed in an Industrial Wastewater Permit, no person shall discharge, permit the discharge, cause the discharge or contribute to the discharge of the following to the publicly owned treatment works (POTW): Any solid or viscous materials which could cause obstruction to the flow or operation of the POTW, and any material which will cause the POTW to violate its NPDES Permit, applicable Federal and State statutes, rules or regulations.” The Ordinance requires the installation of a grease interceptor at all FSE that are to be newly constructed that have the potential to generate waste FOG (FOG) and any remodels of existing FSEs valued at $100,000 or more. A grease interceptor is a plumbing device, with a minimum size of 300 gallons that is installed in an FSEs onsite wastewater drainage system to intercept and prohibit FOG from entering the collection system. Certain exceptions for grease interceptors are made based on an FSE’s size and type of food product; these FSEs are required to install a grease trap. These exceptions are granted by LASAN Industrial Waste Control staff. Similarly, Industrial Waste Control Staff certify the types of equipment that may be installed using guidelines from the International Association for Mechanical Plumbing.

The Industrial Wastewater Permit applies to FSEs to control the introduction of FOG into POTW. Section 64.30(C)(1)(g) specifies the duration of Industrial Wastewater Permits. Section 64.30(C)(1)(e) controls the transfer of permits. The Ordinance specifies that any discharger may be required by the Director, by permit or otherwise, to engage in periodic monitoring and sampling of its discharge. Section 64.30(C)(1)(d) specifies that the Director shall have authority to impose permit conditions including limits regarding the discharge of specific pollutants, requirements, which may include specific sampling locations, frequency of sampling, times of sampling, number, types, test standards and reporting schedules, for monitoring programs, and requirements for maintaining and affording City access to plant records relating to discharges, including hauled waste records and manifests.

LAMC Section 64.30 (C)(1)(b)(12) requires the development of a compliance schedule by each industrial user for the installation of technology required to meet applicable pretreatment standards and requirements. Section 64.30(C)(1)(d)(11) specifies that the Director may require all industrial users to install pretreatment systems, upgrade existing pretreatment systems and/or install additional pretreatment systems, implement BMPs, and any other conditions deemed appropriate to achieve the objectives of the Ordinance. Section 64.30(C)(2) requires industrial users to submit reports necessary to assess and assure compliance.

The *Rules and Regulations Governing Disposal of Industrial Wastewater into the Publicly Owned Treatment Works of the City of Los Angeles* are maintained by LASAN, and are provided in **Attachment C1**.

3.5 Authority to Enforce Violations of Sewer Ordinances

LAMC Sec 64.30.E provides the authority to carry out all inspection, surveillance, and monitoring procedures necessary to make a determination on compliance or noncompliance by industrial users and FSEs with applicable pretreatment standards and requirements, independent of information supplied by industrial users. The Ordinance gives the Board and the Director the power, jurisdiction, and supervision over places of discharge of wastewater into the POTW, necessary to adequately enforce and administer all applicable State and Federal laws. Section 64.30(C)(5) of the Ordinance specifies that whenever it is necessary to make an inspection to enforce any of the provisions of, or perform any duty imposed by this section or other applicable law, or whenever the Director has reasonable cause to believe that there exists upon any premises any violation of the provisions of this section or other applicable law, or any condition which makes such premises hazardous, unsafe, or dangerous, the Director or his/her designate is authorized to enter such property at any reasonable time and to inspect the same and perform any duty imposed upon the Director or his/her designate by this section or other applicable law.

The City ensures industrial user compliance with pretreatment standards, requirements, and conditions of the permit by taking administrative enforcement actions consistent with the IWMD's Enforcement Response Plan and Enforcement Response Guide (ERP/ERG) in the event of noncompliance, included as **Attachment G1**. The City's first ERP/ERG documented existing enforcement procedures in October 1990 and was submitted to the EPA on October 30, 1991. The enforcement procedures described in the ERP/ERG have established criteria and other considerations for responding to violations of pretreatment regulations and discharge standards in a consistent and timely manner. The procedures provide a range of enforcement responses with the objectives of regulating industrial users to achieve and maintain consistent compliance and subjecting repeat offenders to escalated enforcement actions in a timely manner. The types of escalated enforcement actions can range from notices of violation and administrative orders to suspension of discharge privileges, permit revocation, water or utility service termination, and/or City Attorney referral for filing of civil/criminal charges. The City reviews and updates its ERP/ERG periodically to ensure that it accurately reflects modifications to its authority and describes current operating practices.

References for Further Information

- *City of Los Angeles Municipal Code (http://www.amlegal.com/codes/client/los-angeles_ca/)*
- *City of Los Angeles Board of Public Works Rules and Regulations (https://www.lacitysan.org/san/sandocview?docname=cnt008647)*

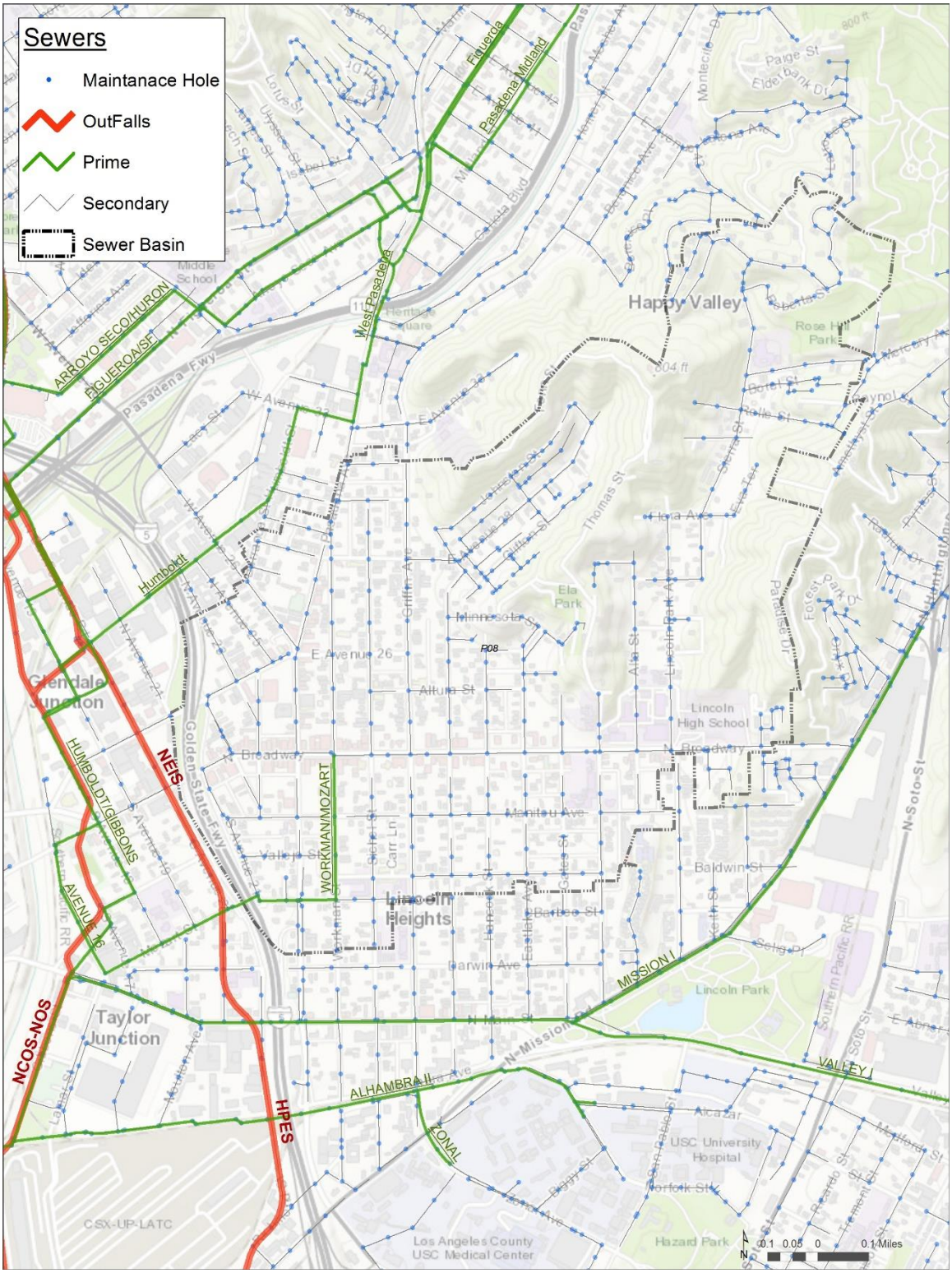
- *Los Angeles City Plumbing Code*

4 Operation and Maintenance Program

4.1 Up-to-Date Map of the Collection System

The City maintains separate sewer and storm drain systems. Plans for both systems were originally digitized into the City's GIS database from the historic "S" maps for sewer lines and "D" maps for the storm drain system. Both sewer and storm drain systems can be queried through the City's NavigateLA web mapping system which also combines over 250 layers of data, linked databases, and reports. The City has separate mapping layers publicly available on internet through NavigateLA for gravity and pressurized sewer pipelines, maintenance access holes, sewer laterals, and stormwater pipelines. The City has also mapped pump plants. Air release valves are not currently mapped in GIS. NavigateLA is also used in the field for locating pipelines, maintenance holes, service connections, and other features of the City's sewer and storm drain systems. For operation and maintenance, customized GIS datasets of both systems and other information layers are used in work prioritization and other decision making processes. The GIS datasets are used in multiple tasks ranging from pipe cleaning, to chemical treatment for roots, corrosion, and odor control, to hydrodynamic sewer modeling and stormwater capture project placement. **Figure 4-1** shows a section of the City's system, represented in the mapping database. The map contains different asset types in the system, including primary and secondary gravity mains, maintenance holes, and sewer basin delineations.

Figure 4-1 Sanitary Sewer Map Database (example)



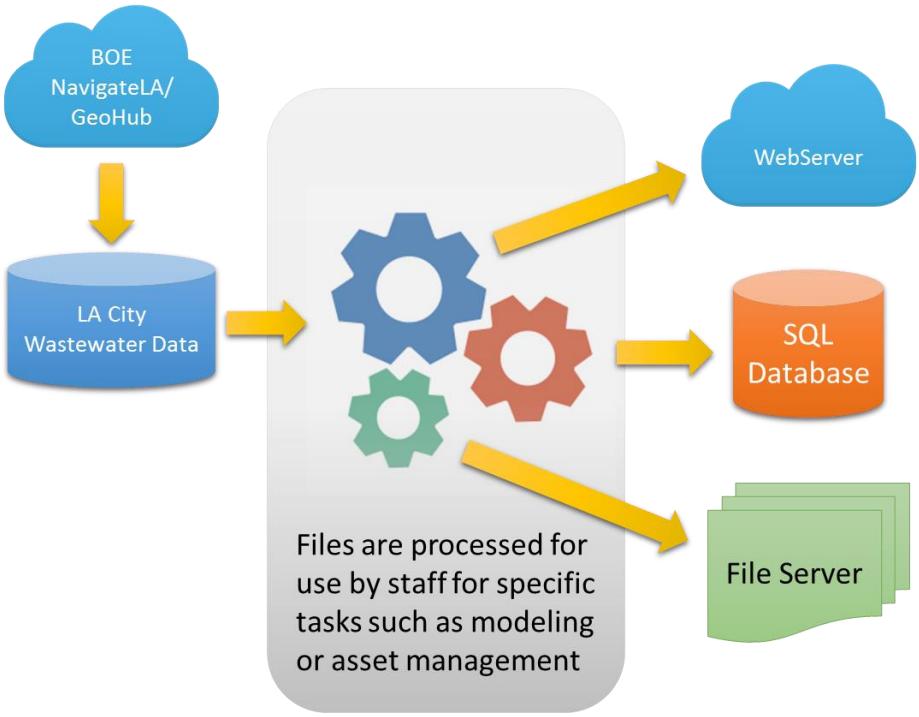
4.1.1 GIS Maintenance Process

The City's maps are routinely updated to include new and rehabilitated sewers as well as the addition of any new developments or tracts. Contractors and developers are required to provide as-builts of new and rehabilitated assets, as well as corresponding asset attribute information. LABOE District Offices and LABCA provide this as-built information to the LABOE Mapping Group as part of the acceptance and close-out process. The Mapping Group then enters this information into the GIS database. A project cannot be closed until the Mapping Group has acknowledged that all of the necessary information has been received. This includes a process to document the rehabilitation of an existing pipe segment. The rehabilitation material and date are stored in GIS along with the host pipe segment original installation date and material.

The GIS database is also updated to correct inconsistencies between the maps and conditions in the field on an on-going basis. LASAN maintenance crews, basin planners, and contractors may find errors in GIS maps that do not reflect what is found in the field. These errors are noted in work order notes and may include a sketch or photo. This information is packaged into a work referral, which is then sent to the Mapping Group for correction. If there is a considerable difference between what is shown in the maps and found in the field, the Mapping Group may dispatch a team to perform a survey. Typically these changes are made within one week, however they can be expedited as needed.

The GIS layer for sewer pipelines maintained by LABOE has to be modified by LASAN to migrate it into their databases. LASAN tracks all maintenance activities for each maintenance hole to maintenance hole pipe segment. LABOE tracks pipe segments to a deeper level and will place "phantom nodes" at changes in slope or material and track potentially more than one record for a maintenance hole-to-maintenance hole pipe segment. LASAN will periodically pull sewer pipe GIS data from LABOE, process the data to remove the phantom nodes, and migrate the updated GIS into the Field Automation Sanitation Trucks (FAST) mobile interface for maintenance data. The process is routine and LASAN has models and subroutines to streamline the process workflow.

Figure 4-2: GIS Maintenance Process Diagram



4.2 Preventative Maintenance Program

The City operates and maintains one of the largest collection systems in the nation, serving a population of over four million within a 600 square mile service area. It consists of approximately 6,500 miles of sewers, 140,000 maintenance holes, and 44 pumping plants. In addition, there are about 700,000 privately owned sewer laterals with an estimated total length of 11,000 miles. Laterals are owned and maintained by private property owners.

The City also provides wastewater conveyance and treatment services to 29 satellite collection systems under contractual agreements, as listed in **Attachment A3**, but is not responsible for management of the 29 satellite collection systems.

In order to manage the system, six maintenance yards are strategically located throughout the city to minimize travel time and maximize efficiency of reactive, preventive, and corrective maintenance activities. The preventative maintenance program is largely carried out by CWNCD and CWSCD through the following programs:

- Cleaning and Easement Maintenance
- Root Control
- Odor, Roach, and Pest Control

- Maintenance Hole Raising
- Pumping Plant Maintenance
- Emergency Repairs

For each program, tasks and their frequency are determined based on operation and maintenance experience, past performance of an asset or area of the system, manufacturer's recommendations, and site-specific conditions. A manager is assigned to each program, and they are responsible for developing an annual schedule for the work to be performed, updating the schedule to accommodate new needs, and monitoring the performance of the program. To do this, each manager uses a program-specific database to track assets included in the program. Scheduled and completed tasks are catalogued and tracked by work orders in the EMPAC maintenance management system (EMPAC). EMPAC also houses asset level performance information, which is used by the managers to determine asset specific maintenance frequencies. Maintenance program includes preventive, proactive, predictive, and corrective maintenance; maintenance engineering; and quality control, with a focus on the most critical or problematic areas of the system. Problem sewers are identified, prioritized and scheduled for maintenance based on comprehensive review of the maintenance history and system characteristics including overflows, blockages, excessive maintenance, age, material, and sewer condition.

The City uses the EMPAC to manage work, track warehouse parts, and streamline maintenance related purchases. The City uses FAST to provide field employees with an interface to EMPAC data. FAST greatly reduces the amount of paperwork required to collect closure data for work orders. Work orders are closed in the field, thus reducing data entry by clerks and supervisors. GIS integration ties EMPAC assets to actual field locations, searchable by street address or intersection. Real-time access to data in the field enables crews to work more efficiently.

The primary means for preventing SSOs through system maintenance are regular cleaning, which includes cleaning due to control FOG build-up and root intrusion.

4.2.1 Scheduled System Cleaning and Easement Maintenance

LASAN uses a combination of high velocity sewer cleaning, mechanical and manual rodding of sewers to clean them of various types of debris that may impede flow or cause an overflow. The City's sewers are classified into two groups: primary sewers (greater than 15 inches in diameter) and secondary sewers (15 inches or smaller in diameter). Primary sewers are divided into 24 basins and secondary sewers into 240 basins along drainage boundaries.

Both primary and secondary sewers are cleaned on a frequency that is determine primarily by its performance history and previous cleaning findings. Pipe segments with a history of overflow are cleaned more frequently than

others. Any pipe that has had an overflow is inspected using CCTV to identify any necessary repairs or special maintenance needs as soon as possible, usually within 48 hours after the initial occurrence of an overflow. Additionally, during cleaning, findings are collected as to the type and severity of debris removed during cleaning. The cleaning findings are reviewed periodically to analyze maintenance history to optimize and modify the maintenance approach and cleaning frequency.

Overflows caused by FOG-related blockages are monitored to identify locations and determine cleaning frequency. Cleaning frequency is increased for sewers with repeated FOG-related blockages or overflows. Additionally, LASAN's FOG inspectors are notified whenever a FOG-related SSO has occurred, so that they may perform inspections of all FSEs within two blocks of the event. Crews also distribute door hangers and mailers to homes in the surrounding area. Both of these measures help to reduce future occurrences of SSOs in the same area. Additionally, flow monitoring, CCTV inspection records, GIS SSO layers, and pipe attribute information are reviewed by primary basin to identify performance deficiencies. High d/D (flow depth to pipe diameter) levels or operational failure (SSO history) trigger further reviews to determine cause and take immediate or accelerated corrective actions, which may include cleaning. Priorities and schedules are set based on the severity of the problem.

In addition, LASAN's preventive maintenance program ensures all "non-problem" sewers are scheduled for maintenance and cleaning, but on a less frequent basis than pipes with a history of problems. All "non-problem" pipes that are less than 16 inches in diameter are cleaned on a three-year cycle; pipes that are 16-30 inches are cleaned on a 5 to 6 year cycle; pipes greater than 30 inches are cleaned as needed. Preventive maintenance of secondary sewers is performed on a basin by basin basis. LASAN may also perform some lateral cleaning on a case-by-case basis depending upon the CCTV results of mainline cleaning. Although lateral maintenance is the responsibility of the homeowner, LASAN may perform this work to protect the performance of the public system.

A master schedule for cleaning that includes all pipes is maintained for the system and is developed on an annual basis. This schedule is used for resource planning and to level load the work with each maintenance zone. The schedule is updated on a month-to-month basis to accommodate pipes that must be put on a more frequent cleaning schedule.

The City implements a sewer cleaning quality control/quality assurance program designed to examine the effectiveness of cleaning. After cleaning a sewer, sample pipes are inspected by CCTV to ensure that cleaning has restored the flow area of the sewer to at least 95 percent of the pipe diameter. Any sewer that fails the inspection is re-cleaned and the crew is retrained on the proper procedures.

As part of the cleaning program and schedule, easements are maintained to ensure that access to a pipe for cleaning or other maintenance is clear. The City can use an emergency contractor to support easement cleaning, if needed.

LASAN has historically conducted maintenance hole inspections when visually checking for flow obstructions at maintenance holes. However, this program was finding very few blockages due to the effectiveness of the cleaning program. Currently, crews will create a referral work order for any maintenance hole in need of repair, and maintenance holes that have caused odor problems are inspected and sealed.

4.2.2 Root Control

In addition to the City's routine mechanical root removal, sewers that are prone to tree root intrusion (primarily through privately owned sewer laterals) are treated for root control using environmentally safe chemicals. These pipes are identified through a comprehensive review of SSO history and CCTV results. The effectiveness of chemical root control treatment is carefully monitored and the frequency of treatment and application rates adjusted as required to eliminate blockages caused by roots. A schedule for root control is maintained for the system. Every pipe that is on the schedule undergoes the following maintenance cycle:

- Pipe is pre-cleaned and two months later the root control chemical is applied, then;
- Pipe is cleaned again six months after chemical root control application, then;
- Pipe is cleaned 18 months after chemical root control application or 12 months from the last cleaning;
- Four months later the process repeats.

This cycle repeats to ensure that there is no root re-growth. A pipe is only taken off the schedule once there has been no evidence of roots over an extended period of time.

The City also implements a community outreach and education program to control roots in private sewer laterals located in areas where tree roots intrusion into mainline sewers require frequent root removal and chemical treatment. A root control pamphlet is periodically mailed to properties in these areas.

4.2.3 Odor, Roach, and Pest Control

LASAN tracks and monitors the odor, roach, and pest complaints that are received throughout the system. Each complaint received is investigated and added to a map tracking all complaints. The appropriate remediation measure is determined by looking systematically at each area. LASAN keeps a sewer odor master plan containing a multitude of odor control and response measures including:

- Ongoing sewer air pressure and odor monitoring;

- Air manipulation in the sewer using flow diversion and air curtains;
- Odor removal from air in the sewer using carbon scrubbers and bio-trickling filters;
- Sewer cleaning and maintenance;
- Chemical treatment;
- Sewer construction and repair;
- Sealing of sewer maintenance holes;
- Trap maintenance hole inspection, cleaning, repair, and replacement.

Assets that require cleaning and maintenance are added to the master cleaning schedule and cleaned at the appropriate frequency.

4.2.4 Maintenance Hole Raising

LASAN operates a Maintenance Hole Raising program to ensure that all pipe segments of the system are accessible for maintenance renewal activities. Work is identified by crews and contractors, who can report a paved over maintenance hole, and during inspections following street paving and repair projects. Maintenance holes requiring raising are added to a master schedule and addressed based on immediacy of need and pipe segment criticality.

4.2.5 Pumping Plant Maintenance

All of the City's 44 sewage pumping plants have built-in backup emergency and redundancy systems. The Venice Pumping Station serves as the main center for monitoring and control of all pumping plants. The City has upgraded its pumping plants and equipped them with state-of-the-art controls, emergency backups, and redundancy systems. This has eliminated overflows caused by power outages and mechanical failure.

As a part of routine preventive maintenance program, CWSCD conducts scheduled preventive maintenance of pumps and related accessories. On the average, each station is visited for inspection/maintenance about 80 times in each year by various crafts, consisting of monthly visits for inspection, equipment testing, pump flow monitoring, and checking run times and amperage. Any repairs that can be made at this time are complete. Any other maintenance needed is scheduled using the work order system. More in-depth maintenance occurs on an annual, semi-annual basis, biennial, and according to manufacturer recommendations. This maintenance consists of activities such as motor testing, valve exercise, cleaning, or oil changes. A crew spends about 30 minutes to 2 hours in a station for every scheduled preventive maintenance visit.

4.2.6 Work Scheduling and Tracking

Each maintenance program has a master schedule and tracks work in a separate database. The master schedule is migrated to the EMPAC system so that crews

and contractors may be scheduled via work order. Once the work has been performed, all pertinent information is entered into EMPAC, and each program updates its database with any findings that would impact future scheduling and need. Each master schedule is developed on an annual basis, so that adequate resources are available to perform the work. The annual schedules are updated throughout the year to account for new work.

4.3 Repair, Rehabilitation, and Replacement Planning

LASAN conducts comprehensive and systematic inspections and assessments of all components of its collection system. Inspections are used to identify problems requiring repair and prioritize the needed improvement projects for inclusion in the Wastewater Capital Improvement Program (WCIP). Sewers are classified into two groups: primary sewers (greater than 15 inches in diameter) and secondary sewers (15 inches or smaller in diameter). Primary sewers have been divided into 24 basins and secondary sewers into 240 basins.

The City assesses and rates the condition of its sewers in an ongoing condition assessment program which includes CCTV, visual inspections, assessment of operating history and performance, and analysis and projection of performance based on asset attributes. Structural deficiencies are identified or estimated and the needed improvements developed and implemented systematically as a part of the City's sewer rehab and replacement plan.

The City uses state-of-the-art CCTV equipment as its primary means of inspecting and assessing the condition of secondary sewers in support of operation and maintenance and for capital improvement planning purposes. Secondary sewer basins are inspected in a priority order using a ranking system that incorporates age, size, construction material, overflow history, and known problems related to the pipes in a basin. Some primary sewers are also inspected using CCTV depending on size and flow levels. Inspection and maintenance of the remaining primary sewers at the City's discretion may be contracted to private contractors.

4.3.1 Condition Assessment

Each maintenance hole to maintenance hole segment is assigned a condition rating from A (Excellent) to E (Emergency Condition), which is used to guide renewal decision-making. Each segment is assigned an initial inspection rank by CCTV contractors (who are required to use the City's defect rating system) or City crews, and entered into the CCTV database along with defect information. Each CCTV video is reviewed again for quality control. This information is then fed into LASAN's renewal planning and decision support tool, InfoMaster. An algorithm reviews the defect information using weighted likelihood of failure factors. It also suggests the renewal action to be taken. The condition rating and defect observations are utilized by basin planners to prioritize and select pipe

segments for condition remediation. The entire system is on a 15- to 20-year schedule to CCTV inspect all applicable pipes.

The City's A to E condition rating program was developed specifically for its collection system. In the future, the City intends to use an industry standard for assessing condition defects for pipelines that allows for defect severity ratings as well as ratings for multiple defects. This will help it better leverage software programs for tracking condition and deterioration, open up new resources for performing CCTV inspections, and reduce the City's costs. The A to E condition rating will continue to be used as a means of prioritizing pipes for renewal by the severity of their condition; the industry standard defect rating system will be mapped to the A to E rating.

Approximately 70 to 80 percent of primary sewers have condition data via CCTV inspection or eyes-on review when a street cut has been made. Pipes that do not have condition data are typically larger diameter, older pipes with numerous curves. For those pipes for which no condition information is available, condition and deterioration is projected using a Risk Assessment Management System (RAMS) algorithm. This algorithm relies on available condition data for pipes in a similar location or with similar characteristics, hydrogen sulfide levels, and age, material type, and other attribute information to project condition.

4.3.2 Remediation Planning

An outcome of LASAN's planning process is the identification of preliminary recommendations for condition remediation. LASAN will decide between near-term condition remediation actions (e.g., one or more spot repairs) or longer-term condition remediation actions such as rehabilitation or replacement. LASAN then applies average unit costs to these preliminary remediation actions to forecast capital costs associated with the basin plan. The Financial Management Division places these costs estimates into the capital plan and uses these to project funding needs.

4.3.3 Immediate and Near-Term Renewal Needs

A Category E condition findings indicates that a pipe failure has already occurred or there is a full flow obstruction. These are considered an emergency and immediate repairs are initiated for sewers rated an E condition. In these cases, LASAN may bypass the usual QC review and defect review via the decision support tool in order to expedite the repair process. Category D condition sewers are in a condition that may require monitoring and/or near-term rehabilitation and, if remediation is needed in the near-term, are included in the Wastewater Capital Improvement Program (WCIP) for planning, design and construction. More frequent inspections are conducted at locations with known problems to avoid emergency situations. Some pipes are scheduled for routine CCTV inspections, typically once per year, if a capital project is pending. In addition, follow-up CCTV inspections are conducted at overflow locations usually within 48 hours of overflow occurrence to determine the root cause of the overflow and identify the

extent of necessary repairs or any special maintenance needs. The inspection schedule is used to build the long-term renewal plan by basin for the collection system.

4.3.4 Long-Term Condition Monitoring and Renewal Planning

In addition to supporting identification of immediate and near-term rehabilitation and renewal needs, the Condition Rating is used to prioritize long-term condition monitoring and renewal needs. The condition ratings trigger a follow-up action that includes either rehabilitation within a certain time frame or a follow-up inspection. Rehabilitation projects are developed and scheduled for implementation on a prioritized basis with other identified needs. Category A and B sewers are in excellent to good condition and are scheduled for continued inspections and monitoring on a regular frequency, which is dictated by the basin prioritization and inspection schedule. Category C condition sewers are considered to be in fair condition and are scheduled for follow-up inspections every five years until condition remediation addresses issue identified.

Rehabilitation and replacement projects are developed and included in the WCIP for pipes requiring condition remediation within the 10-year planning horizon and that are not at imminent risk of failure. Remediation planning is performed for all pipes within a basin and packaged together into a basin plan. Pipes within a sewer basin are selected for remediation based on the condition rating and the number and severity of structural defects. The City has implemented InfoMaster, an asset management software designed to support sewer rehabilitation and replacement decision-making. Condition remediation decisions identified as a result of this review are combined and coordinated with pipe segments selected for capacity remediation.

The WCIP, included as **Attachment D1**, is prepared annually and covers a 5- to 10-year period. This annual report contains a planned expenditure summary for identified projects, projects description, and a 10-year project expenditure plan. Detailed project plans are developed and implemented when they are scheduled for implementation. Projects in the WCIP are prioritized using a Business Case Evaluation (BCE) risk rating framework. Representatives from both LASAN and LABOE are involved in the BCE risk rating review and project prioritization. Projects that score the highest are prioritized first, and any projects that do not get funded in the current year CIP are monitored on a monthly basis. **Attachment D2** includes the *Capital Improvement Program Project Prioritization Criteria Definitions*. New projects may be identified throughout the year, and are also reviewed on a monthly basis (except for emergencies, which are addressed immediately. Monthly monitoring allows for review and re-prioritization on a continual basis. Twice annually, the entire renewal portfolio is reviewed.

In some cases, components of a packaged project may be accelerated if they are high enough risk. LABOE is responsible for reviewing the data provided by LASAN to determine the preferred remediation actions, develop design solutions,

create bid packages, and manage capital delivery. Pipes included in a basin planning package typically remain together through the capital delivery process. In the past, pipes with difficult access, or other issues holding up streamlined capital delivery, were separated from the basin package to be addressed separately, yet this approach is no longer in practice.

4.4 Training

City staff are trained in a number of functions related to wastewater system management including safety, equipment operation and standard operating procedures (SOPs), overflow response and mitigation, emergency management, cross-training, and professional development for wastewater professionals (certifications). Training is provided in both a classroom setting, and through on-the-job, hands-on training. Training is facilitated by both City staff and through outside training workshops. Most internal functional and safety training is provided through LASAN's Industrial Safety and Compliance Division (ISCD). New training courses are added and existing courses are modified to stay current with the rapidly changing technology and requirements, including computer-aided and online training. Training records are maintained in a training information management system, used to monitor completed classes and to schedule employee training on appropriate frequencies to keep skills current and meet certification requirements. **Table 4-1** summarizes the training program.

The City identifies training needs for staff development in its annual budget and provides adequate funding for tuition reimbursement. The City also maintains an online library of self-improvement training courses and encourages self-training. Contractors are required to demonstrate proficiency in meeting the City's standards and specifications, and for eliminating construction-related overflows.

Table 4-1 Summary of Training Program

Training Type	Description	Recurrence
Safety	Safety training is an integral part of the City's training program. Every staff member receives formal classroom training on important safety topics, for example, confined space entry and hazardous materials management as required by regulations. Crews are not allowed to begin work until they have demonstrated proficiency in a task. Ad hoc training on a variety of topics is performed via "tailgates" with staff. Topics range from hands free cell phone requirements, to hearing protection, to power tool safety. The tailgate schedule and topics are available on LASAN's intranet. Crews can access related documents in field.	On-boarding for new employees, scheduled tailgates (two times per month), and refreshers
Equipment	Crews are initially trained in the proper operation and maintenance of all new major mobile equipment and facilities by the contractor/manufacturer. Written operation and maintenance manuals are used as resource material for initial start-up training as well as new staff training. ISCD is responsible for providing operational training on sewer cleaning equipment.	As needed
SOPs	On-the-job and classroom training for standard operating procedures is provided for the following functions: Nozzles and applications	Annual
Overflow Response	All crews responsible for responding to overflows receive training on response and reporting protocols, and volume estimation methods. Re-training is provided when significant updates to standard procedures are made. Tailgate and tabletop exercises for major/regional events are held periodically.	On-boarding for new employees, annually for all staff
Emergency Management	ISCD prepares employees to respond to major emergencies and disasters and has established an operation center and emergency response teams. Emergency training exercises are conducted and documented annually.	Annual
Technology	Information Systems staff visits field staff to perform training for new hires and for all staff when major updates occur. Training documents have been developed and are available for staff through supervisors.	Roll-out and major updates (as needed)
Cross-Training	On-the-Job cross training is actively pursued to ensure that staff has a proficient working knowledge of their tasks and subtasks. City Staff is cross-trained so that critical tasks can be performed without interruption when assigned crew members are not available.	As needed
Certifications/ Professional Development	All new staff must be certified level 1 or 2 by the California Water Environment Association for collection system maintenance within 36 months of hire. Studying is done on the employee's time, although the City process seminars and internal training geared toward the test.	On-going continuing education credits, continued training to advance
FOG Inspection	The training program consists of a comprehensive series of courses and lessons designed to provide inspectors with specific skills and knowledge necessary for their duties. Training is enhanced with presentations conducted by the FOG Control Program engineering staff who continually research and develop new training materials. To stay current and highly proficient, staff routinely attends seminars and presents information at specialty conferences. The City also acquires training presentations by vendors. In order to ensure a complete and thorough inspection of a FSEs (FSE), Standard Operating Procedures (SOPs) have been developed to guide inspectors through inspection process in a systematic fashion.	As needed

4.5 Equipment and Replacement Part Inventory

The City maintains an electronic inventory of equipment, replacement parts, and supplies and follows a structured process to ensure an up-to-date accounting and complete inventory of equipment and replacement parts. The City has a procedure for pre-qualifying manufactures and equipment vendors and for sole-sourcing when necessary to standardize equipment and parts. This additional procurement option reduces inventories, simplifies procurement procedures, and reduces training and operation & maintenance costs.

4.5.1 Equipment and Replacement Part Inventory

Parts needed for preventive maintenance are identified ahead of time for each maintenance task and secured prior to the start of preventive maintenance tasks. Repair and replacement of underground pipelines are contracted out to licensed contractors who have the equipment, materials and staff to complete the work. An inventory of non-critical pumping plant parts and equipment is stored either onsite or in a centralized location. Equipment needed to perform maintenance tasks, such as cleaning nozzles, are maintained by city staff, inspected regularly, re-built when necessary, and replaced according to a set schedule, depending on the equipment type.

4.5.2 Critical Spare Parts

Redundancy is provided for key pumping plant equipment and most pumping plants have backup power and replacement parts onsite to minimize the risk of a complete shut-down. As a backup, managers have credit authority to purchase needed materials and supplies from local vendors of non-stock items when they are critically needed. There has been little need to purchase parts through this means, which attests to the City's advance preparation and readiness. The City also maintains equipment such as sump pumps, portable generators, traffic control and night lighting systems, in a ready state for immediate deployment in an emergency. This is equipment is stored both at locations throughout the City and in centralized locations with each zone.

References for Further Information

- *CCTV Inspection Manual*
- *FAST User Manual*
- *NavigateLA User Manual*

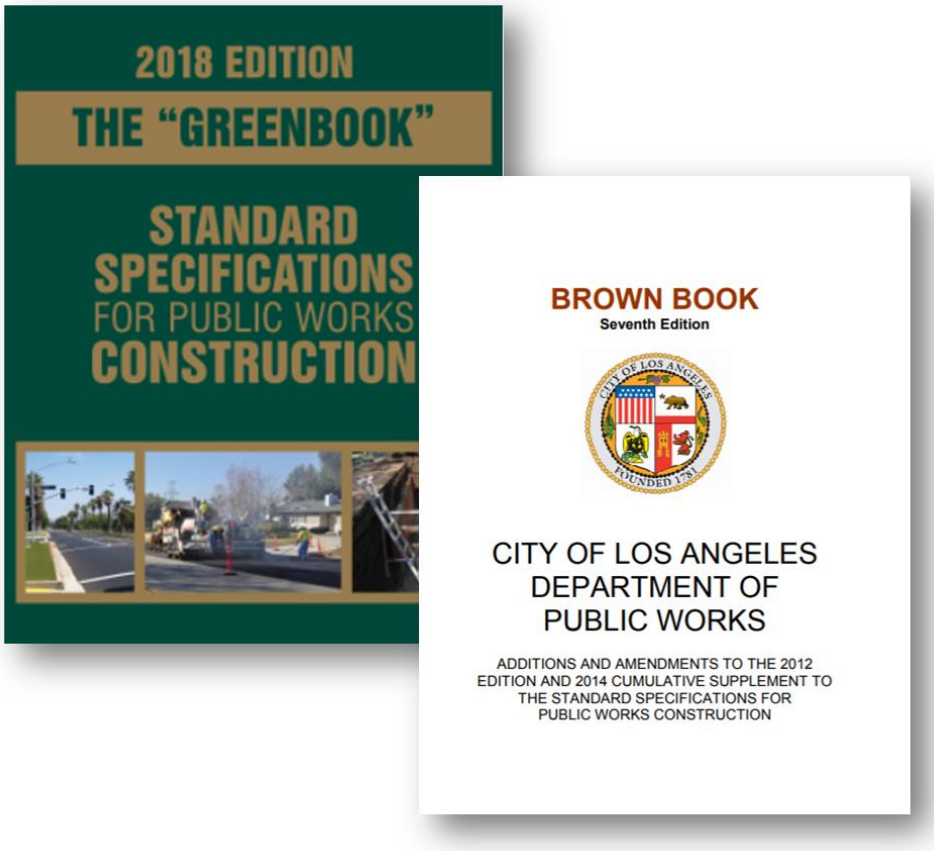
5 Design and Performance Provisions

5.1 Design and Construction Standards and Specifications

New and rehabilitated conveyance pipelines and pumping plants are planned, designed, and constructed to meet the highest performance standards in the industry in accordance with the City's standards and specifications. These are comprised of:

- Sewer Design Manual. The Manual contains criteria for planning and design of new gravity sewers, pumping plants, force mains, and appurtenances; and for the rehabilitation of existing assets. It includes sections on:
  - Flow projections and sewer hydraulics
  - Sewer alignments
  - Sewer materials and structures
  - Planning and design for sewer rehabilitation and replacement
  - Sewer construction
  - Pumping plants and force mains
  - Collection system operation and maintenance
- Standard Plans: standard designs for rehabilitation and replacement of collection system assets. Contractors are expected to utilize these standards where possible, and must receive approval for deviations.
- Construction Manual: specifies standards for estimating, change orders, and other processes related to construction management.
- Approved Products and Materials Lists: provides a list of approved sewer pipeline materials, structure materials, sewer rehabilitation materials, and miscellaneous products, as well as procedures for pre-qualification testing of new materials.
- "Green Book" Standard Plans for Public Works Construction, and the Special Provisions Guide for use with the Standard Specifications for Public Works Construction: provides standards and specifications for construction in Southern California, produced under the oversight of Public Works Standards Inc.
- "Brown Book": contains a set of amendments to the Green Book for areas not addressed, such as pumping plant design.

Figure 5-1 Green and Brown Book Manuals



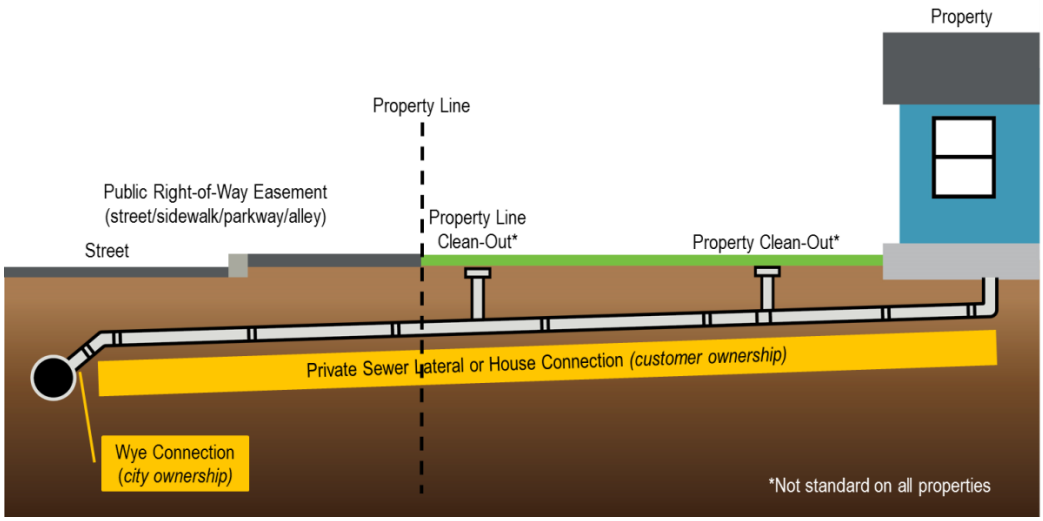
All system components are designed to meet permit requirements of the various federal, state and local agencies. In addition, environmental documents are prepared to comply with the California Environmental Quality Act (CEQA), the National Environmental Policy Act (NEPA), or both as appropriate. This process ensures that projects benefit from the input of all affected and interested parties including the communities. Standard Plans are used to provide consistency and quality in design. Complicated connection, diversion, and transition structures are modeled in the City's hydraulic research laboratory to ensure that each structure will perform equal to or better than designed. Modelers work closely with designers to optimize performance.

Finally, LABCA provides constructability reviews of sewer, pumping plant, and force main designs. All City designs are independently reviewed before they are signed by the City Engineer. Emergency repairs are conducted according to the "Green Book" standards. Specifications for larger diameter sewers are tailored to meet the unique project needs.

The standards for private sewer laterals, also known as House Connections in the Los Angeles Municipal Code, are specified by the Department of Building and Safety through the Uniform Plumbing Code. The City constructs a wye connection to the public mainline sewer for each House Connection and is

responsible for connecting a House Connection to the public mainline sewer. The House Connection is privately owned from the home or business to the connection with the mainline, including the portion of the House Connection within a public right-of-way (i.e., under a street) as shown in **Figure 5-2**.

Figure 5-2: Sewer Lateral Responsibility



5.1.1 Updating Standards and Specifications

The LABOE Wastewater Conveyance Engineering Division (WCED) is responsible for maintaining and updating the City's design standards and specifications. The City encourages users of the Sewer Design Manual and Standard Plans to critique and provide feedback on the guidelines and standards for consideration in future updates. In addition, LABCA provides recommendations to LABOE for modifying the standard details and master specifications for construction projects. CWNCD and CWSCD provide input for improved performance of system components based on experience gained in operation and maintenance. Proposed changes to the criteria and the Standard Plans are evaluated thoroughly before they are adopted.

As new products and methods are introduced, they undergo a thorough review and evaluation by the "Green Book" Committee, a group of public works officials in the Southern California area that is dedicated to high performance construction materials and standards. The "Green Book" Committee is a clearinghouse for the review of new products and construction methods. It develops standard specifications that become part of the "Green Book." The City supports this committee and references applicable "Green Book" specifications as appropriate for the construction of new and rehabilitation sewer projects. Every two years, the City conducts a formal review of its standards and specifications, and makes

specific modifications to the Brown Book to incorporate anything relevant to the City that is not included in the Green Book.

5.1.2 Construction-Related Overflow Prevention

In a determined effort to reach the City's goal to have no preventable dry weather overflows, LABOE, LABCA, and LASAN issued a "Joint Statement of Policy Pertaining to the Prevention of and Response to Construction Contract-Related Sewage Spills." The policy states the responsibilities of each bureau in overflow prevention, response, reporting, public information dissemination and follow up. The policy requires, among other provisions, coordination among the bureaus in pre-design reviews to determine appropriate means for preventing overflows and to determine appropriate flow control requirements during construction to be included in the bid and contract documents. The Policy further requires that flow control requirements be explained to potential bidders at the pre-bid meeting. The contractor is required to provide an Emergency Response Plan (ERP) for controlling sewage flow during construction. LASAN reviews and approves the Contractor's ERP prior to the start of construction. The policy also requires a sign-off for private development projects by LASAN.

A map of all sewer construction projects is continuously updated by LABOE. Contact information for each ongoing construction project, including the names and contact information of the inspector, the inspector's supervisor, and contractor's contact person, is prepared by the LABCA and forwarded to LASAN's CWNCD and CWSCD.

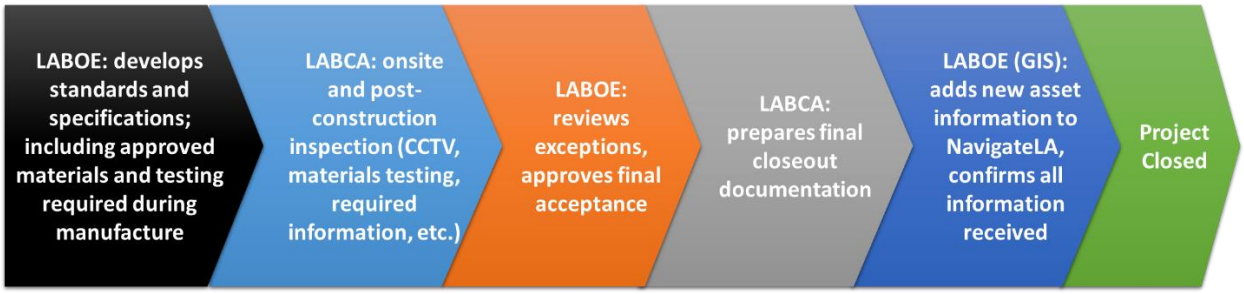
The LABCA inspector is responsible for communicating the City's "no-spills" policy and project plans and specifications to the contractor, enforcing the plans and specifications, and ensuring the contractor responds appropriately in case of emergencies. The inspector is required to explain the City's "no-spills" policy to the contractor, remind them of their responsibility to prevent overflows, and respond with quick mitigating action if an overflow does occur. LABCA form M-159, Sewage Spill Prevention Preconstruction Meeting Check List, covering the bypass plan and implementation and ERP is discussed during the pre-construction meeting with the contractor. The contractor is required to sign the checklist and agree to comply with the plans. A City inspector is on site during sewage bypasses.

5.2 Procedures and Standards for Inspection and Testing System Improvements

LABCA performs inspection on all rehabilitation and new collection system construction contracts. Written inspection procedures are followed to ensure that collection system facilities and components are built to conform to the plans and specifications. Inspections are conducted both on the jobsite and at material fabricators during manufacture and testing. For example, during a cured-in-place re-lining project for a gravity main, a BCA inspector is on site during construction to ensure that the proper methods for installation are followed. They also do

follow-up testing after installation to ensure the specifications are met before work is accepted. The LABCA coordinates its work with the design engineers to ensure the intent of the design is met. The City does not accept the installed components until they pass all required performance tests and a field acceptance from the LABCA final inspector is issued. If something is not accepted or a test is failed, the LABCA notifies the overseeing engineer to resolve the issue. New or rehabilitated system components are placed into service upon certification by the BCA's inspectors that they have been installed in accordance with plans and specifications, and all necessary asset information has been received by the contractor.

Figure 5-3: Process for Inspection, Testing, and Approval



For emergency repairs (address severe environment or human health threats), some standards may be waived in order to resolve the problem. An engineer is onsite at all times while the repairs are made, and must approve any deviations from the standard. Contractors that perform emergency repairs are pre-selected from a list of sewer contractors, and so are familiar with the City's standards and specifications. The City also has standard plans that can be used for emergencies, with project-specific modifications.

5.2.1 Asset Information Requirements

Within the last two years, the City has changed its requirements for final delivery of asset-related information. Before a project can be accepted, the contractor must:

- Provide as-builts in CAD format
- Provide O&M manuals and spare parts inventory
- All asset attribute information, which are specified to the contractor so they may be input into the City's GIS

Upon receipt of this information and verifying completeness, the GIS group signs off on the standard acceptance form before the project may be closed.

References for Further Information

- *City of Los Angeles Design and Construction Manuals, Standards and Specifications (http://eng2.lacity.org/techdocs/index.htm)*

- *City of Los Angeles, Bureau of Engineering, Sewer Design Manual (http://eng2.lacity.org/techdocs/sewer-ma/index.htm)*
- *City of Los Angeles, Department of Public Works, Bureau of Engineering, Standard Plans (http://eng2.lacity.org/techdocs/stdplans/index.htm)*
- *City of Los Angeles, Department of Public Works Approved Lists, Construction Materials and Product Suppliers for the Public Right-of-Way (http://eng2.lacity.org/techdocs/product_material/Product_materials.htm)*
- *City of Los Angeles, City Uniform Plumbing Code, Latest Edition (http://library.amlegal.com/nxt/gateway.dll/California/lamc/municipalcode/chapterixbuildingregulations/article4plumbingcode?f=templates$fn=default.htm$3.0$vid=amlegal:losangeles_ca_mc$anc=JD)*
- *Building News, "Standard Specifications for Public Works Construction," (referred to as the "Green Book"), Anaheim, California, Latest Edition*
- *City of Los Angeles, Department of Public Works, Brown Book, 7th Edition (http://eng2.lacity.org/brownbook/frame.cfm)*
- *Building News, "Public Works Inspectors' Manual," Anaheim, California, Latest Edition*

6 Overflow Emergency Response Plan

6.1 Proper Notification Procedures

CWNCD and CWSCD maintain the *Response and Reporting Procedures for SSOs and Sewer or Stormwater Contamination* included in **Attachment F1**. These procedures ensure that all permit and regulatory requirements are met.

6.1.1 Overflow Notification

The City encourages citizens to report overflows to LASAN. Citizens may use the toll free telephone number "311" or (800) 773-2489 to report overflows and other sewer problems. Staff is available 24 hours per day, seven days per week to receive calls. The appropriate phone numbers are listed in local phone directories and posted on the LASAN's web sites. Additionally, anyone with access to the internet can go to the "myla311" webpage and create a general service request. Calls to the Fire Department (LAFD), Police Department (LAPD), 911, and directly to LASAN are relayed to CWNCD and CWSCD. Calls relayed to CWNCD and CWSCD during after-hours are forwarded to the On Duty Operator at Venice Pumping Plant.

6.1.2 Receipt of Notification

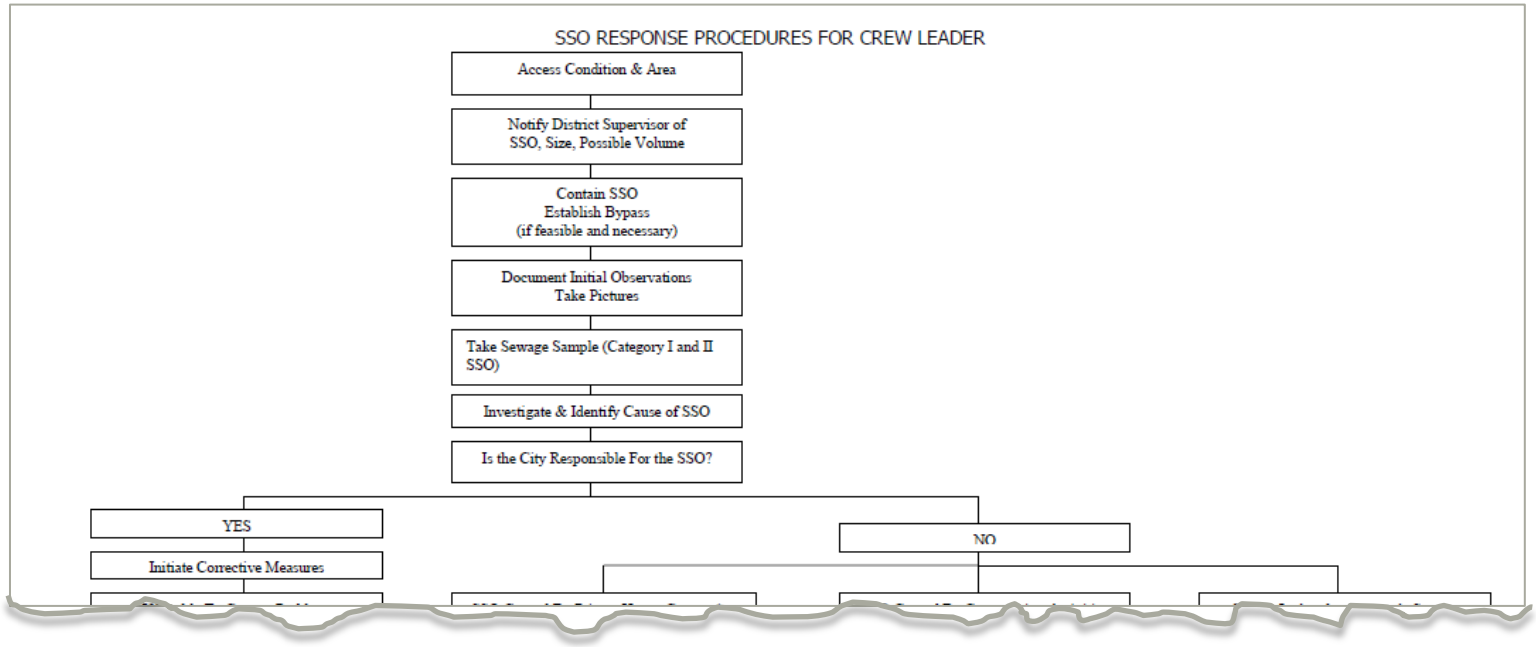
During working hours, a 311 operator uses a layer in NavigateLA to determine where to direct the call and forwards the call to the appropriate district yard. Each yard is staffed by a clerk to receive calls during working hours. Each yard's direct telephone number is published on LASAN's website, and yard clerks may receive calls directly. During after-hours, all 311 calls or calls directly to a yard are automatically forwarded to the Venice Pumping Plant to ensure that none are missed. Notification of possible overflow through other sources are reviewed and manually routed to the Venice Pumping Plant. A responder is dispatched to verify the overflow. (In the event an overflow is not verified, either CWNCD or CWSCD notifies WPD Enforcement that other pollutants have spilled or that the spill does not involve the City's wastewater collection system. WPD Enforcement performs an investigation and reports to management.)

6.1.3 Notification of Internal and External Parties

Once verified, the lead operating division for the SSO event (CWNCD or CWSCD) notifies all appropriate internal and external parties in the chain of communication, regardless of volume or potential impact. The chain of notification is documented in detail in LASAN's *Response and Reporting Procedures for SSOs and Sewer or Stormwater Contamination*. A snapshot is shown in **Figure 6-1**. When an overflow is due to private construction activities, the construction contractors and City inspectors are required to report the overflow to the LASAN immediately.

Immediate notification to appropriate parties are required for all sewer overflows that enter waters of the state such as ocean and waterways. For the purposes of reporting to the Health Officer, the term immediate is defined as within 15 minutes of the knowledge of an overflow event. Immediate notification is made when an overflow results in a direct discharge into the waters of the State and/or when CWNCD or CWSCD personnel determine that an overflow could potentially reach the waters of the state based on their knowledge of the sewer and storm drain infrastructure. Notification to the Health Officer and the RWQCB must occur within two hours of the knowledge of overflow event for all other events. In addition, other agencies must be notified depending on the size and impact of the spill. A contact flow chart and contact list is included in LASAN's *Response and Reporting Procedures for SSOs and Sewer or Stormwater Contamination*, Latest Edition, Appendix A *Sanitary Sewer Overflow Sampling Protocol*.

Figure 6-1: Snapshot of SSO Response Workflow in *Response and Reporting Procedures for SSOs and Sewer or Stormwater Contamination*



6.2 Appropriate Response Program

The City's *Response and Reporting Procedures for SSOs and Sewer or Stormwater Contamination* require full, immediate, and appropriate attention and response to an SSO with the ultimate goal of minimizing impacts to public health and safety and the environment. It is the City policy that "Every reported sewage spill affecting public or private property within the City of Los Angeles shall be acted upon by the Division." Telephone calls to report overflows or other maintenance problems are answered 24 hours per day, 7 days per week. Crew leaders are immediately notified upon receipt of a reported potential sewer overflow and are instructed to respond immediately. Written procedures are provided for assessing the overflow, notifying supervisors, documenting the overflow, estimating the volume of the overflow, sampling and laboratory analysis, posting warning signs and following up.

The highest priorities are to contain the overflow and minimize, if not prevent the overflow from reaching the storm drain system, and to minimize or eliminate exposure to the public and impact on public health. LASAN's procedures are designed to protect public health and safety, meet all regulatory reporting requirements, and ensure immediate and effective response. Spill response procedures require responders to:

- **Contain**: Contain the SSO and establish bypass if feasible or necessary. The respondent is to first determine the direction of the of flow of sewage, then implement immediate containment methods, which include plugging storm drains using sandbags, plastic sheeting, and/or other dam construction material to contain the spill, whenever appropriate. Additional containment measures include containing/directing the spilled sewage using dike/dam, sandbags, or earthen berms in landscaped or undeveloped areas.
- **Restore flow**: Respondents should use appropriate cleaning tools such as flushing or rodding to clear the blockage, cleaning in the upstream direction from a set-up downstream of the blockage. While cleaning, the respondent should observe the flows to ensure that the blockage does not recur downstream. Standard operating procedures for cleaning include procedures for blockage trapping and removal. If the blockage cannot be cleared or requires construction repairs, the respondent is to initiate additional containment measures and/or bypass pumping.
- **Bypass, if needed**: If bypass pumping is required, it should be set up to pump around the blockage/pipe failure to convey the wastewater to the nearest downstream maintenance hole or facility.

To ensure the fastest possible response, the closest crew to a reported overflow is dispatched to respond. The first responding crew will set up immediate containment measures and, upon assessing the spill, may notify a supervisor if more people or equipment is needed. The first responding crew will work to break the blockage and restore flow while a second crew is en route, if a second

crew was requested. Bypass pumps, extra materials, equipment, and sandbags are located at maintenance yards around the city.

Construction contractors are required to have an approved sewage flow bypass system and Emergency Response Plan in place prior to start of construction. Contractors are instructed to take immediate action to stop any overflow. These are discussed at the pre-construction conference and enforced by LABCA.

6.3 Prompt Notification of SSOs Potentially Affecting Public Health

6.3.1 Procedures

LASAN's *Response and Reporting Procedures for SSOs and Sewer or Stormwater Contamination* outlines notification steps following an overflow. Notification depends on the severity and potential impact of the overflow. All sewer overflows that enter the waters of the state such as ocean and waterways must be reported immediately. For the purposes of reporting to the Health Officer, the term immediate is defined as within 15 minutes of the knowledge of an overflow event. Immediate reporting is made when an overflow results in a direct discharge into the waters of the State and/or when the CWNCD or CWSCD personnel determine that an overflow could potentially reach the waters of the State based on their knowledge of the sewer and storm drain infrastructure. The Reporting Procedures also require internal chain of command notification within 30 minutes. All other overflows must be reported to the Health Officer and the RWQCB within two hours of knowledge of overflow event. In addition, immediate notification of the public, health agencies, and others of overflows "that may imminently and substantially endanger human health" is required. For examples, schools that may be impacted must be notified so that staff and students can stay away from the affected area. If there is a potential for beach closure, the LASAN Assistant Director must be notified with 1 hour, and in turn make the appropriate notifications to the Board of Public Works, Mayor's Office, affected Council Office, and Heal the Bay. Initial notification includes posting warning signs and barricades as necessary by the responding crews. Appropriate agencies and impacted entities are notified in accordance with City procedures. Other notifications are required for specific areas and are identified in the Procedures. Finally, procedures are provided in the event that an overflow is verified, but it is not the responsibility of the City. In all cases, crews will continue to contain and bypass as necessary until relieved by a Supervisor.

Construction contractors are required to take immediate measures to mitigate and report overflows as soon as they are discovered. The Department of Public Works' LABCA inspectors report construction-related overflows to LASAN and document the time, location, cause, estimated quantity, and any impact of the overflow, and take mitigation measures as needed.

6.3.2 Notification List

LASAN's *Response and Reporting Procedures for SSOs and Sewer or Stormwater Contamination* includes a comprehensive contact and notification list. The notification lists are updated to keep officials names and positions current.

6.4 Emergency Response Plan and Appropriate Staff Training

The emergency response plan is clearly documented and available to all personnel. It is used as a resource in emergency response training. All wastewater operation and maintenance staff are trained on emergency response procedures at least annually. Additional training is provided if reporting requirements or response procedures are updated. New employees receive this training as part of their orientation and this training is reinforced during tailgate training sessions. Construction inspectors are also trained in emergency response procedures. The City emphasizes its goal to have no construction-related overflows during pre-bid and pre-construction meetings. Construction contractors are required to submit and obtain approval of all flow bypasses and emergency response plans prior to the start of construction.

6.5 Emergency Operation Procedures

LASAN has developed and implemented an advanced and comprehensive overflow prevention, response and reporting program. These include timely reporting to the impacted agencies and stakeholders, computer templates for estimating overflow volume, training for overflow review committee, and follow-up CCTV inspection to accurately determine cause and prevention methods. Field crews are trained in flagging and traffic control, which is set up depending on the location and nature of the spill. Section 5 of the *Response and Reporting Procedures for SSOs and Sewer or Stormwater Contamination* include the posting of community warning signs and barricades if necessary.

Adequate staff is placed on standby status to supplement existing staff as needed or respond to an emergency after hours. The City maintains a list of pre-qualified on-call contractors who provide specific equipment, materials, and crews to the City in emergency operations. Operation Staff at the Venice Pumping Plant constantly monitor the status of the remote pumping plants and are authorized to dispatch standby personnel as necessary. In addition, the City's Police Department, Fire Department, and Department of Transportation can be utilized to assist in emergency situations. The LASAN conducts table top exercises to simulate a multi-agency response to major sewer emergency. Section 6.1.13 of the Response and Reporting Procedures for SSOs includes steps to notify ISCD to support multi-agency response coordination.

6.6 Containment and Prevention Program for SSO Discharge into U.S Waters

The City seeks to protect public health & safety and the environment through the implementation of all Federal and State laws, standards, and orders applicable to untreated wastewater. Through a comprehensive and systematic program of cleaning, condition assessment, repair, and upgrade of its collection system, the City controls the discharge of untreated and partially treated wastewater into receiving waters such as ground water, streams, and rivers by minimizing the number of overflows that occur in the first place.

When an overflow occurs, the highest priorities are to contain the overflow and minimize, if not prevent, the overflow discharge into the storm drain system, and to minimize or eliminate exposure to the public and impact on public health. LASAN's *Response and Reporting Procedures for SSOs and Sewer or Stormwater Contamination* provide guidance to the crews in order to accomplish this objective.

A comprehensive investigation is performed for each overflow event to diagnose cause and take remedial measures to prevent and mitigate similar future events. When Category 1 spills occur, the City is communicating with the Regional Board on the monitoring of impacts, remedial/cleanup measures, and corrective/preventive actions taken.

Furthermore, the City has ongoing public outreach and education programs on untreated or partially treated wastewater, its health risk and impact to the receiving waters.

The City's response and containment have proved very effective in protecting public waterways and the environment. In most cases, 80 percent or more of spill volume is recovered during containment.

References for Further Information

- *Bureaus of Engineering, Contract Administration and Sanitation; "Joint Statement of Policy Pertaining to the Prevention of and Response to Construction Contract-Related Sewage Overflows."*

7 FOG Control Program

7.1 Program Overview

In July 1997, the City launched a study to assess the impacts of excessive FOG (FOG) discharges on its collection system. The study was intended to identify the sources of FOG discharges into the system and recommend measures to control FOG and minimize related sewer blockages and overflows in a cost-effective manner. The study revealed that, at the time, approximately 50 percent of all SSOs were caused by FOG. Major FOG contributors were food service establishments (FSEs), residential dwellings and non-profit organizations involved in food processing or preparation.

The study recommended the establishment of a grease control program that included a more aggressive preventive maintenance program, more extensive sewer inspection and cleaning, and the implementation of a source control program that would restrict the amount of grease from various sources.

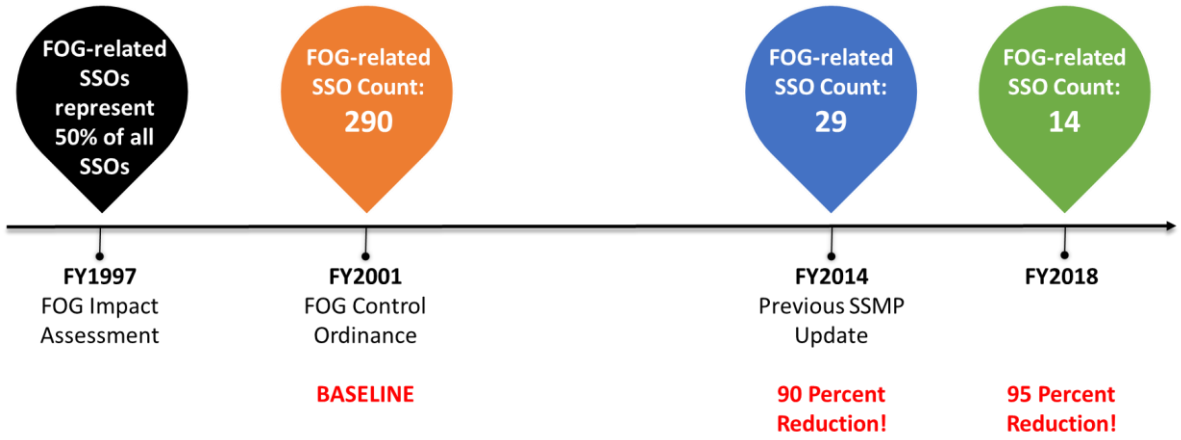
Following an extensive outreach to and in partnership with the City's approximately 10,000 FSEs, a FOG Control Program was developed. The following are the principal elements of the program:

1. Source Control
2. Sewer Cleaning
3. Community Outreach and Education

Effective August 5, 2001, the City Council enacted the FOG Control Ordinance (Number 174,047). This Ordinance amended the Los Angeles Municipal Code Section 64.30 and the Board of Public Works' (Board) Rules and Regulations Governing Disposal of Industrial Wastewater into Publicly Owned Treatment Works (POTW) of the City of Los Angeles (Rules and Regulations), included as **Attachment C1**.

As a result of these efforts, the City has since achieved a 95 percent reduction in FOG-related sewer overflows (SSOs), from a high of over 290 overflows in the baseline FY2001 to 14 in FY2018.

Figure 7-1 FOG-related SSO Reductions over Time



7.2 Implementation Plan and Schedule for Public Outreach

Ongoing public and stakeholder education, outreach, and participation are one of the three pillars of the FOG Control Program. This includes outreach to both commercial and residential FOG generators. LASAN maintains an up-to-date website, www.lacitysan.org, which serves as an additional source of information to the food service industry and the community at large. A summary of the FOG Control Ordinance, BMP Guidebook for FSEs, and general information about eliminating FOG discharges into the collection system are provided.

7.2.1 Summary of Outreach Activities

LASAN performs the following outreach and educational activities:

- Educational videos and brochures on BMPs (BMPs) are distributed to FSEss (FSEs) in five languages: English; Spanish; Korean; and two Chinese dialects, Mandarin and Cantonese.
- The City currently staffs six “champions” to liaison with different industries; it is in the process of adding one for FOG. In the City’s Industry Newsletter, it features spotlights on different industries and their role in protecting the collection system.
- BMP pamphlets and door hangers are distributed to Los Angeles residents following a FOG-related SSO in the area.
- Periodic education events are hosted throughout the year, including:
    - Sewer Science Program (educational outreach to kids on the function and workings of the collection system)

- Holiday flyers and TV ads prior to the Thanksgiving and Christmas holidays

- LASAN hosts six safe disposal sites across the City for the safe disposal of grease.
- LASAN maintains an up-to-date website, www.lacitysan.org, which serves as an additional source of information to the food service industry and the community at large. A summary of the FOG Control Ordinance, BMP Guidebook for FSEs, and general information about eliminating FOG discharges into the collection system are provided.
- Various outreach materials include a description of prohibitions on non-FOG debris like flushable wipes and rags.
- Participation in conferences and expositions, and annual workshops to communicate FOG Control Program requirements to and obtain feedback from the general public, FSEs, and regulatory agencies.

Figure 7-2 shows some of LASAN's outreach materials, which is produced in a number of different languages, and distributed at FSEs, to homeowners, and at outreach events.

Figure 7-2: Example Outreach Materials

7.2.2 Annual Plan and Schedule of Events, SSO Driven Activities

Outreach is conducted on both according to a planned schedule and on an ad hoc basis. Planned outreach is timed around FSE inspections. FOG inspectors visit each FSE to inspect grease traps and interceptors and check for any violations. At this time, they also provide educational material on BMPs. Newly permitted FSEs are also provided with material on BMPs. In addition, educational material is shared with residents every holiday season, and other sewer educational material that is shared at scheduled events contains information on FOG control. Finally, LASAN distributes door hangers and BMP pamphlets to homes in the area following an SSO event. FOG inspectors also perform surprise inspections of FSEs approximately two blocks up and down of the SSO event.

7.3 Plan and Schedule for Disposal of FOG within the Service Area

The City does not own or operate any FOG disposal facilities. The FSEs must, at a minimum, collect waste FOG and prevent its discharge into the collection system by implementing the following BMPs to reduce the amount of FOG requiring disposal:

- "Dry wipe" pots, pans, dishware and work areas prior to washing. Use rubber scrapers or paper towels to remove FOG from cookware, utensils, and serving ware.
- Use absorbent products to clean under fryer baskets and other locations where FOG may be spilled or dripped.

For waste FOG that is generated, it must be collected and stored properly in recycling barrels or drums. FSEs must use a licensed hauler or recycling facility to dispose of this waste.

It provides FSEs with a list of licensed grease haulers and rendering companies. FSE must save receipts for the proper disposal, which can be requested during an FSE inspection by FOG inspectors. Currently, there are 14 approved grease haulers operating in the City.

7.4 Authority to Prohibit FOG Discharges and Identify Measures to Prevent FOG SSOs

7.4.1 Authority

The City's FOG Control Ordinance (Number 174,047) prohibits FOG discharges by FSEs and any homeowners or businesses that discharge to the collection system. *Element 3 Legal Authority* provides more detail on LASAN's legal authority to prevent and control FOG discharges through ordinance.

7.4.2 Preventative Measures

LASAN's measures for preventing FOG-related SSOs are two-fold:

1. **Outreach and Enforcement**: as described above, LASAN conducts both planned and ad hoc outreach to educate customers on what they can do to reduce or eliminate the amount of FOG (and other debris such as flushable wipes) that get into the system. For FSEs, this includes regular inspections of their grease interceptors and traps. For those FSEs that are found to be out of compliance, enforcement actions can be taken to ensure any additional FOG does not get into the system.
2. **Sewer Cleaning**: LASAN has an aggressive cleaning schedule for the collection system to keep FOG from building up in pipes. All pipes up to 30 inches in diameter are cleaned on a set frequency, and pipes in known problem areas are cleaned at a higher frequency. As pipes are inspected and cleaned if they are found to contain FOG deposits, their cleaning frequency can be adjusted.

For FOG-related SSOs that do occur, LASAN implements *Referral and Enforcement Response Procedures for Fats, Oils, and Grease Discharges Resulting in a Sanitary Sewer Overflow,* included as **Attachment G1***,* to mitigate the impact of SSOs resulting from blockages caused by FOG accumulation. These procedures also provide guidelines for investigating FOG-related SSOs and taking enforcement and corrective actions to prevent future occurrences.

7.5 FOG Program Requirements and Design Standards

Major provisions of the FOG Control Ordinance and its Rules and Regulations address requirements related to grease removal devices, specifically, installation, design standards, maintenance, BMPs, and record keeping and reporting. They are summarized in the sections below.

7.5.1 Requirements to Install Grease Removal Devices

Installation of a grease interceptor(s) is required at all FSEs that have the potential to generate waste FOG unless a Conditional Waiver is granted, including: (1) FSEs that are to be newly constructed, (2) any existing non-FSE converting to an FSE, (3) FSEs with remodeling valued at $100,000 or more, and (4) any FSE deemed by the Director of LASAN, for example, any FSE that is known to cause FOG-related sewer blockages or overflows or fails to implement BMPs.

A grease interceptor is a plumbing device, with a minimum size of 300 gallons that is installed in an industrial wastewater drainage system to intercept and prohibit FOG from entering the collection system. If an FSE can demonstrate that installation of a grease interceptor is not feasible due to space constraints or other considerations, the Director may issue a variance from grease interceptor

requirements and authorize the installation of alternative grease removal devices, such as a grease trap.

7.5.2 Design Standards for Grease Removal Devices

The design, construction, installation and testing of commercial kitchen grease interceptors or grease traps is determined by Section 94.1000 of the City of Los Angeles Plumbing Code. The Industrial Waste Control group also works with FSEs on a continual basis to accept feedback on the standards. As appropriate, it may change rules and regulations. For example, the requirement for a minimum 750-gallon grease interceptor has been reduced to a 300-gallon grease interceptor. FSEs must still be permitted, with the ultimate size reviewed and approved by LASAN's Industrial Waste Management Division.

7.5.3 Maintenance Requirements

FSEs must comply with the following requirements for the operation and maintenance of grease interceptors:

- Grease interceptors shall be maintained in efficient operating condition by periodic removal of accumulated grease including floating material, sludge and solids.
- Grease interceptors shall be cleaned at a frequency such that the combined FOG and solids accumulation does not exceed 25% of the total liquid depth of the grease interceptor.
- A logbook of grease interceptor cleaning and maintenance practices shall be maintained.
- Copies of records and manifests of hauled waste FOG or hauled interceptor wastewater shall be maintained in FSE files.

FSEs are also required to comply with the requirements for the operation and maintenance of grease traps as follows:

- Grease traps shall be cleaned on a daily basis.
- A visual inspection of grease traps shall be conducted on a daily basis to check for leaking seams and pipes and ensure effective operation of the baffles and flow regulating device.
- Grease traps and baffles shall be maintained free of all caked-on FOG and food waste.
- Removable baffles shall be removed and cleaned during the maintenance process.
- Grease traps shall be maintained free of all food residues and any FOG waste dislodged during the cleaning and scraping process.

- Any waste including FOG and solid material removed from the grease removal device shall not be discharged into the sanitary sewer.

7.5.4 BMP Requirements

LASAN's Rules and Regulations for Industrial Waste Control includes BMPs in Section 11 *FSEs*. Section 11.B contains 11 BMPs, which all FSEs are required to comply with as applicable.

Acceptable fulfillment of all requirements is subject to approval by LASAN. The specified BMPs are:

1. Dispose food waste directly into the trash or garbage and not in sinks.
2. Install drain screens on all drainage pipes. Periodically clean the screens and dispose screened solids into trash or garbage cans.
3. "Dry wipe" pots, pans, dishware and work areas prior to washing. Use rubber scrapers or paper towels to remove fats, oil and grease from cookware, utensils, and serving ware.
4. Collect waste cooking oil and store properly in recycling barrels or drums. Use a licensed hauler or recycling facility to dispose of this waste.
5. Use absorbent products to clean under fryer baskets and other locations where fats, oil and grease may be spilled or dripped.
6. Use water temperatures less than 140° F in all sinks.
7. Train kitchen staff and other employees to follow BMPs.
8. Post all applicable BMPs in the food preparation and/or dishwashing area.
9. Routinely clean kitchen exhaust system filters.
10. Observe proper grease trap or interceptor cleaning and maintenance procedures to ensure the device is properly operating.
11. Comply with other BMPs deemed appropriate by the Director.

These BMPs are provided to newly permitted FSEs, and are checked during routine, follow-up, and surprise inspections of BMPs. Record Keeping and Reporting Requirements

Most FSEs are required to comply with the following record keeping and reporting requirements:

1. Maintain a logbook of grease interceptor or grease trap cleaning and maintenance practices.
2. Maintain copies of records and manifests of hauled waste FOG or hauled interceptor wastewater.

3. Maintain a record of any required self-monitoring reports or sampling data.

These records must be made available upon request to LASAN staff. Additional may be specified in an FSE's industrial wastewater permit; some requirements may also be omitted at the discretion of LASAN staff.

7.6 Inspection and Enforcement Program

7.6.1 Authority to Inspect Grease Producing Facilities

The FOG Control Ordinance provides LASAN with the legal authority to visit and inspect FSEs and monitor the implementation of BMPs. Section 64.30(C)(5) of the Ordinance specifies that whenever it is necessary to make an inspection to enforce any of the provisions of, or perform any duty imposed by this section or other applicable law, or whenever the Director has reasonable cause to believe that there exists upon any premises any violation of the provisions of this section or other applicable law, or any condition which makes such premises hazardous, unsafe, or dangerous, the Director or his/her designate is authorized to enter such property at any reasonable time and to inspect the same and perform any duty imposed upon the Director or his/her designate by this section or other applicable law. IWMD protocols for performing FOG inspections are documented in *Standard Procedures for FOG Inspections for Industrial Facilities*, included in **Attachment G2**.

7.6.2 Authority to Enforce

The FOG Control Ordinance also provides the authority to take enforcement actions for FSEs that are non-compliant with their Industrial Waste Permit. Enforcement actions can range from notices of violation and administrative orders to suspension of discharge privileges, permit revocation, water or utility service termination, and/or City Attorney referral for filing of civil/criminal charges. IWMD has developed an FOG Program *Enforcement Response Plan and Enforcement Response Guide*, included in **Attachment G3**, providing both a plan and implementation guidance for FOG program enforcement

7.6.3 Resource Plan to Inspect and Enforce

There are approximately 10,000 FSEs in the service area of LASAN. The Industrial Waste Control section of LASAN is staffed appropriately to ensure that all of these FSEs can be inspected on a routine basis and on an ad hoc basis following SSO events, and that new FSEs can be permitted and monitored for initial compliance before they are transitioned to the standard inspection frequency of once per year. The following represents the standard inspection schedule for FSEs:

- New FSEs requesting an Industrial Discharge Permit are inspected and a permit specific to the FSE is issued.
- Newly permitted FSEs are inspected 30 days after initial inspection to ensure compliance and answer questions.
- Routine inspections are conducted once per year for compliant FSEs. Inspections occur at a random time throughout the year to ensure that the inspection is not expected.
- In the event of an SSO, all FSEs within two blocks of the spill are inspected.

In order to achieve this inspection schedule, the system area is divided into four zones with a Senior Compliance Inspector overseeing each zone. Eighteen inspectors are divided between the zones. After-hours inspectors inspect FSEs that are only open in the evenings.

Any non-compliance issues found by Inspectors are elevated to the FOG Engineering group for investigation and follow-up. Initial non-compliance typically results in a Notice of Violation issued to the FSE. An Enforcement Response Plan is developed for each FSE and usually includes a compliance meeting and follow-up inspections, which are performed by a FOG Engineer. Serious or chronic non-compliance can be elevated to a cease and desist order or administration hearing, which are both carried out by the Industrial Waste Management. As a last resort, the City Attorney's office may issue fines, make a determination of public nuisance or disconnect water service. All inspection and enforcement activities are tracked in LASAN's FOG Permitting Information Management System (PIMS) database.

7.7 Maintenance Program to Address FOG Issues

The maintenance program to address FOG and reduce FOG-related SSOs consists of two parts:

1. Identification of FOG accumulation and problems related to FOG
2. Maintenance of pipes subject to FOG accumulation

7.7.1 Identification of Specific Pipe Segments with FOG Accumulation Issues

Pipe segments with FOG accumulation are identified in three ways:

1. Routine CCTV inspections
2. Cleaning, which pulls back FOG and other debris visible by the cleaner

   Findings from inspections and cleanings are used to adjust a pipe's cleaning frequency, so that pipes found to have accumulation can be cleaned more frequency to prevent build up that might cause an SSO.

3. SSO event investigation and inspection

SSOs caused by blockages from FOG are monitored for location and required cleaning frequency. All blockages are plotted on a GIS overlay map. Locations with a high number of FOG blockages are given special investigation and cleaning status. Sewers prone to FOG accumulation or blockages are given high priority and cleaned more frequently in an effort to prevent FOG-related overflows.

The process for adjusting the cleaning frequency of pipes is described in more detail in *Element 4 Operation and Maintenance Program*. Maintenance Program to Address Pipe Segments with FOG Accumulation Issues

LASAN performs frequent pipe cleaning to reduce FOG accumulation. Pipes with a history of FOG accumulation or FOG-related SSOs are cleaned more frequently than the system-wide cleaning frequency of once every three years. Pipes with observed FOG deposits during inspection are cleaned immediately.

All pipe segments, including “non-problem” sewers, are included in a routine preventive maintenance cleaning schedule of once every three years.

In order to ensure that required cleaning is occurring, scheduled and completed tasks are catalogued and tracked by work orders in the City’s maintenance management system, EMPAC. The maintenance program includes all preventive, proactive, predictive, and corrective maintenance; maintenance engineering; and quality control.

7.8 Source Control Program to Address FOG Issues

IWMD investigates potential source(s) of FOG waste through its permit program for FSEs. All FSEs are required to obtain an Industrial Waste Discharge permit and install grease control devices. This helps to prevent FOG waste from getting into the collection system. To verify compliance FOG inspectors carry out inspections of FSEs to ensure they are in compliance with their industrial wastewater permit, comply with source control measures for all sources of grease, implement BMPs, and maintain their grease control device(s) as applicable.

As part of routine inspection activities, inspectors from IWMD provide information and training materials such as multi-language DVDs, BMP posters, an ordinance summary, lists of licensed grease waste haulers, and pretreatment equipment manufacturers.

In the event an industrial discharger fails to comply with the requirements of the FOG Control Ordinance, IWMD takes immediate enforcement action to reduce the risk of FOG entering the collection system by applying one or more appropriate enforcement action(s). The enforcement actions available to the City of Los Angeles are outlined in an Enforcement Response Plan (ERP), and an individual ERP is developed for the non-compliant FSE. ERPs may include the following:

- NOV – A notice by certified mail or personal service which identifies the permit condition(s) violated, the circumstances surrounding the violation(s), and provides the FSE with an opportunity to correct the noncompliance on its own initiative.
- Within 10 days of the NOV, the FSE is required to conduct an investigation and submit a written response describing the cause of the violation, the actions taken to correct the violation or prevent future violations and the date those corrective actions will be completed.
- Telephone Assistance – A telephone call or verbal notification to an FSE official used to address violations, usually of a minor nature. All phone or verbal notifications are documented in the FSE's file.
- Conditional Waiver Revocation – IWMD personnel revoke the FSEs Conditional Waiver for cause and require an installation of a grease interceptor.
- Administrative Enforcement Order – An order that requires the FSE to cease a specific activity and implement corrective actions to permanently achieve and maintain compliance. An Order may be issued when an FSE fails to achieve compliance after a NOV is issued or when a pattern of noncompliance is observed.

The City may pursue civil and criminal penalties, as well as injunctive relief.

References for Further Information

- *City of Los Angeles Municipal Code*
- *FOG Guide for Discharging Industrial Wastewater to the Sewer*

8 System Evaluation and Capacity Assurance Plan

8.1 Overview

The City's collection system has sufficient capacity to handle peak dry-weather flows. Since 2007, the City has only experienced 3 capacity-related SSOs and has not experienced any capacity-related SSOs since March 17, 2012. Beginning in December 2011, California began experiencing the longest duration of drought on record. This has led to increased conservation over the past seven years, which shows no signs of changing. This has led to significant reductions in wastewater flows conveyed by the City's collection system over the past 10 years. An indication of this is the wastewater flow at Hyperion, which went from approximately 350 MGD to 260 MGD average daily flow. As weather patterns change, the system will continue to have the capacity to convey wet-weather flows from 10-year storms. The vast majority of the system components also have sufficient capacity to handle larger, less frequent storms. However, overflows can occur at a limited number of locations during larger than 10-year storm events.

8.2 Collection System Evaluation

8.2.1 Monitoring

Monitoring for Hydraulic Deficiencies

Through an ongoing flow monitoring program, hydraulic model, and CCTV inspections, system components with current or projected hydraulic deficiencies are identified.

The City uses three (3) different flow gauging programs to obtain data to evaluate sewer hydraulic condition.

- Near-time Gauging: Continuously monitors 194 locations in major outfall, interceptors, and primary sewers (pipes 16-inch and greater in diameter).
- Periodic Gauging: Monitors over 500 locations in the primary sewers and some secondary sewers (pipes 15 inch or smaller in diameter).
- Special Gauging: Provides for short-term gauging of one day to one week duration and is conducted at any sewer location upon requests by planners, engineers, and operation & maintenance staff.

The flow rates and flow depth to pipe diameter ratios (d/Ds) provided by the Flow Monitoring Program are inputs into the City's dynamic GIS-based hydraulic model of the Primary System. Operating scenarios are simulated to identify

system deficiencies and to develop and prioritize capacity relief projects. This data is also used to assist in the preparation of wet-weather operation plans.

The City maintains a database where all gauging data is recorded. Data is retrieved from all gauging locations and evaluated. Exception reports are generated for appropriate follow-up actions for the monitoring stations where the flow depths are 75 percent or more of the pipe inside diameter. Causes of high flow rates are determined through flow analysis and field investigations and may include sewer blockage, structural failure, unusually high and excess discharges by industrial users, or continued growth in the basin. As appropriate, immediate actions are taken to address pipes that have failed or are in imminent danger of failing through the City's emergency repair process. Similarly, maintenance (sewer cleaning) may be performed to remove debris, or industrial inspectors may be dispatched to investigate excessive discharges. Locations where gauged flow depth is equal to or greater than 50 percent but is less than 75 percent of the pipe diameter are also listed and closely monitored. Flows are compared to historic flows and trending reports are developed.

The hydraulic model also receives input from other planning tools to identify and estimate potential future capacity constraints due to economic and population growth. For example, the Sewer Flow Estimation Model delineates the system into growth areas, and then provides population forecasts and other growth factors by area. These can be added to the hydraulic model to predict areas that may need to be upsized in the future. For new development requests, the City follows a process to review the impacts of increased flow to the system and ensure there is sufficient capacity to meet the demand. For development projected to add no more than 10,000 GDP, a standard permit is issued if the model shows now capacity constraints. For additions larger than 10,000 GPD, the City Planning Department works with LASAN to determine if additional capacity is needed through the use of the hydraulic model or gauging. The City has also begun to incorporate resiliency and climate change information into its analysis. For example, sea level rise is being modeled to assess its impact on pumping plants and storm intensity is being modeled dynamically to show variations in timing, velocity, and depth.

Monitoring for Structural Deficiencies

As described in *Element 4.3 Repair, Rehabilitation, and Replacement Plan*, LASAN regularly inspects the collection system for structural deficiencies that may lead to blockages and overflows. Inspections are made primary using CCTV, while LiDAR and SONAR are used in addition to CCTV for some primary basins. This information is included in basin reviews together with capacity deficiencies to develop a basin plan.

Wet Weather Prevention and Response

Through its network of flow monitors, LASAN collects flow information in the system real time. During wet weather events, data from flow monitoring stations is collected and summarized using FlowWorks, which can produce a dashboard

to inform decision making around flow diversion to prevent overflows in constrained parts of the system.

8.2.2 Project Planning Process

Sewer basins planning reports are prepared based on model results and include recommended capacity projects. Primary and secondary sewer basin plans and concept reports are then developed based on the planning reports. These basin plans also include findings of condition and other assessments that can identify capital project needs. Basin plans and concept reports identify deficiencies and evaluate alternatives for needed improvements and make recommendations. The Master Plans provide the basis for capital improvement projects. A business case evaluation is developed for all recommended projects, which are rated against a risk rating framework. Both LASAN and LABOE review each project before it is accepted and prioritized with all other project. Finally, projects are included in the Wastewater Capital Improvement Program (WCIP) in a priority order to meet near-term needs and accommodate future growth. Depending on the type of asset, different evaluation methods, tools, and planning techniques are use. **Table 8-1** summaries each.

Table 8-1: Planning Cycles for Collection System Infrastructure

Collection System Infrastructure	Evaluation Methods	Model Uses	Planning Cycle
Interceptor/Outfall	Backwater modeling, visual inspection, CCTV	Dynamic model with input from flow monitoring, capacity forecasting tools	In line with Primary Basin Plans
Primary Sewer	Hydraulic model, visual inspection, CCTV, sonar	Dynamic model with input from flow monitoring, capacity forecasting tools	10 years
Secondary Sewer	Visual inspection, CCTV, flow monitoring	N/A	15-20 years
Pumping Plants	Hydraulic model, visual inspection	Dynamic model with input from flow monitoring, capacity forecasting tools	Ad hoc

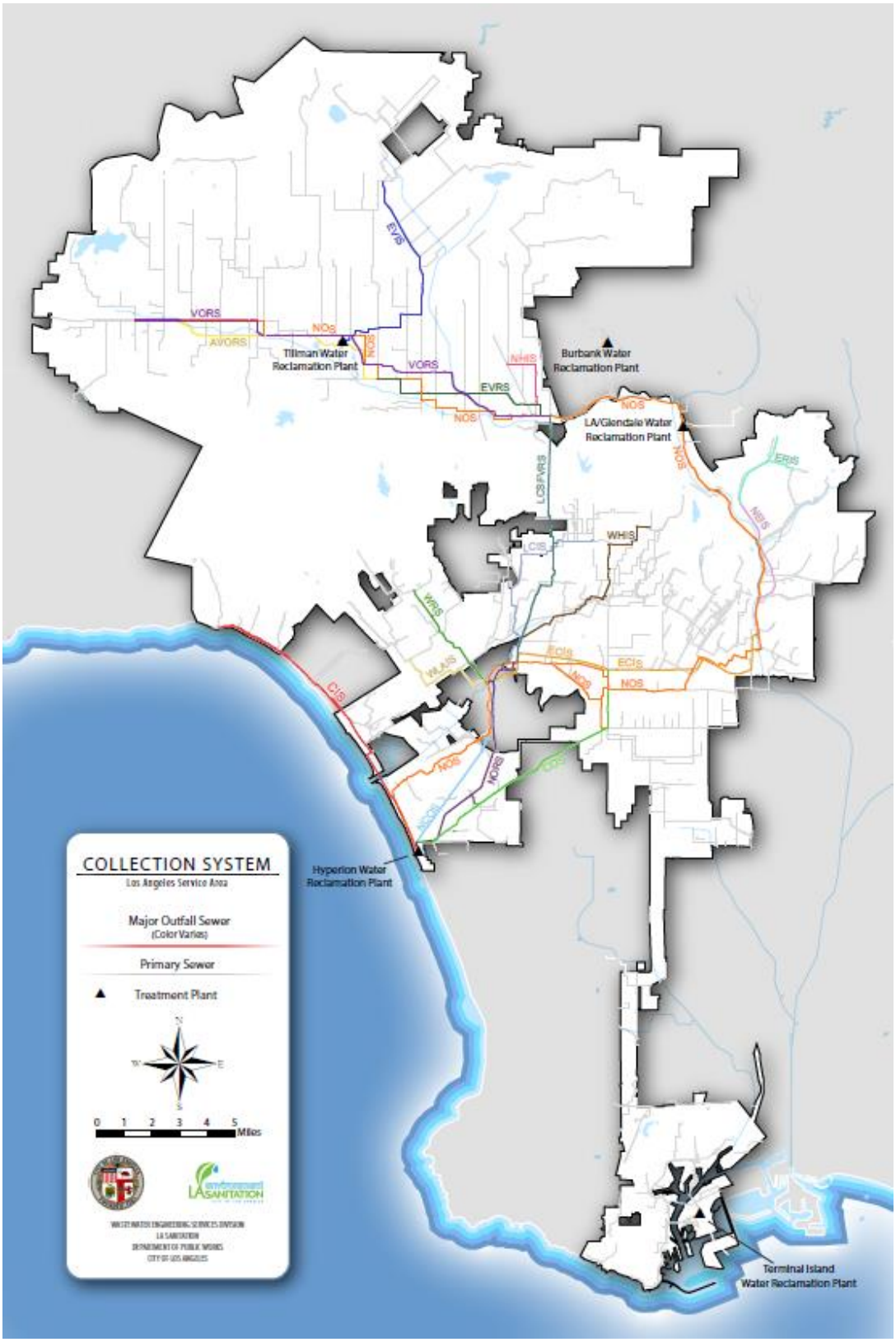
The following sections describe specific processes and projects related to interceptors and outfalls, primary basis, and secondary basins.

8.2.3 Interceptors and Outfalls

The long-term hydraulic, structural, environmental, and operational needs for interceptors and outfalls are studied during the primary basin planning cycle and on an as-needed basis. Operating (flow routing) options and alternatives for major physical facilities for wastewater collection, conveyance, and storage are evaluated and recommendations for capital improvement and optimal operating scenarios are made. During this process, LASAN models backwater flows in order to project the receiving treatment plant's ability to take flows in. Findings

from this process are assigned to the corresponding primary basin plan. **Figure 8-1** show the interceptors and outfalls that are included in the evaluation and planning process.

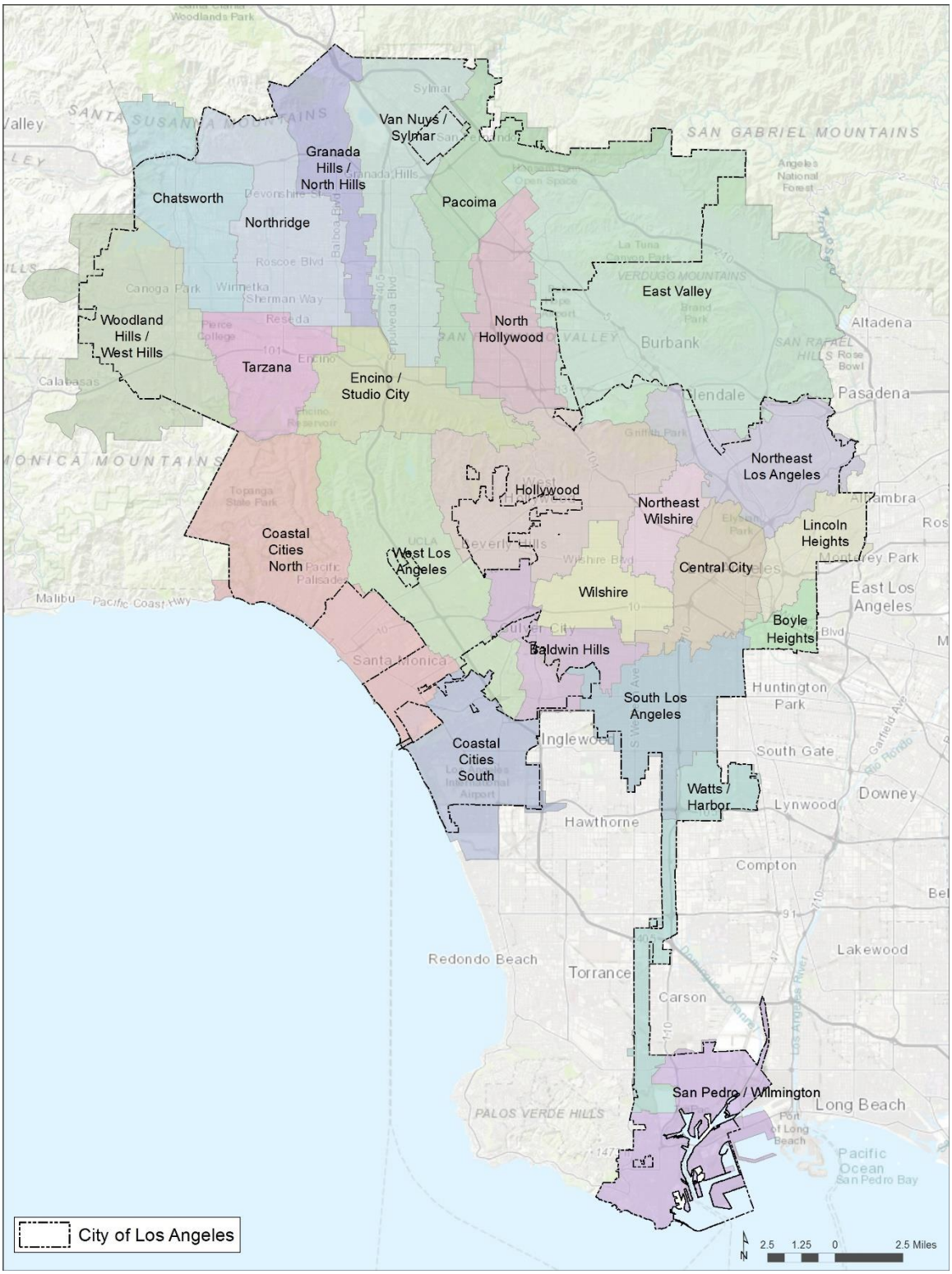
Figure 8-1: Map of Major Outfalls and Interceptors



8.2.4 Primary Basins

Sewers 16 inches and larger in diameter are categorized as primary sewers. As shown in **Figure 8-2**, there are 24 primary sewer drainage basins in the City. Basin boundaries coincide with natural drainage boundaries. Primary basin plans provide comprehensive analysis of basin conditions and recommendations for needed improvements to meet current and future demands. Basin needs are identified through hydraulic, structural, and environmental (odor) condition assessment; alternative solutions are developed, screened, and evaluated based on selection criteria for technical feasibility, cost-effectiveness, community and environmental impact; and selected alternatives are recommended for inclusion with the city's Wastewater Capital Improvement Program (WCIP). Master plans are updated on a 10-year cycle to meet new demands due to changes in population and population forecast, aging system components, and application of new and superior technologies. The last basin planning cycle began in 2006, and planning work was substantially completed by 2009. The current basin planning cycle began in 2018, target completion of the basin plans is 2020, with projects to be substantially completed by 2026.

Figure 8-2: Map of Primary Sewer Basins

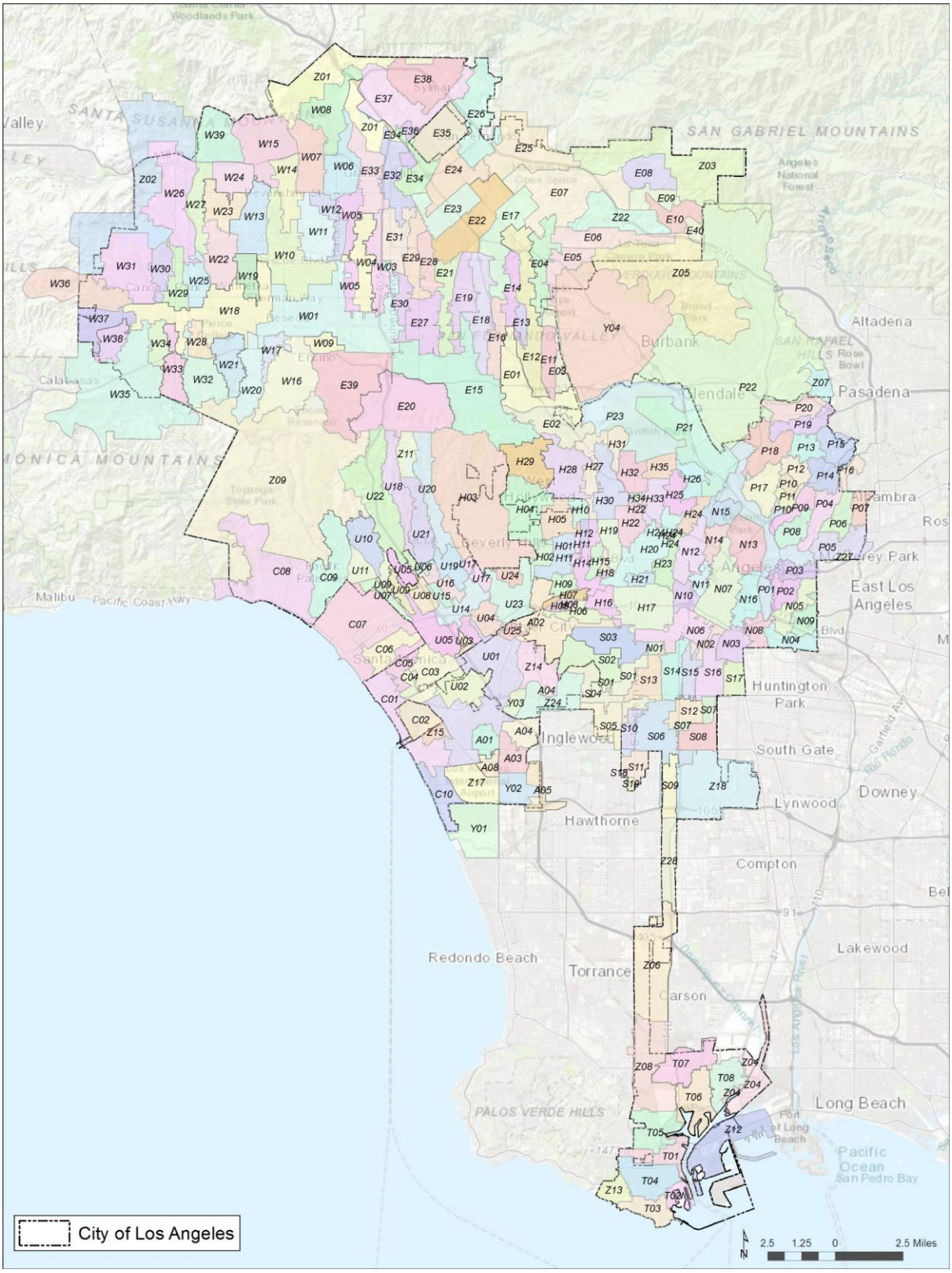


8.2.5 Secondary Basins

Secondary sewers are the City sewers that are smaller than 16 inches in diameter. The City's entire collection system, including all three collection systems, is divided into 220 secondary sewer basins (also known as sewer sheds), shown in **Figure 8-3**. The secondary sewer basins follow the natural sewer drainage boundaries. The basins are prioritized for planning purposes using weighted risk factors such as number of SSOs per unit length of sewer, percentage of known problem material, and age categories. The original prioritization of secondary basins was made in 2000; the highest priority basins (100) were completed by 2014. Additional lower priority basins are now being added. To date, 145 secondary basin plans have been completed. In cases where new inspection data is collected in secondary basins that have already been planned, defects found in these new inspections are evaluated to determine if an immediate repair is needed or if the needed repair can be added to a project developed for another basin.

The basin plans provide comprehensive analysis of the secondary sewer basins; identify structural, operational, and hydraulic deficiencies in the system; and provide corresponding renewal recommendations. Recommended projects are prioritized and implemented using a Business Case Evaluation risk-based prioritization described in further details in *Element 4 Operation and Maintenance Program*. Recommended renewal projects requiring a capital project are prioritized and included in the City's Wastewater Capital Improvement Program (WCIP). For severe pipeline deficiencies that are found during inspection that could lead to or have led to an overflow, emergency and expedited repairs are planned ahead of basin plan projects to address the deficiencies as appropriate.

Figure 8-3: Map of Secondary Sewer Basins



8.2.6 Pumping Plants

A physical condition assessment of all pumping plants was completed in 2015 that assessed the condition of all major infrastructure and componentry of each pumping plant. From this, a list of pumping plant rehabilitation projects was developed, which include everything from complete rehabilitation of a pumping plant to minor upgrade projects.

LASAN has also completed a separate plan analyzing the hydraulic capacity of all pumping plants to project flow based on system growth. No capacity constraints were found; two to three pumping plants are being monitored for future hydraulic upgrades.

From these planning efforts, pumping plant rehab projects have been prioritized and the top 20 to 25 plants will be incorporated into the WCIP this year. Projects were ranked in priority based on risk, severity or need.

8.3 Design Criteria

8.3.1 Summary of Criteria and Differences by Asset Type

The primary collection system is modeled against a 10-year design storm and has the capacity to convey 10-year storms and, in some parts of the system, can handle larger less frequent storms. Primary sewers indicating d/D of greater than 0.50 but less than 0.75 are monitored. Primary sewers with d/D of greater than 0.75 are the targets of further evaluation, monitoring, and identification of measures to address capacity issues. Modeled SSOs in the outfall system are reviewed to ensure an overflow will not occur in wet weather events using information such as gauging data and performance during past events.

In the secondary collection system, CCTV data is reviewed to determine the height of the watermark to identify pipe segments showing d/D of greater than 0.50, which will be targeted for upsizing in secondary basin plans.

For new or rehabilitated infrastructure, the City has a long-established Sewer Design Manual that undergoes periodic review and updates to incorporate the latest advances in design and construction techniques. The Sewer Design Manual is maintained by the LABOE. LABOE is in charge of design, construction, start-up and optimization of public works projects.

8.4 Capacity Enhancement Measures

Through hydraulic condition assessment, population forecast, and modeling, the City identifies the current capacity needs and predicts future requirements and develops capital improvement projects to address them. Flow gauging data is recorded in a computer-based network database, analyzed, and displayed in GIS map overlays, tables and other forms for evaluation and decision-making. When the peak flow in a sewer reaches a predetermined level, it triggers a planning study that is initiated in time to ensure that additional capacity is provided to meet future demands before the sewer d/D (ratio of flow depth to pipe diameter) reaches 0.75 in conformance with the City's Sewer Design Manual criteria. The study results are summarized in a concept report.

Concept reports are prepared for locations in need of additional capacity. The reports validate and quantify capacity needs; develop and evaluate alternative solutions considering current and future structural, hydraulic, and operational needs; and recommend preferred solutions consistent with long-term Master Plans. Environmental documents are prepared and public outreach conducted to incorporate community feedback in project planning and meet the requirements of National Environmental Policy Act (NEPA) and/or California Environmental Quality Act (CEQA) as appropriate.

The City has few capacity enhancement measures in the capital planning process as the result of past efforts and reduced flows. All of the projects identified from the 2008 planning effort are complete. The NEIS 2A project that was entering into final design was reviewed and determined unnecessary and removed from the WCIP. Efforts are still underway to relieve flows on the North Outfall Sewer. The San Fernando Relief Sewer is in the conceptual planning stage and moving towards the design phase. Some previously borderline capacity issues are moving towards becoming capacity constraints due to increased development. Since 2013-2014 timeframe the City has received 500 to 600 new capacity requests due to new construction. This is up from approximately 100 capacity requests.

8.5 Schedule for Implementing Capacity Enhancement Measures

The City's 10-Year WCIP is reviewed and updated annually. It is an expenditure plan for the wastewater collection, conveyance, treatment, disposal, reclamation, and reuse projects. Projects get included in the WCIP based on a risk-based prioritization system. The collection and conveyance projects description and expenditure plans are included in a section titled "Collection System."

The two identified capacity upgrade projects to address previously borderline issues that are now triggered due to new capacity requests are in the current WCIP. Aside from this, LASAN will be updating the 24 Primary Sewer Basin Plans in the next 18-24 months to identify any condition and capacity remediation required on these pipelines prior to the World Cup and Olympics, which the City is hosting in the late 2020s. The City has a separate line item in the WCIP for the North Outfall Sewer of approximately $50 million per year to address condition and capacity issues.

8.5.1 BCE Process

A business case evaluation is developed for each project to be included in the WCIP. The BCE includes information like a statement of need, project benefits, and also rates each project against a risk rating framework. Both LASAN and LABOE participate in the review of each project BCE. Each BCE is also independently evaluated by FMD to ensure a standard approach is used.

8.5.2 Prioritization Process

Projects recommended in concept reports are first prioritized within basins, and then across basins. This occurs in an annual WCIP prioritization workshop. During this workshop all capital projects are evaluated and prioritized based on their risk scores and

BCEs. LABOE and LABCA's ability to resource and manage projects, and other city infrastructure projects are considered in this evaluation.

8.5.3 WCIP Review and Update Process

The WCIP project schedules and funding are approved by a Program Review Committee (PRC) which holds regularly scheduled meetings. The PRC is made up of members of executive management from LASAN and LABOE. The PRC process includes a mechanism for project change authorization as justified based on a variety of reasons including technical and financial considerations and changing needs or requirements.

The WCIP is funded by revenues generated through collection of fees for wastewater services that are determined based on a fair and equitable system of cost-sharing by all users of the system. These include Sewerage Facilities Charge (SFC), Sewer Service Charge (SSC), Quality Surcharge Fees, and fees paid by the City's satellite agencies under contractual arrangements. WCIP funding is augmented through the issuance of revenue bonds.

9 Monitoring, Measurement and Program Modifications

9.1 Overview of Performance Management System

The City employs a robust performance management system to track, assess and improve collection system performance at both tactical (operational) and strategic (organizational) levels. To do this, the City has created “line-of-sight” between citywide and organizational level goals, and individual division business plan objectives and initiatives. These are in turn supported by measures and metrics that range from key performance indicators such as SSO rates, to operating metrics that are measured on a weekly and monthly basis. The performance management system also tracks the progress of implementation of various initiatives, actions, and tasks identified to help the City achieve its goals. **Figure 9-1** demonstrates the organization line-of-sight created between various levels of goals and objectives, and also the relationship between the measures and metrics that measures the organization’s progress and performance. **Figure 9-2** is an example of LASAN’s balanced scorecard tracking system.

Figure 9-1 Performance Line-of-Sight

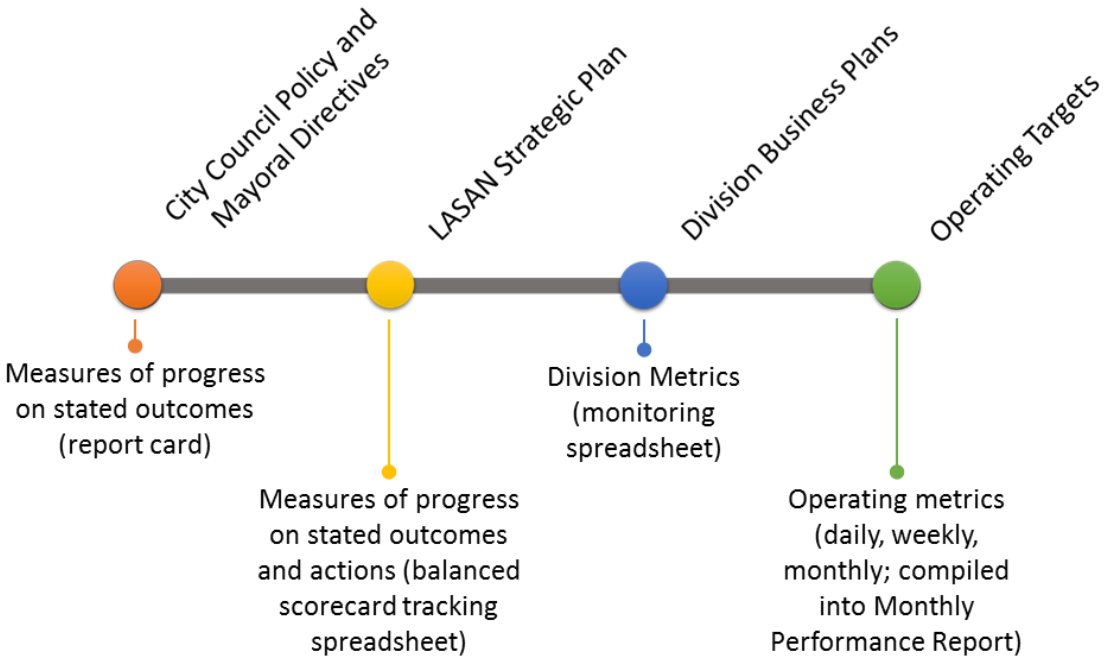
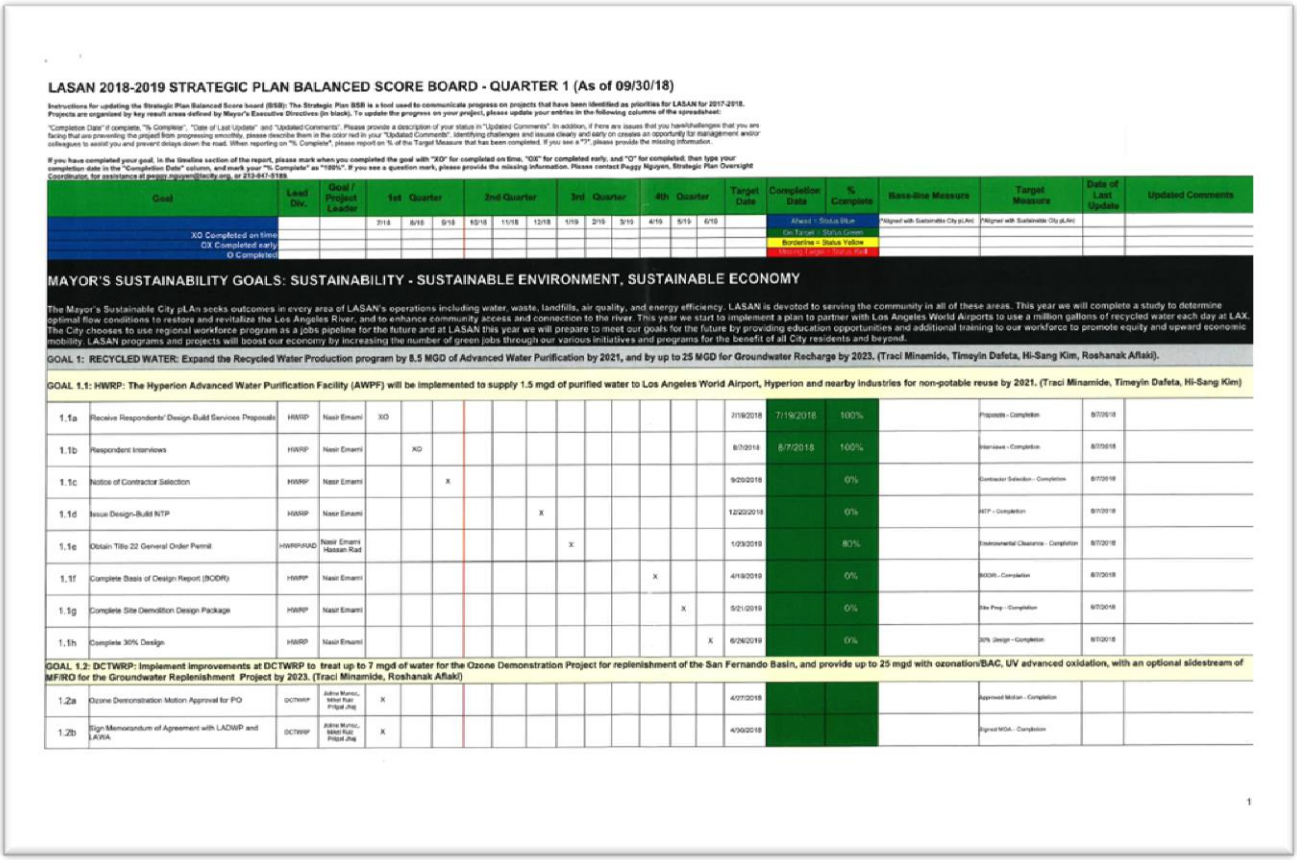


Figure 9-2 "Snapshot" of Performance Management Table



LASAN 2018-2019 STRATEGIC PLAN BALANCED SCORE BOARD - QUARTER 1 (As of 09/30/18)

Instructions for updating the Strategic Plan Balanced Score board (BSB): The Strategic Plan BSB is a tool used to communicate progress on projects that have been identified as priorities for LASAN for 2017-2018. Projects are organized by key result areas defined by Mayor's Executive Directives (in black). To update the progress on your project, please update your entries in the following columns of the spreadsheet:

"Completion Date" if complete, "% Complete", "Date of Last Update" and "Updated Comments". Please provide a description of your status in "Updated Comments". In addition, if there are issues that you have/challenges that you are facing that are preventing the project from progressing smoothly, please describe them in the color red in your "Updated Comments". Identifying challenges and issues clearly and early on creates an opportunity for management and/or colleagues to assist you and prevent delays down the road. When reporting on "% Complete", please report on % of the Target Measure that has been completed. If you see a "?", please provide the missing information.

If you have completed your goal, in the timeline section of the report, please mark when you completed the goal with "XO" for completed on time, "OX" for completed early, and "O" for completed, then type your completion date in the "Completion Date" column, and mark your "% Complete" as "100%". If you see a question mark, please provide the missing information. Please contact Peggy Nguyen, Strategic Plan Oversight Coordinator, for assistance at peggy.nguyen@lacity.org, or 213-847-5189.

Goal	Lead Div.	Goal / Project Leader	1st Quarter			2nd Quarter			3rd Quarter			4th Quarter			Target Date	Completion Date	% Complete	Base-line Measure	Target Measure	Date of Last Update	Updated Comments
			7/18	8/18	9/18	10/18	11/18	12/18	1/19	2/19	3/19	4/19	5/19	6/19		Ahead = Status Blue		*Aligned with Sustainable City pLAn	*Aligned with Sustainable City pLAn		
XO Completed on time																On Target = Status Green					
OX Completed early																Borderline = Status Yellow					
O Completed																Missing Target = Status Red					
MAYOR'S SUSTAINABILITY GOALS: SUSTAINABILITY - SUSTAINABLE ENVIRONMENT, SUSTAINABLE ECONOMY																					
The Mayor's Sustainable City pLAn seeks outcomes in every area of LASAN's operations including water, waste, landfills, air quality, and energy efficiency. LASAN is devoted to serving the community in all of these areas. This year we will complete a study to determine optimal flow conditions to restore and revitalize the Los Angeles River, and to enhance community access and connection to the river. This year we start to implement a plan to partner with Los Angeles World Airports to use a million gallons of recycled water each day at LAX. The City chooses to use regional workforce program as a jobs pipeline for the future and at LASAN this year we will prepare to meet our goals for the future by providing education opportunities and additional training to our workforce to promote equity and upward economic mobility. LASAN programs and projects will boost our economy by increasing the number of green jobs through our various initiatives and programs for the benefit of all City residents and beyond.																					
GOAL 1: RECYCLED WATER: Expand the Recycled Water Production program by 8.5 MGD of Advanced Water Purification by 2021, and by up to 25 MGD for Groundwater Recharge by 2023. (Traci Minamide, Timeyin Dafeta, Hi-Sang Kim, Roshanak Aflaki).																					
GOAL 1.1: HWRP: The Hyperion Advanced Water Purification Facility (AWPF) will be implemented to supply 1.5 mgd of purified water to Los Angeles World Airport, Hyperion and nearby industries for non-potable reuse by 2021. (Traci Minamide, Timeyin Dafeta, Hi-Sang Kim)																					
1.1a	Receive Respondents' Design-Build Services Proposals	HWRP	Nasir Emami	XO											7/19/2018	7/19/2018	100%		Proposals - Completion	8/7/2018	
1.1b	Respondent Interviews	HWRP	Nasir Emami		XO										8/7/2018	8/7/2018	100%		Interviews - Completion	8/7/2018	
1.1c	Notice of Contractor Selection	HWRP	Nasir Emami			X									9/29/2018		0%		Contractor Selection - Completion	8/7/2018	
1.1d	Issue Design-Build NTP	HWRP	Nasir Emami					X							12/20/2018		0%		NTP - Completion	8/7/2018	
1.1e	Obtain Title 22 General Order Permit	HWRP/RAD	Nasir Emami Hassan Rad						X						1/29/2019		80%		Environmental Clearance - Completion	8/7/2018	
1.1f	Complete Basis of Design Report (BODR)	HWRP	Nasir Emami									X			4/19/2019		0%		BODR - Completion	8/7/2018	
1.1g	Complete Site Demolition Design Package	HWRP	Nasir Emami										X		5/21/2019		0%		Site Prep - Completion	8/7/2018	
1.1h	Complete 30% Design	HWRP	Nasir Emami											X	6/26/2019		0%		30% Design - Completion	8/7/2018	
GOAL 1.2: DCTWRP: Implement improvements at DCTWRP to treat up to 7 mgd of water for the Ozone Demonstration Project for replenishment of the San Fernando Basin, and provide up to 25 mgd with ozonation/BAC, UV advanced oxidation, with an optional sidestream of MF/RO for the Groundwater Replenishment Project by 2023. (Traci Minamide, Roshanak Aflaki)																					
1.2a	Ozone Demonstration Motion Approval for PO	DCTWRP	Jolina Munoz, Mikel Ruiz, Pritpal Jhaj	X											4/27/2018				Approved Motion - Completion		
1.2b	Sign Memorandum of Agreement with LADWP and LAWA	DCTWRP	Jolina Munoz, Mikel Ruiz, Pritpal Jhaj	X											4/30/2018				Signed MOA - Completion		

1

9.2 Maintenance of Information to Prioritize SSMP Activities

The City maintains several software systems to collect, store, and translate data on the collection system for the purposes of monitoring and decision-making. **Table 9-1** inventories the City's software systems relevant to implementation and monitoring of the SSMP.

Table 9-1: Information Systems Relevant to SSMP Implementation and Monitoring

System	Description of Primary Functions	Related SSMP Activities
FAST	Crew-facing work order management system, interfaces with EMPAC system	Contains work order information needed by crews to complete work, and tracks work order completion information (e.g. time completed, materials used)
EMPAC	Master work order management system, interfaces with FAST system, interfaces with program management databases	Central repository for all preventative maintenance schedules (PMs) and record of work performed on individual assets, tracks and aggregates work order information by maintenance program
Program Management Databases	Development and tracking of individual program preventative and corrective maintenance, interfaces with EMPAC system, directs contractor work	Used to plan and schedule work for individual SSMP maintenance programs: Cleaning, Maintenance hole Raising, Roach/Pest Control, Root Control, Cleaning QA/QC, CCTV, Emergency Sewer Repair, Odor Control, Inventory Reconciliation Program, Lateral Cleaning; manages contractor information
NavigateLA (GIS)	Asset database of record, including asset attribute information such as material type, diameter. Represents asset physical location spatially.	Work order planning and schedule; emergency response; system modeling and evaluation; asset on-boarding; retirements
Wastewater Information Systems Enterprise (WISE) database	Maintains record of all spills that occur in the system	Used for regulatory reporting, maintains individual asset spill history and maintenance history. Can be queried for SSO performance analysis, trending, and spatial analysis.
CCTV Log (database)	Tracks condition scores for assets that have been CCTV'ed; links to video file for inspections	Referenced by engineers and planners when determining renewal needs and severity, prioritizing work, and determining appropriate renewal technology/method.
Sewer Flow Estimation Model (SFEM)	Delineate system into growth areas, forecast population and other growth factors	Capacity assurance forecasting tool used to assess population and employment growth; input into modeling program
Sewer Capacity Availability Review (SCAR)	Primary tool for evaluating current capacity against proposed new development; interfaces with system hydraulic model	Evaluates the existing collection system to determine if there is adequate capacity to safely convey sewage from proposed development projects, proposed construction projects, proposed groundwater dewatering projects and proposed increases of sewage from existing facilities
MIKE URBAN	Collection system modeling of primary collection system; receives input from flow monitors, SFEM, and SCAR	Dynamic model designed to model system capacity, potential constraints and points of overflow, incorporate population and employment development, and ensure sufficient current and future capacity. Model outputs are used extensively by planners when identifying and prioritizing basin improvement projects.
Supervisory Control and Data Acquisition (SCADA) system	Tracks pumping plants operating data	Monitors real-time performance of pumping plants to trigger maintenance action; makes control decisions to maximize flows through the system.
InfoMaster	Secondary sewer basin planning tool	Uses CCTV condition information for expected pipes to review found defects and select an appropriate renewal method and technology based on the severity of the defect, number of defects, and overall pipe risk.
Permit Information Management System (PIMS)	Maintains inventory of FSEs, permitted variances, grease traps and interceptors.	Primary database for FOG program, including planning and scheduling of inspections, tracking permitted variances, and tracking violations and follow-up enforcement actions.
Uniform Project Review System (UPRS)	Capital project tracking and reporting system	Tracks capital projects through design, construction, inspection, and close-out; reports on improvements of the collection system through renewal activities.
Financial Management System	Financial management system for O&M and capital expenditures	Capital and operating expenditure tracking, renewal planning (prioritization against funding levels).

These information systems support the Operations and Maintenance program, Sewer Condition Assessment program, emergency response, odor and corrosion abatement programs, and system survey and capacity assurance programs, serving as a repository of information for analysis. This in turns provides for the prioritization of SSMP activities, such as work order planning and scheduling, hydraulic modeling to identify capacity constraints and other issues, performance trend analysis based on asset attribute information. The following sections provide examples of how these programs interact with information to support SSMP activities.

Preventative Maintenance and GIS

Information regarding all maintenance activities, sewer condition, overflows, and odor complaint is entered into EMPAC, which serves as the central repository for maintenance data. This information is routinely evaluated to document maintenance needs, identify problem locations, and assist in analysis of overflow events and odor complaints. This data is periodically coupled with flow information and overlaid on a GIS base map of the collection system to quickly identify and visualize problem areas, communicate actual condition and maintenance needs to operation and maintenance staff, prioritize cleaning and root removal activities, and provide corrective measures. The GIS maps are among the primary tools used in prioritizing and scheduling sewer assessments and maintenance activities in the preventive maintenance program.

Overflow Prevention

In an effort to prevent overflows, flow monitoring and CCTV records are reviewed to identify potential weaknesses in the system. Sewer locations that exhibit high flow levels and sewers that are in poor condition are identified through this process. These assessment activities may trigger further reviews to determine cause and/or may trigger immediate or accelerated corrective actions. Maintenance priorities are set based on the relative severity of the problem. This process relies on information from multiple sources, including the collection system model, CCTV log, and EMPAC work order management system.

9.3 Monitoring of Implementation and Effectiveness of the SSMP

The SSMP is a well-integrated plan with each element designed to complement and support the others. Each year the sewer system management performance goals are set through the annual strategic planning process, the deliverables required to meet goals are defined and prioritized, the lead and support offices and resources are assigned, and progress is measured and reported on to ensure meeting or exceeding goals. Operations and maintenance program elements are tracked on a monthly basis through the City's operational performance management system. Overall sewer system management performance is evaluated and reported to management monthly, quarterly, and annually following the end of each fiscal year. Any plan updates necessary to enhance sewer system management performance are identified and become a part of the following year's Five-Year Strategic Planning process. These cyclical reviews are described below.

Collection System Operational Monthly Report

This report is compiled on a monthly basis and includes metrics for each of the maintenance programs (i.e. root control or maintenance hole raising), performance compared to plan, and stormwater, customer service, and resource management metrics. Much of this information is tracked on a weekly and daily basis through the City's work order management system which is collected into reports by sewershed and yard. Is it used by CWNCD and CWSCD management teams, from the Division Manager to Zone Managers and other staff responsible for overseeing daily collection system operational activities.

Monthly and Quarterly SSMP Performance Evaluations

On a monthly basis, progress on the SSMP is reported on to executives and division heads. This progress report is focused primarily on implementation progress metrics including percent spent and percent complete, compared to plan. The quarterly report focuses on similar metrics, but reports to a wider internal audience. The evaluations serve as an opportunity to course correct and reallocate resources if progress is not meeting plan.

Annual Reporting

The City issues a Collection System Annual Performance Report, produced jointly by WESD, CWNCD and CWSCD. The annual report covers major program activities (e.g., cleaning, condition assessment, basin planning, and capacity assessment) and reports on metrics such as SSO performance and annual renewal quantities. During the review of this annual report, targets and goals are revisited, and each division reviews resource allocations and determines the next year's targets and required resources. SSMP implementation progress is also reported at this time, and any updates necessary are incorporated into the next year's business plan.

9.4 Assessment of Preventative Maintenance Program

The City assesses the success of its programs by analyzing condition assessment results and responding with the appropriate correction measure, and keeping track of the quantities and trends of various types of sewer blockages and overflows as well as odor problems and complaints. Based on these trends, successful practices are continued and program adjustments are made when appropriate.

Examples of these assessments include: weekly condition assessment review meetings, monthly SSO reviews, monthly performance meetings with chemical root control contractors, and a comprehensive annual review of the preventive maintenance program.

The City's preventive measures also include community outreach and education programs on the workings of the collection system and steps the public can take to help reduce blockages and overflows, such as lateral root control and the City's FOG outreach and enforcement program. The effects of these efforts are tracked by reviewing condition assessment results for these particular types of defects, and trends in FOG- and root-related SSOs.

9.5 Identification and Illustration of SSO trends

Data acquisition, analysis, and management of SSOs is supported by an integrated information management system. SSO trends are identified and tracked through a state-of-the art GIS tracking system. When events are reported, they are uploaded to a master database and plotted on a City-wide map. All attributes of each sewer pipe gravity and pressure segment are included in a comprehensive SSO event inventory database. Information collected during the response to a new overflow or odor complaint is also entered into a maintenance management database. This information is evaluated to document locations, causes, and frequency of overflows and odors (which are public nuisance but also might indicate a greater problem in a particular area). This data is then superimposed on a GIS base map of the collection system to quickly identify and visualize problem areas; communicate conditions and needs to City policy makers and management; and prioritize maintenance activities, urgent and emergency repairs, and mid- and long-term solutions. This system allows the City to review SSO and odor performance by frequency (seasonal variations, year-over-year comparisons), location (known problem areas, system characteristics such as pipe material and installation timeline), and volume (totals hitting surface waters, average volumes, changes to volume over time, which can indicate effectiveness of response time). The following figures represent some of the analyses the City performs routinely to identify SSO trends; each is included in either the monthly or annual collection system performance report.

Figure 9-3 Seasonality of Spills

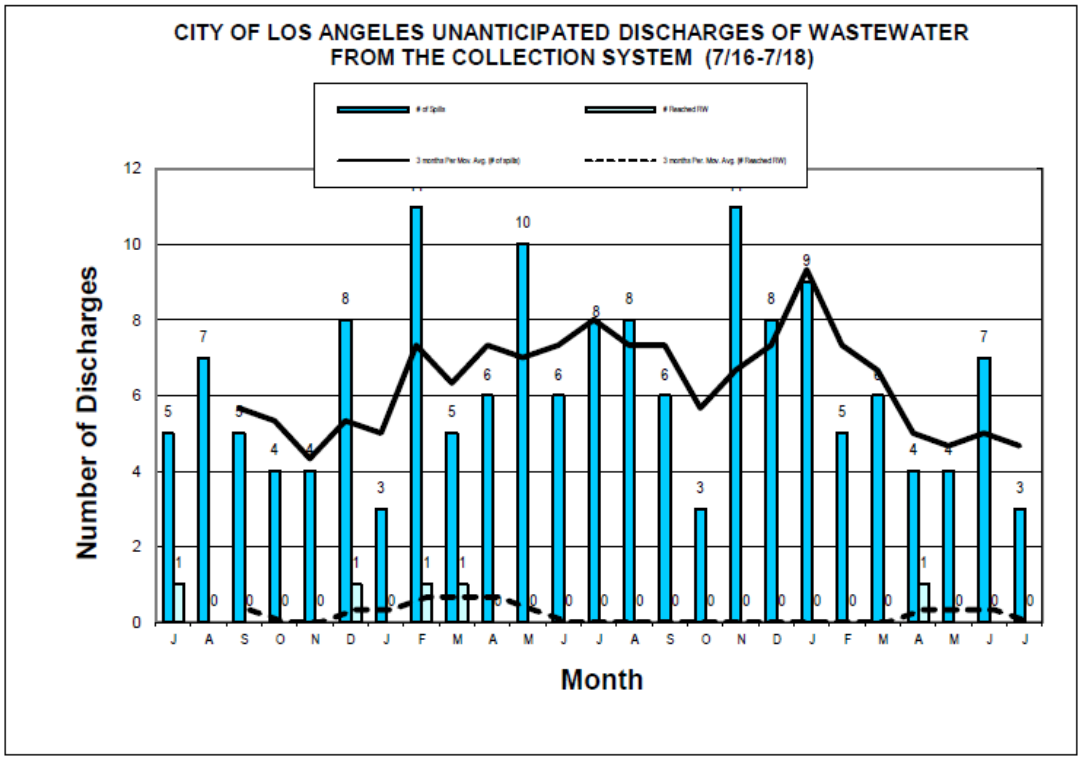


Figure 9-4 Geographic Distribution of Odor Complaints

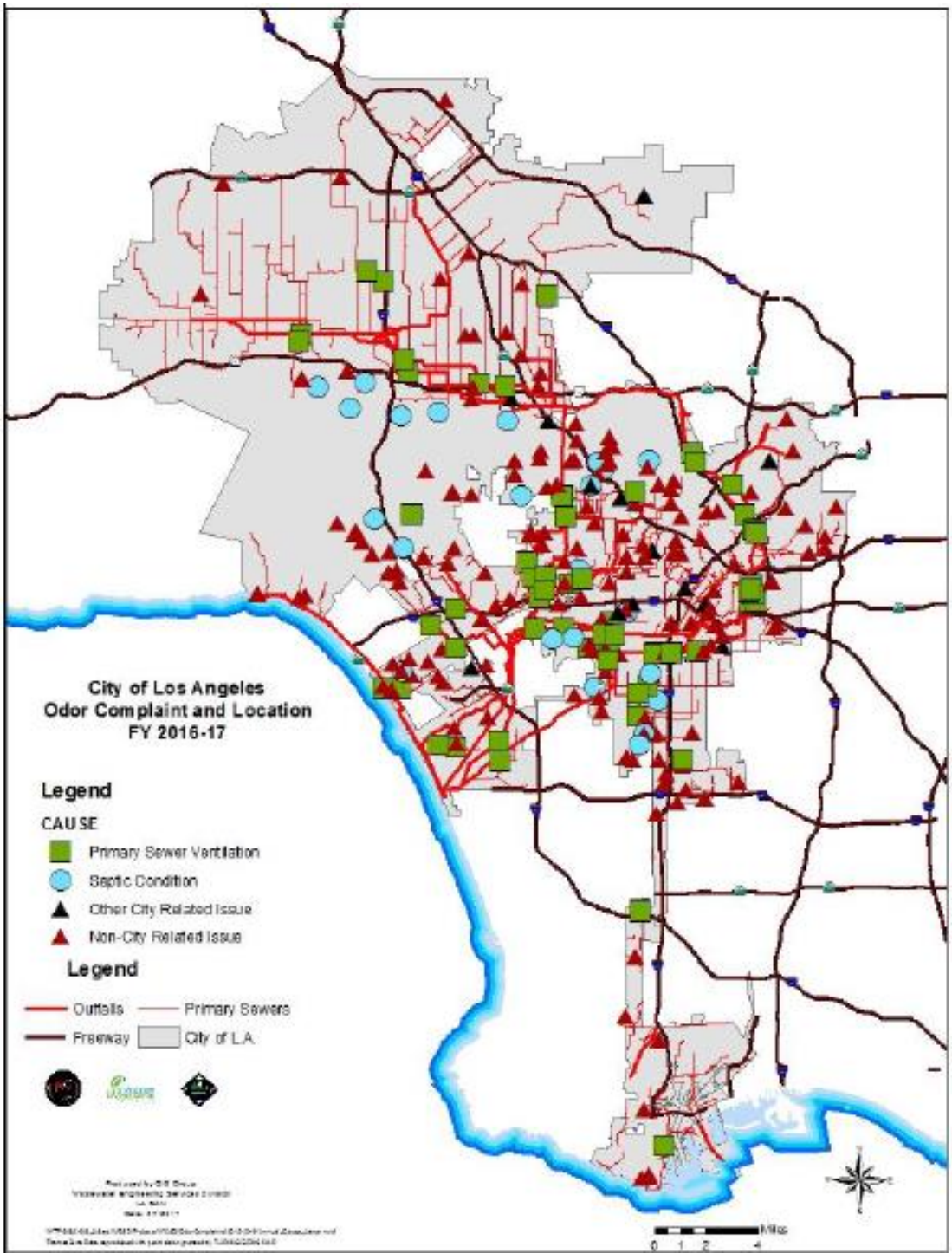
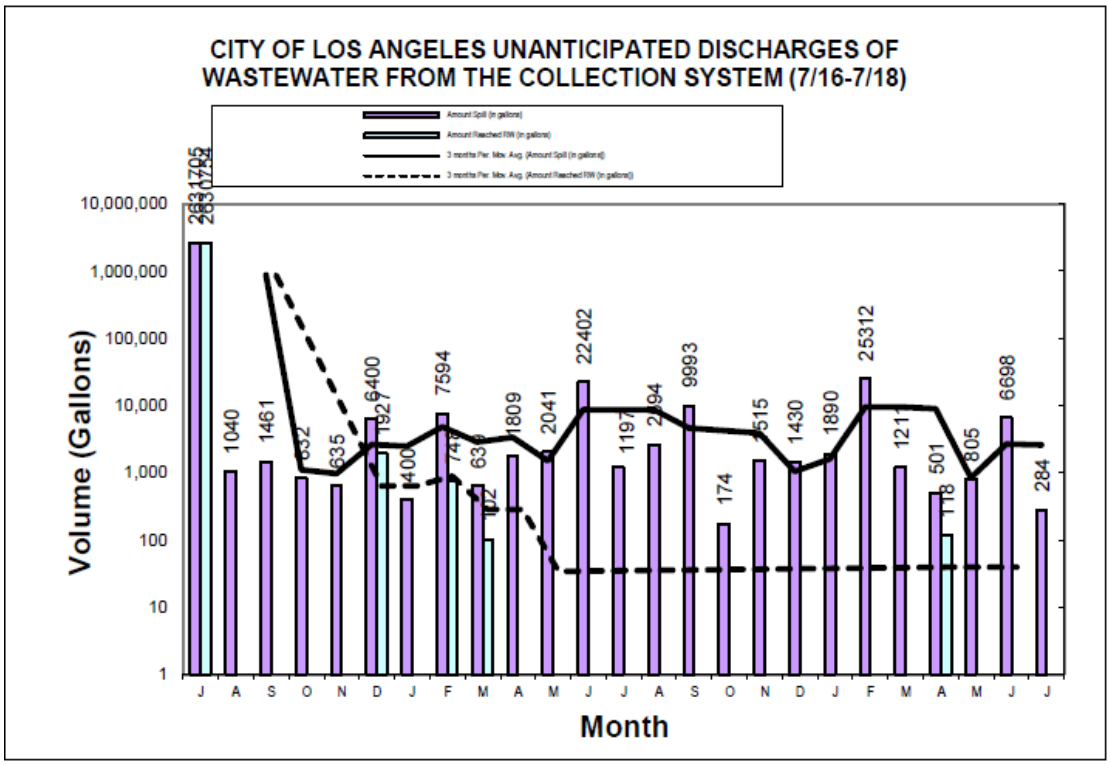


Figure 9-5: Volume of SSO Discharges Over Time



9.6 Approach to Program Modifications

The City performs periodic monitoring and reporting (weekly, monthly, quarterly, annually) to measure the implementation progress and the performance of the various SSMP elements; identifies and implements any needed improvements; and updates the SSMP accordingly.

9.6.1 Course Correction Measures

Depending on the nature of the finding of performance or progress, the City may act in one of three ways:

1. ***Do nothing***: progress or performance is going according to plan, and no action is required. This indicates that the schedule, resource allocation, and implementation plan is appropriate.
2. ***Address acute/isolated incident***: if an action is behind schedule or a program element is not performing as expected, it is assessed to determine the cause, and whether that cause is an isolated instance or an acute problem. If it is an isolated instance, then a corrective measure appropriate to the specific incident is taken.
3. ***Address programmatically for on-going issues***: if the reason for unexpected performance is chronic, then a programmatic solution is developed. For instance, if SSOs due to root intrusion are increasing in a particular area, then the entire

area may be put on a chemical root control schedule, rather than just the individual pipes that have caused an SSO.

Table 9-2 Program of Work and Typical Program Modifications Identified for Core SSMP Elements

SSMP Element	Program of Work	Typical Program Modifications
Operations and Maintenance Program	Sewer cleaning Sewer inspection Sewer repairs Pump plant operations and maintenance	Cleaning frequency changes Cleaning method changes Cleaning referrals Inspection referrals Sewer repairs and renewal identified
Overflow Emergency Response Plan	SSO Response and Reporting	After Action Review leads to lessons learned for response team
FOG Control Program	FOG inspections FOG enforcement Outreach	FOG investigations Targeted outreach
System Evaluation and Capacity Assurance	Primary basin planning Sewer Capacity Availability Request Watermark review Gauging	Problem areas identified Flow monitoring Capacity upgrades identified

Ad hoc teams are also formed to address specific issues as they are identified. For example, Strategic Planning Teams (SPTs) which are joint labor and management teams, meet regularly to identify opportunities for task enhancement and determine optimal workload, resource and personnel requirements. Core business activities are identified and a task analysis of each activity is used to determine appropriate staffing levels and equipment needs. The following sections provide examples of program modifications the City has implemented to address specific issues affecting the collection system.

Stormwater Inflow and Infiltration Prevention (SIIP) Program

The Los Angeles Municipal Code prohibits connections of storm drains, downspouts, area drains, storm sewer connections and other sources that could contribute infiltration and/or inflow to the system. In early- to mid-2000s, the City identified sources of unauthorized discharges of stormwater into the collection system using smoke testing. These included roof drains, yard area drains, parking lot drains, downspouts, and other sources draining directly to the collection system. To address this systemic problem, LASAN and Department of Building & Safety jointly sent notices to property owners, including evidence of such unauthorized connections and the need for corrective action as required by City ordinances. Follow-up inspections and surveys conducted in the mid-2000s confirmed the success of the SIIP Program. An estimated annual average of more than 8 million gallons per day (mgd) of extraneous water has been excluded from the system due to the SIIP Program.

FOG Control Program

In order to reduce FOG-related SSOs, the City implemented a robust prevention program including FOG control at the source (FSE education and enforcement and homeowner outreach), frequent sewer cleaning, and ongoing user education and involvement. The goal is to eliminate all preventable FOG-related sewer overflows. Program modifications

continue to be made with active support and input from FSEs as needed and appropriate.

9.6.2 Proactive Planning of Program Elements

In addition to tracking the various program elements and implementing course correction measures as appropriate, the City incorporates data review and analysis into the proactive planning for each of the program elements. Examples of this are described below.

Annual Review of Preventive Maintenance

On an annual basis in a comprehensive review the critical sewers are identified, prioritized, and scheduled for maintenance based on parameters such as blockage and overflow records, frequent maintenance requirement, age, pipe material, and condition assessment results.

Flow monitoring and CCTV records are reviewed to identify potential weaknesses in the system. Sewer locations that exhibit high flow levels and sewers that are in poor condition are identified through this process. As appropriate further reviews may follow to determine cause, develop and prioritize corrective actions. Based on this review, the City can then plan its upcoming year for preventative maintenance and develop appropriate performance targets.

Root Control Program

The City has an aggressive root control program that entails chemically treating problem sewer reaches using environmentally friendly chemicals. The program includes root growth monitoring by CCTV inspection, mechanical root removal, and chemical treatment with herbicide to prevent root re-growth.

Recognizing that private sewer laterals are a major source of tree root intrusion into the collection system, the City expanded the root control program in 2006 by adding a community outreach and education program. Property owners are provided helpful information on routine maintenance and corrective actions required to protect the laterals from roots penetration and damage and to prevent root-related overflows.

Flow Monitoring Program

Flow monitoring provides important support to sewer planning and operation & maintenance. Trending reports are used to project future flows and prioritize planning studies, design and construction projects. Sewers where peak dry weather flow levels reach 0.75 d/D (75 percent of the pipe diameter) receive the highest priority. When the unrestricted flow in a pipe reaches a predetermined “trigger flow” depth, a planning study will be initiated to define and validate the problem; evaluate future needs; and develop recommended alternatives for implementing sewer relief or replacement projects. The trigger flow concept ensures that projects planning are initiated sufficiently in advance so that capital improvements are implemented to provide additional capacity by the time needed.

Construction

LABCA requires contractors to develop and implement a spill prevention and response plan for all sewer construction projects to comply with the City's "zero spill" policy. The "zero spill" policy is documented in the Brown Book, which is an adaptation of the "Standard Specifications for Public Works Construction (Green Book)" and documents the City's amendments and additions that address specific City needs and policy requirements.

9.6.3 Audit-Driven Program Modifications

Every five years the SSMP document is updated. The update consists of:

- Reviewing the existing SSMP language and updating any outdated information. This includes things like organizational structures and reporting lines that have changed, changes to system characteristics such as basin areas.
- Updates to reflect new goals identified through the City's strategic planning process.
- Incorporation of the adopted and implemented recommendations from previous SSMP program audits.

Upon completion of the five-year SSMP update, the SSMP is provided to the Board of Public Works with a request for approval. Upon acceptance by the Board, the SSMP is re-certified under State Water Board CIWQS database and made publically available on the LASAN website.

References for Further Information

- *Collection System Annual Performance Report*
- *LASAN Strategic Plan, latest version*
- *Mayoral Executive Directives*
- *pLAn Annual Report*

10 SSMP Program Audits

The City uses the SSMP update process to identify actions for improving how it manages, operates, and maintains the collection system. This process identifies the tasks and actions that are required to meet SSMP goals and defines and prioritizes them. Resourcing and planning for delivery of the actions identified in the SSMP audit are incorporated into the City's strategic planning process, described in *Element 9 Monitoring, Measurement and Program Modifications*.

10.1.1 Schedule of Program Audits and Updates

The City monitors the performance of the collection system on an on-going basis through monthly performance reviews performed at the operating unit level, and annually during division level business planning and goal setting and the annual strategic plan review. It also performs a formal audit of its SSMP every two years in accordance with the WDRs. Every five years, the City formally updates and recertifies the SSMP. **Table 10-1** shows the timeline for SSMP audits and updates for the last five years and the anticipated schedule for the next five years.

Table 10-1: SSMP Audit and Update Schedule

Year	Audit
2015	Biennial self-audit completed in February 2015
2017	Biennial self-audit performed in February 2017
2019	Biennial third-party audit and 5-year SSMP update completed in February 2019
2021	Biennial self-audit planned in early 2021
2023	Biennial self-audit planned in early 2023
2024	5-year SSMP update planned in early 2024

10.1.2 Program Audit and Update Process

A team of experienced personnel is formed once every two years to perform biennial self-audits in accordance with regulatory requirements for SSMP Program Audits. The team consists of representatives from the relevant city departments and is led by WESD. In a series of in-person meetings over the course of approximately three months, the audit team evaluates the effectiveness of each SSMP element, identifies any deficiencies, and makes recommendations for improvements and updates. This is done by answering a set of questions developed specifically for the purpose of the audit for each element of the SSMP. It also includes referencing and reviewing performance reports and measures monitored throughout the year in accordance with the strategic plan. These findings are documented in an audit report. Once the audit is complete, a QC review of the audit report is performed, with a focus on consistency, completeness, and inclusion of references and attachments as appropriate. The final audit report is reviewed by the City's LRO before final acceptance. Audit reports and related materials are maintained in a hard copy and an electronic document tracking and management system.

10.1.3 Audit Implementation and Tracking of Results

The SSMP program audit recommendations and corrective actions are incorporated into the annual strategic plan review and budgeting process to ensure the necessary resources are in place to implement audit corrective actions and recommendations. Through that process, implementation progress is measured and reported on an ongoing basis to ensure timely completion of corrective actions. Any deficiencies in meeting the schedule are identified or anticipated and mitigation measures developed and implemented to ensure the corrective actions from the audit are addressed. Each subsequent audit update begins with a review of the previous audit to ensure all recommendations have been implemented and anything outstanding is incorporated. As described in *Element 9 Monitoring, Measurement and Program Modifications*, any updates necessary to enhance the SSMP performance are included as a part of the following year's Five-Year Strategic Planning process and/or the formal SSMP program audit.

References for Further Information

- *SSMP Program Audit Report, 2019*

11 Communication Program

The City shares the SSMP and program implementation updates with the public, stakeholders, and satellite agencies to ensure decision-makers and customers are aware of the program. It also uses these communications to help educate stakeholders on the program and ensure the resources needed to be successful are in place. Other regular communications on various elements of the SSMP are also made.

11.1.1 SSMP Communication and Outreach

The City publishes the most recent version of the SSMP on its website (www.lacitysan.org/ssmp), along with the most recent audit report, which includes findings on performance like SSO trends. City staff periodically review and update the City websites. Regulatory compliance reports such as implementation plans and periodic progress reports are also posted on the sites. Contact information for anyone wishing to inquire about the SSMP is also provided on the website.

11.1.2 Other Communication and Outreach

The City sends the SSMP to satellite agencies for informational purposes. The City also reaches out to its communities through various means including LASAN's website (www.lacitysan.org), newsletters; surveys; community events; presentations to neighborhood councils and other community organizations; advisories and press releases; websites; and toll-free helplines. Outreach events are held for the general public, commercial and industrial entities, trade associations, professional organizations, and students. Outreach events include community fairs, LASAN Maintenance Yard Open Houses, and school visits. Outreach materials are available in a number of languages. Electronic versions of the outreach materials are made available on CDs, DVDs and on the website.

The City communicates to its customers on topics ranging from informational and educational, to ways customers can help improve collection system performance, to upcoming impacts to the community. Questionnaires are also sent out at appropriate intervals on selected programs to seek public input, gauge the effectiveness of the programs, and make changes as appropriate. The following are examples of program-related community outreach and communication efforts.

FOG Control Program Outreach

The FOG Control Program outreach is geared towards FSEs, non-profit groups that have large food preparation services, and residents. Outreach is conducted both through the FSE inspection process, and in visits to schools and through educational material. The City staff participates in conferences and expositions and conducts annual workshops to communicate Program requirements and obtain feedback from the general public, FSEs, and regulatory agencies on various requirements and BMPs for the control of FOG.

Private Lateral Sewer Maintenance and Root Control Outreach

This outreach is focused in the areas of the City designated as “root hot spots” where sewers are susceptible to blockages and overflows caused by tree root intrusion through laterals. Properties in the “root hot spot” areas are sent pamphlets which contain information regarding causes of root growth in private laterals, prevention methods, and proper operation and maintenance. Customers can use a telephone helpline and an e-mail address to contact City staff for further assistance. A website (www.lacitysan.org/sewerhazards) also provides additional information and useful tips.

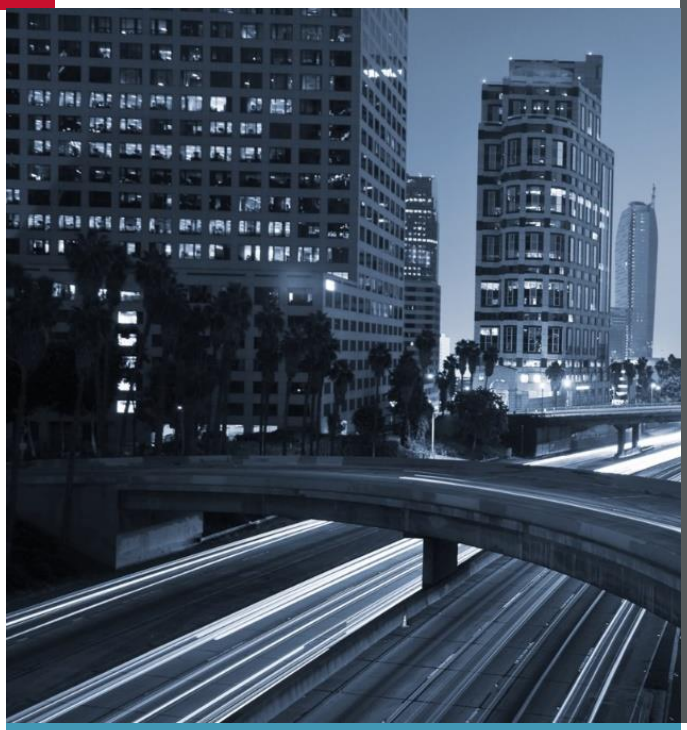
Communication of Capital Improvement Projects

Capital Improvement Projects are listed on lasewers.org and are advertised in the community on billboards throughout the community. Phone numbers are posted on project signs that customers can call either for more information on a project or to report dust or noise coming from the project site, as well as project start and end dates. Outreach is also conducted by meeting with local businesses and the community. These activities ensure that the communities are informed about projects in their neighborhoods, know how to get further information, or report adverse project effects.

Stakeholder and Educational Engagement

LASAN participates in the Annual Congress of Neighborhood Councils, presenting on different issues. It also hosts events, activities, and tours at the Los Angeles Environmental Learning Center, an education center located at the Hyperion Water Reclamation Plant. The Center was developed to bring textbook and classroom learning to life while showcasing the City’s commitment to protecting public health and the environment.

The City provides wastewater conveyance and treatment services to 29 satellite communities under contractual agreements but does not fund, operate or have control over the collection systems of these communities. The City meets with its satellite agencies on common contractual matters semi-annually. It also has open lines of communication for any matters requiring immediate attention related to system performance. This may include spills that affect downstream areas and complaint and problem investigation.



Sewer System Management Plan

Version 3.0

City of Los Angeles

LA Sanitation & Environment

Los Angeles, California
January 25, 2019