



2019 Audit Report

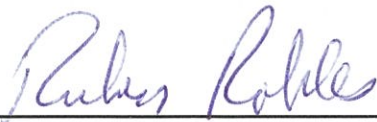
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Regional San Sewer System Management Plan

Developed in compliance with Waste Discharge Requirement Water Quality Order No. 2006-003

Approved By:

Ruben Robles
Director
Regional San Operations Department

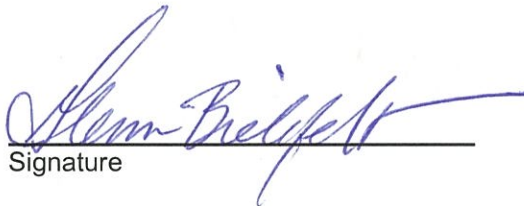


Signature

11/22/19
Date

Approval Recommended By:

Glenn Bielefelt
O&M Manager II
Regional San Operations & Maintenance



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11/22/2019
Date

Mitch Maidrand
Principal Engineer
Reviewer



Signature

11/22/19
Date

Anna Johnson
Senior Engineer
Reviewer



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11/21/19
Date

Jared Wagoner
Associate Engineer
Preparer



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11/21/2019
Date

November 21, 2019

1. Purpose

The purpose of this document is to report the results of the Sewer System Management Plan (SSMP) Audit conducted for Sacramento Regional County Sanitation District’s (Regional San) interceptor system covering Calendar Years (CY) 2017 and 2018. This report was prepared and is being submitted pursuant to the requirements included in the State Water Resources Control Board (SWRCB) Order No. 2006-0003 – Statewide General Waste Discharge Requirements for Sanitary Sewer Systems (WDR). The audit requirements are:

“As part of the Sewer System Management Plan (SSMP), the Enrollee shall conduct periodic internal audits, appropriate to the size of the system and the number of SSOs. At a minimum, these audits must occur every two years and a report must be prepared and kept on file. This audit shall focus on evaluating the effectiveness of the SSMP and the Enrollee’s compliance with the SSMP requirements identified in this subsection (D.13), including identification of any deficiencies in the SSMP and steps to correct them.”

The objective of this audit is to evaluate the effectiveness of the SSMP’s programs, identify potential weaknesses, and determine improvement opportunities for use in future SSMP modifications.

2. Interceptor System Description

Since 1974, Regional San has worked with other local agencies to collect, convey (via an Interceptor System), and treat wastewater (via the Sacramento Regional Wastewater Treatment Plant - SRWTP) for the urbanized parts of Sacramento County, an area covering more than 250 square miles. Today, Regional San owns and operates two main facilities: the Interceptor System and the SRWTP. The Interceptor System conveys wastewater collected by four contributing agencies directly to the SRWTP in Elk Grove: 1) the City of Folsom, 2) the City of Sacramento, 3) the City of West Sacramento, and 4) the Sacramento Area Sewer District (SASD, formerly known as CSD-1).

Regional San maintains 165¹ total miles of pipeline. This pipeline is broken up into approximately 111 miles of gravity interceptors with diameters generally ranging from 36 inches to 144 inches and 54 miles of force mains with diameters generally ranging from 16 inches to 66 inches². Included in the interceptor system are eight pump stations, inverted siphons, flow meters, valve vaults, fall and gate structures. Regional San also owns and incurs the cost of maintaining 3 pumping stations that are operated by the City of Sacramento. The table below provides a breakdown of the interceptor pipelines by decade of construction.

¹ Regional San owns 169 total miles of pipeline; however the City of Sacramento maintains approximately 5 miles of it and reports these miles as part of the miles they maintain in their CIWQS Questionnaire.

² For the purposes of delineating Regional San’s Interceptor System from contributing agencies, Regional San’s system is generally defined as pipes 36 inches and larger. There are some exceptions as Regional San owns and maintains some pipes that are smaller than 36 inches.

Table 2-1: Interceptor System Miles

Age	Gravity Mainlines & Force Mains (%)
2000 – Present	54
1980 – 1999	39
1960 – 1979	7
Unknown Age	0
Total	100

3. Audit Approach

This audit, covering from January 1, 2017 through December 31, 2018, is the fifth SSMP Audit performed to meet WDR requirements for completion of an audit a minimum of once every two years. In addition to this requirement, the WDR requires that the SSMP must be updated every five years. Regional San recently completed this update over the course of 2018. As part of this update, Regional San assessed each element for accuracy and effectiveness, conducted interviews with stakeholders, and updated the SSMP with any significant program changes as necessary. So as not to repeat identical efforts associated with the five-year update, information gathered through the SSMP revision process is included as part of this audit.

Using sanitary sewer overflows (SSO) as the primary metric, the focus of this audit is to evaluate the effectiveness of the SSMP, identify any deficiencies, and suggest opportunities for improvement for modifying the current SSMP program. Regional San experienced only one SSO during the 2017-2018 period. Therefore, evaluation of each SSMP element herein will foremost consider that incident, if applicable. Regional San intends to use this audit to improve performance, eliminate SSOs, and ensure proper operation and maintenance of its interceptor system.

Regional San staff conducted the audit by reviewing and incorporating the findings of the five-year SSMP update, as well as conducting a series of meetings with staff involved with implementation of activities required by provisions included in Provision D.13 of the WDR. The Audit Team and Regional San staff supporting the audit interviews and audit process are identified in **Table 3-1** and **Table 3-2** organized in alphabetical order by last name. As noted above, staff involved with implementation of the WDR were interviewed as part of the SSMP Update and information gathered from those interviews is included in this audit. Staff interviewed as part of the SSMP Update have been omitted and therefore only additional interviewees are listed in **Table 3-2**.

Table 3-1: Audit Team Members

Team Member	Department	Role
Jared Wagoner	Operations Support	Lead Auditor, Associate Civil Engineer
Anna Johnson	Operations Support	Audit Reviewer, Senior Civil Engineer
Mitch Maidrand	Operations Support	Audit Reviewer, Principal Civil Engineer

Table 3-2: WDR Audit Interviewees

Name	Title
Carolyn Balazs	Environmental Specialist
Matt Ernst	Interceptor Senior Equipment Mechanic
Kyle Frazier	Senior Civil Engineer
Anna Johnson	Senior Civil Engineer
Oscar Starks	Interceptor O&M Supervisor
Dean Wyley	Principal Civil Engineer

SSMP audit interviews were performed over multiple weeks in August 2019. In addition to the interviews, phone calls and emails were conducted on an as-needed basis. The WDR provision audited and Regional San staff interviewed is documented in **Table 3-3**:

Table 3-3: Audit Participants

WDR Provision Section	Topics	Participants
D.13 (i)	SSMP Goal	Anna Johnson
D.13 (ii)	SSMP Organization	Anna Johnson
D.13 (iii)	Legal Authority	Carolyn Balazs
D.13 (iv)	O&M Program Mapping Maximo PM Activities Rehab & Replacement Inspection/Condition Assessment Training Spare Parts & Inventory CIP	Dean Wyley Matt Ernst , Oscar Starks Kyle Frazier Kyle Frazier Matt Ernst, Oscar Starks Matt Ernst, Oscar Starks Kyle Frazier
D.13 (v)	Design and Performance Provisions	Kyle Frazier, Mike Crooks
D.13 (vi)	Overflow Emergency Response Plan	Anna Johnson,
D.13 (vii)	FOG Control Program	Anna Johnson
D.13 (viii)	System Evaluation and Capacity Assurance Plan	Kyle Frazier
D.13 (ix)	Monitoring, Measurement, and Program Modifications	Anna Johnson, Dean Wyley
D.13 (x)	SSMP Program Audits	None Interviewed
D.13 (xi)	Communication Program	Anna Johnson

4. SSMP Effectiveness

Based on analysis of the SSO trends over the past two (2) years and the results of the SSMP audit, the interceptor system program implementation has kept SSOs to a minimum. In the last 2 years, from January 2017 through December 2018, the Regional San Interceptor System has had one reportable SSO in the California Integrated Water Quality System (CIWQS) as detailed in **Table 4-1**³. A breakdown of the SSO causes can be seen in **Table 4-2**.

Table 4-1: CIWQS Summary of Regional San SSOs January 2018-December 2018

No.	DATE	SSO CATEGORY	SSO DESCRIPTION	SSO VOLUME (GAL.)	VOLUME RECOVERED (GAL.)	VOLUME REACHED SURFACE WATER (GAL.)
1	06/21/2018	2	N50 (South River Pump Station Force Main MH00013B). SSO occurred out of a manhole that contains two CAVs. VRV failed two weeks after annual PM was performed, causing SSO to discharge to nearby unpaved land.	17,063	49	0

Table 4-2: Regional San SSOs Causes January 2018-December 2018

SSO CAUSE	SSO COUNT	TOTAL VOLUME
Asset Failure	1	17,063

In comparison with other systems of similar size, Fairfield Suisun Sanitation District (FSSD) and Orange County Sanitation District (OCSD), the Regional San Interceptor System has performed comparably well. **Table 4-3** provides a comparison of SSO count, total SSO volume, and Category 1 SSO count with FSSD and OCSD. Compared to its counterparts, Regional San has a comparable amount of SSOs over the last two years and ranks in the middle with respect to total volume of wastewater spilled during that time.

Table 4-3: SSOs by Agency January 2018-December 2018

AGENCY	SSO COUNT	TOTAL SSO VOLUME	CATEGORY 1 SSO COUNT
Regional San	1	17,063	0
FSSD	3	497	0
OCSD	1	83,527	1

5. Review of Effectiveness of SSMP Elements

The following sections focus on evaluating the effectiveness of each element of the SSMP.

³ The WDR requires that SSO records be kept for the previous 5 years as a minimum.

5.1. Introduction

WDR Requirement: *The WDR does not require this section to be part of the SSMP.*

Audit Finding: The introduction gives an accurate description of the interceptor system, including details about its historical background, contributing agencies, asset age, as well as background on the WDR and SSMP. Following recommendations from the 2017 audit, this section has been updated to (1) include the number of pumping stations currently operated and maintained by Regional San, (2) include all executive orders affecting the SSMP to date, and (3) add a table that lists the interceptor pipelines by decade of construction.

Reviewer Response

No exceptions to the audit findings.

Management Response

Agree with reviewer response.

5.2. Element 1 - Goal

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

Audit Finding: Regional San has the appropriate goals accurately stated in the SSMP.

Reviewer Response

No exceptions to the audit findings.

Management Response

Agree with reviewer response.

5.3. Element 2 - Organization

WDR Requirement: The Sewer System Management Plan (SSMP) must identify:

- a. *The name of the responsible or authorized representative as described in Section J of this Order.*
- b. *The names and telephone numbers for management, administrative, and maintenance positions responsible for implementing specific measures in the SSMP program. The SSMP must identify lines of authority through an organization chart or similar document with a narrative explanation; and*
- c. *The chain of communication for reporting SSOs, from receipt of a complaint or other information, including the person responsible for reporting SSOs to the State and Regional Water Board and other agencies if applicable (such as County Health Officer, County Environmental Health Agency, Regional Water Board, and/or State Office of Emergency Services (OES)).*

Audit Finding: The SSMP clearly identifies the names of responsible or authorized representatives as described in Section J of the WDRs. The names of staff responsible for implementing specific measures in the SSMP program are shown in Appendix B – Figure B-1. This organizational chart depicts lines of authority and is accompanied by a narrative description included in Table B-1.

While the phone number for Regional San reception desk is listed in Table B-1, specific phone numbers for management, administrative, and maintenance positions responsible for implementing specific measures in the SSMP program are not listed. Regional San may consider including these in Appendix B-1 in the next SSMP update, or at minimum, list the phone number for the SASD reception desk, as some staff identified in Table B-1 operate out of SASD.

Reviewer Response

It was Regional San’s intent not to include individual phone numbers. However, in the next update we will include SASD and Regional San’s Reception phone numbers.

Management Response

Agree with reviewer response.

5.4. Element 3 – Legal Authority

WDR Requirement: *Each Enrollee must demonstrate, through sanitary sewer system use ordinances, service agreements, or other legally binding procedures, that it possesses the necessary legal authority to:*

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

Audit Finding: Regional San possesses sufficient legal authority to control sewer use and illicit discharges via the Regional San Consolidated Ordinance, which identifies prohibited substances and characteristics and prohibited discharge locations. Regional San interceptors and connections are designed and constructed in accordance with appropriate standards and specifications, which is further discussed in Element 5 – Design and Performance Provisions. The Wastewater Source Control Section (WSCS) enforces the Regional San Consolidated Ordinance using the WSCS Enforcement Response Plan as the guiding document for enforcement actions.

Other than updates to the classification of users for the rate and fee schedule, there have been no updates to the sewer use section of the Consolidated Ordinance in the last five years; therefore, the Legal Authority section of the SSMP still accurately addresses the ability for Regional San to enforce illicit discharges and violations of the ordinance.

Reviewer Response

No exceptions to the audit findings.

Management Response

Agree with reviewer response.

5.5. Element 4 – Operation and Maintenance Program

WDR Requirement: *The Sewer System Management Plan (SSMP) must include those elements listed below that are appropriate and applicable to the Enrollee’s system:*

- a. *Maintain an up-to-date map of the sanitary sewer system, showing all gravity line segments and manholes, pumping facilities, pressure pipes and valves, and applicable stormwater conveyance facilities;*
- b. *Describe routine preventive operation and maintenance activities by staff and contractors, including a system for scheduling regular maintenance and cleaning of the sanitary sewer system with more frequent cleaning and maintenance targeted at known problem areas. The Preventative Maintenance (PM) program should have a system to document scheduled and conducted activities, such as work orders;*
- c. *Develop a rehabilitation and replacement plan to identify and prioritize system deficiencies and implement short-term and long-term rehabilitation actions to address each deficiency. The program should include regular visual and TV inspections of manholes and sewer pipes, and a system for ranking the condition of sewer pipes and scheduling rehabilitation. Rehabilitation and replacement should focus on sewer pipes that are at risk of collapse or prone to more frequent blockages due to pipe defects. Finally, the rehabilitation and replacement plan should include a capital improvement plan that addresses proper management and protection of the infrastructure assets. The plan shall include a time schedule for implementing the short- and long-term plans plus a schedule for developing the funds needed for the capital improvement plan;*
- d. *Provide training on a regular basis for staff in sanitary sewer system operations and maintenance, and require contractors to be appropriately trained; and*
- e. *Provide equipment and replacement part inventories, including identification of critical replacement parts.*

Audit Finding: The following sections describe the audit findings as they pertain to the specific components of the operation and maintenance program.

System Mapping

Regional San meets the System Mapping requirement of WDR Provision D.13. Regional San maintains a Geographic Information System (GIS) that contains the locations of all interceptor facilities including pump stations, pipelines, junction structures, manholes, and related assets. All Regional San staff have access to this database. Additionally, Regional San maintains record documents within the Electronic Document Management (EDM) System, which is maintained by the Regional San Documentation Section. Interceptor System schematics are also included in PowerPoint presentations and are used as a training tool.

Reviewer Response

No exceptions to the audit findings.

Management Response

Agree with reviewer response.

Preventative Maintenance

Regional San interceptor pipelines require minimal cleaning as a result of the design standards for self-cleaning velocities. This is supported by the low number of SSOs related to cleaning activities. Regional San performs routine flushing during the dry season for force mains that have experienced historical solids accumulations and also utilizes contractors for cleaning activities on an as-needed basis.

Regional San uses Maximo, a computerized maintenance management system (CMMS), to schedule, generate, and track preventative, predictive, and corrective maintenance. Frequency of preventative maintenance work is set through quality control review of maintenance records, post SSO investigations, institutional knowledge, flow monitoring, and monitoring how the system performs during wet weather events. The majority of scheduled maintenance is preventative, scheduled on a recurring frequency. Regional San's implementation of Maximo adequately meets the requirement of the WDR to document scheduled and conducted maintenance activities.

The SSO listed in **Table 4-1** occurred after failure of a vacuum relief valve (VRV) that has an annual preventative maintenance schedule. While this SSO occurred within two weeks of the annual maintenance being completed, interviews conducted with O&M staff support that preventative maintenance is sufficient in preventing SSOs. This is further supported by Regional San's historical SSO records, which demonstrate that SSOs have been kept to a minimum. Recommendations regarding this incident are noted later in Section 5.10.

Regional San is in the early stages of reliability centered maintenance (RCM) to analyze and optimize scheduled preventative maintenance. However, resources dedicated to RCM have been temporarily reallocated to higher priority work until that work is completed. Based on staff interviews, it is estimated that RCM will resume once the Regional San EchoWater and Gas Management System compliance projects are complete.

Reviewer Response

No exceptions to the audit findings.

Management Response

Reliability Centered Maintenance is a process used to determine the optimum maintenance requirements that considers the operating context of the equipment, risk, criticality, consequence of failure and other factors. Formal RCM is not a requirement of the WDR but Regional San has initiated the RCM process to further improve its maintenance practices.

Rehab and Replacement Plan

Regional San has a rehabilitation and replacement (R&R) strategy that includes short and long-term components. The short-term component generally meets the requirements of the WDR, and relies on the prioritization of day-to-day O&M activities to preserve the functional requirements the interceptor system. The SMP Manual Section 4 and ACE table establish the criteria for prioritizing work orders.

The long-term R&R component consists of condition assessments, risk evaluations, and Business Case Evaluations (BCE) to prioritize rehabilitation work. The need for inspection and R&R is determined

based on field staff knowledge, field investigation, and review of corrective and emergency maintenance records. The long-term component also includes a Capital Funding Projection (CFP) for 50-year funding needs. Information from the CFP is used to help prioritize projects, which are then further developed through a Project Development Plan (PDP). The PDP includes considerations for cost, performance, and risk, and provides recommendations for cost effective alternatives to implement the project. Finally, Regional San has also developed the Condition Assessment, Repair, and Rehabilitation Report that is used to assess the condition and remaining useful life of Regional San's assets and rehab, repair, and replace when appropriate.

In 2018, Regional San updated the Condition Assessment, Repair, and Rehabilitation Report and identified potential areas for further investigation in the Central Interceptor system based on a CCTV inspection of six miles of pipeline. Regional San is initiating a project to perform additional supplemental inspections and physical testing, which is expected to begin in summer 2020. Currently, regular CCTV inspections are not performed. Regional San may consider performing additional CCTV inspections to address potential areas of concern within the Interceptor system.

Regional San developed the Interceptor Condition Assessment Implementation Plan Phase 1 (ICAIP) in 2015, which continues to be implemented. The ICAIP provides a schedule of gravity pipeline inspections for three gravity interceptors and the manholes along those interceptors. Condition assessments of inlet and outlet structures for these pipelines identified a severe corrosion, as well as a third structure upstream of the original two that is in similar condition and in need of rehabilitation. The schedule and sequence for rehabilitation will expand into the 2020 construction season and be coordinated with the Sacramento Area Sewer District's project to line the Mission Trunk.

Reviewer Response

No exceptions to the audit findings.

Management Response

Agree with reviewer response.

Training

Regional San provides formal and on-the-job training for staff and contractors, as well as vendor training on an as-needed basis. O&M staff conduct bi-weekly tailgate meetings that cover various safety and training topics. SSMP and SSO response training is held annually for all Interceptor O&M, PCC supervisors, Regulatory Compliance, and SRWTP O&M and support staff that have the potential to perform duties at Interceptor system facilities. All training events are documented and tracked by online Learning Management Systems (LMS).

Contractors are informed of SSO potential, prevention, and response during the Access Request (AR) process. Through this process, contractors must receive approval from Regional San Operations, Engineering, and Safety Office prior to accessing and performing work on Regional San assets.

Reviewer Response

No exceptions to the audit findings.

Management Response

Agree with reviewer response.

Equipment and Replacement Parts

Regional San interceptor equipment and replacement part inventory are managed using Maximo. Each asset has a unique number and is assigned a criticality to accurately reflect its function per Section 4 of Regional San’s SMP Manual and the Availability of Critical Equipment (ACE) Table. Replacement parts used on the most important assets have a higher stocking priority and inventory. The Regional San store purchases the majority of replacement and spare parts and tracks discrete items in its inventory. As these items are used and the inventory is reduced to a predefined level, an automatic reorder of the parts is triggered and the parts are ordered.

Reviewer Response

No exceptions to the audit findings.

Management Response

Agree with reviewer response.

5.6. Element 5 – Design and Performance Provisions

WDR Requirement:

- a. *Design and construction standards and specifications for the installation of new sanitary sewer systems, pump stations and other appurtenances; and for the rehabilitation and repair of existing sanitary sewer systems; and*
- b. *Procedures and standards for inspecting and testing the installation of new sewers, pumps, and other appurtenances and for rehabilitation and repair projects.*

Audit Finding: Regional San has appropriate design and construction standards and specifications for the installation of new sanitary sewer systems as described in multiple documents:

- Interceptor Design manual (IDM),
- Interceptor Standard Specifications,
- County of Sacramento Standard Construction Specifications (CSSCS),
- SRCSD Pump Station Design Manual (PSDM), and
- Sacramento Area Sewer District Standards and Specifications

Due to the nature of Regional San’s large diameter pipelines, standards used for rehabilitation and repair projects are developed on an as-needed, case-by-case basis if there are not existing standards within the abovementioned documents.

The IDM provides clear guidance for all interceptor design, including gravity pipes, force-mains, manholes, metering facilities, valves, gate structures, etc. The document is used as a guideline for both Regional San staff and consultants who perform design services for the interceptor system. The IDM is used in conjunction with the SASD Standards and Specifications to provide minimum standards for both

contractors and the District during the planning, design, construction, and rehabilitation of the collection system.

The Interceptor Standard Specifications contain specifications for the preparation of thorough and complete construction documents for interceptor projects. Historically, the Interceptor Standard Specifications were updated every five years. They are currently in draft form and will need to be updated again, however, as there are no new interceptor construction projects scheduled to occur within the 10-year CFP planning horizon, further development of Interceptor Standard Specifications is not required at this time.

Reviewer Response

No exceptions to the audit findings.

Management Response

Agree with reviewer response.

5.7. Element 6 – Overflow Emergency Response Plan

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

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

Audit Finding: Regional San maintains an SSO Response Plan (SSORP) that defines proper notification procedures when the District experiences an interceptor overflow so that primary responders and regulatory agencies are informed in a timely manner. The SSORP is reviewed during annual pre-storm season SSO response refresher training for PCC supervisors, O&M, Regulatory Compliance, and other staff as needed. The SSORP contains protocols to ensure prompt notification to appropriate regulatory

agencies and other potentially affected entities as defined in the WDR. The SSORP and SSMP identify officials who will receive immediate notification in the event of an SSO, as well as a flow chart and contact list that dictate who may need to be notified depending on the category of SSO. The SSORP contains appropriate procedures to address emergency operations, such as traffic and crowd control and other necessary activities, as well as contact information if additional resources are required.

Regional San also maintains an SSO Response Plan Quick Reference (SSORPQR) document that contains response procedures, notification and reporting requirements, water quality monitoring procedures, roles and responsibilities, and important contact information. The SSORPQR is a reference used by staff during SSO response to ensure prompt SSO mitigation efforts and emergency operations when needed. The document is updated annually as needed, and distributed to designated SSO responders and interceptor O&M staff during annual SSORP training.

Regional San conducts an annual wet weather preparation meeting to ensure that the interceptor facilities are prepared for rain events. Each pump station has backup generators available for use in the event of power failure. O&M staff conducts regular generator maintenance and testing on all of its pumping station backup generators.

Contractors that perform work on the interceptor system are trained in SSO potential, prevention, and response as part of the Access Request (AR) submittal and approval process. The AR is used to approve, restrict, and/or condition all contractor work. In addition, Regional San provides all contractors with an informational document that details appropriate response procedures in the event of an SSO.

Reviewer Response

No exceptions to the audit findings.

Management Response

Agree with reviewer response.

5.8. Element 7 – FOG Control Program

WDR Requirement: *Each Enrollee shall evaluate its service area to determine whether a FOG control program is needed. If an Enrollee determines that a FOG program is not needed, the Enrollee must provide justification for why it is not needed. If FOG is found to be a problem, the Enrollee must prepare and implement a FOG source control program to reduce the amount of these substances discharged to the sanitary sewer system. This plan shall include the following as appropriate:*

- a. *An implementation plan and schedule for a public education outreach program that promotes proper disposal of FOG;*
- b. *A plan and schedule for the disposal of FOG generated within the sanitary sewer system service area. This may include a list of acceptable disposal facilities and/or additional facilities needed to adequately dispose of FOG generated within a sanitary sewer system service area;*
- c. *The legal authority to prohibit discharges to the system and identify measures to prevent SSOs and blockages caused by FOG;*
- d. *Requirements to install grease removal devices (such as traps or interceptors), design standards for the removal devices, maintenance requirements, BMP requirements, record keeping and reporting requirements;*

- e. *Authority to inspect grease producing facilities, enforcement authorities, and whether the Enrollee has sufficient staff to inspect and enforce the FOG ordinance;*
- f. *An identification of sanitary sewer system sections subject to FOG blockages and establishment of a cleaning maintenance schedule for each section; and*
- g. *Development and implementation of source control measures for all sources of FOG discharged to the sanitary sewer system for each section identified in (f) above.*

Audit Finding: Regional San meets the WDR requirement and provides adequate justification for why a FOG program is not necessary at this time. Regional San has not experienced a stoppage or SSO caused by FOG in its 25 plus years of recorded maintenance history and 35 years of institutional knowledge for the Interceptor system. Contributing agencies' FOG control programs are protective of the Interceptor System, and therefore a Regional San FOG program is not warranted. However, Regional San has control measures in its Consolidated Ordinance as well as design standards in the Interceptor Design Manual to prevent FOG related SSOs. Regional San also operates a FOG receiving station at the SRWTP that accepts FOG waste from collection trucks and provides a site to properly dispose of FOG generated within Regional San's service area.

Reviewer Response

No exceptions to the audit findings.

Management Response

Agree with reviewer response.

5.9. Element 8 – System Evaluation and Capacity Assurance Plan

WDR Requirement: *The Enrollee shall prepare and implement a capital improvement plan (CIP) that will provide hydraulic capacity of key sanitary sewer system elements for dry weather peak flow conditions, as well as the appropriate design storm or wet weather event. At a minimum, the plan must include:*

- a. *Evaluation: Actions needed to evaluate those portions of the sanitary sewer system that are experiencing or contributing to an SSO discharge caused by hydraulic deficiency. The evaluation must provide estimates of peak flows (including flows from SSOs that escape from the system) associated with conditions similar to those causing overflow events, estimates of the capacity of key system components, hydraulic deficiencies (including components of the system with limiting capacity) and the major sources that contribute to the peak flows associated with overflow events;*
- b. *Design Criteria: Where design criteria do not exist or are deficient, undertake the evaluation identified in (a) above to establish appropriate design criteria; and*
- c. *Capacity Enhancement Measures: The steps needed to establish a short- and long-term CIP to address identified hydraulic deficiencies, including prioritization, alternatives analysis, and schedules. The CIP may include increases in pipe size, I/I reduction programs, increases and redundancy in pumping capacity, and storage facilities. The CIP shall include an implementation schedule and shall identify sources of funding.*
- d. *Schedule: The Enrollee shall develop a schedule of completion dates for all portions of the capital improvement program developed in (a)-(c) above. This schedule shall be reviewed and*

updated consistent with the Sewer System Management Plan (SSMP) review and update requirements as described in Section D. 14.

Audit Finding: The following sections describe the audit findings as they pertain to the specific components of the system evaluation and capacity assurance plan.

Evaluation

Regional San owns and maintains several flow meters for purposes of flow assessment, studies, master planning, and project development plans. The District also has a dynamic interceptor model as described in the Interceptor Sequencing Study (ISS). The ISS updated the Interceptor Master Plan 2000 (MP 2000) by evaluating the capacity of the existing system and updating the growth projections and patterns in the Sacramento Area to predict future capacity needs of the interceptor system.

The interceptor model estimates peak flows that result from design storm event flows, estimates of the capacity of all system components, predicted hydraulic deficiencies, and major sources that contribute to the peak flows. The model is updated on a regular basis to reflect new development and any modifications to the interceptor system or systems of contributing agencies.

SSO's in the interceptor system are very infrequent, and currently there are no identifiable portions of the system that are experiencing or contributing to an SSO discharge caused by hydraulic deficiency. The hydraulic model did not predict any capacity-related SSOs in the existing interceptor system using the December 21, 2005 "New Year's Storm", which is representative of an approximate 10-year frequency peak flow event.

Design Criteria

Regional San uses a continuous simulation hydrologic model to develop estimates of long-term flow response in the interceptor system using an approximate 70-year historical rainfall record. The New Year's Storm is representative of an approximate 10-year peak flow event and is used to represent the design storm for the interceptor system. The ISS model uses a conservative future flow scenario as well as a less conservative "realistic" flow scenario to identify existing and future capacity needs. Both flow scenarios allow for design based on conservative and realistic density distributions for recent and existing developments, as well as growth estimates for planned development.

Capacity Enhancement Measures

There are no identifiable portions of the interceptor system that are experiencing or contributing to SSOs caused by hydraulic deficiency. Regional San relies on several documents that plan for future growth, secure needed funding, and prioritize projects based on the needs of contributing agencies to design and construct improvements. In general, the ISS, Project Prioritization process, and PDP process consider the needs of contributing agencies as well as Regional San's capacity and operational needs. Regional San also has the ability to identify and determine areas of the interceptor system to be evaluated during the capacity assurance process through historical flow data, ad-hoc flow studies, and hydraulic modeling.

Schedule

Regional San has identified future projects that may be needed in the long term within the ISS. These projects have been placed in the capital funding projection list to ensure funding is available when the projects are required for capacity. Regional San maintains a 5-year CIP list that is reviewed annually to

determine the need for additional projects, or projects recommended for further prioritization or project development plans.

Reviewer Response

No exceptions to the audit findings.

Management Response

Agree with reviewer response.

5.10. Element 9 – Monitoring, Measurement, and Program Modifications

WDR Requirement: *The Enrollee shall:*

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

Audit Finding: The following sections describe the audit findings as they pertain to the specific components of the monitoring, measurement, and program modifications requirement.

Relevant Information

Regional San maintains relevant information to analyze the implementation and success of each section of the SSMP. Maximo is used to document all maintenance work history associated with the interceptor system, including job plans, schedules, assets and spare parts.

Regional San enters all SSO information into CIWQS and maintains local files containing SSO event information and SSO response documentation. Based on the audit interview process and historical SSO records, it was discovered that the incident investigation report initiated for the June 2018 SSO (**Table 4-1**) was not finalized. This internal report summarizes the sequence of events, SSO cause, and corrective actions. While the incident investigation was completed, not all the information and investigation findings documented from various meetings and correspondence were compiled into a single summary report. It is recommended that Regional San promptly finalize this incident investigation report.

Regional San utilizes the PCCS to store and track pertinent system data points such as pumping station flows, wet well elevations, and valve positions. Regional San can also develop custom PCCS displays as needed. Interceptor staff also uses the TiPPS system to receive specific alarms (such as high water elevation alarms) encountered at the pump stations.

Regional San utilizes a dynamic hydraulic flow model as the basis for determining the interceptor system capacity needs and retains historical flow data captured during flow studies.

Regional San documents and tracks all training activities in the County's online LMS.

Monitor and Measure

Regional San monitors and measures the effectiveness of the SSMP by maintaining a prioritized list of Improvement Opportunities that is updated every two years as part of the biennial SSMP Audit or as the agency becomes aware of possible improvements or deficiencies. Regional San also analyzes monitoring data and trends to measure the effectiveness of each element, where applicable.

Assess Preventative Maintenance Program

Regional San assesses the success of its preventative maintenance program by monitoring O&M records, asset inventories, and equipment failures in Maximo. If it is determined that an SSO may have been prevented through preventative maintenance, job plans and schedules are adjusted accordingly. As discussed previously, Regional San has also begun implementing an RCM process to analyze and optimize schedule preventative maintenance, which will eventually be incorporated into CMMS.

Update Elements

SSMP elements are updated or modified based on review of monitoring and reporting data, and Improvement Opportunities identified through the biennial self-audit process. Improvement Opportunities identified in the 2017 self-audit have been implemented in the most recent SSMP update.

Identify and Illustrate SSO Trends

Regional San tracks and analyzes the frequency, causes, volumes, locations, and other SSO details and trends. A complete history of Regional San SSO events are contained in the CIWQS database, and Table 4 of this document identifies every SSO event, date, location, and volume since the last SSMP audit. SSOs are also illustrated via a GIS layer within the SewerViewer software, which is available to all Regional San staff.

Reviewer Response

No exceptions to the audit findings. Concerning documentation of SSOs, Regional San completed the incident investigation for the June 2018 SSO, and reported the SSO details, cause of the spill, and corrective actions to the regulatory agencies. The CIWQS report was completed and certified. As indicated, the findings from the investigation were not completely compiled into a single report immediately after the investigation was completed due to staff oversight. This report has since been completed during the course of this audit.

Management Response

As was mentioned previously, Reliability Centered Maintenance is a process used to determine the optimum maintenance requirements that considers the operating context of the equipment, risk, criticality, consequence of failure and other factors. Formal RCM is not a requirement of the WDR but Regional San has initiated the RCM process to further improve its maintenance practices.

5.11. Element 10 – SSMP Program Audits

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

Audit Finding: Regional San produces internal audits every two years to evaluate the effectiveness of the SSMP elements and programs. Regional San conducted internal audits in 2011, 2013, 2015, and 2017, which are kept on file and available on Regional San’s public website. The 2017 audit identified areas of deficiency and provided a prioritized list of improvement opportunities. Based on priority and available funding, most of these improvement opportunities have been implemented.

This audit serves as the 2019 audit and falls within the WDR requirement of conducting an SSMP audit every two (2) years. This audit contains steps to correct deficiencies and identifies SSMP updates for Regional San’s consideration that reflect current programs and management of the interceptor system.

Reviewer Response

No exceptions to the audit findings.

Management Response

Agree with reviewer response.

5.12. Element 11 – Communications Program

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

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

Audit Finding: Regional San properly maintains both a social media and public website that provides ratepayers the opportunity to review critical supporting documents and bi-annual audit reports. The webpage also offers ratepayers the opportunity to submit comments, which are emailed and responded to by a Regional San representative. In addition, a notification was distributed to ratepayers that informed them of the SSMP webpage. Regional San communicates with its four contributing agencies on an annual basis, or more often as needed. Links to each satellite agency are listed on the Regional San SSMP SharePoint webpage.

Reviewer Response

No exceptions to the audit findings.

Management Response

Agree with reviewer response.

6. Strengths and Implementation Accomplishments

Documenting the strengths and implementation accomplishments of the SSMP is an important component of the audit findings. Regional San should both recognize the areas of strength in interceptor system management as well as continue building upon success in these areas. **Table 6-1** includes the strengths and implementation accomplishment that were identified during the audit.

Table 6-1: Strengths and Implementation Accomplishments

No.	WDR PROVISION	STRENGTH AND IMPLEMENTATION ACCOMPLISHMENTS
1	D.13(ii) - Organization	Regional San has assigned roles and responsibilities for development and implementation of the SSMP.
2	D.13(iii) – Legal Authority	Regional San has ordinances and design guidelines providing the authority to: <ul style="list-style-type: none"> • Prevent illicit discharges; • Require interceptors to be properly designed and constructed; • Limit discharge of fats, oils, and grease, and; • Enforce violations of sewer ordinances via the WSCS Enforcement Response Plan.
3	D.13(iv) – Operations and Maintenance Program	Regional San currently: <ul style="list-style-type: none"> • Maintains an up-to-date map of the interceptor system in GIS and properly updates it as needed via the DCN process. • Provides access to digital files and schematics via EDM. • Utilizes EDS to monitor and remotely operate the interceptor facilities as-needed. • Documents, tracks, and schedules all maintenance activities in Maximo. • Uses the ACE table to identify critical parts and maintains spare parts inventory. • Documents all training events and classes in LMS. • Developed the ICAIP for interceptor gravity pipe condition assessment. • Conducts capital funding projections on a 10 year window and prioritizes projects on an annual basis.
4	D.13(v) – Design and Performance Provisions	Regional San utilizes appropriate design and construction standards and specifications.

No.	WDR PROVISION	STRENGTH AND IMPLEMENTATION ACCOMPLISHMENTS
5	D.13(vi) – Overflow Emergency Response Plan	Regional San maintains and recently updated the SSORP and SSORPQR that identifies all roles, responsibilities, procedures and points of contact needed during an SSO event. Regional San conducts an annual wet weather preparation meeting prior to the wet season. Staff is knowledgeable of the SSO response procedures.
6	D.13(vii) – FOG Control Program	Regional San provides historical trends justifying that a FOG Control Program is not warranted for the interceptor system.
7	D.13(viii) – System Evaluation and Capacity Assurance Plan	Regional San maintains a dynamic flow model that identifies capacity needs for the interceptor system. Regional San has not experience a capacity related SSO in the last six (6) years.
8	D.13(ix) – Monitoring, Measurement, and Program Modifications	Regional San has developed multiple reports that utilizes Maximo data. The reports monitor and track maintenance activities and identify backlog work for each O&M craft. Regional San enters all SSO events into CIWQS and illustrates each SSO in GIS and other pertinent reports.
9	D.13(x) – SSMP Program Audits	Regional San has conducted SSMP audits every two (2) years since 2011 and maintains a list of SSMP Improvement Opportunities that is reviewed annually. Each audit document is available on-line.
10	D.13(xi) – Communication Program	Regional San utilizes its website and Facebook page to deliver notifications and announcements to the public. Regional San meets with its satellite agencies annually.

Other Findings and Improvement Opportunities

This section includes other findings and opportunities for improvements not linked directly to WDR requirements. These are ideas which resulted from the audit and are presented for Regional San’s consideration.

Table 7-1: Other Findings and Improvement Opportunities

No.	WDR PROVISION	FINDING	OPPORTUNITY
1	D.13(ix) – Monitoring, Measurement, and Program Modifications	The June 2018 SSO was investigated and all required regulatory reporting was completed. However, the investigation findings were not completely compiled into a single summary report in a timely manner.	Review internal documentation process to ensure that required documentation and investigation findings are compiled promptly.

Reviewer Response

As stated previously, Regional San completed the investigation for the June 2018 SSO, and met all the required regulatory reporting. Staff initiated a summary report that compiled all of the relevant information from the investigation, but did not finalize the report. This report has since been completed during the

course of this audit. For future investigation reports, staff will add internal reminders so that investigation reports are completed in a timely manner.

Management Response

Agree with reviewer response.