



CARPINTERIA

Sanitary District

SEWER SYSTEM MANAGEMENT PLAN

UPDATED: November 2019

APPROVED:

A handwritten signature in black ink, appearing to read 'Craig Murray', is written over a horizontal line.

Craig Murray, P.E.
General Manager

Date: _____

ADOPTED:

Lin Graf
President, Board of Directors

Date: _____

TABLE OF CONTENTS

INTRODUCTION	1
SSMP REQUIREMENT BACKGROUND.....	1
DOCUMENT ORGANIZATION	1
DISTRICT SERVICE AREA AND SEWER COLLECTION SYSTEM	3
DEFINITIONS AND ACRONYMS	4
1.0 SSMP GOALS	8
2.0 ORGANIZATION	9
2.1 WDR REQUIREMENTS.....	9
2.2 AUTHORIZED REPRESENTATIVE	9
2.3 RESPONSIBLE PERSONNEL.....	9
2.4 SSO REPORTING PROTOCOL	11
3.0 LEGAL AUTHORITY.....	14
3.1 WDR REQUIREMENTS.....	14
3.2 DISTRICT ORDINANCES	14
3.3 DISTRICT CONSTRUCTION STANDARDS.....	16
4.0 OPERATION AND MAINTENANCE	17
4.1 WDR REQUIREMENTS.....	17
4.2 SEWER SYSTEM MAPPING	17
4.3 MAINTENANCE MANAGEMENT SYSTEM.....	18
4.4 MAINTENANCE AND INSPECTION PROGRAM.....	19
4.6 PUMP STATION IMPROVEMENTS	31
4.7 OPERATOR TRAINING AND CERTIFICATION.....	32
4.8 EQUIPMENT MAINTENANCE PROCEDURES	36
5.0 DESIGN AND PERFORMANCE	37
5.1 WDR REQUIREMENTS.....	37
5.2 DESIGN AND CONSTRUCTION STANDARDS.....	37
5.3 CONSTRUCTION PERMIT PROGRAM.....	38
5.4 TESTING AND INSPECTION PROCEDURES	38
6.0 OVERFLOW EMERGENCY RESPONSE PLAN.....	39
6.1 WDR REQUIREMENTS.....	39
6.2 OVERFLOW RESPONSE PLAN.....	39
7.0 FOG PROGRAM	40
7.1 WDR REQUIREMENTS.....	40
7.2 LEGAL AUTHORITY	40
7.3 FOG PROGRAM SUMMARY	41
7.4 ENFORCEMENT	42
7.5 FOG DISPOSAL	43
7.6 PRIORITY LINE CLEANING.....	43
8.0 SYSTEM EVALUATION / CAPACITY ASSURANCE.....	47
8.1 WDR REQUIREMENTS.....	47
8.2 WASTEWATER COLLECTION SYSTEM REHABILITATION PLAN	47
8.3 INFILTRATION AND INFLOW STUDY.....	48
8.4 WASTEWATER MASTER PLAN.....	49

8.5 HYDRAULIC MODEL.....	49
8.6 CAPITAL IMPROVEMENT PROGRAM	50
9.0 MONITORING AND MEASUREMENT	53
9.1 WDR REQUIREMENTS.....	53
9.2 PERFORMANCE MEASURES	53
9.3 BASELINE COLLECTION SYSTEM PERFORMANCE	54
9.4 MONITORING AND REPORTING.....	55
9.5 ONGOING PROGRAM IMPROVEMENTS	55
10.0 SSMP PROGRAM AUDITS	56
10.1 WDR REQUIREMENTS.....	56
10.2 PROGRAM AUDIT PROCEDURES	56
11.0 COMMUNICATION PROGRAM	61
11.1 WDR REQUIREMENTS.....	61
11.2 DISTRICT OUTREACH PROGRAM	61
APPENDIX A	63
CARPINTERIA SANITARY DISTRICT ORDINANCES	63
APPENDIX B	64
EXAMPLE SEWER ATLAS MAP	64
APPENDIX C	65
2002 DESIGN AND CONSTRUCTION STANDARDS.....	65
APPENDIX D	66
SSO RESPONSE PLAN	66
APPENDIX E	67
COLLECTION SYSTEM REHABILITATION PLAN EXCERPTS.....	67
APPENDIX F	68
INFILTRATION AND INFLOW STUDY EXCERPTS	68
APPENDIX G	69
WASTEWATER MASTER PLAN EXCERPTS	69

INTRODUCTION

SSMP Requirement Background

In an effort to reduce the occurrences of sanitary sewer overflows (SSOs) within California, Statewide General Waste Discharge Requirements (General WDRs) were adopted on May 2, 2006, that imposed several new requirements on all agencies that operate wastewater collection systems. To date, the District has complied with all prescribed provisions, including enrollment in electronic spill reporting and the establishment of its legal authority to enforce sewer ordinances. The final provision requires the development and implementation of a written Sewer System Management Plan (SSMP) that complies with the following regulatory mandates:

- National Pollutant Discharge Elimination System (NPDES) Permit CA0047364 issued by the Central Coast Regional Water Quality Control Board on September 2017;
- California Water Resources Control Board adopted Statewide General Waste Discharge Requirements for Wastewater Collection System Agencies (GWDR) on May 2, 2006.
- On July 26, 2013, the SWRCB authorized Order No. WQ 2013-0058-EXEC, Amending Monitoring and Reporting Program for Statewide General Waste Discharge Requirements for Sanitary Sewer Systems (Amended MRP). The Amended MRP became effective on September 9, 2013.

Document Organization

The organization of this document is based on the mandatory SSMP elements as outlined in the General WDRs. Each of the eleven elements as listed below forms a section of this document.

1. **SSMP Goals:** The goal of the SSMP is to provide a plan and schedule to properly manage, operate and maintain all parts of the sanitary sewer system to help reduce and prevent sanitary sewer overflows (SSOs), as well as to mitigate the impacts of any SSOs that do occur.
2. **Organization:** The SSMP must identify the name of the responsible or authorized representative, names and contact numbers for management, administrative, and maintenance personnel, and a chain of command for reporting SSOs.
3. **Legal Authority:** The Enrollee must demonstrate that it possesses the legal authority to:
 - a) Prevent illicit discharges to its sewer system.
 - b) Require that sewers be properly designed and constructed.
 - c) Ensure access for maintenance, inspection, and repair; limit the discharge of materials that may cause blockages.
 - d) Enforce violations of its sewer ordinances.

4. **Operation and Maintenance:** The SSMP must include an Operation and Maintenance (O&M) Program that includes mapping, a description of routine preventive maintenance activities, a rehabilitation and replacement plan, staff training, and an equipment list.
5. **Design and Performance:** The Enrollee must have design and construction standards and specifications for the installation of new and/or rehabilitated sewer systems and procedures and standards for inspecting and testing new or rehabilitated sewers.
6. **Overflow Emergency Response Plan:** The Enrollee shall develop and implement an overflow emergency response plan that identifies measures to protect public health and the environment.
7. **FOG Control Program:** The Enrollee shall prepare and implement a FOG source control program if it is determined to be needed.
8. **System Evaluation / Capacity Assurance:** The Enrollee shall prepare and implement a capital improvement plan (CIP) that will provide hydraulic capacity for the appropriate design storm event including an evaluation, design criteria, capacity enhancement measures and a schedule.
9. **Monitoring and Measurement:** The Enrollee shall maintain relevant information to establish and prioritize activities, monitor the implementation, assess the PM program, update elements based on monitoring and evaluation, and identify and illustrate SSO trends.
10. **SSMP Program Audits:** The Enrollee shall conduct periodic internal compliance and effectiveness audits (at least biannually) and prepare a report.
11. **Communication Plan:** The Enrollee shall communicate on a regular basis with the public on the development, implementation, and performance of the SSMP

Each section contains a basic description of the District's approach to compliance or general management of the corresponding program component. Detailed supporting information, including corollary documents and plans, forms, and other items, are contained in a series of appendices attached to this SSMP.

District Service Area and Sewer Collection System

The Carpinteria Sanitary District (District), established in 1928, owns and operates approximately 46 miles of wastewater conveyance pipelines serving a population of 13,040 (2010 US Census). The District's 3.1 square mile service area is located within the Carpinteria Valley which is in the southwestern portion of Santa Barbara County, approximately 12 miles east of the City of Santa Barbara. Currently, the District serves approximately 6,683 customer connections, of which approximately 6,158 are residential and 525 are non-residential. There are approximately 4,400 individual parcels within the District's service area. The District is primarily comprised of residential development with limited commercial, light industrial, and agricultural land uses intermixed throughout its service area.



The wastewater collection system consists of nearly 960 access structures (manholes and cleanouts), 8 lift stations, 3 inverted siphons, 9 creek crossings, 7 highway crossings, one railroad crossing, 131 grinder pump units, 4.0 miles of force mains. These facilities convey wastewater to the District's 2.5 million gallons per day (MGD) wastewater treatment plant. Gravity pipelines range in size from 6 to 24 inches in diameter, with nearly 70 percent of the pipes being either 6 inches or 8 inches in diameter. The predominant pipe material is vitrified clay pipe (VCP), accounting for approximately 78 percent of the collections system total length. The average age of the collection system is approximately 40-50 years.

Definitions and Acronyms

The following definitions and acronyms are used in this SSMP and in the Appendix documents:

ArcGIS - Geographic Information System (GIS) software created by Environmental Systems Research Institute (ESRI).

BMP - Best Management Practice.

Cal EMA - California Emergency Management Agency.

Capacity Assurance Plan - A Sewer System Management Plan (SSMP) requirement that the District shall prepare and implement a capital improvement plan (CIP) that will provide a hydraulic capacity of key sanitary sewer system elements for dry weather peak flow conditions, as well as the appropriate design storm or wet weather event.

CIP – Capital Improvement Plan.

Category 1 Overflow – Discharges of untreated or partially treated wastewater **of any volume** resulting from an enrollees' sanitary sewer system failure or flow condition that:

- Reach surface water and/or reach a drainage channel tributary to a surface water; or
- Reach a Municipal Separate Storm Sewer System (MS4) and are not fully captured and returned to the sanitary sewer system or not otherwise captured and disposed of properly. Any volume of wastewater not recovered from the MS4 is considered to have reached surface water unless the storm drain system discharges to a dedicated storm water or ground water infiltration basin (e.g., infiltration pit, percolation pond).

Category 2 Overflow – Discharges of untreated or partially treated wastewater **equal to or greater than 1,000 gallons that does not reach surface water**, a drainage channel, or an MS4 unless the entire SSO discharged to the storm drain system is fully recovered and disposed of properly.

Category 3 Overflow – All other discharges of untreated or partially treated wastewater resulting from the Districts sanitary system failure or flow condition.

CCTV – Closed-Circuit Television used for producing video footage of the inside of a wastewater pipe.

Cleaning – The process of removing any debris, roots, grease or other potential blockages that build up in the wastewater system.

Clean Out – A capped pipe that provides access to a collection system pipe.

CMMS – Computerized Maintenance Management System used to track and schedule maintenance activities.

CIWQS – California Integrated Water Quality System.

DIP – Ductile Iron Pipe.

Easement – An area of property owned by another party that grants the District the right to install and maintain collection system facilities.

Enrollee – The organization responsible for fulfilling the SSMP requirements.

Fiscal Year – The planning and operating annual calendar for the District starting July 1st.

FOG – Fats, Oils, and Grease that can accumulate in a sewer pipe. A common source of FOG is food service establishments.

Force Main – A pressurized wastewater pipe that transports sewage.

FSE – Food Service Establishment.

GCD – Grease Control Device. Typically a grease trap or grease interceptor which limits the amount of FOG entering the collection system from an FSE.

GIS – Geographic Information System. A computerized mapping and spatial analysis application.

GPS – Global Positioning System. A satellite-based navigation system used to locate or track the position of an object over time.

Gravity Collection System – A hydraulic system that carries wastewater to a treatment plant or other authorized point of discharge that uses gravity as the means of conveyance.

Grease Interceptor/Trap – A grease control device designed to separate and retain most fats, oils, greases, and solids, excluding sanitary wastes, before entering the sewerage system. Smaller versions of grease interceptors are commonly known as grease traps.

GWDR – General Waste Discharge Requirements.

HDPE - High-Density Polyethylene.

Inverted Siphon – A depressed sewer pipe that allows wastewater to pass under an obstruction such as a river.

Lateral – An underground wastewater pipe that connects a residence or business to the District wastewater system. Lower Lateral cleaning and maintenance is the responsibility of the homeowner or business owner if a property line cleanout is not present.

Manhole – The top opening to an underground maintenance vault that allows access to the collection system pipes. Used as an access point for installing, operating, and maintaining flow meters and for cleaning and inspecting sewer pipe.

MRP – Monitoring and Reporting Program.

MS4 – Municipal Separate Storm Sewer System.

NASSCO – National Association of Sewer Service Companies.

NPDES – National Pollutant Discharge Elimination System Permit.

OES – Governor's Office of Emergency Services.

O&M – Operations and Maintenance.

PACP – Pipeline Assessment and Certification Program.

PLSD – Private Lateral Sewage Discharge.

Primary responder – The field crew or the on-call personnel that are the District's initial response to an SSO or other sewer system event.

Pump Station – A facility that pumps wastewater from a low spot to a point of higher elevation in the gravity collection system.

PVC – Polyvinyl Chloride.

Quality Assurance – A process used to verify or determine whether products or services meet or exceed customer expectations.

Quality Control – A process used to ensure a certain level of quality in a product or service.

Property Damage Overflow – Sewer overflow or backup that contaminates a property owner's premises.

Rehabilitation – To perform repairs in order to bring an asset or pipe back to like-new condition.

RDII – Rainfall Dependent Infiltration and Inflow. Stormwater or groundwater that enters the collection system through defects in the pipes and manholes or through direct connections.

RWQCB – Regional Water Control Board: Central Coast Regional Water Quality Control Board.

SCADA – Supervisory Control and Data Acquisition. A system that monitors lift station performance.

Sewer system – Sewer system refers to the sanitary sewer facilities owned and operated by the Carpinteria Sanitary District.

SSMP – Sewer System Management Plan. Document required by the State Water Resources Control Board General Waste Discharge Requirements.

SSO – Sanitary Sewer Overflow. SSO refers to the discharge of untreated or partially treated sewage at any point upstream of the treatment plant.

Stoppage – A blockage that prevents wastewater from flowing but does not produce an overflow.

SWRCB – State Water Resources Control Board.

Wastewater Collection System (WCS) – Sanitary sewer collection and transport facilities owned and operated by the Carpinteria Sanitary District.

Wastewater Treatment Plant (WWTP) – Facility owned and operated by the Carpinteria Sanitary District that treats the wastewater transported through the collection system.

Water Body – Any stream, creek, river, pond, impoundment, lagoon, wetland, bay, or the Pacific Ocean.

Waters of the State – Any water, surface or underground, including saline waters, within the boundaries of California. In case of a sewage spill, storm drains are considered to be waters of the State unless the sewage is completely contained and returned to the sewer system.

Work Order – A document that provides important details about a maintenance or repair activity that must be performed.

1.0 SSMP GOALS

The mission of the Carpinteria Sanitary District is to provide its customers with reliable, cost-effective wastewater treatment. In support of this mission, the District has developed the following goals as adopted by the District's Board of Directors:

- Maintain or improve the condition of the collection system infrastructure in order to provide reliable service now and into the future.
- Cost-effectively minimize infiltration/inflow (I/I) and provide adequate sewer capacity to accommodate design storm flows.
- Minimize the number and impact of sanitary sewer overflows that occur.
- Respond to sanitary sewer overflows in a manner that protects private property, human health, and the environment.
- Implement and enforce current design and construction standards for new collection system infrastructure.
- Educate the public to build an awareness of collection system issues and ways to help prevent sanitary sewer overflows.
- Maintain continuous compliance with the General Waste Discharge Requirements and other applicable regulatory requirements.

2.0 ORGANIZATION

The Carpinteria Sanitary District maintains an organizational structure that provides sufficient resources to operate and maintain the District's public sanitary sewer collection system. Although the District staff is relatively small, we pull from all departments when necessary to meet the SSMP goals outlined herein. The Collection System Department is supported by staff in every department and responsibilities for various aspects of collection system operation, maintenance and emergency response have been clearly defined.

The District's Organization Chart, modified to reflect goals and responsibilities in relation to this SSMP, is presented in **Figure 2-1**.

2.1 WDR Requirements

The General WDRs governing sanitary sewers specify that the Sewer System Management Plan (SSMP) must identify the appropriate responsible representative, identify the organization and lines of authority, and provide a chain of communication for reporting SSOs from receipt of a complaint and include the person responsible for reporting SSOs.

2.2 Authorized Representative

The District's General Manager is identified as the Authorized Representative and is the legally responsible official (**LRO**) for the purpose of compliance with the General WDRs. The Operations Manager is authorized to act in the General Manager's absence. The Collection System Supervisor is authorized to submit SSO reports via the electronic CIWQS reporting system and to make reports to other appropriate agencies.

See **Table 2-1**, located at the end of this section, for current contact information for the District's authorized representatives.

2.3 Responsible Personnel

District staff members responsible for implementation of this SSMP, and for operation and maintenance of the wastewater collection system, are identified in **Table 2-1**. This table, which provides names and contact information for each responsible staff member, is a stand alone page within this document and it shall be updated regularly to reflect any changes that occur.

The key roles and responsibilities of the Carpinteria Sanitary District Management and staff that carry out SSMP activities are:

Board of Directors: The District is an independent public agency governed by a five member Board of Directors who are elected on an "at-large" basis from the District's electorate and serve a four-year term. The Board meets on the first and third Tuesdays of each month and is responsible for establishing policy, authorizing operational and capital expenditures, adopting ordinances and other legal authorities as required by the SSMP.

General Manager: The General Manager is responsible for addressing a variety of managerial matters to ensure positive fiscal and operational health of the District. With general direction from the Board, the General Manager manages the development and implementation of financial plans, District goals, objectives, and priorities. Further, the General Manager is also responsible for the District's labor and employee/employer relations and is an active participant in various wastewater/water industry organizations in order to advocate District interests and objectives.

Operations Manager: Under the direction of the General Manager, the Operations Manager's duties include that of preparing budgetary proposals, design/planning of treatment plant upgrades, ensuring that all federal, state and local regulatory requirements are met and to provide oversight on work in support of District activities related to the operation and maintenance of equipment, facilities and related appurtenances as found in the treatment plant, pump stations and the collections system.

Collection System Supervisor: The Collection System Supervisor plans and organizes workloads, provides oversight to the Collections Field Crew, and personally performs work in support of all District Collection System installations, inspections, and preventive/corrective maintenance activities. In addition to managing the Collection System activities, the Collection System Supervisor also ensures that all federal, state and local regulatory requirements are met during normal operations and that of SSO Response events. When needed, the Collection System Supervisor provides assistance to District management staff in areas of capital project development, planning and execution; and performs related work as assigned.

Collection System Operations Staff: The Collections System Operations Staff routinely performs work in support of preventative and corrective maintenance of the wastewater mainlines and District owned lower laterals. This work is inclusive of CCTV inspections, hydro cleaning, asset data updates/corrections, USA mark outs; servicing and repair of mobile equipment; and providing on call services for emergency response around the clock.

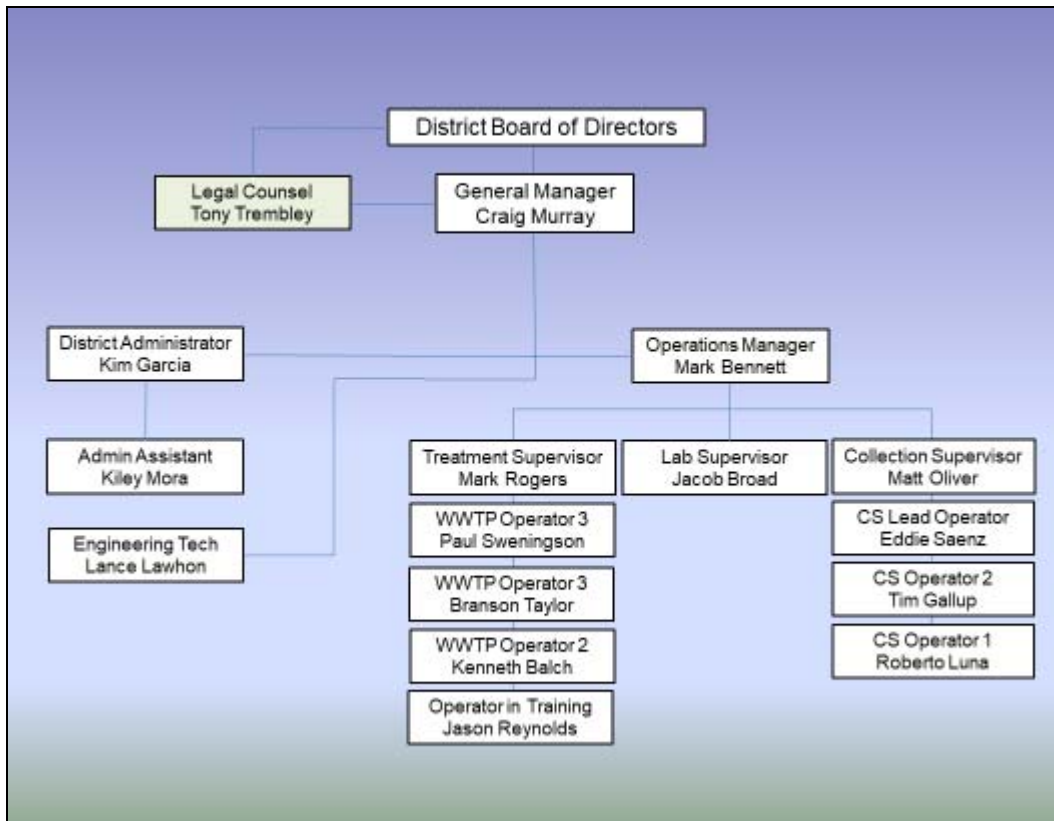
Engineering Technician: The Engineering Technician performs a wide variety of field and office duties in support of the District's interests including that of performing sanitary sewer construction/modification inspections, performing USA mark outs, maintaining engineering records and updating GIS maps and as-built drawings. Duties also include receiving and responding to inquiries and complaints from the public, performing field observations, and overseeing/implementing the FOG Program.

Treatment Supervisor: Under the direction of the Operations Manager, the Treatment Supervisor provides oversight and assistance to a staff of four Treatment Plant Operators that work in support of general operation and maintenance of the eight (8) remote pump stations and the wastewater treatment facility. In addition, the Treatment Supervisor continuously analyzes and evaluates operation and maintenance functions, initiates or recommends new or improved practices, prepares and monitors operating budgets and ensures compliance with all federal, state, and local health regulations.

Operations Staff: Under the general direction of the Treatment Supervisor, the Operations Staff operates and maintains the District's wastewater treatment facility and its eight (8) pump stations in compliance with State regulatory agency requirements. The Operations Staff duties may include: inspections of treatment process components and equipment, evaluating plant performance, collecting samples from various treatment processes throughout the facility, cleaning tanks, pipes, clarifiers and pumps, performing facility and equipment preventative maintenance tasks, making emergency repairs to plant equipment and facilities, and performing minor building maintenance/custodial tasks and providing around the clock emergency "on call" readiness.

Laboratory Technician: Under the general supervision of the Treatment Supervisor, the Laboratory Technician performs laboratory analysis of water, wastewater, and sludges pursuant to NPDES monitoring program requirements and certifies the accuracy of the data collected. The Laboratory Technician is also responsible for the coordination of sample collection, providing direction to operations personnel to ensure that collection protocols are complied with, sample holding times are met and chain-of-custody procedures are followed. Further, the Laboratory Technician submits reports and the results of process control analysis to the Treatment Supervisor.

Figure 2-1 CSD Organizational Chart



2.4 SSO Reporting Protocol

The District’s SSO Response Plan, described fully in Section 6.0, provides detailed procedures for emergency response to all categories and types of SSOs. These procedures include SSO reporting requirements and clear instructions on how and when to notify regulatory agencies, public health officials, the public, and other interested parties.

Figure 2-2 General SSO Chain of Communications

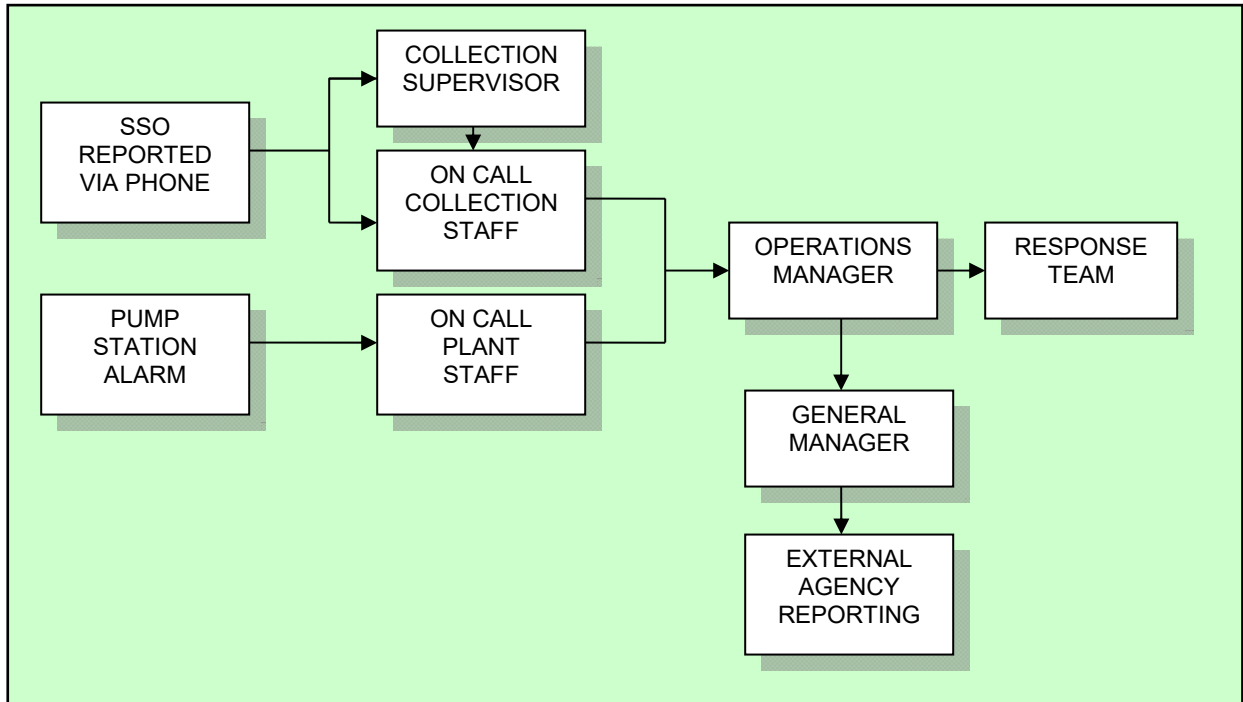


TABLE 2-1 RESPONSIBLE PERSONNEL CONTACT INFORMATION

General Manager	<p>Craig Murray, P.E. Office: (805) 684-7214 x12 Mobile: (805) 451-7804 Email: Craigm@carpsan.com</p>
Operations Manager	<p>Mark Bennett Office: (805) 684-7214 x17 Mobile: (805) 452-3962 Email: Markb@carpsan.com</p>
Collection System Supervisor	<p>Matt Oliver Office: (805) 684-7214 x22 Mobile: (805) 451-7806 Email: Matto@carpsan.com</p>
Engineering Technician	<p>Lance Lawhon Office: (805) 684-7214 x13 Mobile: (805) 705-5248 Email: lancel@carpsan.com</p>
Treatment Supervisor	<p>Mark Rogers Office: (805) 684-7214 x 18 Mobile: (805) 570-9446 Email: markr@carpsan.com</p>
District Administrator	<p>Kim Garcia Office: (805) 684-7214 x11 Email: Kimg@carpsan.com</p>
Administrative Assistant	<p>Kiley Mora Office: (805) 684-7214 x10 Email: Kileym@carpsan.com</p>
Collection System Lead Operator	<p>Eddie Saenz Office: (805) 684-7214 x 22 Mobile: (805) 451-7809 Email: Eddies@carpsan.com</p>
Collection System Operator 2	<p>Tim Gallup Office: (805) 684-7214 x22 Mobile: (805) 451-7809 Email: TimG@carpsan.com</p>
Collection System Operator 1	<p>Robert Luna Office: (805) 684-7214 x28 Mobile: (805) 451-7809 Email: RobertL@carpsan.com</p>

CSD Main Phone Number: (805) 684-7214

CSD After Hours Emergency Number: (805) 451-7809

CSD Main Fax Number: (805) 684-7213 CSD Plant Fax Number: (805) 566-6599

3.0 LEGAL AUTHORITY

The Carpinteria Sanitary District has the legal authority to implement this SSMP. Existing ordinances and standards set forth requirements for design and construction of sewer infrastructure, connection to the public sewer system, and use of public sewers, among other things.

3.1 WDR Requirements

The General WDRs require the District to confirm that it possesses the legal authority to do the following:

1. Prevent illicit discharges into its sanitary sewer system, including infiltration and inflow from satellite wastewater collection systems and laterals, storm water, unauthorized debris, etc.
2. Require proper design and construction of sewers and connections.
3. Ensure access for maintenance, inspection, and repairs to publicly owned portions of the laterals.
4. Limit the discharge of FOG and other debris that may cause blockages.
5. Enforce violations of its sewer ordinances.

The remainder of this section outlines the District's regulatory and legal authority with respect to these and other collection system matters.

3.2 District Ordinances

The Carpinteria Sanitary District was formed in 1928 and organized pursuant to the Sanitary District Act of 1923. It derives its legal authority from Section 6400 et seq of the California Health & Safety Code. The District is governed by a five member Board of Directors who are elected on an at large basis.

The District has adopted ordinances which satisfy the WDR requirements related to legal authority. Pertinent ordinances are summarized below. Full text of the ordinances is included in **Appendix A**.

Ordinance No. 2 – General Regulations

Ordinance No. 2, an Ordinance Establishing General Rules, Regulations, and Policies of the Carpinteria Sanitary District, was adopted on October 2, 1975.

This comprehensive sewer use ordinance addresses basic requirements regarding sewer use and connection to the District's public sewer system. It establishes regulatory and enforcement authority and generally sets forth limitations and prohibitions for wastewater discharges. Easement and access rights/requirements are established by this ordinance and basic construction standards (e.g. separate sewers, cleanouts, etc.) are documented. Ordinance No. 2 is bolstered by additional District ordinances that provide users with additional details and requirements for sewer use. These are described in the following sections.

Ordinance No. 7 – Sewer Use (Source Control)

Ordinance No. 7 was adopted by the District Board of Directors on June 21, 1994. The ordinance is titled a “General Regulation Providing Rules and Regulations for the Quality of Wastewater Discharged to District Facilities; for the Issuance of Source Control Permits; Authorization for Monitoring Inspection, Compliance, and Enforcement Activities; for Industrial User Reporting; Procedures for Variances and Appeals; and for the Repeal of Inconsistent Ordinances.”

This ordinance is a sewer use ordinance that primarily pertains to discharges from non-residential connections. Originally modeled after a US Environmental Protection Agency Model Pretreatment Ordinance, the District’s Ordinance No. 7 sets forth specific discharge prohibitions and requirements that are, in part, intended to protect sewer collection system infrastructure and minimize the potential for SSOs. Quantitative local discharge limits are also established by this regulatory instrument.

Ordinance No. 7 also contains specific provisions related to the control of discharges containing Fats, Oils, and Grease (FOG). Section 8 establishes requirements for food service establishments and related facilities to construct and maintain FOG control devices (e.g. traps and interceptors).

Permitting and enforcement provisions are also set forth in Ordinance No. 7. These are a key aspect of the District’s overall program to control illicit discharges and other inappropriate uses of the District’s collection system.

An update to Ordinance No. 7, based on the USEPA model sewer use ordinance, is anticipated in 2020.

Ordinance No. 15 – Sewer Service Charges

Ordinance No. 15 is an ordinance that establishes and adopts the fees charged for the provision of public sewer service. The rate structure incorporates a flat fee for residential connections based on the number of dwelling units on each legal parcel. Non-residential sewer service charges have a fixed component and variable component that is based on average water use and wastewater strength factors. Although users fees and charges do not directly relate to sewer system management, they provide crucial revenue and enable the District to perform required maintenance, inspection, and capital facility improvements. The schedule of current SSC’s is presented in Table 3-1 below.

Table 3-1 Schedule of Sewer Service Charges

RESIDENTIAL SEWER SERVICE CHARGES						
	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	
Annual Charge Per Dwelling Unit	\$625.31	\$650.33	\$676.35	\$703.41	\$731.55	
NON-RESIDENTIAL SEWER SERVICE CHARGES						
Strength Class	Combined BOD/TSS	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22
Rate Per 1000 Gallons Water Used						
Low	< 380 mg/L	\$9.52	\$9.90	\$10.30	\$10.72	\$11.15
Medium Low	380 to 500 mg/L	\$10.18	\$10.59	\$11.02	\$11.47	\$11.93
Medium	501 to 710 mg/L	\$10.52	\$10.94	\$11.38	\$11.84	\$12.32
Medium High	711 to 1100 mg/L	\$12.00	\$12.48	\$12.98	\$13.50	\$14.04
High	1101 to 1700 mg/L	\$14.24	\$14.81	\$15.41	\$16.03	\$16.68
Very High	> 1700 mg/L	Individually Calculated				
MINIMUM CHARGE PER PARCEL		\$625.31	\$650.33	\$676.35	\$703.41	\$731.55

NOTE: Fiscal year = from July 1 to June 30 of the subsequent year.

Ordinance No. 16 – Fees and Charges

Ordinance No. 16 is an ordinance that establishes and adopts certain fees and charges for sewer system connection, construction, and related actions. Adopted on June 6, 2017, the ordinance set forth a schedule of fees as follows:

The District charges a baseline Development Impact Fee, or connection fee, which is currently \$4,895 per each new equivalent dwelling unit (EDU). This fee escalates annually based on a national construction cost index value.

An EDU is defined as the baseline wastewater flow and strength contribution from a single-family residential dwelling. For the purposes of this ordinance, it is presumed that a single-family residential dwelling discharges 140 gallons per day of wastewater with a biochemical oxygen demand (BOD) concentration equal to 325 milligrams per liter and a total suspended solids (TSS) concentration equal to 325 milligrams per liter. The contributions from other users can be represented in the form of an equivalency to one single family residential dwelling unit.

Development impact fees for new non-residential customers are calculated on an EDU basis according to a formula set forth in the ordinance.

3.3 District Construction Standards

The District has had design and construction standards for sewer infrastructure in place for many decades. These standards, which apply to the main sewer, lateral sewer, and private building sewer construction, have evolved over time to reflect currently accepted materials and methods of construction. Legal authority to implement the standards is granted by statute and is set forth in the adopted ordinances described above.

Section 5.0 provides details on design and construction standards currently in effect and discusses ongoing efforts to refine and update them.

4.0 OPERATION AND MAINTENANCE

The Carpinteria Sanitary District has a well-developed operation and maintenance program to ensure that its wastewater collection system functions reliably and as designed. This section describes some of the key aspects of this program.

4.1 WDR Requirements

The SSMP must include an Operation and Maintenance (O&M) Program that includes:

1. Up-to-date mapping of the sanitary sewer system, showing all gravity line segments and manholes, pumping facilities, force mains and valves, and applicable storm water conveyance facilities.
2. A description of routine preventive maintenance activities including a schedule for regular maintenance and cleaning and targeted maintenance performed at known problem areas. The preventative maintenance program should have a system to document scheduled and conducted activities such as work orders.
3. A rehabilitation and replacement plan to identify and prioritize system deficiencies including CCTV inspections.
4. Staff training.
5. Equipment and replacement part inventories, including identification of critical replacement parts.

4.2 Sewer System Mapping

The District has a comprehensive ArcGIS Geographical Information System (GIS) that includes spatial and technical information for its wastewater collection system assets including gravity line segments, manholes, lift stations and force mains. The District's GIS based mapping system is built on a commercial software program that is the industry standard for utility mapping. The District first developed GIS mapping in 2003. Upgrades and improvements are made on an ongoing basis by District staff and with assistance from outside consultants.

The District's GIS platform provides a geographically and spatially accurate system map that is integrated with external collection system data. Some of the key features include:

- Pipelines and manholes accurately located and depicted
- Pump stations and other system features accurately mapped
- Link to CMMS database (refer to Section 5.2)
- Attribute and inspection data continuously updated
- Static link to District's billing database
- Routinely updated parcel information from SB County shapefiles
- Periodic updates to base aerial imagery
- Link to hydraulic model output data for entire system
- Hotlinks to as-built drawings for each pipe and feature

The GIS based mapping system is a powerful tool that enhances our operation and maintenance functions. The GIS is used for scheduling and tracking hydro cleaning and CCTV activities, and also to spatially depict problem areas within the system by linking condition assessment data (e.g. root intrusion, infiltration, etc.). Queries can be generated to identify and show pipe age, pipe material, SSO locations, food service establishments, hydraulic model data, and many other important operational parameters.

Atlas Map Books

Digital and printed atlas map books are provided to key staff members with printed copies maintained in each collection system vehicle. The atlas maps are a full color, GIS generated a representation of the CSD Collections System overlaid on an aerial image of the corresponding region. Pipe diameter, material, length and direction of flow are depicted. Street names, parcel boundaries, easements, fire hydrants and other critical information are also shown.

The atlas maps are generated from the District's GIS based electronic mapping system. Individual maps can be easily generated to identify the location of existing sewer infrastructure when requested by members of the public, utility providers or other parties who need this information. An atlas map page is provided for reference in **Appendix B**.

In the event findings in the field or a construction project necessitates a map edit, a work order is generated by the Collections System Supervisor. This work order is issued to the District Engineering Technician for review and completion. Depending on the type or quantity of edits made, the map page will either be published as soon as the edits are made or published bi-annually.

Record Drawings

Complete as-built plan and profile drawings are maintained for each pipeline within the District's inventory. Permanent record drawings (mylar sheets) are kept in a secure location for archival and reproduction on an as-needed basis. Each drawing has been scanned and indexed for access electronically. Drawing sheets can be accessed directly through the GIS or from an electronic file index. Copies can be printed or plotted on demand.

4.3 Maintenance Management System

The District utilizes a computerized maintenance management system (CMMS) to facilitate operation and maintenance of its wastewater collection system. The District uses a software application called **Lucity**, which is a database application, designed for use in government utility management. This asset management tool is also used within the District's wastewater treatment facility.

The CMMS database contains detailed attribute information for all pipelines, manholes, pump stations and other collection system assets. This data is routinely updated to reflect system improvements and modifications and also to refine the dataset as additional asset information is obtained through system inspection and evaluation.

The CMMS is a powerful asset management tool. The program is used to schedule operation and maintenance tasks and to generate associated work orders with resource assignments. Completed work orders are completed in the field via a mobile device and data is sent back into the CMMS to provide documentation, but also to provide cost and

resource tracking. Notes and comments are also documented by field operations staff and any follow-up activities or requirements subsequently scheduled.

The CMMS database has query generation and reporting functions that are used to track performance, to generate annual budgets, to assess resource and staffing needs and for other critical functions. The CMMS is accessible from multiple workstations at the District's offices. Security measures are built into the program that limits accessibility and grants specific authorization for system changes. As discussed in Section 4.2, the CMMS data is integrated with the collection system GIS.

4.4 Maintenance and Inspection Program

As per regulatory mandates, the District is required to perform and document regular preventative maintenance of the collection system, maintain an updated system map, record work activities in a work management system, and provide a program to target problematic areas with more frequent cleaning. This plan incorporates all of these requirements into the District's cleaning program(s).

Maintenance and Inspection Equipment

The District's Collection System Department owns and maintains a complement of equipment dedicated to maintenance and emergency response within the District.

Key equipment includes:

- **2013 Vactor 2100 Plus Combination Sewer Cleaning Truck** equipped with: Traffic control measures, spill response kit, spill response nozzles, general cleaning nozzles, 35' of 8" vacuum tubing, a 20 gpm lateral jetter kit, first aid kit, PPE and miscellaneous tooling to support general maintenance and response events.
- **Envirosight Digital Video Pipeline Inspection Truck** equipped with: 2019 Envirosight RoverX camera, WincanVX Pro software bundle, traffic control measures, first aid kit, PPE and miscellaneous tooling to support mainline inspection activities.
- **2009 1-Ton Utility Truck** equipped with: Mongoose 12gpm lateral jetting machine, wifi enabled lateral inspection camera, traffic control measures, 3000w generator, spill response kit, PPE, first aid kit, and miscellaneous tooling in support of inspection, maintenance and response events.

Inventory Control Process

Collections personnel maintains its most used consumables (Ex: PPE, DEF, Root X) by conducting a weekly inventory and notifying the Collections System Supervisor when quantities are low. Inventory of equipment, replacement parts, and supplies are performed per a scheduled biannual work order generated to ensure an up to-date and complete inventory of equipment and replacement parts is in place.

Biannual inventory items:

- Traffic Control Equipment
- Bypass Equipment

- E-One Pump Spare Parts
- Collections Tools
- Manhole Rehab Parts
- PPE/Fall Arrest Equipment

Collection System Cleaning

The District has implemented two pipe cleaning programs to keep the entire collection system clean and prevent maintenance-related spills and stoppages. The System-Wide Cleaning Program was designed to ensure that every pipe in the collection system is cleaned at least once within a 3-year period. The Priority Line Cleaning Program is used for pipes that require more frequent cleaning due to the more frequent accumulation of material within the pipe. The cleaning frequency for each pipe is based on findings from prior maintenance activities with strategic programming to ensure system operability.

Cleaning Methodology

The District's overall process for cleaning the wastewater collection system is to remove roots, deposits, and debris through hydraulic cleaning using a truck mounted sewer flushing/vacuum machine. This system is designed to clear all types of blockages including roots, grit, debris, fats, oils, and grease (FOG).

The general process is as follows:

- Each sewer main section is cleaned from its downstream manhole up to the adjacent upstream manhole. Cleaning through intermediate manholes is avoided whenever possible.
- During cleaning from the downstream manhole, a debris trap is set up at the downstream manhole to collect sand, rocks, grease, roots, and other material flushed from the pipe. If there is a significant amount of debris, the vacuum system is used to remove the collected material.
- Cleaning rates are at 35 feet per minute or less, typically at 2000 PSI @ 40 GPM in most circumstances.
- The material seen or removed from the pipe is quantified as 'clear', 'light', 'medium' or 'heavy' and appropriately recorded.
- The cleaning crew makes as many passes as necessary, based on cleaning spoils, to fully clear the pipe of debris.
- A proof skid is used, whenever possible, to prove that the pipe is clean and that there are no protruding service connections misaligned joints or deformed pipe.
- The amount and type of debris removed is used as a factor to determine the next scheduled cleaning target date.

System- Wide Cleaning Program

Pipes scheduled under the System-Wide Cleaning Program will have a target cleaning date set 36 months from the date the pipe was last cleaned. These pipes typically do not have any previous maintenance problems and have been found to have “clear” or “light” findings during their most recent cleaning. Under the System-Wide Cleaning Program, each pipe in the collection system has been scheduled for cleaning.

Priority Line Cleaning Program

Within the District’s collection system, certain pipe segments need to be cleaned more frequently than every 36 months to prevent the build-up of material that can potentially cause blockages or SSO’s. These pipes are maintained under the Priority Line Cleaning Program. Under this program, cleaning frequencies are set for each pipe based on the amount and type of material found during the previous cleaning and problematic hydraulic conditions (inverted siphons, sags, incorrect grade, etc.). These frequencies range from 1 month to 24 months. Each pipe has its own cleaning frequency and target cleaning date. Cleaning frequencies are adjusted as necessary to time the next cleaning when blockage material is just beginning to accumulate. Pipe cleaning frequencies are adjusted according to the criteria defined in the *Cleaning Schedule Strategy* section below.

Cleaning Schedule Strategy

The District utilizes a dynamic scheduling strategy based on the results of prior cleaning events to determine frequencies for upcoming scheduled cleaning.

The overall process is as follows:

- Each pipe segment has its own cleaning frequency and defined target cleaning date.
- Pipes are grouped and scheduled for cleaning according to common target cleaning date and geographic area to efficiently use the cleaning crew's time and resources.
- Pipe diameters, accessibility, historical flow rates, traffic control requirements and other factors are also considered.
- The District utilizes its CMMS to plan each week's cleaning/inspection schedule.
 - Each active gravity sewer main in the application has a “next” cleaning date identified in the database.
 - This date is automatically generated depending upon the cleaning frequency assigned to the pipe and the findings of the last cleaning event.
 - Weekly cleaning events are automatically created by “generating” work orders within the upcoming target dates on the appropriate CMMS module.
- The work orders are sorted by priority by the Collections Supervisor and field crew.
- After cleaning each sewer main or lateral, the field crew records the cleaning findings for each pipe segment as ‘clear’, ‘light’, ‘medium’, ‘heavy’.

- At the end of each shift, work orders are “closed in the field”. The Collections System Supervisor reviews the cleaning/inspection results and if needed, changes the cleaning schedule accordingly.
- Pipes that have been recently repaired or replaced, impacted by SSOs, have seasonal issues or chronic problems are managed by the Collections System Supervisor and scheduled on a case-by-case basis.

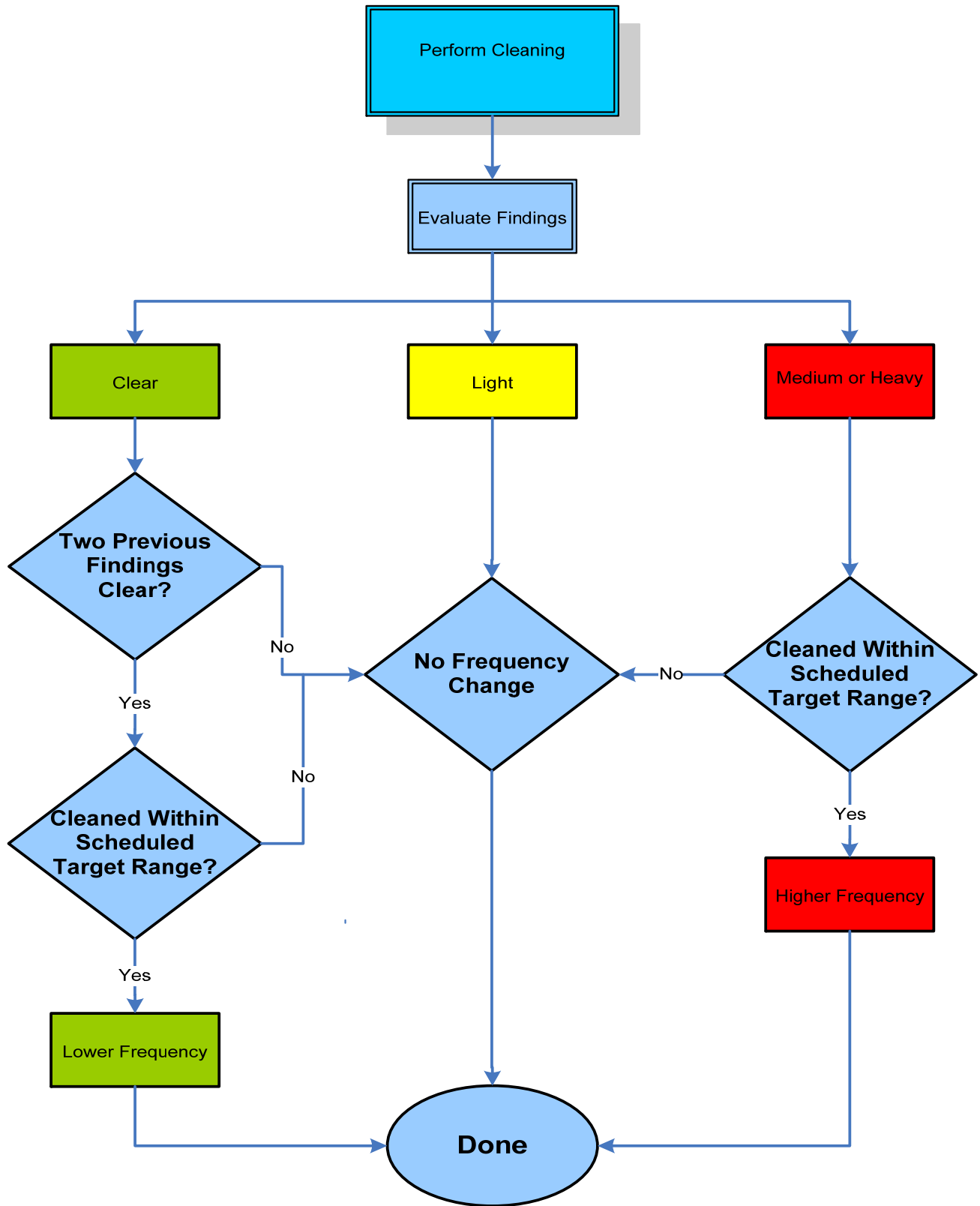
Modifying Cleaning Frequencies

Each time a pipe segment is cleaned, the cleaning frequency is evaluated based on the cleaning results documented by field staff. This allows the time interval between cleanings to be adjusted to reach an optimal cleaning frequency for each pipe.

The objective of this process is to determine the optimum frequency so that each pipe is just beginning to need cleaning at the next cleaning date and returns a ‘light’ finding. Pipe cleaning that results in the removal of more material (e.g. ‘medium’ or ‘heavy’) indicates that the pipes are not being cleaned frequently enough and are candidates for a more frequent cleaning. Pipes that are consistently ‘clear’ of any material or have trace amounts of material are candidates for less frequent cleaning.

Clear	No observable grease, roots or debris.
Light	1 to 1.5 gallons of debris, small chunks of grease. 20-30 minutes of cleaning time required, 1-2 passes to obtain clear water.
Medium	2-3 gallons of debris, moderate chunks of grease 30 minutes of cleaning time required, 2-3 passes to obtain clear water
Heavy	4 or more gallons of debris, grease or clumps of roots More than 30 minutes to clean line, 4 or more passes to obtain clear water

Figure 4-1 Determination of Cleaning Frequency Flow Chart.



CCTV Mainline Pipeline Inspection

In October 2019, the Collections System Department completed a system wide video inspection project. The video capture and reporting process was performed by NASSCO-PACP certified personnel using a pipeline inspection software called WinCan VX. The inspections have provided the District with updated, high-resolution digital video of each pipeline segment in our inventory along with carefully generated inspection records in database format based on industry standard defect coding. Structural and operational defects encountered during this inspection project were categorized by type and severity and packaged into a rehabilitation project that is to commence in the spring of 2020.

CCTV Lateral Pipeline Inspection

In January of 2013, the Collections System Department launched a Sewer Lateral Inspection/Inventory Project. The goal of this project is to ensure that the District is servicing all of its assets by updating the lower lateral inventory database. This project requires the Field Crew to go to each household within the District, determine if a property line cleanout exists and if found, inspect, clean and catalog the asset. Video inspections of the laterals are being accomplished with a portable “push” camera system that wirelessly sends a video signal to the CCTV inspection van for processing by NASSCO-PACP certified District personnel. If problems were found, such as root intrusion or grease buildup, the line is cleaned by either the Gorlitz sewer cleaning machine (snake), the lateral hydro cleaning kit mounted on the Vactor or a truck mounted jetter system. Once the lower lateral is clean, it is then put on a regular maintenance schedule as per **Figure 4-1**.

The Sewer Lateral Inspection/Inventory Project was completed in May of 2016. This project was deemed a success in that the crew identified, inspected, cleaned and prescribed future maintenance for over 200 property line clean outs. The Districts current overall lower lateral inventory is 774 and maintains 83 “priority” laterals.

** CCTV inspections of main lines and laterals are also performed on an as-needed basis in response to requests from the public, contractors, District staff and as a follow up to an SSO.*

Cleaning Performance Quality Assurance/Quality Control (QA/QC)

CCTV is periodically used to ensure a recently cleaned sewer main was properly cleaned. In addition, to post cleaning CCTV inspections, Collections Department personnel routinely utilize the CCTV unit in concert with the Vactor in support of ensuring removal of roots, encrustation, and debris. This allows the Collections Supervisor and the Collections Operators to monitor the effectiveness of their cleaning procedures and verifies that the cleaning assessments are accurately recorded.

Management and Field Crew Communication Summary

The generation of electronic work orders is the primary means of formal communication between Management, the Collections Supervisor, the Collections Lead, and the Field Crew. Work is electronically “generated” every Friday for the upcoming week. The quantity and type of work are designed to keep the crew in step with meeting inspection and cleaning goals and accommodating “priority” status mainlines and laterals. Upon completion of a work order, the Field Crew records the cleaning results and any pertinent notes on work order form. The cleaning results and notes on the work order are checked by the Lead and

then “Closed in the Field (CIF)” electronically. The “CIF” work order is then reviewed by the Collections System Supervisor and closed. This data is then accessible for report generating to identify the necessity to change a schedule, schedule further inspection or rehabilitation.

Informal communications take place on an ongoing basis between the Collections System Field Crew and the Supervisor. There are daily informal discussions regarding work plans, verifying resources, review of cleaning results, and other daily issues.

Meetings between management and supervisory staff are held on a regular basis to discuss progress, coordinate resources and resolve issues. A safety meeting is also held, at a minimum, every other week.

Additional Collection System Responsibilities:

- **Response to USA/ Dig Alert Requests**

The District’s Collection System Department and Engineering Technician also mark the location of mainline sewers in response to USA Dig Alert notifications that are delivered to the USA Dig Alert App on the Collections Department IPAD. This important function is necessary to protect the integrity of our buried infrastructure from damage associated with other excavation and sub surface work.

- **Manhole Inspections**

Collection System personnel routinely perform inspections of manholes concurrent with hydro cleaning and/or CCTV inspection activities. Manhole condition is documented on a MACP form. Certain manhole repairs, such as concrete collar replacement, are done using in-house resources.

- **E-One Grinder Tank/Pump Inspections**

From 2012 to 2014, the District initiated maintenance and inspection duties for 133 E-One grinder pump units located in the Sandyland Cove, Sandpoint Road, and Rincon Point communities. With the support of multiple governmental and environmental agencies, these beachfront communities elected to abandon their septic systems and have a low-pressure sewer system installed. These systems consist of a holding tank, a grinder pump and a control panel equipped with an automated audio/visual alarm. District personnel has been extensively trained by the vendor's technical staff in regards to troubleshooting these units and have implemented a yearly inspection cycle to ensure that the homeowner is following proper usage protocols and that the pump/control panel is in good working order.

- **Smart Cover Inspection/Monitoring**

The District currently has eight (8), “Smart Covers” strategically located within the collection system to alert District personnel via email and text message if a surcharge condition arises. Although these units are automated, the Collections System personnel routinely inspect the units’ condition and configuration to ensure they are in proper working order and orientation.

- **Spill Response Readiness**

Sanitary sewer overflow (SSO) calls are considered to be a high priority that demands a prompt response to the location of the reported problem. The District’s goal is to respond to an SSO report within 15 minutes during normal working hours and within 30 minutes for after hour’s calls when possible. The Collections Department maintains spill response readiness during normal and after hours as outlined in the District SSO Response Plan.

4.5 Collection System Rehabilitation and Replacement

The District is focused on rehabilitation and replacement of aging or defective collection system infrastructure, equipment and streamlining workflow. Significant capital improvement projects have recently been completed to improve buried infrastructure and enhance operational efficiency/safety. These projects are outlined below:

Collection System Rehabilitation Project (2007/2008)

The District completed the first phase of a major collection system rehabilitation project in FY 2007/08. Carollo Engineers completed planning and design of a project that ultimately involved rehabilitation or replacement of over 12,000 linear feet of gravity sewer. A construction contract was issued to Insituform Technologies. The work involved primarily cured in place pipe (CIPP) lining of sewers ranging from 8-inch to 21-inch diameter. A substantial number of pipe segments were replaced using pipe bursting technology as part of this project. These were primarily 6-inch diameter VCP pipelines that were upsized to 8-inch diameter HDPE. The work also included a number of point repairs to address identified defects.

Manhole Rehabilitation (2009)

In 2009 the District engaged a contractor to perform structural rehabilitation and polymer lining of approximately 100 existing manholes. The District previously completed a system-wide manhole inspection and evaluation program using in-house staff. Based on observed condition, a prioritized rehabilitation schedule was developed. Future manhole rehabilitation, when appropriate, will follow in order of priority based on condition ratings.

Carpinteria Bluffs Sewer Main Replacement (2011)

This project involved the relocation of approximately 6,100 linear feet of existing gravity sewer pipeline from its location along the edge of the Carpinteria Bluffs to within Carpinteria Avenue. The original pipeline had historically been prone to surface erosion. Relocation of the sewer to Carpinteria Avenue has provided improved accessibility for maintenance and has avoided failures related to geologic activity on or near the bluff face.

CCTV Mainline Inspection Project (2010-2013)

The District has recently completed a comprehensive system-wide collection system CCTV inspection program. The project allowed the District to collect inspection data using the NASSCO PACP defect coding system. Upon completion, the District prioritized a rehabilitation schedule for use in preparing a construction bid package for the 2013 Collection System Rehabilitation Project.

Point Repair Projects (May 2013)

Upon finishing the CCTV Mainline Inspection Project, the Collections Department identified and prioritized a number of point repairs to be done in low ground water conditions.

The point repairs were as follows:

- 126 Ash- Cleanout Repair
- Cedar Place- Mainline repair (6G400-7G005)

- Third St.- Mainline repair (7G155-7G230)
- Old Linden- Mainline repair (6H105-6G095)
- Linden-Mainline repair (5H090-5H165)
- Manhole Rehabilitation/ Smart Cover Installation (8G010)
- Manhole Rehabilitation/ Smart Cover Installation (3B045)

Collection System Rehabilitation Project (2013/2014)

The District completed a major collection system rehabilitation project in 2014. In-house, staff evaluated the main line CCTV data and designed a project that involved rehabilitation or replacement of over 16,000 linear feet of gravity sewer. The construction contract was issued to Sancon Engineering. The work involved primarily cured in place pipe (CIPP) lining of sewers ranging from 6-inch to 10-inch diameter. The work also included a number of point repairs and top hat installations to address identified defects.

Combination Sewer Cleaning Truck Procurement (September 2013)

The replacement of a 1996 model year Vac-Con combination sewer cleaning machine with a 2013 Vactor 2100 Plus was completed in September of 2013. The new vehicle has been a key element in accelerating our System Wide Cleaning Project and has proven to be more powerful, efficient and safe for District personnel.

Addition of Collections Department Personnel (September 2013)

Upon completion of a manpower report based on current and projected workloads, the District elected to create a Collections Operator I position. As of September 2013, this position was filled and the Collections Department has experienced a more consistent manpower resource/workflow, the ability to engage multiple cleaning tasks simultaneously, and a steady increase in productivity.

Update of Computerized Maintenance Management System (2013- Ongoing)

This project involves migration from the District's current computerized maintenance management system (CMMS) software platform to a new application, particularly for collection system management and data integration. District staff has evaluated the myriad of options and has identified **Lucity** as the desired software solution. District staff is currently working on data migration and look forward to bringing this priority project to completion in the near future. This new software bundle will be instrumental in the management of our ongoing efforts to efficiently and effectively manage our infrastructure assets and comply with an increasingly stringent regulatory framework. (Reference: www.lucity.com)

Truck Mounted Sewer Lateral Cleaning Machine-Procurement (August 2014)

With the addition of the Vactor combination truck in 2013, the Collections department has been able to utilize the hydro-excavation pack on the Vactor that doubles as a jetter to clear lower laterals with improved cleaning results, production rates, and employee ergonomics. The truck mounted jetter package will provide a redundant means of jetting lower sewer laterals, increase lateral service production rates, provide a pressure washer to aid in SSO response, alleviate the usage of homeowners water and hoses for SSO

clean-up, root chemical application, and minimize noise/spatial impact of the community with the usage of the Vactor.

Trimble Geo 7X-GPS Unit-Procurement (July 2014)

Technological advances in Global Positioning Systems (GPS) have made it possible to use a hand held, non-survey grade GPS device to collect location data with a horizontal accuracy of 1 cm and a vertical accuracy of 1.5 cm. In the past, acquiring positional data of this accuracy would previously have required the District to contract with a professional surveyor and obtaining the data for the entire system would be prohibitively expensive. The Trimble Geo7X device will be utilized by District staff, typically in conjunction with routine maintenance and/or inspections. It will also be used to accurately map property line clean outs, low-pressure sewer system infrastructure, and other facilities. The vertical elevations captured for each manhole will be of great benefit, as it will allow us to update and refine the hydraulic system model.

Carpinteria Creek Suspended Line Crossing Restoration (2015)

In concert with preparing for the Caltrans Hwy 101 Widening Project, the District realigned the Carpinteria creek crossing that was previously an aging suspended line. Project scope involved the realigning of gravity sewer mainlines/manholes and installing a two-barrel inverted siphon using horizontal directional drilling to both improve District wastewater conveyance and accommodate the Caltrans US 101 Widening Project.

Linden Avenue Sewer Later Installation (2015/2016)

Five residential properties in the 1300 block of Linden Avenue were connected to the District owned public sewer via a deteriorated shared private sewer line that existed along the rear of their property boundaries. No clear record or documentation was located regarding the history or ownership of this shared sewer. To mitigate potential pipe failure and associated SSOs, the District constructed a new main sewer in the street in front of these parcels. The homeowners subsequently connected to the new pipeline, pursuant to an agreement with the District, and abandoned the private shared lateral.

Mobile Device Integration (2015/2016)

In 2014, the Collections Department implemented the use of tablet devices ahead of the full CMMS/GIS integration in order to get personnel familiar with the devices. The tablets were loaded with SDS data sheets, tailgate safety topics, vehicle pre-trip forms, construction inspection forms, e/one pump inspection forms, asset mapping ,SSO response manual, SOP's, an SSO response app and a USA Digaalert application.

The goal of the second phase of implementing our new CMMS system was to move the Collections Department to a "100% paperless" operation. This was accomplished in early 2015. Developing an efficient means of processing work orders, collecting/communicating asset data and providing pertinent information in the field has been collaborative and fluid in nature and is constantly being developed to further productivity, situational awareness, and data management.

The following features have improved our workflow process:

- a) The ability to generate a work order in the field against an asset not scheduled for inspection/service.

- b) The ability to take a picture or video and attach it to a work order or send it to the Collections Supervisor.
- c) View as-builts in the field.
- d) View prior inspection pictures in the field.
- e) View WinCan line reports in the field.

Santa Claus Lane Sewer Improvement (2016)

A sewer line crossing under US 101 which provides service to the Sandpoint Beach Community and Santa Claus Lane commercial customers was found have serious vertical deflection. Hydraulic limitations required the District had to implement frequent maintenance intervals within and upstream of this crossing to keep the sewer system in this area functional. The existing 24-inch steel casing had apparently failed and water intrusion into the annular space had caused the sewer pipe to float within the casing. Ultimately the District replaced the existing gravity sewer crossing under US 101 using auger boring methods. Due to severe site constraints, unfavorable subsurface conditions and high traffic levels, this project cost in excess of \$1M to complete.

Odor Control Program (2016)

In 2015, the District conducted a pilot study to evaluate odor control benefits associated with the injection of magnesium hydroxide into the collection system upstream of its two largest pump stations. The study documented measurable reductions in hydrogen sulfide gas concentration in the influent structure at the WWTP and noticeable odor reduction within the collection system. The result of the study justified a capital project to purchase a storage tank and delivery pump to continue the use of the product. The installation of the new tank and magnesium hydroxide injection system was completed November 2016.

Diesel Pump Procurement (2017)

Procurement of a 6-inch, diesel engine driven, sound attenuated, trailer mounted pump. This pump is used for emergency response during power outages and when necessary for bypass pumping in the collection system and at the treatment facility.

Lateral Lining Project (2017)

The District currently maintains 480 lower laterals that are on preventative service schedules ranging from 1 month to 5 year intervals. Approximately 61 of these laterals required maintenance every 3 months or less and account for nearly 40% of lateral work orders. In 2017 the District completed a comprehensive CIPP lateral lining project that resulted in full rehabilitation of 41 laterals using the Trelleborg EPROS MTH system. We have continued an ongoing program to replace other laterals with root intrusion or structural defects using local contractors with either open cut or pipebursting methods.

Plum Street Sewer Replacement Project (2017/2018)

This project involved replacing an existing 10-inch diameter sewer pipeline on Plum Street, between Highway 101 and the Union Pacific Railroad right-of-way to the south, and a sewer pipeline running parallel to the railroad right-of-way between Plum Street and Sandyland Cove Road, which varies in size from 10-inch to 12-inch diameter. The sewer pipeline on Plum Street and the sewer pipeline parallel to the railroad is in the process of being upsized to 14-inch diameter. The existing 15-inch diameter sewer pipeline between

Sandyland Cove Lane and the existing sewer the lift station was upgraded with a cured-in-place liner (CIPP).

Update WinCan Software Package (2019)

The Collections Department currently utilizes an industry specific software package to assist in the inspection of sewer mains throughout its collection system. This software (WinCan) assists with recording video and coding pipeline defects with industry standardized coding (NASSCO) rating matrix. Once this data is collected WinCan allows for further analysis and data management, critical when designing sewer rehabilitation projects.. The upgrade to WinCan VX has provided a better workflow during inspections, ease of data transfer from the field and additional tools to integrate inspection data into the District's GIS system.

CCTV Inspection Equipment Upgrade (2019)

The Collections Department had been using a 2009 Envirosight Rovver for its mainline inspection/rehabilitation program. In 2019, the Rovver had reached the end of its lifecycle and had become more problematic than productive. An Envirosight RovverX system was purchased and the CCTV truck was retrofitted to accommodate a larger cable reel (1500') and updated control components. Since its implementation the camera has proved to produce higher quality images and more productive mileage and safer

Lower Lateral Pipebursting (27 laterals replaced. Projects are ongoing.)

In addition to maintaining laterals on a maintenance/inspection schedule and lining laterals, the District periodically replaces problematic lower laterals using pipebursting methods.

- 436,500,572,839,833,610 Arbol Verde
- 5590,5558,5583,5575 Cameo Rd.
- 1241 La Brea Lane
- 1287,1275 La Pala Lane
- 1322 Vallecito Rd.
- 5351 Star Pine Rd.
- 1330 La Manida Ave.
- 4771 Ninth St.
- 580,591,592,595 Calle Dia
- 1305,1317 Camino Trillado
- 5688,5664,5640,5677 Fiesta Dr.

Sewer System Hydraulic Model Update- 2020

The District developed a computerized hydraulic model of the sewer collection system in 2004 as an element of the Sewer System Master Plan process. The model was built using a standalone software package called HYDRA. The District is currently in the process of updating its hydraulic model with Innovyze Infosewer modeling software that is designed

to be integrated with GIS and CMMS applications, allowing for simple and immediate analyses, assessments and updates. Updating the hydraulic model periodically supports the District's overall Sewer System Management Plan and allows for improved assessment of hydraulic limitations within the system for long range capital planning purposes.

Collection System Rehabilitation Program - Phase 3 (2019/2020)

This project involves rehabilitation and/or replacement of 36 (9374') sewer pipelines that have been identified as defective through a comprehensive condition assessment program. The work includes cured in place pipe (CIPP) lining, in combination with open cut spot repairs and linear replacement projects. This represents the third phase of a five-phase program expected to occur over the next six years.

Lower Lateral Rehabilitation Project – Phase 2 (2020)

The District currently has ownership of 774 lower laterals. 282 of these lower laterals are on preventative maintenance schedules that range from 2 months to 5+ year cycles. In an effort to reduce potential SSOs, improve customer service, and minimize long term maintenance costs, the Collections Department has evaluated its current inventory/schedules and is developing a second phase lower lateral rehabilitation project. The goal of this project is to reduce the number of laterals on a recurring maintenance schedule of 9 months or less by means of pipe bursting, open cut repairs, and by CIPP lining. Upon completion of this project the District will have eliminated all laterals on 30 and 60-day schedules and will have approximately 25 on 180-day schedule, 20 on 270-day schedule, 184 on a 365-day schedule and 30 on a 720-day schedule.

4.6 Pump Station Improvements

- Influent Pump Station Pump Replacement
- Pump Station No. 1 and No. 2 Pump Replacement (2009)
- Pump Station No. 1 and No. 2 Flow Meter Installation
- Pump Station No. 1 and No. 2 VFD Replacement
- Pump Station No. 1 and No. 2 Control and Telemetry Replacement
- Pump Station SCADA System Development/Integration
- Pump Station No. 3 Pump Replacement Project
- Pump Station No. 4 Force Main Replacement
- Pump Station No. 4 and No. 5 Complete Rehabilitation (2009)
- Pump Station No. 5 Control Replacement
- Pump Station No. 5 Flow Meter Installation
- Pump Station No. 6 New Panel, Control and Telemetry Replacement
- Pump Station No. 7 Construction, Start up and Addition to CSD Collections System
- Pump Station No. 8 Construction (To serve Rincon Point Community)
- Pump Station No. 6 Pump Replacement

- Pump Station No. 1 Controller Replacement
- Pump Station No. 2 Controller Replacement
- Pump Station No. 2 Magnesium Hydroxide Odor Control Feed System (2017)
- Pump Station No. 1 Comminutor Pit Modifications (2019)
- Pump Station No. 1 Stationary Emergency Generator Installation (2019)
- Pump Stations Nos. 1,2 and 3 Wetwell Rehabilitation (2020)

**The District has standardization across all pump stations. We have developed a standard specification for pump station controls and telemetry so that each station utilizes the same pump controller, transducers, auto dialer, and other key equipment. This standardization is beneficial to operators who have to respond to the pump stations for routine or emergency maintenance activities. Similarly, we have made efforts to utilize a common pump style and manufacturer, one that has proved to be extremely reliable, for the same reasons.

Pump Station SCADA System

The District has developed a SCADA system to monitor its remote pump stations from the central wastewater treatment facility. All of the District's pump stations are equipped with radio-based telemetry systems that continuously communicate with the SCADA computer at the District's treatment plant. The SCADA system provides real time monitoring of flow, pump conditions, and other key operating parameters. Historical information and trends can be viewed from the SCADA computer. This information is incredibly valuable. The SCADA system is also tied to the District's automated alarm system so that problems or failures at any station are immediately reported to the system operators any time, day or night. The automated dialers at each pump station now serve as a redundant backup. Additionally, pump stations #1, #2 and #3 all have Smart Cover manhole monitoring at the upstream manhole. The Smart Covers monitor water levels in the manhole and communicate via satellite to an independent alarm system.

4.7 Operator Training and Certification

Training and professional development of staff members is a key management objective at the District. District management and policy makers understand the importance of technical training and have consistently invested in on-site and off-site training opportunities for staff at all levels.

The District is an active member of the California Water Environment Association (CWEA) at the State level and in the Tri-Counties Section chapter. Collection system and maintenance staff participate regularly in local, regional and state level training sessions and conferences through CWEA.

Other technical training is provided to staff members on a regular basis to support specific roles and duties that are related to collection system maintenance and operation. This includes specialized training provided by vendors and manufacturers, safety training on confined space entry, trench safety, traffic control and other topics, and industry specific training on pertinent topics (e.g. NASSCO PACP, MACP, LACP defect codes, hydro cleaning nozzle selection, etc.).

Each year the District's Collection System Supervisor and Operations Manager develop an annual training plan and associated budget that is authorized by the General Manager and

the District's Board of Directors. Training is carefully documented in general and employee specific files.

Carpinteria Sanitary District

Collections Personnel Equipment Training Log

<u>Subject</u>	<u>Initials</u>	<u>Date</u>
Review SSMP	_____	_____
Vactor 2100 Combination Truck	_____	_____
Lateral Jetting Machine	_____	_____
Ridgid Lateral Camera	_____	_____
2009 Ford CCTV Van (Assistant)	_____	_____
2009 Ford CCTV Van (Operator)	_____	_____
IPAD (Lucity Reference and Acrobat Documents)	_____	_____
LUCITY (Work Orders)	_____	_____
On Call Cell Phone Responsibilities	_____	_____
Review of Current SSO Response Plan	_____	_____
E-One Call Out Response Procedures	_____	_____
Lateral Backup Response Procedures	_____	_____
Odor Complaint Response Procedures	_____	_____
Mainline Backup Response Procedures	_____	_____
Smartcover Alarm Response Procedures	_____	_____
Trash Pump Set-Up/Operation	_____	_____
Generator Set-Up/Operation	_____	_____

Operator Signature/Date: _____

Trainer Signature/Date: _____

Carpinteria Sanitary District CWEA TCP Certifications

District staff members are encouraged to pursue certification through the CWEA Technical Certification Program (TCP). Many of these certifications indicate direct competency in various areas of the collection system and lift station maintenance and operation. A summary of the current TCP certificates held by District staff is provided below:

<u>Name/Title</u>	<u>Certificate</u>	<u>Grade Level</u>
Mark H. Bennett Operations Manager	Plant Maintenance Technologist	4
	Collection System Maintenance Technologist	4
	Laboratory Analyst	1
Mark J. Rogers Treatment Supervisor	Mechanical Technologist	1
	Laboratory Analyst	1
	Collection System Maintenance Technologist	1
Matt Oliver Collections Supervisor	Collection System Maintenance Technologist	3
	Mechanical Technologist	1
Eddie Saenz Lead Collections Operator	Collection System Maintenance Technologist	4
	Mechanical Technologist	2
Jacob Broad Laboratory Supervisor	Laboratory Analyst	2
Keith P. Sweningson Operator 3	Mechanical Technologist	2
	Collection System Maintenance Technologist	1
	Laboratory Analyst	1
Branson Taylor Operator 3	Collection System Maintenance Technologist	1
	Mechanical Technologist	1
Kenneth Balch Operator 2	Mechanical Technologist	1
	Collection System Maintenance Technologist	1
Tim Gallup Collections Operator	Collection System Maintenance Technologist	3
Robert Luna Collections Operator	Collection System Maintenance Technologist	1

4.8 Equipment Maintenance Procedures

As discussed in Section 4.3, the District utilizes its Lucity CMMS database application to schedule and track collection system and pump station maintenance activities. Work orders are generated according to established schedules. Generally, these work orders contain detailed instructions for maintenance and servicing equipment and infrastructure.

The maintenance procedures were developed primarily from Operations and Maintenance (O&M) Manuals for equipment. However, the procedures are evaluated by District staff and updated to include industry best management practices and/or modifications based on specific user experience.

Generally, equipment maintenance is performed in-house by District staff. Certain functions are performed by outside vendors or contractors (e.g. service of Vactor combination sewer cleaning unit). The District is focused on preventative maintenance so that emergency response equipment is fully functional and available at all times.

5.0 DESIGN AND PERFORMANCE

The Carpinteria Sanitary District implements a comprehensive program to ensure that public and private sewer construction, modification and replacement activities conform to established design and performance standards. This section provides an overview of this program.

5.1 WDR Requirements

The General WDRs require the District to have design and construction standards and specifications for the installation of new sewer systems and for the rehabilitation and repair of existing sewer systems. The District is also required to have procedures and standards in place for inspecting and testing the installation of new sewers, pump stations, and other appurtenances, and for rehabilitation and repair projects.

5.2 Design and Construction Standards

District Ordinance No. 2 provides the basic framework for the design and construction of public and private sewer infrastructure within the District's service area boundaries. The District has maintained detailed standards and specifications for the construction of main sewers, lateral sewers, and building sewers for many decades. These standards and specifications have evolved over time to reflect industry standard practices and changes in accepted materials and methods.

The District's standards and specifications for building and lateral sewers were last updated and approved in June 2002. A copy of the June 2002 standards and specifications is provided in **Appendix C**. Minor revisions to these standards have been made since 2002 and are reflected in printed materials that are provided applicants, agents, contractors and other parties interested in sewer construction requirements.

The District is currently undertaking a major redevelopment of its design and construction standards. The updated requirements will be formatted to be consistent with the District Code and will reflect a comprehensive review and retooling of the standards.

Public Sewer Infrastructure Design and Construction Standards

The District generally implements a project-specific approach to the review and approval of proposed public sewer system infrastructure construction.

Main sewer extensions, pump stations and related facilities that are constructed by private parties for future dedication to the District are generally undertaken pursuant to a Sewer Construction Agreement between the District and the proposing party. This obligates the developer to comply with design and construction requirements set forth by the District during a collaborative plan development and review process. Ultimately, the District's General Manager and District Engineer approve the project plans and issue permits for construction.

Sewer improvements constructed by the District are designed to reflect current standards and specifications and to implement general internal objectives relative to equipment and system standardization and uniformity. For example, all new pump stations utilize a standardized control panel and telemetry package. The District's General Manager and District Engineer must approve construction plans and specifications prior to bidding and contract award.

5.3 Construction Permit Program

Construction of private and public sewer infrastructure within the District's service area boundary requires a permit. The District has had a sewer construction permit program in place for many decades in accordance with established District ordinances. It is a formal means to ensure that sewer infrastructure is built in conformance with District standards and to allow for inspection of all constructed facilities.

Permits are generally issued over the counter for most types of sewer improvements. Main sewer extensions and other complex projects require a more comprehensive plan check and review process, but sewer construction permits are issued in the same manner for all projects. Property owners (or their contractors) are required to have a copy of the issued permit available at the job site.

Sewer construction permits provide a lasting record of construction activities within the District. Permits are filed and maintained on a parcel by parcel basis for future reference. The District has made efforts to keep permit fees affordable so that property owners, contractors, plumbers and other individuals performing work on sewer infrastructure are not discouraged from obtaining the required permit.

5.4 Testing and Inspection Procedures

Standard requirements and protocols for testing newly constructed lateral and building sewers are set forth in the June 2002 Design and Construction Standards (see Appendix C).

Newly constructed sewer mains require post construction CCTV inspection, pressure testing and deflection (mandrel) testing. This is in addition to on-site inspection during construction by the District. Lateral sewer installation or replacement must be followed by air or water pressure testing witnessed by District staff. Testing and inspection of other public sewer improvements, such as manhole installation or rehabilitation, pump station upgrades and other work, also follows rigorous testing and inspection protocols.

Inspection and Testing Jurisdiction

The District performs rigorous inspection and testing of all public sewer infrastructure following (or during) installation. Testing requirements are set forth in the project plans and specifications for all public works projects. District staff will typically perform this inspection and testing on small projects. The District does contract with third party inspectors to oversee construction of larger public sewer construction projects.

For lateral sewer construction, modification and repair within the City of Carpinteria, the District has jurisdiction for inspection and testing. District staff documents the work, in conjunction with the sewer construction permit materials. Photographs are taken and required testing procedures are witnessed or performed by District staff.

For lateral sewer construction, modification and repair outside of the City of Carpinteria and in the unincorporated areas of Santa Barbara County, the County building department maintains jurisdiction for inspection and testing. We issue permits and document improvements on private property but defer to the County for inspection and testing.

6.0 OVERFLOW EMERGENCY RESPONSE PLAN

The District has maintained and implemented plans and procedures for response to SSOs for several decades. These procedures have included protocols for reporting to appropriate governmental agencies and the public.

6.1 WDR Requirements

The General WDRs governing sanitary sewers specify the development and implementation of an overflow emergency response plan as an element of each wastewater collection agency's SSMP. This element identifies the agency's practices to protect public health and the environment in the event of a spill.

6.2 Overflow Response Plan

In December 2008, the District completed and adopted a comprehensive, updated **Sanitary Sewer Overflow Response Plan** that is fully compliant with General WDR requirements. A 2019 revision has been finalized and put in use.

The SSO Response Plan is a stand-alone document that is used by District staff members during and following all reported or detected SSOs. Copies of the plan are located in each District vehicle that could be involved in SSO response, as well as in the offices of District staff members likely to participate.

Key elements of the SSO Response Plan include:

- Flow Charts for Responders
- SSO Report Forms
- Detailed SSO Response Procedures
- SSO Notification and Reporting Procedures and Contact Numbers
- Vendor/Contractor Support Information and Contact Numbers
- Recovery and Cleanup Procedures
- Sampling and Investigation Requirements
- Procedures for Addressing SSOs Affecting Private Property
- Detailed Lift Station Failure Response Procedures
- SSO Training and Preparedness

A copy of the body of the District's SSO Response Plan, with pertinent appendices, is provided in **Appendix D**.

7.0 FOG PROGRAM

This section of the Sewer System Management Plan (SSMP) provides a summary of the District's FOG Control Program for the wastewater collection system. Program elements include legal authority, enforcement, source controls, system maintenance, best management practices for food service facilities and public outreach.

7.1 WDR Requirements

The State Water Resources Board (SWRCB) requirements for the FOG Control Program Element of the SSMP are summarized as follows:

The District shall evaluate their service areas to determine whether a FOG control program is needed. If it is determined that FOG programs are not needed, justification must be provided. If FOG is found to be a problem, the District must prepare and implement a FOG source control program to reduce the amount of these substances discharged to the sanitary sewer system. The FOG source control program shall include the following as appropriate:

- a. An implementation plan and schedule for a public education outreach program that promotes proper disposal of FOG;
- b. A plan and schedule for the disposal of FOG generated within the sanitary sewer system service area. This may include a list of acceptable disposal facilities and/or additional facilities needed to adequately dispose of FOG generated within a sanitary sewer system service area;
- c. The legal authority to prohibit discharges to the system and identify measures to prevent SSOs and blockages caused by FOG;
- d. Requirements to install grease removal devices (such as traps or interceptors), design standards, maintenance requirements, Best Management Practices [BMPs] and record keeping and reporting requirements for grease removal devices;
- e. Authority to inspect grease producing facilities and enforce violations;
- f. A description of whether or not the District has sufficient staff to inspect and enforce the CSD FOG ordinance;
- g. An identification of sewer system sections subject to FOG blockages and an established a cleaning maintenance schedule for each section; and
- h. Development and implementation of source control measures, for all sources of FOG discharged to the sewer system, for each sewer system section identified in (g) above.

7.2 Legal Authority

Ordinance No. 7 – Sewer Use (Source Control)

In order to improve its FOG Program, the District adopted Ordinance No. 7 on June 21, 1994. The ordinance is titled a "General Regulation Providing Rules and Regulations for the Quality of Wastewater Discharged to District Facilities; for the Issuance of Source Control Permits; Authorization for Monitoring Inspection, Compliance, and Enforcement Activities; for Industrial User Reporting; Procedures for Variances and Appeals; and for the Repeal of Inconsistent Ordinances." This ordinance is a sewer use ordinance that primarily pertains to discharges from non-residential connections.

Originally modeled after a US Environmental Protection Agency Model Pretreatment Ordinance, the District's Ordinance No. 7 sets forth specific discharge prohibitions and requirements that are, in part, intended to protect sewer collection system infrastructure and minimize the potential for SSOs.

Quantitative local discharge limits are also established by this regulatory instrument. Ordinance No.7 also contains specific provisions related to the control of discharges containing Fats, Oils and Grease (FOG).

CSD Ordinance 7, Section 8 establishes requirements for food service establishments and related facilities to construct and maintain FOG control devices (e.g. traps and interceptors).

Permitting and enforcement provisions are also set forth in Ordinance No. 7. These are a key aspect of the District's overall program to control illicit discharges and other inappropriate uses of the District's collection system.

(Reference Appendix A- CSD Ordinances)

7.3 Fog Program Summary

The discharge of fats, oils, and grease (FOG) from animal and vegetable sources can create sewer line blockages that may result in sanitary sewer overflows (SSOs). Two main sources of FOG discharges are from restaurants and residential users. The FOG discharges may be a result of poor housekeeping practices at restaurants or from misinformed residential users.

The discharge of hot or warm FOG materials to the sewer causes the quickest blockage problems due to the receiving environment. The sewer main line temperatures typically range from 70-80°F and at this temperature; the hot or warm FOG that is discharged to the sewer main cools off, adheres to the interior surfaces of the sewer line and then hardens in place once completely cooled. The adhesion site(s) then becomes a focal point for additional adhesions much like making a candle. A sign of a chronic FOG discharge source is created within the sewer mainline, at or downstream of the user's lateral connection, in various forms characteristic of the material and frequency of discharge.

The Districts approach to keeping the collection system free of blockages not only requires proactive cleaning and maintenance but also source identification, pretreatment, and public education. To aid in the ongoing process of refining its current maintenance and outreach practices, the District has established a FOG Program that continually aims to accomplish the following goals:

- Identify and monitor new and continual FOG sources;
- Enforce District Ordinance No.7 requiring the installation and maintenance of pretreatment facilities for non-domestic sanitary sewer customers;
- Minimize FOG-related sewer blockages and overflows in a cost-effective manner;
- Educate the public about FOG and its impact on the community and environment.

Site Inspections

The District has one full-time employee responsible for the FOG Program. The subsequent FSE (food service establishments) inspections and the majority of the public outreach are executed by this individual.

To prevent sewer overflows and protect District facilities, the District inspects and evaluates seventy (70) FSEs within the Carpinteria Valley, generally annually with some FSEs being inspected on a more frequent basis. Fifty-four (54) of these facilities have been determined to generate FOG in their wastewater process and require a grease trap or interceptor. Nine (9) of the facilities are equipped with grease interceptors and forty-five (45) of the facilities are equipped with grease traps. (See Appendix H- CSD FOG Program Data)

In the event a condition is found to be in violation of District Ordinance 7, following a warning, the inspection frequency may increase depending upon the history of the site, type of restaurant, complaint history, and sewer line blockage or SSO history. Upon successful inspection results, the FSE will be issued a non-transferable Grease Control Permit that remains valid for (3) years. In addition, the FSE is then added to the Districts asset management program to aid in scheduling inspections, recording inspection results, and tracking enforcement history.

Public Outreach

The District currently uses the Engineering Technician as the principal education and outreach vehicle to contact the restaurant community. During an inspection of a restaurant, the inspector uses the opportunity to inform and educate the owner or manager about the various laws and regulations that affect their business. Subject areas include product usage and substitution, best management practices for food service establishments, grease interceptor evaluation, record keeping, District regulation applicability, and any additional Grease Control Permit requirements.

The District's current pipeline for educating residents is at www.carpsan.com, facebook and through informational handouts located in the District Administration Office. In addition to social media, the District holds annual open houses that showcase our treatment facility and enters local parades that raises awareness of the Districts mission statement and the equipment used to maintain the collection system.

Grease Trap/ Interceptors

Ordinance No. 7, Section 8, requires FSEs that have been identified as a FOG producing establishment by the District are to have an approved, adequately sized, properly operated and maintained grease interceptor or gravity separating device. Interceptors must be of a capacity sufficient to provide the appropriate quality of effluent as per District standards (Ordinance 7, Article III) and shall be in an easily accessible location for inspection and cleaning purposes. Requirements for the installation of a grease interceptor or trap shall be determined on a case by case basis by the District using the Uniform Plumbing Code, current edition, as a guide. As required by the Source Control Permit, the permit holder is required to retain for a minimum of three years, documents inclusive of the following: maintenance records/contracts, FOG waste hauling records, and employee training records.

7.4 Enforcement

The District is empowered by CSD Ordinance No. 7 to take enforcement actions against any user(s) that causes a sewer line blockage and/or SSO. In order for the enforcement actions to be successful, a firm foundation of factual evidence must be obtained. This evidence must be objective and devoid of personal opinions. CSD personnel's use of CCTV to gather evidence is a critical component of an enforcement action taken against a user for causing a sewer line blockage and/or SSO. In addition to the CCTV evidence, inspections

are performed by the District at the suspected business to evaluate and investigate the cause(s) of the sewer line blockages and/or SSO. Once all evidence is collected, the information is reviewed by the General Manager and an enforcement strategy is planned. The enforcement will always be commensurate with the degree of the violation found and will follow the procedures and requirements outlined in CSD Ordinance No. 7. If the sewer line debris accumulation has just begun and no SSO or sewer obstruction has occurred, then a correction notice may be issued to improve housekeeping practices and evaluate the business practices that may lead to the discharge of materials that caused the sewer line debris accumulations. If the sewer line accumulations are significant and/or an SSO has occurred, then more severe enforcement actions may be taken. A notice of violation (NOV) may be issued with a compliance schedule to mitigate the conditions that caused the sewer line blockage and/or SSO to occur.

7.5 Fog Disposal

FOG removed by the District during cleaning of the collection system is taken to the WWTP to be processed. FOG generated by private businesses or residents is not allowed at the WWTP. Generally, businesses that comply with the provisions of CSD Ordinance No. 7 will capture FOG within a grease interceptor located outside the building or collect FOG within a grease trap located inside the building and then dispose of it in a waste bin.

Grease collected in disposal bins and interceptors are handled in two ways. Grease haulers collect grease from disposal bins or pump grease from grease interceptors and haul the grease to disposal facilities. Rendering companies generally collect grease from disposal bins and use the grease to produce biofuels, soap, tallow, and feed fat for animal feed.

Although District staff does not endorse any particular service provider, the following service providers are used by businesses in Santa Barbara County:

Service Provider	Phone Number
Biodico	(805) 683-8103
Clays Septic & Jetting, Inc.	(805) 925-6686
Coastal Byproducts	(805) 845-8086

7.6 Priority Line Cleaning

Sewer mainlines that exhibit low flow conditions or have frequent blockages caused by excessive grease, roots, solids, hydraulic faults or all four findings are referred to as "Priority Lines." These lines are identified based on qualitative findings such as tracking locations of repeat sewer blockages and surcharges, significant grease collected on hydro-jetting nozzles during cleanings, or through closed-circuit television inspection (CCTV) findings. Once the mainline is identified as a potential area of concern or in need of further investigation, the mainline is put on a monthly, quarterly or bi-annual preventive maintenance cleaning schedule. (Reference Figure 4-1 Determining Cleaning Frequency Flowchart) These locations are forwarded to the District Source Control Inspector for follow-up source determination and inspection. Priority lines remain on a preventative maintenance schedule until subsequent observations determine that the potential for obstruction or blockage has been reduced or eliminated. This program is described in more detail in SSMP Element 4-*Operation and Maintenance*.

BEST MANAGEMENT PRACTICES (BMP's) FOR FOOD SERVICE FACILITIES

As food service facility operators, grease can be managed effectively to minimize the discharge of fats, oil and grease (FOG) into sewer systems and in turn, possibly prevent future costly and time consuming exterior or interior plumbing repairs. Good grease handling habits can decrease the required maintenance on grease traps or interceptors, but it is up to each food facility operator to effectively implement these habits. Good grease controlling habits are called **Best Management Practices** or **BMP's**. The techniques presented below are used throughout the source control industry and are proven effective when done properly.

Maintenance – In order to prevent blockages caused by FOG, a consistent maintenance program must be in place. All grease collection and storage equipment must be regularly maintained per District and industry standards. All kitchen or facility staff must be well informed and trained to perform correct grease maintenance procedures. **Post these maintenance practices or at least make them available to each employee and cleaning staff.**

RECOMMENDED GREASE COLLECTION MAINTENANCE PRACTICES

Recommended Maintenance Practices	Reason	Benefits
Witness all grease trap or interceptor cleanings and other service activities to ensure that a proper job is being done and that all interceptor or trap equipment is in place and working.	Grease trap or interceptor service personal may take shortcuts. Witnessing cleanings will ensure that an establishment is getting the full value of service.	Possible savings on additional cleanings. The establishment may be paying for cleaning more often than necessary if full service is not provided.
Grease traps under sinks should be cleaned weekly. If proper BMP's are maintained, the cleaning cycles may be lengthened under District permitting directions.	Under sink grease traps have less volume than grease interceptors therefore retention times are less and more frequent cleanings are necessary.	Proper cleaning cycles help prevent malfunctions in traps and plumbing, therefore maintenance and costs may be reduced.
Grease interceptors should be cleaned as frequent as necessary per the District's or manufacturer's recommendations, whichever is more stringent. (Typically, the combined thickness of the floating grease and the bottom solids should not be more than 25% of the total interceptor depth.)	Interceptors must be thoroughly pumped and cleaned to ensure that the accumulation of grease and solids do not cause the interceptor to operate improperly. The cleaning frequency is a function of the type of establishment, the size of the interceptor, and the volume of flow discharged by the establishment.	Routine cleanings will prevent plugging of the sewer line between the food service establishment and the public sewer system. If a blockage occurs, it will cause a sewage backup into the establishment which in turn causes costly maintenance and repairs to the system.
Keep a maintenance log at all times, not just copies of trap or interceptor cleaning receipts.	The maintenance log serves as a record of the frequency and volume of cleaning the trap or interceptor. It is required by the District's Source Control Program to ensure that grease trap/interceptor maintenance is performed on a regular basis.	The maintenance log serves as a record of cleaning frequency and can help the owner of the establishment optimize cleaning frequency and possibly reduce costs.

Recommended Maintenance Practices	Reason	Benefits
Train all employees (especially new employees) on the importance of good cleaning habits for traps and interceptors.	People are more willing to support an effort if they understand the basis for it.	Overall good operational results for the establishment and possible cost-saving benefits.
Post “NO GREASE” signs above all sinks and on the front of dishwashers in several languages if necessary.	Signs serve as a constant reminder for all employees and kitchen service vendors.	Constant reminders will help minimize or eliminate grease discharges into traps and interceptors and possibly reduce the costs of cleaning and disposal.
<p>Water Temperature Limits – Use water temperatures less than 140° F in all sinks, especially the pre-rinse sink before the mechanical dishwasher. Use a three-sink dishwashing system which includes sinks for washing, rinsing and sanitizing in a 50-100 ppm bleach solution.</p> <p>Never use hot water when cleaning & rinsing the traps or interceptors. Temperatures for dishwashers should be set per manufacturers, health department’s and/or plumbing code standards. Dishwashers should never be connected to grease traps.</p>	Temperatures in excess of 140° F will dissolve the grease and when introduced into sanitary sewer lines it will cool and congeal or solidify within the lines which will cause blockages.	The establishment may help reduce its energy costs on gas or electric for heating of water.
<u>Recycle waste cooking oil.</u> Waste cooking oil is usually stored in secured bins in a location accessible for grease recyclers or disposal companies.	There are many waste oil recyclers throughout California. Some contact names are available at www.calfog.org .	Possible cost recovery opportunity and environmentally friendly solutions.
“Dry wipe” all pots, pans and dishware prior to hand or dishwashing. “Dry wipe” into the trash; dump excess amounts of grease from dishware into grease recycling bin.	The grease and food from all dishware will likely go to the landfills or composting piles. By “dry wiping” and disposing in garbage or recycling bins, the grease material will be eliminated that much more from the traps, interceptors and sewer lines.	Less frequent cleanings for grease traps and interceptors and possible savings on maintenance costs.
Dry clean-up any grease spills within kitchens and outside kitchens (especially around dumpster and bin locations). Control the spill, then sweep or clean-up with rags or granular absorbents and dispose of in dumpsters. Do not let any grease spill or end up in floor drains or storm drains. Mop and collect wastewater for disposal. Every grease handling establishment should have a “Spill Clean-Up Plan” in place.	Immediately washing spills down the drains without doing a dry clean-up will wash greasy waste materials into the drains and this will eventually cause blockages and sewage spills back into properties.	Will keep drains clear of grease and possibly prevent costly plumbing service calls or repairs.

Recommended Maintenance Practices	Reason	Benefits
<p>Check for the presence of floor drains and the potential entry of any unwanted chemicals to the sanitary sewer. Never pour cooking oil or grease into sinks or floor drains. Dispose or recycle grease through a licensed waste grease hauler.</p>	<p>Floor drains must have screens to capture solids. The screen must be clean, especially before cleaning the floor. Check for screening devices in sinks. Screens should be placed in all sinks to prevent solids from entering drain. Eliminate or avoid using an under-the-sink garbage disposal unit when possible. Excessive solids from produce and meats in grease traps and vaults may prove that garbage is discharged directly to the drain and not in the solids waste container (garbage receptacle).</p>	<p>Will keep floor drains clear and working properly, including all other drains linked to sinks if proper clean-up habits are enforced.</p>
<p>Be cautious of additives such as emulsifiers, solvents or <u>enzymes</u> other than typical dishwashing detergents that claim their products “break down” grease and enhance the performance of grease traps and interceptors.</p>	<p>Such “additives” cannot be substituted for a grease removal device and regular inspection and maintenance practices. These emulsifiers or solvent products just dissolve the grease and wash it down into the building’s plumbing and public sewer systems.</p>	<p>Allows for proper removal of grease and savings when emulsifiers or solvents are not used.</p>
<p>Have kitchen hood filters cleaned properly. Dispose of grease in grease bins. Do not clean equipment in food preparation sinks.</p>	<p>Proper and routine cleanings will prevent a build-up of grease and possible spills.</p>	<p>Good kitchen cleaning practices and possible savings on costly clean-ups or replacement of kitchen equipment. Dryer workplaces is safer for employees in avoiding slips, trips and falls.</p>
<p>Use absorbent paper under fryer baskets.</p>	<p>Reduces amount of grease during clean-ups. Dispose of soaked papers in a trash receptacle.</p>	<p>Reduces amount of grease entering the drain and protects sewers from grease blockages and overflows.</p>
<p>Periodically inspect for leaky grease bins or dumpsters. Never wash down bin or dumpster areas with a hose.</p>	<p>Contact the vendor or owner of the bins or dumpsters to repair or replace them. Have the company perform clean-ups or use other BMP’s to clean the bin or dumpster area.</p>	<p>Will help prevent illegal grease waste from entering into the storm water/storm drain system, streams and oceans and eliminate the potential for civil and criminal prosecutions.</p>
<p>Do not dump food wastes high in fat content down the disposal; the garbage bin is the best way to dispose unwanted scraps. The fat in soup broths should be allowed to separate and be disposed of in a grease container for proper grease disposal. All dips, dressings, marinades, etc. should be disposed of in the garbage and not poured down kitchen drains.</p>	<p>Food wastes high in fat content overload the grease trap and cause blockages and sewage overflows.</p>	<p>Will prevent grease accumulation into traps and interceptors and possibly cut down on maintenance duties and costs.</p>

8.0 SYSTEM EVALUATION / CAPACITY ASSURANCE

The District initiated a comprehensive collection system planning and improvement program in the early 2000's that continues today. The District's efforts were, in part, in response to forthcoming US EPA requirements to prepare a Capacity, Management, Operation and Maintenance (CMOM) program. This federal program, which was pending at the time, has not yet been implemented, but in many respects, the WDRs have similar plan and program requirements.

This section provides a summary of completed and ongoing efforts to evaluate the District's wastewater collection with respect to both structural condition and hydraulic capacity.

8.1 WDR Requirements

The General WDRs governing sanitary sewers specify that the District shall prepare and implement a capital improvement plan (CIP) that will provide hydraulic capacity of key sanitary sewer system elements for dry weather peak flow conditions, as well as the appropriate design storm or wet weather event as part of the Sanitary Sewer Management Plan (SSMP).

8.2 Wastewater Collection System Rehabilitation Plan

The District engaged *Dudek & Associates* to prepare a comprehensive **Wastewater Collection System Rehabilitation Plan**. The plan, completed in April 2002, was intended to identify defects with the District's 46 linear miles of gravity sewers and to prioritize remedial efforts based on defect distribution and severity.

This engineering based planning effort was primarily intended to assess the structural condition of the collection system based on existing data. The District had conducted a significant CCTV pipeline inspection program in the late 1990's and augmented this with contracted pipeline inspection prior to initiating the condition assessment planning effort.

The project approach for this study included the following basic elements:

- Develop refined defect coding system for CCTV inspection and data management
- Complete preliminary review of compiled CCTV inspection data
- Recommend follow-up CCTV inspection
- Analyze and manipulate data based on identified defect types
- Perform focused, engineering based review of CCTV inspections
- Generate numerical rankings for pipelines based on overall condition and defect specific data
- Recommend appropriate rehabilitation method or approach for priority segments
- Generate engineering cost estimates for recommended pipeline rehabilitation
- Develop a prioritized capital improvement program for strategic implementation
- Recommend additional planning and investigation measures.

The study recommendations included development of a wastewater collection system master plan and computerized hydraulic model as well as focused efforts to identify and control infiltration and inflow. A comprehensive list of pipelines requiring new or updated CCTV inspection was also prepared.

The study culminated in a prioritized list of pipeline segments based on a weighted total defect score. Weighting gave priority to structural defects and active infiltration. For each pipe reach a suggested rehabilitation method was provided, as were applicable unit and extended planning level costs.

A copy of the Executive Summary and pertinent excerpts from the Wastewater Collection System Rehabilitation Plan are presented in **Appendix E**

8.3 Infiltration and Inflow Study

The District completed a comprehensive **Infiltration and Inflow Study** to characterize and quantify groundwater and rainfall dependent infiltration as well as storm water inflow into its wastewater collection system.

Field monitoring, analyses, and reporting was conducted by MGD Technologies under sub contract to Dudek & Associates. Eight monitoring locations within the collection system were selected, generally to isolate separate drainage basins within the District's service area. MGD utilized area velocity type open channel flow meters with continuous data logging to monitor flow.

Dry season flow monitoring was conducted over a one-week period in September 2003. The data quality was generally quite good and was felt to be representative of dry weather conditions.

Wet season flow monitoring was first attempted over a four-week period from January 13, 2004 to February 9, 2004. Flow meters were placed in the same eight locations and two electronic rain gauges were deployed. During this period, no significant rainfall event occurred and no wet weather response was observed at any of the flow metering stations. At the end of the month long monitoring period, there was no rain predicted in long range forecasts and the study was abandoned.

A second attempt to acquire wet weather flow data was made in early 2005. Meters and rain gauges were put in place between January 5, 2005 and February 2, 2005, again at the same locations as those used for the dry weather monitoring in 2003. A very significant rainfall event occurred during this monitoring period, with nearly ten inches of rain falling between January 8th and January 10th. Although this rain event resulted in surcharge conditions at several monitoring sites, satisfactory monitoring data was collected.

MGD prepared report binders for each of the three monitoring events with detailed data from each station. Data reduction was performed by MGD and also by Dudek & Associates. All but two of the delineated drainage basins exhibited evidence of significant inflow and rainfall dependent infiltration. Groundwater infiltration (base infiltration) was quantified in both wet and dry seasons and compared.

The Infiltration and Inflow Study findings were used in subsequent hydraulic modeling and master planning efforts. The findings also provided direction to the District when prioritizing pipeline rehabilitation and repair. Future efforts to control inflow and infiltration - through smoke testing, lateral inspection, dyed water testing or other means - will utilize the study data to identify focus areas and to measure efficacy.

Excerpts from the Infiltration and Inflow Study are presented in **Appendix F**. Influent flow monitoring and meter data from remote pump stations has provided clear indication that pipeline rehabilitation and other comprehensive efforts to control I&I since 2005 have been successful. Wet weather peaking factors are clearly diminished from those previously observed.

8.4 Wastewater Master Plan

The District completed a comprehensive **Wastewater Master Plan** in April 2005. The master planning project was performed by Dudek & Associates with support and coordination from District staff.

One of the key goals of the master planning effort was to clearly identify and document a baseline condition of the District's existing wastewater conveyance infrastructure. Chapter 4 of the Wastewater Master Plan provides a comprehensive overview of the District, its customer base, and historical flow regimes, together with a detailed description of system pipelines and pump stations.

The master plan was developed in conjunction with a computerized hydraulic model of the District's collection system (see Section 9.4). This dynamic model was used to evaluate existing flow conditions and identify segments with capacity limitations in both dry weather conditions and peak wet weather conditions. Flow monitoring data from both dry weather and wet weather periods were used to calibrate the model.

Long range land use planning and zoning information was gathered from the City of Carpinteria and the County of Santa Barbara to determine the projected build-out condition within the District's service area. This data was modeled to assess future flow conditions and associated pipeline capacity limitations.

The Master Plan included tabular and spatial representations of pipelines with the District's collection system with current and future hydraulic capacity limitations. This information has been and will continue to be used to focus rehabilitation and infiltration/inflow mitigation efforts in portions of the system with limited capacity. The Master Plan also identified a series of prioritized projects intended to address existing and future hydraulic capacity limitations.

Other planned projects, including certain projects identified in the 2002 Collection System Rehabilitation Plan, were incorporated into the Master Plan document.

Excerpts from the Wastewater Master Plan are presented in **Appendix G**.

8.5 Hydraulic Model

In support of the District's master planning efforts, described in the previous section, a single computer model was developed for the entire wastewater collection system. Development of a computerized hydraulic model begins by importing pipeline information from the system GIS database. Manholes are automatically created in the model based on upstream and downstream coordinate pairs. Pump station information was gathered and the operating criteria values were input. Finally, system flow data was integrated from the wet weather flow measurement program.

All existing wastewater collection facilities currently in operation within the District's service area were included in the system GIS and imported into the collection system hydraulic model. The District's record drawings and asset database were researched and relevant information collected including data on manholes, invert elevations, pipeline diameters,

pipeline lengths, and other pertinent information. Information included in the modeling database is sufficient to define the sewer reaches upstream, manhole outlet information, the downstream manhole inlet elevation, the diameter of the pipeline, the length of the pipeline and the coordinates of each system manhole.

The hydraulic model utilized to evaluate the District's system is called HYDRA®. HYDRA® is a publicly available computer software program produced by Pizer, Inc. The program performs hydraulic calculations based on standard open channel flow algorithms and Manning's equation. It is a dynamic model that routes flow through the system. The model has a graphical interface, which allows the collection system's physical geometry to be entered graphically using standard CADD software, such as AutoCAD. Similarly, required parcel data is entered graphically from the District's GIS parcel layer.

The model runs completed for the 2005 Wastewater Master Plan were integrated into that planning document. Hydraulic conditions were evaluated at current and future (buildout) conditions for both dry weather and peak wet weather flows. A series of other model runs were performed to evaluate interim period conditions and assumed conditions with effective infiltration and inflow mitigation. The hydraulic model is used periodically to evaluate proposed development projects and associated impacts to downstream hydraulics.

The District is in the process (2019/2020) of building and implementing an updated hydraulic model utilizing Innovyze InfoSewer Modeling software. Although this update has not been a critical undertaking, as wastewater flows have dropped substantially due to conservation and a controlled growth environment in the region, we have compiled more accurate elevation data and added pipeline segments since 2005. Prior to undertaking major pipeline upgrades, development of a new computerized hydraulic model will ensure appropriate pipe sizing for future conditions.

8.6 Capital Improvement Program

The District maintains an updated long range Capital Improvement Program (CIP) that identifies proposed infrastructure upgrades, generally over a 7 to 10-year forward looking time horizon. The CIP project list is reviewed at least annually and presented to the District's Board of Directors for consideration.

Each year during the annual budget process, capital projects and capital equipment purchases are identified and developed for the coming fiscal year. These projects and expenditures are authorized by the Board concurrent with their approval of the annual operating budget. The projects include those programmed in the District's long range CIP, but also include smaller projects and equipment procurement that may benefit the District's collection system operations.

From a funding perspective, the District continually evaluates its revenue stream and reserve fund balances in the context of funding CIP projects, both near term and long term. A fiscal model is used to assess the need for rate and fee increases and long term borrowing to fund ongoing capital projects.

Completed and Ongoing CIP Projects

Over the past eight years the District has implemented an aggressive CIP project list, focused primarily on collection system improvements.

Completed projects include:

- Collection System Rehabilitation Project – Phase 1

- Manhole Rehabilitation Project
- Bluffs Sewer Relocation Project
- CCTV Inspection Vehicle Procurement
- CCTV Mainline Inspection Project
- Collection System Rehabilitation Project- Phase 2
- Point Repair Project
- Vactor 2100 Plus Procurement
- Asset Management Software Upgrade (Lucity)
- Lateral Inventory Project
- E-One Inspection/Maintenance Project
- Suspended Line Realignment (Carpinteria Creek Siphon Installation)
- Santa Claus Lane Improvements
- Old Linden Sewer Improvements
- Lateral Lining Project
- Odor Control Program Upgrade
- Plum/Pear Sewer Line Rehabilitation
- Mainline Rovver X camera procurement and processing software upgrade (2019)
- Collection System Rehabilitation Project- Phase 3 (2020)
- Pump Station No. 4 Replacement
- Pump Station No. 5 Rehabilitation
- Pump Station No. 1 and 2 Control System Upgrades
- Pump Station No. 1 Pump Replacement Project
- Pump Station No. 2 Pump Replacement Project
- Pump Station No. 7 Construction, Start up and Addition to CSD Collections System
- Pump Station No. 8 Construction (Serves Rincon Point)
- Pump Station No. 6 Pump Replacement
- Pump Station No. 1 Controller Replacement
- Pump Station No. 2 Controller Replacement
- Pump Station No. 2 Magnesium Hydroxide Odor Control Feed System (2017)
- Pump Station No. 1 Comminutor Pit Modifications (2019)
- Pump Station No. 1 Stationary Emergency Generator Installation (2019)

Future CIP Projects

Collection system related capital projects that are programmed for implementation over the next five to seven years include:

- Pump Stations Nos. 1,2 and 3 Wetwell Rehabilitation (2020)
- Holly Avenue Trunk Sewer Replacement
- Carpinteria Avenue Bridge Sewer Siphon Realignment
- Lift Station 2 Force Main Replacement/Realignment
- Collection System Rehabilitation Project - Phase 4
- Sewer Lateral Rehabilitation Project - Phase 2

Some of these projects are capacity related projects identified in the 2005 Wastewater Master Plan. The District will continue to reevaluate the need for these projects as wet weather flows are reduced through implementation of system-wide pipeline and manhole rehabilitation projects. Both dry and wet weather flows have been affected by a reduction in infiltration and inflow. Hydraulic model runs will be conducted to confirm design criteria and to reassess the need to undertake these expensive infrastructure upgrades.

9.0 MONITORING AND MEASUREMENT

This section of the SSMP outlines the process that the District will follow to evaluate the effectiveness of the SSMP and to identify updates that may be needed for a more effective program.

9.1 WDR Requirements

The District is required to monitor the effectiveness of each SSMP element and update and modify SSMP elements to keep them current, accurate, and available for audit as appropriate. The General WDRs specifically require the District to do the following:

1. Maintain relevant information that can be used to establish and prioritize appropriate SSMP activities;
2. Monitor the implementation and, where appropriate, measure the effectiveness of each element of the SSMP;
3. Assess the success of the preventative maintenance program;
4. Update program elements, as appropriate, based on monitoring or performance evaluations; and
5. Identify and illustrate SSO trends, including: frequency, location, and volume.

9.2 Performance Measures

A number of performance indicators are or will be tracked to evaluate the long-term effectiveness of the elements described in this SSMP. Some of these indicators could be expected to relate directly to specific elements or operations and maintenance activities, whereas others relate to multiple activities or program effectiveness, as a whole. For example, it may be possible to correlate the number of blockages attributed to roots with the total annual footage of sewer lines subject to activities as part of the preventative maintenance program (see SSMP Element 4.2.2). In contrast, the volume of SSOs reaching surface waters would more likely reflect multiple maintenance activities, emergency response times, the FOG program, and even uncontrollable factors. In measuring an outcome that is characterized by a relatively small number of events (e.g., number of annual wet weather SSOs), it is important to recognize that statistical variability may dominate short-term trends and that true causal relationships are likely to be evident only over the long term.

The following list shows the quantitative indicators that are currently tracked or those planned to be tracked.

- Number of SSOs over the past 12 months
- Location of all SSOs over the past 12 months
- Estimated volume distribution of SSOs (e.g., number of SSOs less than 100 gallons, 100- to 999 gallons, 1,000- to 9,999 gallons, more than 10,000 gallons)
- Causal factors for reported SSOs (e.g., roots, FOG, debris, pipe failure, pump station failure, capacity, other)
- Mainline SSOs vs. Lower Lateral SSOs

- Number of known stoppages or backups not resulting in SSOs
- Miles of gravity sewer hydrocleaned over the past 12 months
- Miles of gravity sewer inspected (CCTV) over the past 12 months

As the historical record grows, future annual reports to the State and Regional Board will include trend plots for key measures. Performance measures related to maintenance activities will be tabulated and charted in the annual collection system report.

9.3 Baseline Collection System Performance

In order to track the progress of the District's efforts to reduce SSOs and the overall effectiveness of the SSMP, it is helpful to establish a baseline from which to draw comparisons. The following tables provide a baseline performance summary for the past three-year period.

Table 9-1 Historical Annual SSOs by Type

Calendar Year	Gravity Sewer SSOs	Lower Lateral SSOs	Pump Station SSOs
2009	0	1	0
2010	0	1	0
2011	1	1	0
2012	1	4	0
2013	1	3	0
2014	0	1	0
2015	0	2	0
2016	0	0	0
2017	0	1	0
2018	1	1	0
2019	0	0	0

Table 9-2 Historical Annual SSOs by Cause

Calendar Year	Roots	Debris	Grease	Capacity	Pipe Failure	Pump Station	Other
2009	1	0	0	0	0	0	0
2010	1	0	0	0	0	0	0
2011	1	0	0	0	0	1	0
2012	4	0	1	0	0	0	0
2013	3	0	1	0	0	0	0
2014	1	0	0	0	0	0	0
2015	2	0	0	0	0	0	0
2016	0	0	0	0	0	0	0
2017	1	0	0	0	0	0	0
2018	2	0	0	0	0	0	0
2019	0	0	0	0	0	0	0

9.4 Monitoring and Reporting

In order to track the progress of the District's efforts to reduce SSOs and the overall effectiveness of the SSMP, annual monitoring and reporting will be conducted. At a minimum, the performance measures outlined in Section 9.2 will be compiled and documented in a simple annual performance report.

District staff will review the annual report and the overall findings each year and compare them to baseline and historical performance data. A careful review of the data, including any apparent trends or patterns that may develop, will be the basis for program modifications. These may include changes in maintenance and inspection frequency, targeted source control to reduce grease or other appropriate response measures.

In addition to annual reporting, the Collections Department conducts weekly reports tracking hydro cleaning progress, staff training, SSO's, mainline/lateral inspections, equipment maintenance, and repair, and special projects progress. The weekly reporting enables the District to immediately augment cleaning schedules/ priorities according to current data analysis trends.

9.5 Ongoing Program Improvements

It is the District's intent that the SSMP remain a living document and that it be regularly updated to reflect program or organizational changes, new regulatory requirements, facility improvements, and other changing conditions. Methods to ensure this objective is met include:

- The General Manager will assume the overall responsibility for maintaining and updating the SSMP. District Collection System and Operations staff will provide input and make recommendations for SSMP updates and improvements.
- A number of the activities described in the SSMP reflect ongoing programs for which the review and update process is well established. Examples include preventative maintenance measures, staff training, outreach, inspection, and testing.
- The General WDRs require periodic auditing of the SSMP and comprehensive updates on five-year intervals. Resultant modifications and improvements to the plan will have corresponding benefits for the overall program.

10.0 SSMP PROGRAM AUDITS

10.1 WDR Requirements

The General WDRs require enrollees to conduct periodic internal audits, appropriate to the size of the system and the number of SSOs reported. These audits must occur, at a minimum, every two years and a report must be prepared and kept on file. The audits shall focus on evaluating the effectiveness of the SSMP and the District's compliance with the SSMP requirements, including the identification of any deficiencies in the SSMP and the steps to correct them.

10.2 Program Audit Procedures

The District shall perform internal SSMP audits on a bi-annual basis. The audits will be scheduled using the District's CMMS and shall typically occur in January on odd years. The audit will determine whether the SSMP meets the current requirements of the General WDRs, whether the SSMP reflects the District's current practices, and whether the District is following the SSMP.

The audit will be conducted by a team consisting of District staff members. If appropriate, the District may elect to engage a consultant to conduct the biannual audit to provide an independent evaluation of the SSMP and its ongoing implementation.

The scope of the audit will cover each of the sections of this SSMP. An SSMP Audit Checklist, based on the requirements in the General WDRs, is included in this Section. The results of the audit will be compiled into an SSMP Audit Report. The SSMP Audit Report will focus on the effectiveness of the SSMP program, compliance with the General WDRs, and identification of any deficiencies in the SSMP. The SSMP Audit Report will identify revisions that may be needed for a more effective program.

The District will certify that it has completed the semi-annual audit using CIWQS. Copies of the semi-annual Audit Reports will be retained by the District for five years.



CARPINTERIA SANITARY DISTRICT SSMP AUDIT CHECKLIST

Audit Period: _____

Date: _____

Completed By: _____

Reviewed By: _____

Element 1 – Goals		Yes	No
A	Are the goals stated in the SSMP still appropriate and accurate?		
Element 2 – Organization		Yes	No
A	Is the Contact Information in Appendix 2-A current?		
B	Is Organization Chart in Figure 2-1 of the SSMP current?		
C	Is the chain of communication for reporting and responding to SSOs accurate and up-to-date?		
Element 3 – Legal Authority		Yes	No
Does the SSMP contain excerpts from the current Carpinteria Sanitary District's Code documenting the District's legal authority to:			
A	Prevent illicit discharges?		
B	Require proper design and construction of sewers and connections?		
C	Ensure access for maintenance, inspection, or repairs for portion of the lateral owned or maintained by the City?		
D	Limit discharges of fats, oil and grease?		
E	Enforce any violation of its sewer ordinances?		
Element 4 – Operations and Maintenance		Yes	No
A	Does the SSMP reference the current process and procedures for maintaining the District's sanitary sewer system maps?		
B	Are the district's sanitary sewer system maps complete, current and sufficiently detailed?		
Resources and Budget			
C	Does the District allocate sufficient funds for the effective operation, maintenance, and repair of the sewer system and is the current budget structure documented in the SSMP?		

Prioritized Preventive Maintenance			
D	Does the SSMP describe current preventive maintenance activities and the system for prioritizing the cleaning of sewer lines?		
E	Based upon the SSO information in CIWQS, are the District's preventive maintenance activities sufficient and effective in minimizing SSOs and blockages?		
Scheduled Inspections and Condition Assessments			
F	Is there an ongoing condition assessment program sufficient to develop a capital improvement program addressing the proper management and protection of infrastructure assets? Are the current components of this program documented in the SSMP?		
Contingency Equipment and Replacement Inventory			
G	Does the SSMP list the major equipment currently used in the operation and maintenance of the sewer system and document the procedures for inventory management?		
H	Are contingency equipment and replacement parts sufficient to respond to emergencies and properly conduct regular maintenance?		
Training			
I	Are the training records current?		
J	Does the SSMP document current training expectations and programs within the District's Collections System Department?		
Element 5 – Design and Performance Standards		Yes	No
A	Does the SSMP contain current design and construction standards for the installation of new sanitary sewer systems, lift stations, and other appurtenances and for the rehabilitation and repair of existing sanitary sewer systems?		
B	Does the SSMP document current procedures and standards for inspecting and testing the installation of new sewers, pumps and other appurtenances and the rehabilitation and repair of existing sewer liens?		
Element 6 – Overflow and Emergency Response Plan		Yes	No
A	Does the District's Overflow Emergency Response Plan establish procedures for the emergency response, notification, and reporting of sanitary sewer overflows (SSOs)?		

B	Are District staff and contractor personnel appropriately trained on the procedures of the Overflow Emergency Response Plan?		
C	Is the SSO Response Procedure Flow Chart (Figure 6-1) accurate?		
D	Are the SSO External Reporting Requirements and Contact Information (Figures 6-2 and 6-3) current?		
E	Is the After Hours and Emergency Contact Information in Appendix 6-A current and complete?		
F	Is the Overflow Emergency Response Plan effective in handling SSOs in order to protect public health and the environment?		
Element 7 – Fats, Oils and Grease (FOG) Control Program		Yes	No
A	Does the Fats, Oils and Grease (FOG) Control Program include efforts to educate the public on the proper handling and disposal of FOG?		
B	Does the District's FOG Control Program identify sections of the sewer system subject to FOG blockages, establish a cleaning schedule and address source control measures to minimize these blockages?		
C	Are requirements for grease removal devices, best management practices (BMP), record keeping and reporting established in the District's FOG Control Program?		
D	Is the current FOG Control Program effective in minimizing blockages of sewer lines resulting from discharges of FOG to the system?		
Element 8 – System Evaluation and Capacity Assurance Plan		Yes	No
A	Does the Carpinteria Sanitary District's Sewer Master Plan evaluate hydraulic deficiencies in the system, establish sufficient design criteria and recommend both short-term and long-term capacity enhancement and improvement projects?		
B	Does the District's Capital Improvement Program (CIP) establish a schedule of approximate completion dates for both short-term and long-term improvements and is the schedule reviewed and updated to reflect current budgetary capabilities and activity accomplishment?		
Element 9 – Monitoring, Measurement and Program Modifications		Yes	No
A	Does the SSMP accurately portray the methods of tracking and reporting selected performance indicators?		
B	Is the District able to sufficiently evaluate the effectiveness of SSMP elements based on relevant information?		

Element 10 – SSMP Audits		Yes	No
A	Were the results of prior SSMP Audits recorded in a written report?		
B	Were the actions recommended in the SSMP Audit report(s) implemented?		
Element 11 – Communication Program		Yes	No
A	Does the District effectively communicate with the public and other agencies about the development and implementation of the SSMP and continue to address any feedback?		

11.0 COMMUNICATION PROGRAM

11.1 WDR Requirements

The General WDRs governing sanitary sewers specify that the District shall communicate on a regular basis with the public on the development, implementation, and performance of its Sewer System Management Plan (SSMP). The communication system shall provide the public the opportunity to provide input to the District as the program is developed and implemented. The District shall also create a plan of communication with systems that are tributary or satellite to the District's sanitary sewer system.

11.2 District Outreach Program

The District maintains an approach to open and direct communication with its customers and community. Additionally, the District regularly interacts with the local municipality, the County of Santa Barbara and other utility providers within the Carpinteria Valley. The District's communication efforts are further described below.

Public Outreach Efforts

The District uses various communication tools to interact with its customers and surrounding community. These include the District's website, a newsletter that is periodically mailed to all customers, quarterly articles in the Coastal View News, Facebook posting, issue specific customer door hangers, and other outreach tools.

The District's website, found at www.carpsan.com, provides information on the District ranging from the organizational structure and board meeting minutes to capital improvement projects and planning documents. During the SSMP development process, the District invited interested parties to provide feedback on the plan via a banner on the website home page. The website also provides the public with detailed information on collection system management, operation, and maintenance practices. There is information available on the site, including frequently asked questions, intended to educate customers on how they can help prevent SSOs and other collection system impacts.

The District publishes a newsletter on a periodic basis (generally annually) that the District distributes within its service area. The newsletter typically contains important information for customers and the public regarding use of the sanitary sewer system and ways that property owners can help prevent SSOs. Direction on controlling the discharge of FOG has been a recurrent informational topic, as has information regarding the prohibition of stormwater discharge and illicit drain connections. Additionally, the newsletters have outlined requirements for lateral construction and repair, transmitted information regarding smoke testing efforts and have introduced collection system personnel to the readers.

Communication with Surrounding Cities and Agencies

The District service area encompasses the City of Carpinteria and most all developed parcels within the City limits receive public sewer service. Additionally, the District provides sewer service to developed parcels located outside of the City limits within unincorporated areas of Santa Barbara and Ventura Counties. The District maintains regular contact with these neighboring agencies.

The District works closely with the local planning and development departments on review of residential, commercial and industrial developments. Comments and input are provided through this review process to ensure that District construction standards and requirements are conformed to and that District permits are obtained when necessary.

Opportunity for Public Comment

The District's web page and newsletter provide the community with avenues to contact the District with any questions they may have regarding this SSMP. A banner was posted on the District's home page during the original development of this SSMP to notify the public that the plan was being prepared and providing an opportunity for public review and input.'

The SSMP is posted on the District website with proof of Board adoption. Periodic review and adoption of SSMP updates by the Board of Directors are performed in properly noticed public meetings.

The District reports SSOs electronically to the California Integrated Water Quality System (CIWQS). The electronic SSO data, which has a public information section as well as information regarding regulatory actions, is available at:

www.waterboards.ca.gov/water_issues/programs/ciwqs/publicreports.shtml/.

Additionally, at the bi-monthly board meetings, which are open to the public, updates are given regularly on collection system activities, SSMP compliance, SSO events and response and other key compliance activities. Performance updates will also be given to the Board and included in the public meeting minutes.

APPENDIX A

Carpinteria Sanitary District Ordinances

APPENDIX B

Example Sewer Atlas Map

APPENDIX C

2002 Design and Construction Standards

APPENDIX D
SSO Response Plan

APPENDIX E

Collection System Rehabilitation Plan Excerpts

APPENDIX F

Infiltration and Inflow Study Excerpts

APPENDIX G

Wastewater Master Plan Excerpts

