

CITY OF ROSEVILLE

Sewer System Management Plan (SSMP)

Biennial Audit for FY 13/14 – FY 14/15

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SECTION 1 Audit Objectives

This report covers the results of the required Sewer System Management Plan (SSMP) internal audit process for the City of Roseville (City) for fiscal years 2013-2014 (FY13/14), and 2015-2015 (FY14/15). The purpose of the SSMP is to provide a written framework and process for sanitary sewer collection system (collection system) management, operation, and maintenance programs executed by the City with the ultimate goal of minimizing sanitary sewer overflows (SSOs) and sustaining compliance with the California State Water Resources Control Board (SWRCB) order No. 2006-0003-DWQ, the Statewide General Waste Discharge Requirements for Sanitary Sewer Systems (SSS WDR). The basis for the SSMP internal audit process is reviewing the performance of the collection system versus the performance measures used by the City to evaluate compliance with the various requirements of the SSS WDRs. The intention of the SSMP audit is to help the SSMP evolve over time as a “living document” that City continually adjusts after identifying potential enhancements and implementing changes to address any deficiencies to the management, operation and maintenance of the City sanitary sewer collection system.

The City is committed to completing the SSMP internal audit (Audit) on a biennial basis that is consistent with the procedure outlined in Appendix J-1 of the SSMP. The City completed its first Audit for FY 2011-2012, but subsequently contracted Water Works Engineers (WaterWorks) to conduct the FY 11/12-13/14 biennial audit. Similarly, the City contracted WaterWorks to complete the FY 13/14-14/15 biennial audit, the results of which are detailed in this document. The key objective of the Audit is to review SSMP compliance, implementation, and effectiveness. The key tasks performed in this Audit are detailed below:

1. Review records from previous internal audits, and confirm deficiencies have been addressed (See SECTION 2)
2. Analyze the City’s historical SSO data and performance measures listed in the SSMP (See SECTION 3)
3. Using a standardized audit procedure detailed in SECTION 4 , identify deficiencies and provide recommendations that could improve the effectiveness of the SSMP (See SECTION 4).
4. Analyze the City’s preventative maintenance (PM) program and rehabilitation and replacement (R&R) program as it relates to the operation and maintenance of the collection system (See Section 5.4)
5. Review the Sanitary Sewer Overflow Emergency Response Plan (SSEORP) for SSOs and identify improvements as needed (See Section 5.6)
6. Document all findings during the Audit and retain it on file (See SECTION 6)

SECTION 2 Agency Background / System Information

The City of Roseville is located in Placer County and is situated approximately 16 miles north of the City of Sacramento. Along Interstate 80, Roseville is located adjacent to the City of Rocklin in the north-east and the City of Citrus Heights in the south. The City covers approximately 42 square miles near the base of the foothills of the Sierra Mountains. Typical elevations are within a range of 250 to 100 feet of sea level with an average slope across the City of 0.5% from east to west. Several streams flow through the City (i.e., Dry Creek, Pleasant Grove Creek, Kaseburg Creek, Linda Creek, Cirby Creek, Secret Ravine, and Miners Ravine.).

The City is responsible for the operation and maintenance of a continually growing collection system that has grown over 5% since the last internal audit to now serve approximately 129,000 people. Table 1 below highlights key indicators about the City collection system.

Table 1. Overview of System Indicators

Audit	FY 11/12 – 12/13	FY 13/14 – 14/15
Miles of Mainline	485.52	501.11
Miles of laterals (lower)	235.3	238
Pump stations	14	15
Sewer service lateral connections	41,568	43,619
Population served	122,060	128,832
WWC Staff	25	28
Annual Budget (FY1 – FY2)	\$3,400,000 / \$3,800,00	\$3,700,000 / \$4,000,000
Category 1 SSOs	2	0
Category 2 SSOs	75	0
Category 3 SSOs	-	89

The City treats wastewater conveyed through its collection system at two regional wastewater treatment plants that are both owned and operated by the City (i.e., Dry Creek and Pleasant Grove WWTPs). Two other satellite collection systems owned and operated by other agencies (i.e., South Placer Municipal Utility District and Placer County) discharge directly into the City’s collection system as well. One small portion of the City’s collection system, however, discharge outside of Roseville into the Sacramento Area Sewer District (SASD) collection system and is treated at the Sacramento Regional WWTP. The City is a part of the Central Valley Region 5 (Sacramento sub-region) of the SWRCB.

2.1 Review of Last SSMP Audit

The previous biennial SSMP audit for Roseville was conducted by WaterWorks for FY 11/12-12/13 and was completed in December 2013. In the last Audit, a list of approximately 40 recommended actions to address deficiencies or improve the effectiveness of the City SSMP were listed. That list is re-inserted and adapted in Table 2 below, along with a description of the status of the task (i.e., Completed, Ongoing Updates, In/No Progress, Considered) per the latest SSMP documents on the City’s website and based on information from City staff.

Table 2. Summary of Findings from the Last SSMP Internal Audit

Element	Action Item	Status
2 – Organization	Appendix B-1 needs to be updated to show Ken Glotzbach and Chris Bracco as LROs for the City. Additionally, once Dan Pruden (Wastewater Collections Supervisor) is registered as a Data Submitter in CIWQS, his information should be added to Appendix B-1 and updated on the City website.	Completed.
	Figure 2.2 in SSMP section 2.3 has typographical errors. There is text missing. The figure found in SSMP Appendix F-1 (1) - SSO Procedures Flowchart is the same chart, but includes all of the text. WWE recommends reinserting the figure from Appendix F-1 (1) into section 2.3 of the SSMP with the corrections made.	Completed
	Appendix B-3 includes a call list of staff members who are on call during non-business hours; this is out of date, but also unnecessary. WWE recommends the City develop a SOP for the call center procedures for receiving calls and mobilizing field staff. A call list may be kept internally as deemed necessary by the City.	Considered.
4 – O&M	Include the Mapping Update Policy document on the City SSMP website	No Progress
	Identify targets for all performance measures so that data collected can be compared to a goal to assess performance and the effectiveness of SSMP activities. A comprehensive review of benchmarks or performance measures/indicators is discussed in the recommendations of Section 5.9 .	No Progress.
	Continue the efforts of the recently revised eeling program due to the immediate impact on the frequency of SSOs from laterals. Data on the number of lateral SSOs per month should be monitored so that the impact of these efforts can be evaluated at the time of the next internal SSMP audit.	Considered.
	Develop SOPs for the regular preventative maintenance activities using SOP-WWC-01 as a template. The following is a list of suggested SOPs based on the	Considered

	<p>activities currently tracked with performance measures:</p> <ul style="list-style-type: none"> ▪ Lift station maintenance ▪ Receiving and responding to customer service request 	
	<p>Develop SOPs for regular inspection activities using SOP-WWC-01 as a template. The following is a list of suggested SOPs based on the activities currently tracked with performance measures:</p> <p>-Alarm testing of lift stations</p>	Considered
	<p>Document the process/procedure for evaluating available data (i.e., CCTV, CMMS, GIS, capacity assessment, visual inspections), conducting a risk assessment to determine the assets to be renewed, and developing the R&R plan with its associated data.</p>	No Progress
	<p>The SSMP internal audit from FY10/11 stated that NASSCO training for condition assessment should be added to SSMP Element 4.5. The City implements the NASSCO rating system for collecting condition assessment data and provides this training to the WWC staff. While this is not a requirement of the SSS WDR, the City needs to decide if this training will be referenced in SSMP Element 4.5.</p>	Considered.
	<p>Use the SOPs recommended to be developed in this section as a training tool for WWC staff. The SOPs can also be used to inform contractors working in the system of the role they play in responding to and mitigating potential SSOs.</p>	Considered.
	<p>The SSMP identifies the WWC Superintendent as the person responsible for maintaining lists of the equipment and critical spare parts. The position directly responsible for tracking equipment and maintaining up-to-date equipment and critical spare parts lists is Materials Technician. The SSMP should be updated to correctly reflect the responsible party for equipment and critical spare parts.</p>	Completed.
6 – OERP	<p>Complete all unpopulated fields in the revised “Collection System Questionnaire” in CIWQS. Enrollees have six months from the date that the revised MRP became effective to complete the questionnaire. This means that the questionnaire must be completed by approximately March 9, 2014. If this questionnaire is not completed by that time, the system will lock the Enrollee out from all reporting capabilities.</p>	Completed

	<p>Figure 6.2 in SSMP section 6.3 has a typographical error. There is text missing in some of the decision boxes. The same figure is in SSMP Appendix F-1(1) without the missing text. WWE recommends reinserting the figure with the corrections made or removing the figure from the SSMP and only reference Appendix F-1(1).</p>	Completed.
	<p>Section 2.I.A of the City SSO Response Procedures indicates that the time a call was received notifying the City of a SSO will be used as the SSO start time on the forms reported to CIWQS. WWE recommends that the City develop a SOP for estimating the start time of SSOs to include additional methods for examining possible start times to support the SSO start time entered into CIWQS.</p>	Considered.
	<p>The WWC has developed a table of information specific to lift station response which includes all of the lift stations in the City and lists for each station; the average flow from the station, the wet well depth, the volume of the wet well, the available storage/downtime if the lift station goes down, the point at which a SSO will first occur if the lift station goes down, the assigned manhole for decanting if vacuum trucks are used to draw down the wet well, and the street location of the decant manhole. This information should be included as an Appendix in the OERP and the information for each lift station should be posted onsite at each respective lift station.</p>	In Progress.
7 – FOG Control Program	<p>List Sean Bigley as the responsible party for the FOG Public Education Plan.</p>	Ongoing updates.
	<p>Schedule routine meetings between WWC and IWS to share findings from preventative maintenance activities and FSE inspections to identify FSEs who are negatively impacting the collection system by discharging excessive amounts of FOG.</p>	Considered.
	<p>Develop a SOP describing the process of how pipelines are added to the hot spot cleaning schedule, how the cleaning frequency (i.e., quarterly, semiannually, annually) for each hot spot is initially set, and how the cleaning frequency for an individual hot spot may be adjusted over time.</p>	In Progress
	<p>SSMP section 7.8, paragraph three contains a typographical error. It states that “sewer line maintenance work orders are issued and completed to ensure that hot spot lines <u>do</u> have grease blockages/SSOs between cleaning schedules”.</p>	Completed

	The word “do” should be changed to “do not”.	
8 – SECAP	Reevaluate the capacity of the system so that changes to the system can be updated and recent flow monitoring results can be used to update findings to reflect current conditions and revisions to planned development. The City should consider revising the planned frequency for system evaluation updates if a frequency of five years is not warranted based on system needs.	In Progress
	Add documentation to internal SSO reports showing that the amount of precipitation over a 24-hour period exceeded 2.82 inches if the cause of the SSO is identified as “rainfall exceeded design”. The lower bound of the 10-year 24-hour precipitation frequency estimate with a 90% confidence interval from the NOAA Atlas 14, Volume 6, Version 2 data for the Rocklin (station ID 04-7516) is 2.82 inches.	Considered
9 – MMM	Update Appendix I-Benchmarking Metrics on City website with information from FY11/12 and FY12/13	Completed.
	Update Appendix I. This appendix includes information from the initial 2007 Implementation Schedule. The initial SSMP implementation and the SWRCB compliance schedule concluded many years ago and does not need to be included in the SSMP. However, the information regarding the continual implementation of the SSMP such as the document location, responsible person, and review frequency should be included	No Progress
	Identify the metrics that correspond with specific elements of the SSMP and develop numerical goal ranges so the data currently collected and monitored by the City can be used as performance indicators (PIs) to quantitatively monitor SSMP effectiveness.	Considered
	Consider tracking additional metrics targeted at measuring the effectiveness of SSMP elements that do not currently have metrics associated with them. A list of potential performance measures listed by SSMP element is included in Appendix 7.2 of this internal audit.	Considered

	Using the data collected in SSMP Appendix I as a reference, develop goals for metrics that track preventative maintenance activities and identify the person/position responsible for tracking data against those goals. See Appendix 7.2 for a list of potential performance indicators for preventative maintenance activities with responsible parties.	Considered
	Assign the individuals responsible for the various elements of the SSMP to complete the Performance Indicator Assessment Forms that are developed for their SSMP elements. See Appendix 7.2 for a list of potential performance indicators with the assigned responsible parties.	Considered
	Using the data collected in SSMP Appendix I as a reference, set performance goals for the metrics used to illustrate SSO trends. See Appendix 7.2 for a list of potential performance indicators related to SSO trends.	Considered
10 – SSMP Program Audits	Post this SSMP internal audit to the City website.	No Progress
	Schedule the next internal SSMP audit for July - August 2015.	Considered
	The SSMP must be recertified by the City Council before January 21, 2014. Per SSS WDR D.14, the City must have the SSMP updated and re-certified by the governing board (i.e., City Council) every five years. The City Council approved the original SSMP on January 21, 2009 which sets the date for re-certification on January 21, 2014.	Completed
	Revise Appendix J-1 to reflect recommendations for review of performance indicators (i.e., metrics associated with specific SSMP elements and the associated timelines).	No progress.

	Revise Appendix J-2 (Audit Form) to provide areas in the tables for each SSMP element to conduct an assessment of both 1) the compliance against SSMP requirements and 2) the effectiveness of the SSMP element. Information gathered on the recommended Performance Indicator Assessment Forms should be included in the “Support Documents and Data” section of the Audit Form.	No progress.
	Document the submittal process for proposed changes to the SSMP. The process may include the following; identify the individual who maintains the most current version of the SSMP, the steps in which suggested modifications are received (by internal staff or the public), how suggestions are routed to the individual/position responsible for the SSMP element associated with suggested modification, the process for review, and the process for updating the SSMP on the City website and documenting changes.	In progress.
11 - Communication	As of September 2013 the State Water Board amended the MRP of the SSS WDR. Update or develop a new PowerPoint presentation to reflect the new reporting requirements and how it affects the City.	Completed.
	Finalize the formal agreement with Sacramento Area Sewer District (SASD) regarding the discharge of wastewater from the City collection system into the SASD system.	Completed.
	Update SSMP section 11.4 to reference Appendix C-5 for the Joint Exercise of Powers Agreement for the SPWA and to reference SSMP Appendix C-6 for the Agreement Regarding the Operation and Use of the South Placer Regional Wastewater Facilities.	In Progress
	Update SSMP Appendix K-5 to include the Funding Agreement Relating to the South Placer Wastewater Facilities. It currently includes only the flysheet.	No Progress.
	Update SSMP document to reference the appendices included on the City website (i.e., Appendix K-6 Sewer Smart Newsletter and Appendix K – FOG Pharm Outreach 2012-13 Budget).	No progress.

2.2 Review of FY13/14 and FY14/15

The City has prioritized eliminating SSOs from the collection system and was successful preventing any Category 1 and Category 2 SSOs during the FY 13/14-14/15 audit period. A total of 10 Category 3 mainline SSOs occurred, of which 5 were caused by Grease Deposition (FOG) issues (i.e., 50% of all mainline SSOs). A total of 79 Category 3 lateral SSOs occurred, of which 63 were caused by Root intrusion (i.e., 80% of all lateral SSOs).

SECTION 3 SSO Trends

3.1 Historical SSO Data

A total of 89 Category 3 SSOs occurred during FY 2013/14 (47 SSOs) and FY 2014/15 (42 SSOs). Information regarding these SSOs is located in Section 7.1 and details the date, location, type, volume, volume recovered, and recovery percentage of total volume of each spill.

One of the City-defined tasks of the Audit is to compare the information submitted to the publicly available California Integrated Water Quality System (CIWQS) database with internal City records. The WWC Superintendent verifies that SSO data in CIWQS is accurate and matches the SSO Field Report Forms. Table 3 shows an organized view of key data present in the CIWQS and City internal records and shows discrepancies, if any, between them. The information presented in the “Internal Records” column represents a summarized view of various performance measures maintained by the City.

Table 3: CIWQS and City SSO Historic Data

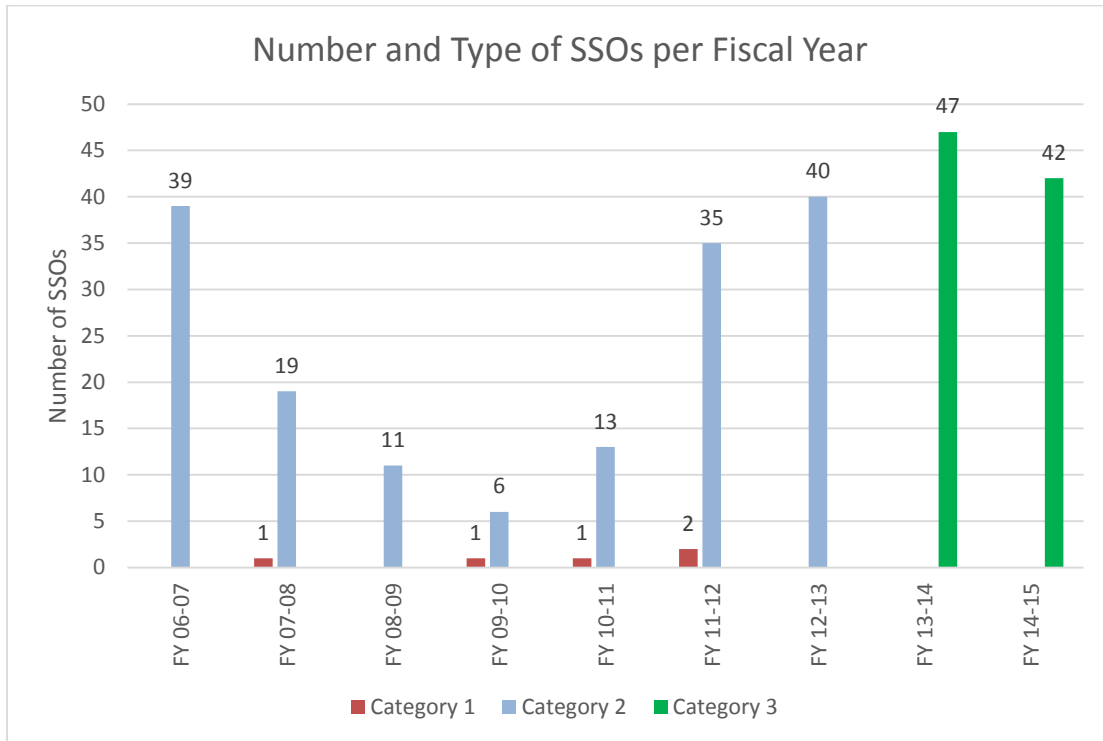
SSO Historical Data since last SSMP Internal Audit	CIWQS Data FY 11/12 – 12/13	Internal Records FY 11/12 – 12/13	CIWQS Data FY 13/14 – 14/15	Internal Records FY 13/14 – 14/15
The total number of potential SSO service calls received	-	505 / 438 calls	-	627 / 915 calls
The total number of SSOs reported	77 SSOs	77 SSOs	47 / 42 SSOs	47 / 42 SSOs
The reported total volume of SSOs	2053 gallons	2053 gallons	2388 gallons	2385 gallons
The reported total volume of SSOs that reached waters of the state	405 gallons	405 gallons	0 gallons	0 gallons
The percent volume of SSOs recovered	80%	80%	93%	94%
The average SSO response time	23 minutes	21 minutes	18 minutes	18 minutes
The average SSO duration time	18 minutes	-	3:00 hours*	-
The average SSO mitigation time	-	-	< 6 minutes	< 5 minutes

* Seven long-duration SSOs (> 3 hours long) occurred during the audit period that increased the average SSO duration length from 42 minutes to 3 hours

The following discussion investigates the City’s historical SSO data to identify potential SSO trends to provide insight into measuring the effectiveness of the City SSMP and future improvements in reducing SSOs. Figure 1 highlights the type and number of SSOs since FY 2006/07. The SWRCB defined new three SSO categories as of September 13th, 2013. A category 1 SSO is currently defined as a spill of any volume that reaches surface water. A Category 2 SSO is currently defined as a spill greater than or equal to 1,000 gallons that does not reach surface

water. A Category 3 SSO is currently defined as a spill less than 1,000 gallons that does not reach surface water. As demonstrated in Figure 1, the total number of SSOs per fiscal year has increased slightly since FY 11/12 and FY 12/13 but is limited to Category 3 SSOs.

Figure 1: Number of SSOs per Fiscal Year



To provide regional context and insight into the City’s collection system performance, **Table 4** compares the City’s average number of SSOs and average spill volume per SSO per 100 miles of sewer pipeline next to results from sub-region Central Valley –Sacramento (part of State Water Control Board Region 5) and California (State). This information is gathered from the SWRCB’s annual compliance reports. These reports and their related data can be found online at the following link:

http://www.waterboards.ca.gov/water_issues/programs/sso/docs/compliance_report_fy1112.pdf. Generally the City average SSOs/100 miles of sewer pipe is far below the average of all municipal agencies in the Central Valley Sacramento subregion, and is slightly higher than the State. The City’s average spill volume/100 miles of sewer pipe is an order of magnitude smaller than the state, which highlights how effective the City’s SSO preventative maintenance and response program has been.

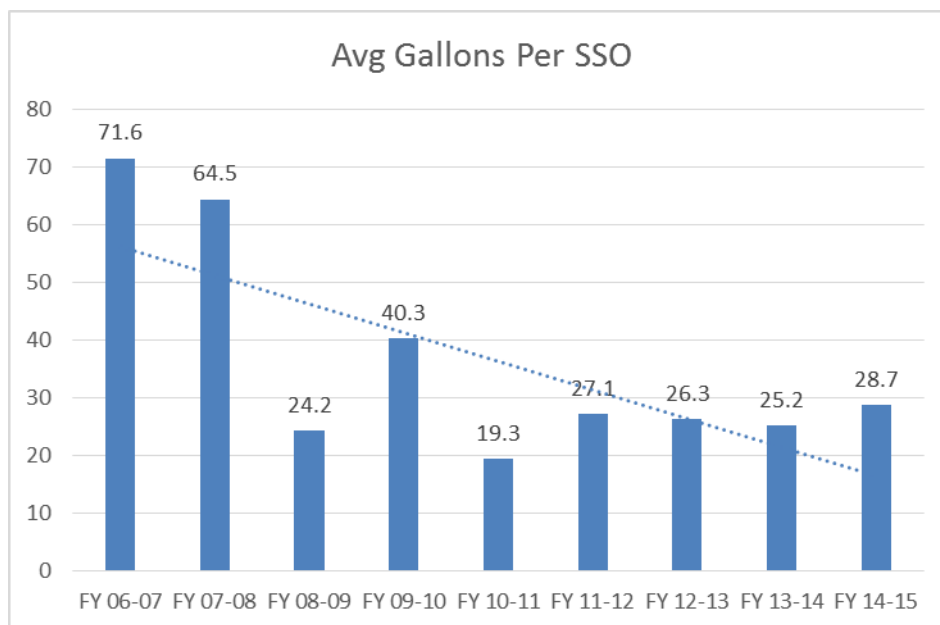
Table 4: Regional Comparison of SSO Data

Fiscal Year	Average # of SSOs per 100 miles (number)			Average Spill Volume per 100 miles (gallons)		
	City	Central Valley - Sacramento	State	City	Central Valley - Sacramento	State
2011/12	4.88	12.4	4.28	132	3,396	13,925
2012/13	5.85	12.72	4.38	154	4,371	8,194
2013/14	6.39	11.96	4.38	160	2,878	4,587
2014/15	5.71	Report not available yet		163	Report not available yet	

* Includes gravity mainline, laterals, and pressure pipes

A valuable source of analysis is also comparing average gallons spilled per SSO across fiscal years. As demonstrated in Figure 2, the overall gallons per SSO since 2007 shows a downward trend, but the more recent trend in the past 4 years shows that gallons per SSO is generally steady and holding at approximately 27 gal/SSO. Table 4: Regional Comparison of SSO Data

Figure 2: Average Gallons per SSO



Based on CIWQS records, Table 5 demonstrates the leading causes of SSOs in this audit period compared to the previous audit period. Generally SSOs from Debris and Fog have increased moderately, but SSOs caused by Roots (51 to 63) have experienced a notable increase. There have been no Capacity-caused SSOs in this audit period. The actions planned as a result of this SSMP Audit will target the leading causes to most effectively reduce the number and spill volume of SSOs.

Table 5. Leading Causes of SSOs in FY13-15 (results from FY11-13 in parenthesis)

By Number		By Volume		By Average Volume per SSO	
Cause	Number	Cause	Gallons	Cause	Gallons
Roots	63 (51)	Roots	1281 (1235)	FOG	149 (39)
Debris	15 (12)	FOG	743 (77)	Debris	21 (19)
Pipe Failure	6 (9)	Debris	314 (222)	Roots	20 (24)
FOG	5 (2)	Pipe Failure	50 (114)	Pipe Failure	8 (13)
Capacity	0 (2)	Capacity	0 (400)	Capacity	0 (200)
Vandalism	0 (1)	Vandalism	0 (5)	Vandalism	0 (5)

3.2 Performance Measures

The City utilizes multiple performance measures to assess the effectiveness of the SSMP in achieving proper operation and management of the sanitary sewer system to reduce and prevent SSOs. While the City may use other performance measures for evaluation purposes, the following measures are typically used:

- SSO Rate (SSOs per 100 miles of collection system piping per year)
- Number of SSOs for each cause (roots, FOG, debris, pipe failure, capacity, lift station failures, etc.)
- Median SSO volume (gallons)
- Percentage of SSOs greater than 100 gallons (%)
- Percentage of SSOs reported as Category 1 (%)
- Percentage of SSO volume recovered (%)
- Percentage of SSO volume reaching a surface water (%)

The City’s CIWQS SSO record were queried to analyze each performance measure from FY 11/12 to FY 14/15 and the data is displayed in **Table 6** below. From analyzing the table, the City’s SSO rate has increased slightly during this audit period compared to the last, mostly related to the increase in root-related SSOs.

Table 6: Performance Measures

Performance Measures		FY 11/12	FY 12/13	FY 13/14	FY 14/15
SSO Rate, SSOs/100 mi		4.88	5.85	6.39	5.71
SSO Cause	FOG	0	1	4	1
	Roots	18	30	32	31
	Debris	1	0	1	0
	Debris-Rags	7	2	7	2
	Pipe Failure	6	4	1	5
	Non Dispersables	0	0	1	2
	Vandalism	1	0	0	0
	Capacity	0	2	0	0
	Construction	0	0	0	1
	Unknown/Other	2	3	1	0
Median SSO Vol (gal)		27	26	25	29
% of SSOs > 100 gal		2.8	2.3	2.1	4.7
Category 1 % of Total SSOs		0	7	0	0
% of Spill Volume Recovered		99	63	94	93
% of Spill Vol Reaching Surface Water		0	37	0	0

SECTION 4 Audit Procedure

In accordance with SSS WDER Section D.13.x, the primary SSMP audit objective is to focus on evaluating the effectiveness of implementing the SSMP and the City’s compliance with the SSMP requirements identified in the SSS WSDR Order. This section details the procedures used to meet this objective.

4.1 Review of SSMP Compliance

This Audit assessed the City’s SSMP against the requirements outlines in the SSS WDR. The subsections of SECTION 5 listed below are organized by SSMP elements. Each subsection contains a table which lists the SSS WDR section D.13 requirements and City’s level of compliance of the SSMP with that particular requirement. The compliance status of the City’s SSMP is indicated with one of the following ratings: **Yes** – *in compliance*, **No** – *not in compliance*, or **N/A** – *not applicable with a written justification in the SSMP*. If there are any compliance deficiencies, then an explanation of the deficiency is given. Each deficiency will have a recommended SSMP enhancement, which may include action items, adjustments, and/or timelines of the planned completion.

4.2 Review of SSMP Effectiveness

Subsequent to the SSMP compliance assessment compared to SSS WDR requirements, an evaluation of the effectiveness of the SSMP elements has been conducted to comply with the requirements for SSMP audits per subsection D.13.x of the SSS WDR. The discussion review if the plan outlined for each section is being followed, and how effective the plan is at reaching the desired objectives. Recommendations will be made where

appropriate based on the results of this Audit to identify tasks to improve the effectiveness of SSMP activities. Performance metrics will be used wherever possible to measure the effectiveness of the SSMP elements.

This section will not repeat the information and plans presented in each section of the SSMP and is intended to evaluate the effectiveness of the stated plans for each SSMP element. The reader should reference the City's SSMP to obtain the information referenced by this Audit.

A summary of the recommended modifications made through this Audit is included in SECTION 6.

SECTION 5 Audit of SSMP Elements

This section evaluates all elements of the City’s SSMP. Each section of this chapter is associated with one of the eleven elements of the SSMP in accordance with SS WDR section D.13 requirements. Each element is evaluated for compliance and effectiveness described above in 4.1 and 4.2 respectively.

5.1 Goals

5.1.1 Compliance

Table 7. Compliance with SSS WDR D.13.i - Goals

SSMP Requirement	Compliance	Deficiencies
i Properly manage, operate, and maintain all portions of the City’s wastewater collection system.	Yes	-

5.1.2 Effectiveness of SSMP Elements and Recommended Modifications

Roseville Goals (SSMP 1.2)

- Level of Effectiveness: The City currently has six goals identified in the SSMP. The goals of the City recorded in the SSMP have been effective in guiding the City’s activities to support the objective of the SSS WDR to protect the waters of the state.
- Recommendations: No recommendations at this time

5.2 Organization

5.2.1 Compliance

Table 8. Compliance with SSS WDR D.13.ii - Organization

SSMP Requirement	Compliance	Deficiencies
ii(a) Identify Legally Responsible Official (LRO)	Yes	-
ii(b) SSMP responsibility and organization chart	Yes	-
ii(c) Chain of communication for reporting SSOs	Yes	-

5.2.2 Effectiveness of SSMP Elements and Recommended Modifications

List Legally Responsible Official (LRO) (SSMP 2.1)

- Level of Effectiveness: The City has Ken Glotzbach (Utility Manager) and Chris Bracco (Wastewater Collections Superintendent) listed in CIWQS as LROs. Dan Pruden (Wastewater Collections Supervisor) is listed as a data submitter. This is recorded in Appendix B-1 of the SSMP and is publicly accessible. The

current organization of data submitters and LROs has proven effective in reporting SSOs to meet the requirements of the September 2013 amended Monitoring and Reporting Program.

- Recommendations:
 - Modify Appendix B-1: Add Wastewater Collections Supervisor Dan Pruden to Appendix B-1
 - Modify Appendix B-1: Update City Council positions and add phone numbers (Mayor Carol Garcia, Vice Mayor Susan Rohan, City Attorney Robert Schmitt). Update Commissioners and phone numbers: Chair Blandon Granger, Vice Chair John Speight. Update Liaisons and phone numbers for EU Director Richard Plecker, and Secretary Cheryl Hammond. Update Principal EU engineer and phone number for Jason Shykowski. Update Administrative Analyst and phone number for Maurice Chaney.

SSMP Responsibility Organization Chart (SSMP 2.2)

- Level of Effectiveness: The SSMP Responsibility Organization Chart (SSMP Figure 2-1) is current in the SSMP and lists a descriptive definition of each individual's responsibilities. The chart is effective in defining the work flow and responsibilities of the individuals as well as departments within the City of Roseville's operations with relation to the SSMP. The narrative of the general position description are outlined in Section 2.2 of the SSMP.
- Recommendations:
 - Modify Figure 2-1: Modify the Industrial Waste Specialist category and remove the FOG Control Program from the description due to the FOG program oversight transitioning from IWS to WWC in 2016. Add the Fog Control Program description to the Wastewater Collection Office Assistant category.
 - Modify SSMP Section 2.2: Modify the general position description and SSMP responsibilities under the Lab/Industrial Waste Supervisor, Specialist, and Technician and remove the FOG Control Program or inspection program from those descriptions.
 - Move the FOG Control Program SSMP responsibility into the WWC Superintendent category and the WWC Office Assistant category.

Chain of Communication Reporting Chart (SSMP 2.3)

- Level of Effectiveness: The internal notification contact chart is current and readily available to all wastewater utility district staff. The city of Roseville has a 24 hour call center, standardized answering script and procedures, and a full time staff wastewater utility customer service representative. The individual's job is to respond to any service calls including but not limited too: backups, SSOs, smell complaints, etc. This has been an effective and well-utilized service, as service calls have increased and the average SSO response time has decreased from 23 minutes from the previous audit period to 18 minutes which is well below the 40 minute target. Only 3 SSO response times were above 40 minutes during the audit period (1:30:00, 00:42:00, and 1:11:00) which totaled 16 gallons in spills and all occurring in the morning at around 8:30 AM, two of which occurred on weekday mornings possibly impacted by dense morning traffic.

- Recommendations:
 - Modify Figure 2-2 Flowchart: Update the WWC Divisions overflow emergency response plan chain of communication to match existing operations, whereby WWTP and LS staff and SCADA alerts should always call the 24 hour call center instead of WWC service staff. In addition, modify the Wastewater Admin cell and rename the position as Office Assistant.
 - Modify Appendix F-1 Flowchart: Follow the same recommendations written above.

5.3 Legal Authority

5.3.1 Compliance

Table 9. Compliance with SSS WDR D.13.iii – Legal Authority

SSMP Requirement	Compliance	Deficiencies
iii(a) Prevent illicit discharges	Yes	-
iii(b) Properly designed and constructed sewers	Yes	-
iii(c) Ensure access to laterals owned/maintained by City	Yes	-
iii(d) Limit the discharge of FOG and other debris	Yes	-
iii(e) Enforce any violation of City ordinances	Yes	-

5.3.2 Effectiveness of SSMP Elements and Recommended Modifications

Industrial Pretreatment Program (SSMP 3.2)

- Level of Effectiveness: The Industrial Waste Section (IWS) administers the Pretreatment Program Enforcement Response Plan and implements enforcement procedures specified by the U.S. EPA in accordance with 40CFR 403.5 (f) (5). The IWS has the authority to permit and monitor significant industrial users (SIUs) and small commercial/industrial dischargers. The implementation of the Pretreatment Program Enforcement Response Plan has been effective in providing the City the authority to control and prevent illicit discharges to the collection system.
- Recommendations: No recommended modifications at this time.

Municipal Code and Design and Construction Standards (SSMP 3.3)

- Level of Effectiveness: The City’s design and construction standards regulate the preparation of plans for construction of additions/improvements to the sewer. The Roseville Municipal Code (RMC) section 14.12.040 requires that building sewer and connection into the public sewer system conform to the requirements of the building and plumbing code or other applicable rules and regulations of the City. The RMC also requires an installation of a lateral line clean out at the point of connection with the public sewer. The City design and construction standards and the RMC section 14.12.040 have been effective in providing the City the legal authority to properly design and construct the sewers and connections.
- Recommendations: No recommended modifications at this time.

Municipal Code – Sewer Access Authority (SSMP 3.4)

- Level of Effectiveness: The Charter in the RMC, Article X Sec. 10.01 designates the authority to access City owned and operated facilities, either within or outside its corporate limits, number of activities including, but not limited to maintenance, inspection, and repair related to sewage collection. The authority gives legal access to all City-owned sewer facilities. The City has not had issues to date with lack of access to facilities based on legal authority. The current legal authority to access sewer facilities has been effective in supporting the goals of the SSMP.
- Recommendations: No recommended modifications at this time.

Municipal Code – FOG (SSMP 3.5)

- Level of Effectiveness: The RMC chapter 14.14 is a robust FOG ordinance that lists regulatory requirements, fees, administrative requirements, and authority to enforce regulatory compliance. This ordinance is effective in identifying the required equipment and BMPs for FSEs as well as indicating the authority of the City to enforce the FOG requirements.
- Recommendations: No recommended modifications at this time.

Municipal Code – Enforcement Authority (SSMP 3.6)

- Level of Effectiveness: The RMC section 14.12.060 authorizes the City to penalize violators of the City's code requirements. At the discretion of the City attorney, an individual may be charged with an infraction or a misdemeanor. The authority to penalize infractions that may cost City resources has proven effective to maintain proper use of the wastewater collection system.
- Recommendations: No recommended modifications at this time.

Inter-Agency Agreements and Satellite Systems (SSMP 3.7)

- Level of Effectiveness: The City maintains a Joint Exercise of Powers Agreement for the South Placer Wastewater Authority and Agreement Regarding the Operation and use of the South Placer Regional Wastewater Facilities. In addition, the City has an Agreement Regarding the Operation and Use of Wastewater Services between the Sacramento Area Sewer District (SASD) and the Sacramento Regional County Sanitation District (SRCSD).
- Recommendations: Update SSMP section 3.7 to include the Wastewater Service Contract and Operating Agreement between the City, SASD, and SRCSD.

5.4 Operation and Maintenance Program

5.4.1 Compliance

Table 10. Compliance with SSS WDR D.13.iv – O&M Program

SSMP Requirement	Compliance	Deficiencies
iv(a) Collection system maps	Yes	-
iv(b) Preventive O&M activities	Yes	-
iv(c) Rehabilitation and Replacement (R&R) plan	Yes	The City does have an R&R plan in place but additional improvement should be implemented (see below)
iv(d) Training	Yes	The City provides regular training but additional improvements to the training program should be implemented (see below)
iv(e) Equipment and critical replacement parts	Yes	-

5.4.2 Effectiveness of SSMP Elements and Recommended Modifications

Roseville Collection System Maps (SSMP 4.2)

- **Level of Effectiveness:** The city maintains electronic and hard copy maps of the sanitary sewer system and storm drain system. Updates to the electronic map system are translated to the field crew trucks via single sheet prints, if required. Full hard copy mapbooks are updated on a yearly basis. The City Mapping Update Policy is followed in order to ensure mapping is correct and completed in GIS and made available to the required users.
- **Recommendations:** Include the Mapping Update Policy Document as an appendix to the SSMP and post it to the City's SSMP website page.

Roseville Preventive Operations & Maintenance Activities (SSMP 4.3)

- **Level of Effectiveness:** WWC engages in various programs to complete routine preventative maintenance activities, which include jet cleaning, lateral eeling, chemical root control, CCTV inspections, visual inspections, and lift station maintenance.

The City experienced a 24% increase in root-caused SSOs during the audit period but also increased total mechanical root control by 35% and implemented chemical root control in laterals with known root issues. The spike in root growth SSOs could be correlated with the City's mandatory water conservation efforts in response to California historic drought over the audit period. Homeowners and the City responded by decreasing irrigation use, in which case root systems may have intensified growth around existing laterals and connection points to main line pipes as overall soil moisture decreased.

The City outperformed targets and past performance measures as evident in Table 11. Other performance measures or benchmarks are reviewed in full in the recommendations of Section 5.9.

Table 11. Performance Measures related to SSS WDR D.13.iv(b)

Performance Measure	Target	FY11/12	FY12/13	FY13/14	FY14/15
Total miles cleaned per year	250	277	272	330	284
Total miles of mechanical root control per year	-	9.74	11.23	13.89	14.69
Total number of sewer maintenance field staff	NA	23	23	23	24
Average high velocity cleaning per crew per day	NA	1866 LF	1852 LF	2393	2922
Average cost of sewer mechanical cleaning	-	\$1.57/LF	\$1.36/LF	\$1.23/LF	\$1.20/LF

- Recommendations:
 - Update SSMP Section 4.3 Overview with updated statistics about the City’s service area, number of customers, miles of main, number of services, and number of lift stations. Also update the number of WWC employees.

Rehabilitation and Replacement Plan (SSMP 4.4)

- Level of Effectiveness: The City regularly CCTV inspects pipelines using the national Association of Sewer Service Companies (NASSCO) Pipeline Assessment Certification Program (PACP) coding standard. The City evaluates the risk of failure for each asset based on the various data sources it maintains (i.e., CCTV, CMMS, GIS, capacity assessment, visual inspections) and assigns high risk assets in a ranked Rehabilitation and Replacement (R&R) Plan. If an R&R project is not completed in one year, then it is rolled over to the next. The City maintains a 5-year list of planned R&R CIP projects.

During this audit period WWC produced the R&R list for pipeline lining and manhole rehabilitation which was then used by EU Engineering which operates the R&R program. The City is anticipating changes to this program soon, however, and WWC will produce its own manhole R&R list like before but will also operate the R&R program for it. In addition, EU Engineering will receive the condition assessment data generated by WWC for sewer pipelines and will then produce its own R&R list and continue operating the R&R program for sewer pipelines. In addition, use of the Hansen CMMS software will be discontinued and Maximo CMMS software implemented.

In accordance with City-utilized performance measures related to inspection and R&R program activities as displayed in Table 12, the City has met or exceeded targets with one exception. In FY 14/15 the City missed its goal for total miles of laterals rehabilitated using CIPP per year. The total number of laterals rehabilitated in this audit period was less than the previous audit period, but the total sewer main miles of CCTV inspections increased. Overall the R&R plan development and implementation has been effective and ensures high-priority projects are implemented.

Table 12. Performance Measures related to SSS WDR D.13.iv(c)

Performance Measure	Target	FY11/12	FY12/13	FY13/14	FY14/15
Total miles visually inspected per year (not CCTV)	-	0.25	0.25	0.25	0.25
Number of laterals rehabilitated using CIPP per year	50	134	50	90	43
Total miles CCTV inspected per year (main)	30	29.2	67.6	53.27	65
Average cost of CCTV (main)	-	\$0.48/LF	\$0.56/LF	\$0.35/LF	\$0.41/LF

- Recommendations:
 - Document the process/procedure for evaluating available data (i.e., CCTV, CMMS, GIS, capacity assessment, visual inspections, etc.), conducting a risk assessment to determine the assets to be renewed, and developing the R&R plan with its associated data. This was also included during the previous audit but has not been completed.
 - Document the upcoming transition in responsibilities between WWC and EU Engineering in developing and operating the R&R plan by describing it in the SSMP. Confirm that field observations from WWC field crew are accounted for by EU Engineering when conducting risk assessment.

Training (SSMP 4.5)

- Level of Effectiveness: The WWC requires employees be certified with CWEA, DMV, CPR, First Aid, Confined Space Policy, Gas Detector Policy, as well be trained in equipment safety, maintain OSHA rules, and review material safety data sheets.

The existing training program has been effective in supporting a well-trained staff. Over this audit period WWC has reported 2 on the job accidents in FY 13/14 and 8 in FY 14/15. WWC strives for zero-on-the-job accidents and has weekly tail-gate training meetings and monthly training sessions where WWC staff is trained in part via various SOPs.

- Recommendations:
 - Augment the ongoing training program by documenting that WWC staff have demonstrated the ability to operate a major piece of equipment (i.e., combo Vactor unit) in accordance with available SOPs to a supervisor before using it for the first time in the field and at a specified frequency (i.e., annually or if equipment is upgraded). The document would need to list a piece of equipment, the name of the journeyman, supervisor, signatures, name of SOP if used, and date.
 - Modify SSMP Section 4.5 to include training on SSOERP.

Equipment and Critical Replacement Parts (SSMP 4.6)

- Level of Effectiveness: WWC maintains a list of equipment and critical replacement parts inventory in Appendix D of the SSMP. The critical replacement parts list is 100% stocked, up to date, and is maintained by the Material Technician at Dry Creek WWTP. The equipment and critical replacement

parts inventory and upkeep is effective and ensures that a lift station critical part failure can be quickly mitigated.

- Recommendations: No recommended modifications at this time.

5.5 Design and Performance Provisions

5.5.1 Compliance

Table 13. Compliance with SSS WDR D.13.v – Design and Performance Provisions

SSMP Requirement	Compliance	Deficiencies
v(a) Sanitary sewer design and construction specifications	Yes	-
v(b) Procedures and standards for inspecting and testing new and R&R projects	Yes	-

5.5.2 Effectiveness of SSMP Elements and Recommended Modifications

Sanitary Sewer Design and Specifications (SSMP 5.2)

- Level of Effectiveness: The City’s design and construction standards are available on the website and the online SSMP documentation lists their location. These designs and construction standards are effective in ensuring that new or rehabilitated infrastructure is designed and constructed in an acceptable manner.
- Recommendations: No recommended modifications at this time.

Sanitary Sewer System Construction and Performance Provisions (SSMP 5.3)

- Level of Effectiveness: The City’s construction and design standards include procedures and requirements for the testing of new/rehabilitated assets and has been effective in ensuring that recently constructed assets perform as expected.
- Recommendations: No recommended modifications at this time.

5.6 Overflow Emergency Response Plan

5.6.1 Compliance

Table 14. Compliance with SSS WDR D.13.vi - OERP

SSMP Requirement	Compliance	Deficiencies
vi(a) Proper notification procedures	Yes	-
vi(b) Program for appropriate SSO response	Yes	-
vi(c) Procedure for prompt notification to regulatory agencies	Yes	-
vi(d) Procedures for appropriate staff and contractor training	Yes	-
vi(e) Procedures to address emergency operations (e.g., traffic, crowd control)	Yes	-
vi(f) Program to ensure containment of SSO to prevent discharge and minimize adverse impacts on the environment	No	SSOERP does not meet certain water quality monitoring requirements of the amended MRP document

5.6.2 Effectiveness of SSMP Elements and Recommended Modifications

Notification Procedures (SSMP 6.2)

- Level of Effectiveness: The average SSO response time was 18 minutes from notification of SSO to operator arrival time for the City of Roseville. This response time is much faster than the City target response time of 40 minutes and indicates that the notification procedures employed the City are effective in facilitating a rapid response from the City’s first responders.
- Recommendations: No recommended modifications at this time.

Response Program (SSMP 6.3)

- Level of Effectiveness: SSO response procedures are documented in Appendix F-1 Section 2 of the SSMP and are summarized in the flow chart in Figure 6-2 of the SSMP and Appendix F-1 SSOERP. The flow chart uses a series of yes/no questions to guide SSO responders in quickly identifying the right sequence of decisions and actions to properly assess and mitigate an SSO. This chart is simple and effective in explaining the process in which to mitigate an SSO.

During the audit period, the average SSO volume spilled was 26 gallons, with an average 94% recovered from the total SSO volume. Similarly, the average SSO duration length was 3:00 hours long, however there were 7 long-duration SSOs (over 3 hours) that caused the average SSO duration length to increase from 42 minutes. One of these SSOs in FY 13/14 spilled from a lower lateral for 70 hours and resulted in the largest volume spilled of 570 gallons, however all of it was recovered. In all of these instances, the City was notified very late, and once notified, stopped all of the long duration SSOs in under 25 minutes.

The average City response time to SSO calls during the audit period was 18 minutes, and the average time it took to stop the SSO (SSO mitigation) once on-site was just under 5 minutes. These statistics demonstrate that the City has been effective in responding and mitigating SSOs.

- Recommendations:
 - The WWC has developed a table of information specific to lift station response which includes all of the lift stations in the City and lists for each station; the average flow from the station, the wet well depth, the volume of the wet well, the available storage/downtime if the lift station goes down, the point at which a SSO will first occur if the lift station goes down, the assigned manhole for decanting if vacuum trucks are used to draw down the wet well, and the street location of the decant manhole. This information should be included as an Appendix in the OERP and the information for each lift station should be posted onsite at each respective lift station. This list should also be updated to incorporate new lift stations at Washington Blvd and 7600 Sierra College. This was also recommended during the previous audit but has not been implemented.
 - Modify SSOERP Section IV Traffic Control (WWC Personnel) to require WWC Personnel to implement traffic control in every situation where WWC personnel may be at risk of vehicular impact in accordance with MUTCD (part of Caltrans Work Area Traffic Control Handbook). It is recommended that WWC produce several standard TCPs (Traffic Control Plan) to match existing traffic conditions or type of roadway (i.e., arterial, residential, etc.).
 - Modify SSOERP Section V Correct Cause (WWC Personnel) to include a discussion of whether a root-caused SSO could be classified as a PLSD if the City defines a spill cause as the entry point of the root and whether that location is on lower (city) or upper lateral side (private). Include recommendations to provide good documentation of the decision with photographic evidence and a logical narrative.

Regulatory Notification Procedure (SSMP 6.4)

- Level of Effectiveness: The Superintendent and Utility Manager are the legally responsible officials (LRO) for certifying SSO reports submitted to CIWQs. The Superintendent and Supervisor are also responsible for reporting the SSOs to RWQCB, OES, and Placer Environmental Health Department as required. This section is effective in conveying the responsibility the LRO in reporting SSOs to the proper authorities.
- Recommendations: No recommended modifications at this time.

Staff and Contractors Training (SSMP 6.5)

- Level of Effectiveness: Each WWC employee is required to complete the SSO response procedure training updates and review of SSO training are included in the weekly tailgate meeting throughout the year. They are also trained on the various SOPs implemented within WWC. Contractors are also required to implement the procedures identified in the SSO training prior to working within the collection system. As evidenced by the fast response and mitigation times, the WWC staff's training has been effective.

- Recommendations: No recommended modifications at this time.

Emergency Response Coordination (SSMP 6.6)

- Level of Effectiveness: WWC employees are required to complete the Emergency Action plan training annually. This covers HAZ WOPER first responders and Roseville's Incident Command System (ICS). These process, procedures, and response systems are also reviewed via weekly safety tail gate meetings. These training sessions have been effective way to prepare staff to deal with hazardous waste and materials.
- Recommendations: No recommended modifications at this time.

Spill Mitigation and Containment Procedure (SSMP 6.7)

- Level of Effectiveness: Appendix F-1 of the SSMP includes an SSOERP which includes an SOP for estimating spill volumes, containment, and mitigation of spills. The new amended Monitoring and Reporting Program (MRP) requirements implemented in September 2013 require a robust water quality monitoring plan that must account for spill travel time in surface water, among several new requirements. The City's current SSOERP Appendix C Water Quality Sampling Procedures document does not meet these requirements.
- Recommendations:
 - Modify SSOERP Appendix A – Start Time Documentation Policy to include the following WWC standard field practice: If the start time cannot be set based on witnesses and if there is evidence of a spill traveling a farther distance than 15 minutes, then the field crew estimates the new start time and may try to recreate the spill (with clean water) to estimate volumes.
 - Modify SSOERP Appendix C – Water Quality Sampling Procedures to the meet the requirements of the amended MRP.
 - Account for spill travel time in the surface water and scenarios where monitoring may not be possible to safety concerns or access restrictions once an SSO has stopped. This may be estimated by dropping floatable debris, for instance, and measuring the time required to travel a certain distance.
 - Expand minimum sampling parameters to include appropriate bacterial indicators that have been specifically listed in the beneficial uses of the City's waterways or more broadly listed by the regional Basin Plan.
 - Modify SSOERP Appendix C – Water Quality Sampling Procedures to include a list of all of the required equipment that the employee would need to conduct proper sampling.

5.7 FOG Control Program

5.7.1 Compliance

Table 15. Compliance with SSS WDR D.13.vii – FOG Control Program

SSMP Requirement	Compliance	Deficiencies
vii(a) Public education plan	Yes	The City does have a public education plan but additional improvements should be implemented (see below)
vii(b) FOG disposal plan	Yes	-
vii(c) Legal authority to prohibit SSOs and blockages caused by FOG discharges	Yes	-
vii(d) BMPs, grease removal devices, recordkeeping, and reporting requirements	Yes	-
vii(e) Authority to inspect and enforce FOG ordinance	No	The City does have the authority to inspect/enforce FOG ordinance but no inspection records were produced for the Audit period.
vii(f) FOG Characterization Assessment and Hot Spot Cleaning Schedule	Yes	-
vii(g) FOG Control Program Measures	Yes	-

5.7.2 Effectiveness of SSMP Elements and Recommended Modifications

Public Education Plan (SSMP 7.2)

- Level of Effectiveness: The City has developed and operates a comprehensive FOG outreach program to residents, restaurants, and the plumbing community on the proper disposal of FOG. The main objective is to educate the City of Roseville residents and restaurants on the proper disposal of FOG to meet or exceed outreach standards set forth in the State General WDR requirements. The program has implemented TV ads, flyers, bill inserts, and websites to convey the message of educating the public on the proper disposal of FOG and other substances. This system appears to be effective in educating the public on the proper disposal of FOG and other substances.
- Recommendations: List Maurice Chaney as the responsible party for the FOG Public Education Plan.

FOG Disposal Plan (SSMP 7.3)

- Level of Effectiveness: During the audit period the Industrial Waste Section (IWS) oversaw the FOG disposal plan with permitted FSEs, however all FOG program-related responsibilities transitioned to WWC in 2016. The City currently has 319 FSEs that are required to and have obtained a FOG wastewater discharge permit (FOG WDP). The same City regulations from the audit period are in place which require

permittees to retain a minimum 3 years of documentation to prove the proper cleaning, maintenance, and removal of FOG from grease control devices and the disposal site location. The City provides information about the permitting process and permit applications on the City website (URL address below) as a resource for businesses and residences within the City.

http://www.roseville.ca.us/eu/wastewater_utility/fats_oils_n_grease/default.asp

The FOG record keeping requirements for FSEs appear to be effective in that only three FOG-related SSOs occurred over the audit period.

- Recommendations:
 - Modify SSMP Section 7.3 to reflect the change in responsibilities from IWS to WWC.

Record Keeping Requirements (SSMP 7.4)

- Level of Effectiveness: As discussed in the previous section, FOG control program responsibilities transitioned from IWS to WWC in 2016, but during the audit period, IWS operated the program. The City requires in RMC Section 14.14.260 that permitted FSEs retain logbooks on grease control device maintenance cycles, FOG hauling records, sampling data and sludge height monitoring in FOG control devices, BMPs, and records of private lateral SSOs and subsequent mitigation. The recordkeeping requirements and time frames identified in the RMC have enough information necessary for the City to enforce permit requirements of FSEs.
- Recommendations:
 - Modify SSMP Section 7.4 to reflect the change in responsibilities from IWS to WWC

Legal Authority to Prohibit SSOs and Blockages Caused by FOG Discharges (SSMP 7.5)

- Level of Effectiveness: The RMC Section 14.12.050 provides the City with a FOG ordinance and legal authority to require FOG interceptors when deemed necessary by the director. The ordinance prohibits FOG-related blockages and SSOs, and limits the maximum allowable concentration of FOG in FSE discharges at the current level of 100 mg/L of wastewater. This ordinance is effective in providing the City with the tools necessary to minimize FOG discharges into the sewer system.
- Recommendations: No modifications recommended at this time.

BMP, Grease Removal Devices, Recordkeeping, and Reporting Requirements (SSMP 7.6)

- Level of Effectiveness: The City requires all FSEs that discharge FOG to acquire a FOG WDP permit which includes provisions for FSEs to maintain BMPs and grease interceptors, cleaning records, and to report private FOG-related SSOs or blockages. The FOG WDP requirements are effective in providing the City with the tools to limit FOG discharges into the sewer system.
- Recommendations:
 - Modify SSMP Section 7.6 to reflect the change in responsibilities from IWS to WWC

Inspection and Enforcement Authority – FOG Producers (SSMP 7.7)

- Level of Effectiveness: All FSEs that discharge FOG are required to obtain and comply with a City FOG WDP. Under the permit, the FSE must comply with the FOG ordinance as detailed under the RMC, and the City maintains the legal authority to physically inspect the FSE and determine if it is in compliance. During the audit period, the City reported that all 319 permitted FSEs were inspected by IWS and zero enforcement actions initiated. Under oversight from WWC, the City plans on inspecting all 319 FSEs each fiscal year.

The City possesses effective tools to regulate FOG discharges via a robust FOG ordinance which also requires an effective FSE inspection program. During this audit, the City did not provide inspection records, however, and without detailed documentation it is not possible to judge the effectiveness of the FOG inspection and enforcement authority element of the SSMP.

- Recommendations:
 - Modify SSMP Section 7.7 to reflect the change in oversight from IWS to WWC
 - Document all FSE inspections. Develop a standard FSE inspection form which lists individual elements the FOG WDP permittee is required to maintain in a logical order for the inspector to follow. At a minimum, the inspector should enter the FSE, check the grease removal device, conduct a FOG concentration sample, request and view cleaning/hauling records and associated BMPs. After filling out the inspection form to document the whole procedure, transfer the results of the inspection form into a database or spreadsheet by which WWC can track compliance of the multiple required elements under the permit. Follow up with FSEs as required and formally document the process. Attach a blank version of the inspection form as an appendix in the SSMP.

FOG Characterization Assessment and Hot Spot Cleaning Schedule (SSMP 7.8)

- Level of Effectiveness: The City has been effective in limiting FOG-related SSOs to three during the audit period by identifying and placing assets impacted by FOG as a last resort on the hot-spot, high frequency 3-month cleaning list. If the City encounters abnormal FOG levels in a pipe it will first reach out to FSEs and residents that it thinks may be contributing to it and distribute pamphlets to them to minimize FOG discharges. If that does not solve the problem, then the asset is put on the hot-spot list. Approximately 60% of the 90 hot-spot assets have FOG-related issues that as a whole require significant City resources to clean every 3 months.
- Recommendations:
 - Modify the EU Engineering GIS database to include hotspot assets and FSEs and add them as layers to the maps that WWC receives.
 - Modify SSMP Section 7.8 to describe the process of how pipelines are added to the hot spot cleaning schedule, and remove mention of annual sewer line maintenance work orders.

FOG Control Program Measures (SSMP 7.9)

- Level of Effectiveness: The City has established that all FOG-producing FSEs acquire a FOG WDP which limits discharge of FOG, requires proper O&M records, hauling record, BMPs, and other conditions. The FOG Control Program measure provides the City’s with an effective tool to limit FOG discharges from FSEs.
- Recommendations:
 - Modify SSMP Section 7.9 to reflect the change in responsibilities from IWS to WWC.

5.8 System Evaluation and Capacity Assurance Plan

5.8.1 Compliance

Table 16. Compliance with SSS WDR D.13.viii - SECAP

SSMP Requirement	Compliance	Deficiencies
viii(a) Evaluate hydraulic deficiencies	Yes	
viii(b) Establish design criteria	Yes	-
viii(c) Establish short- and long-term CIP	Yes	-
viii(d) Develop schedule of completion dates for CIP	Yes	-

5.8.2 Effectiveness of SSMP Elements and Recommended Modifications

Evaluation Process – Capacity Enhancement Projects (SSMP 8.2)

- Level of Effectiveness: The City has developed two hydraulic simulation models to identify peak flows in the collection system in 2006. The City is currently developing a new hydraulic model and drafting a new System Evaluation and Capacity Assurance Plan (SECAP) that will conclude in 2017, making it 10 years since the last study. The modeling efforts conducted in 2006 have been effective in evaluating the system and planning for future growth, which is evident from no capacity-deficiency-related SSOs during this audit period.
- Recommendations: Modify Appendix I-1 of the SSMP to indicate that the system evaluation and capacity assurance plan will be reviewed and updated every 10 years.

Design Criteria (SSMP 8.3)

- Level of Effectiveness: The City established a 10-year, 24-hour peak design storm for the hydraulic wet weather loading of the existing collection system along with flow generation factors based on water use

records and flow monitoring data. Based on the lack of capacity-related SSOs during the audit period, it appears the City’s capacity design criteria are effective.

- Recommendations: No recommended modifications at this time.

Capacity Enhancement Measures (SSMP 8.4)

- Level of Effectiveness: The SPWA Wastewater Systems Evaluation includes the identification of short and long-term Capital Improvement Project (CIP) to meet current and future wastewater flows. The new hydraulic model which will be introduced in 2017 will provide new capacity enhancement measures.
- Recommendations: No modifications recommended at this time.

Capital Improvement Program Schedule (SSMP 8.5)

- Level of Effectiveness: The City lists the goal of the CIP is to develop annual project bundles of approximately \$1.5 million based on WWC condition assessment data and the hydraulic model CIP results and subsequent flow monitoring or studies. The CIP schedule is effective in identifying the tasks required to assure hydraulic capacity within the collection system.
- Recommendations: No modifications recommended at this time.

5.9 Monitoring, Measurement, and Program Modifications

5.9.1 Compliance

Table 17. Compliance with SSS WDR D.13.ix – MMM

SSMP Requirement	Compliance	Deficiencies
ix(a) Maintain metrics to prioritize SSMP activities	Yes	-
ix(b) Measure effectiveness of SSMP elements	Yes	The City does have performance indicators linked with SSMP elements, but additional improvements should be implemented (see below)
ix(c) Assess preventative maintenance program	Yes	-
ix(d) Update elements based on evaluations	Yes	-
ix(e) Identify and illustrate SSO trends	Yes	-

5.9.2 Effectiveness of SSMP Elements and Recommended Modifications

Utility Metrics to Prioritize SSMP Activities (SSMP 9.2)

- Level of Effectiveness: The WWC tracks four categories of utility metrics to monitor and measure the effectiveness of the various elements of this SSMP, which include system information, financial

information, sewer maintenance, and performance measures. The city also tracks various performance measures related to various SSMP elements and they are summarized in Appendix 7.2. Appendix I has effectively been used to identify and track the specific metrics each of the City’s four categories.

- Recommendations: Update Appendix I on the City website with information from FY 13/14 and FY 14/15.

Metrics to Monitor Effectiveness of SSMP (SSMP 9.3)

- Level of Effectiveness: The utility metrics listed in Appendix I pertain to different overseeing departments within the City, and the coordination between these different Departments in measuring/monitoring various metrics and sharing results has been effective in ensuring the SSMP goals have been met.
- Recommendations:
 - Update Appendix I and modify it to include document location, responsible person, and review frequency. This was also recommended during the previous audit but has not been completed.
 - Identify the metrics that correspond with specific elements of the SSMP and develop numerical goal ranges so the data currently collected and monitored by the City can be used as performance indicators (PIs) to quantitatively monitor SSMP effectiveness. The ultimate measure of SSMP effectiveness is the limiting of SSOs. However, setting goals for activities related to various SSMP elements and measuring performance against those goals, will help determine how success in those elements, relates to the overall effectiveness of limiting SSOs. Associating metrics with specific SSMP elements will allow for direct assessment of those elements and provide consistency in their evaluation in future audits. **Appendix 7.2** of this internal audit contains a list of PI and associates each one with a SSMP element, a suggested audit frequency, and a person responsible for monitoring that PI. A sample Performance Indicator Assessment Form is included in **Appendix 7.3** of this internal audit. Performance Indicator Assessment Forms can be developed for each metric and assessed periodically by the person responsible, according to the suggested audit frequency for that metric. At the time of the next internal SSMP audit, the completed Performance Indicator Assessment Forms can be used to evaluate the effectiveness of SSMP elements and included as attachments to the audit. This was also recommended during the previous audit but has not been implemented.
 - Consider tracking additional metrics targeted at measuring the effectiveness of SSMP elements that do not currently have metrics associated with them. A list of potential performance measures listed by SSMP element is included in **Appendix 7.2** of this internal audit. This was also recommended during the previous audit but has not been implemented.

Metrics to Assess Preventative Maintenance Program (SSMP 9.4)

- Level of Effectiveness: The City’s current utility metrics Appendix I defines the frequency and type of utility metric that is being tracked to measure SSMP effectiveness. This is effective because it allows the city to monitor performance of particular activities and compare against SSO trends to determined data

correlations. These metrics do not all have associated goals or targets, however, which makes it hard to track whether the activity is meeting the intended result.

- Recommendations: As discussed in the previous section, use data collected in SSMP Appendix I as a reference, and develop goals for metrics that track preventative maintenance activities and identify the person/position responsible for tracking data against those goals. See **Appendix 7.2** for a list of potential performance indicators for preventative maintenance activities with responsible parties. This was also recommended during the previous audit but has not been implemented

SSMP Performance Monitoring and Update Process (SSMP 9.5)

- Level of Effectiveness: Individual staff oversee various SSMP element performance indicators. The City tracks all revisions/updates with the SSMP using a revision log that is maintained by the LRO. The log is effective documenting changes to the SSMP and encourages the use of the SSMP as a living document.
- Recommendations: No modifications recommended at this time.

SSO Trends – Frequency, Location and Volume (SSMP 9.6)

- Level of Effectiveness: The City tracks a comprehensive list of metrics that are included in Appendix I and the City's Performance Reports. This allows the City to quickly identify and respond to changing trends in SSOs over time.
- Recommendations: Using the data collected in SSMP Appendix I as a reference, set performance goals for the metrics used to illustrate SSO trends. See **Appendix 7.2** for a list of potential performance indicators related to SSO trends. This was also recommended during the previous audit but has not been implemented.

Table 18. Current Performance Measures to Monitor SSO Trends

Performance Measure	Unit	Target	Source
SSOs - Total number, mains and laterals	Number	-	A, B
SSOs - Total volume, mains and laterals	Gal	-	A, B
SSOs - Total volume recovered	Gal	-	B
SSOs - Total number of wet weather	Number	-	A, B
SSOs - Total volume of wet weather	Gal	-	A, B
SSOs - % of spills caused by FOG (main)	%	-	A, B
SSOs - % of spills caused by roots (main)	%	-	A, B
SSOs - % of spills caused by Vandalism (main)	%	-	A, B
SSOs - caused by LS failures	Number	-	A, B
SSOs - caused by pipe failures	Number	-	A, B
SSOs - % of spill volume caused by FOG (lateral)	%	-	A, B
SSOs - % of spill volume caused by roots (lateral)	%	-	A, B
SSOs - % of spill volume caused by Vandalism (lateral)	%	-	A, B
Customer service requests per year	Number	-	A, B
Sewer odor complaints	Number	-	A, B
Flooding claims per year	Number	-	A, B
Cost of flooding claims per year	\$	-	A, B
SSO – Repeats within two years	Number	0	B, C
SSOs - Category 1	Number	0	C, D
SSOs / 100 mi pipe / year - Category 2	Number	2.0	C
SSOs / 100 mi pipe / year - Mainline	Number	0.6	C
SSOs / 100 mi pipe / year - Lateral	Number	8.0	C

- A = SSMP section 9.6
- B = SSMP Appendix I
- C = WW Collections KPIs
- D = Program / Performance Reports

5.10 SSMP Program Audits

5.10.1 Compliance

Table 19. Compliance with SSS WDR D.13.x – SSMP Program Audits

SSMP Requirement	Compliance	Deficiencies
x Conduct periodic audits	Yes	-

5.10.2 Effectiveness of SSMP Elements and Recommended Modifications

Audit Procedures, Roles, and Responsibilities (SSMP 10.2)

- Level of Effectiveness: The City conducts an internal audit biennially to continually measure the effectiveness of the SSMP primarily through evaluating system metrics, performance measures, and reduce SSOs by improving SSMP procedures to better respond to new SSO trends. In addition the audit evaluates the City's compliance with SSMP requirements, particularly the amended MRP requirements that were formalized in September 2013. The City developed an audit form as a template to record information produced during the internal SSMP audits. This form is included in SSMP Appendix J-2. The previous audit identified many areas of improvement which the City responded and acted on. Some of these recommended improvements were excluded from this audit based on discussions with the City that eliminated the need for them. Others are considered standing, and should still be implemented by the City. Generally the internal audits implemented by the City have been effective in improving the SSMP and turning it into a living document that that is current, practical, and useful for the City.
- Recommendations:
 - Post the previous SSMP internal audit (FY 11/12 and FY 12/13) and this SSMP internal audit to the City website.
 - Post the most recent City council SSMP recertification (from 2014) the City website.
 - Schedule the next internal SSMP audit for July-August of 2017
 - Revise Appendix J-1 to reflect recommendations for review of performance indicators (i.e., metrics associated with specific SSMP elements and the associated timelines). This was also recommended during the previous audit but has not been implemented.

Revise Appendix J-2 (audit form) to provide areas in the tables for each SSMP element to conduct an assessment of both SSMP compliance to Regional Board requirements, and effectiveness of individual SSMP elements. Remove Kim Spears and IWS from the certification of audit table. This was also recommended during the previous audit but has not been implemented.

SSMP Program Modification/Update Process (SSMP 10.3)

- Level of Effectiveness: The City developed a program for monitoring, reviewing sewer performance metrics and the effectiveness of SSMP elements on a biennial basis. Based on the results of the SSMP audits, the Wastewater Utility Manager is assigned to initiate/direct corrective actions to respond to deficiencies and enhancements identified in the audit. As determined in the City's SSMP revision log, the City has been prompt in responding to audit and continually strives to implement improvements.
- Recommendations:
 - Update the SSMP revision log and post on the website.
 - Document the submittal process for proposed changes to the SSMP. The process may include the following; identify the individual who maintains the most current version of the SSMP, the steps in which suggested modifications are received (by internal staff or the public), how suggestions are routed to the individual/position responsible for the SSMP element associated

with suggested modification, the process for review, and the process for updating the SSMP on the City website and documenting changes. This was also recommended during the previous audit but has not been implemented.

5.11 Communication Program

5.11.1 Compliance

Table 20. Compliance with SSS WDR D.13.xi – Communications Program

SSMP Requirement	Compliance	Deficiencies
xi(a) Communicate on a regular basis with the public and tributary/satellite systems regarding SSMP	Yes	-

5.11.2 Effectiveness of SSMP Elements and Recommended Modifications

Internal Communication – Staff, Utility Commission, and City Council (SSMP 11.2)

- Level of Effectiveness: The WWC has used PowerPoint presentations as a resource to describe the purpose of the SSMP and summarize SSS WDR requirements to the City council and City staff. These presentations are attached to the SSMP website.
- Recommendations:
 - As of September 2013 the State Water board amended the MRP of the SSS WDR and the City produced a training PowerPoint to City staff, council, and stakeholders regarding the update. Attach the PowerPoint to the SSMP website.

Stakeholder Communication – Residential, Commercial and Industrial (SSMP 11.3)

- Level of Effectiveness: The City communicates regularly with the public and stakeholders via monthly newsletters entitled “EU Today” that includes items regarding sewer utilities. This newsletter is presented online and through bill inserts. A sample newsletter is included in Appendix K of the SSMP. In addition, the City specifically communicates FOG related items to the community via FOG outreach program over TV ads, flyers, direct mail, and site visits to FSEs. The WWC registered approximately 40 percent more service calls during this audit period than during the last. As the level of SSOs has only increased slightly since the previous audit period, the increase in service calls may indicate the effectiveness of City outreach programs in encouraging the public to communicate with WWC their concerns or observations about any sewer utility issues.
- Recommendations:
 - Update SSMP Appendix K-4 with FY 13-15 EU marketing Plan budget & spending

Tributary/Satellite Communication (11.4)

- Level of Effectiveness: The City routinely communicates with their satellite partners and has three formal agreements in place that include:
 - The joint exercise of power agreement for the SPWA
 - The agreement regarding the operation of and use of South Placer Regional Wastewater Facilities
 - The funding agreement relating to the South Placer Regional Wastewater Facilities
 - Agreement Regarding the Operation and Use of Wastewater Services between the Sacramento Area Sewer District (SASD) and the Sacramento Regional County Sanitation District (SRCSD).

- Recommendations:
 - Add the Agreement Regarding the Operation and Use of Wastewater Services between the Sacramento Area Sewer District (SASD) and the Sacramento Regional County Sanitation District (SRCSD) as attachment K-7 and modify the SSMP to mention it.
 - Modify SSMP 11.4 to include the Agreement Regarding the Operation and Use of Wastewater Services between the Sacramento Area Sewer District (SASD) and the Sacramento Regional County Sanitation District (SRCSD).

SECTION 6 Audit Summary

Table 21. Summary of SSMP Compliance Deficiencies

SSMP Requirement	Compliance	Deficiencies
vi(f) Program to ensure containment of SSO to prevent discharge and minimize adverse impacts on the environment	No	SSOERP does not meet certain water quality monitoring requirements of the amended MRP document.
vii(e) Authority to inspect and enforce FOG ordinance	No	The City does have the authority to inspect/enforce FOG ordinance but no inspection records were produced for the Audit period.

Table 22. Summary of Audit Recommendations

SSMP Section	Recommendation	Suggested Timeline for Completion
2.1	Modify Appendix B-1: Add Wastewater Collections Supervisor Dan Pruden. Update City Council positions and add phone numbers (Mayor Carol Garcia, Vice Mayor Susan Rohan, City Attorney Robert Schmitt). Update Commissioners and phone numbers: Chair Blandon Granger, Vice Chair John Speight. Update Liaisons and phone numbers for EU Director Richard Plecker, and Secretary Cheryl Hammond. Update Principal EU engineer and phone number for Jason Shykowski. Update Administrative Analyst and phone number for Maurice Chaney.	
2.2	Modify Figure 2-1: Modify the Industrial Waste Specialist category and remove the FOG Control Program from the description due to the FOG program oversight transitioning from IWS to WWC in 2016. Add the Fog Control Program description to the Wastewater Collection Office Assistant category.	
2.2	Modify SSMP Section 2.2: Modify the general position description and SSMP responsibilities under the Lab/Industrial Waste Supervisor, Specialist, and Technician and remove the FOG Control Program or inspection program from those descriptions.	
2.2	Move the FOG Control Program SSMP responsibility into the WWC Superintendent category and the WWC Office Assistant category.	
2.3	Modify Figure 2-2 Flowchart: Update the WWC Divisions overflow emergency response plan chain of communication to match existing operations, whereby WWTP and LS staff and SCADA alerts should always call the 24 hour call center instead of WWC service staff. In addition, modify the Wastewater Admin cell and rename the position as Office Assistant.	
2.3	Modify Appendix F-1 Flowchart: Follow the same recommendations written above.	
3.7	Update SSMP section 3.7 to include the Wastewater Service Contract and Operating Agreement between the City, SASD, and SRCSD.	
4.2	Include the Mapping Update Policy Document as an appendix to the SSMP and post it to the City's SSMP website page.	
4.3	Update SSMP Section 4.3 Overview with updated statistics about the City's service area, number of customers, miles of main, number of services, and number of lift stations. Also update the number of WWC employees.	
4.4	Document the process/procedure for evaluating available data (i.e., CCTV, CMMS, GIS, capacity assessment, visual inspections, etc.), conducting a risk assessment to determine	

	the assets to be renewed, and developing the R&R plan with its associated data. This was also included during the previous audit but has not been completed.	
4.4	Document the upcoming transition in responsibilities between WWC and EU Engineering in developing and operating the R&R plan by describing it in the SSMP. Confirm that field observations from WWC field crew are accounted for by EU Engineering when conducting risk assessment.	
4.5	Augment the ongoing training program by documenting that WWC staff have demonstrated the ability to operate a major piece of equipment (i.e., combo Vactor unit) in accordance with available SOPs to a supervisor before using it for the first time in the field and at a specified frequency (i.e., annually or if equipment is upgraded). The document would need to list a piece of equipment, the name of the journeyman, supervisor, signatures, name of SOP if used, and date.	
4.5	Modify SSMP Section 4.5 to include training on SSOERP.	
6.3	The WWC has developed a table of information specific to lift station response which includes all of the lift stations in the City and lists for each station; the average flow from the station, the wet well depth, the volume of the wet well, the available storage/downtime if the lift station goes down, the point at which a SSO will first occur if the lift station goes down, the assigned manhole for decanting if vacuum trucks are used to draw down the wet well, and the street location of the decant manhole. This information should be included as an Appendix in the OERP and the information for each lift station should be posted onsite at each respective lift station. This list should also be updated to incorporate new lift stations at Washington Blvd and 7600 Sierra College. This was also recommended during the previous audit but has not been implemented.	
6.3	Modify SSOERP Section IV Traffic Control (WWC Personnel) to require WWC Personnel to implement traffic control in every situation where WWC personnel may be at risk of vehicular impact in accordance with MUTCD (part of Caltrans Work Area Traffic Control Handbook). It is recommended that WWC produce several standard TCPs (Traffic Control Plan) to match existing traffic conditions or type of roadway (i.e., arterial, residential, etc.).	
6.3	Modify SSOERP Section V Correct Cause (WWC Personnel) to include a discussion of whether a root-caused SSO could be classified as a PLSD if the City defines a spill cause as the entry point of the root and whether that location is on lower (city) or upper lateral side (private). Include recommendations to provide good documentation of the decision with photographic evidence and a logical narrative.	
6.7	Modify SSOERP Appendix A – Start Time Documentation Policy to include the following WWC standard field practice: If the start time cannot be set based on witnesses and if there is evidence of a spill traveling a farther distance than 15 minutes, then the field crew estimates the new start time and may try to recreate the spill (with clean water) to estimate volumes.	
6.7	Modify SSOERP Appendix C – Water Quality Sampling Procedures to the meet the	

	<p>requirements of the amended MRP.</p> <ul style="list-style-type: none"> Account for spill travel time in the surface water and scenarios where monitoring may not be possible to safety concerns or access restrictions once an SSO has stopped. This may be estimated by dropping floatable debris, for instance, and measuring the time required to travel a certain distance. Expand minimum sampling parameters to include appropriate bacterial indicators that have been specifically listed in the beneficial uses of the City’s waterways or more broadly listed by the regional Basin Plan. 	
6.7	Modify SSOERP Appendix C – Water Quality Sampling Procedures to include a list of all of the required equipment that the employee would need to conduct proper sampling.	
7.3	Modify SSMP Section 7.3 to reflect the change in responsibilities from IWS to WWC.	
7.4	Modify SSMP Section 7.4 to reflect the change in responsibilities from IWS to WWC	
7.6	Modify SSMP Section 7.6 to reflect the change in responsibilities from IWS to WWC	
7.7	Modify SSMP Section 7.7 to reflect the change in oversight from IWS to WWC	
7.7	Document all FSE inspections. Develop a standard FSE inspection form which lists individual elements the FOG WDP permittee is required to maintain in a logical order for the inspector to follow. At a minimum, the inspector should enter the FSE, check the grease removal device, conduct a FOG concentration sample, request and view cleaning/hauling records and associated BMPs. After filling out the inspection form to document the whole procedure, transfer the results of the inspection form into a database or spreadsheet by which WWC can track compliance of the multiple required elements under the permit. Follow up with FSEs as required and formally document the process. Attach a blank version of the inspection form as an appendix in the SSMP.	
7.8	Modify the EU Engineering GIS database to include hotspot assets and FSEs and add them as layers to the maps that WWC receives.	
7.8	Modify SSMP Section 7.8 to describe the process of how pipelines are added to the hot spot cleaning schedule, and remove mention of annual sewer line maintenance work orders	
7.9	Modify SSMP Section 7.9 to reflect the change in responsibilities from IWS to WWC.	
8.2	Modify Appendix I-1 of the SSMP to indicate that the system evaluation and capacity assurance plan will be reviewed and updated every 10 years.	
9.2	Update Appendix I on the City website with information from FY 13/14 and FY 14/15.	
9.3	Update Appendix I and modify it to include document location, responsible person, and review frequency. This was also recommended during the previous audit but has not been	

	completed.	
9.3	Identify the metrics that correspond with specific elements of the SSMP and develop numerical goal ranges so the data currently collected and monitored by the City can be used as performance indicators (PIs) to quantitatively monitor SSMP effectiveness. The ultimate measure of SSMP effectiveness is the limiting of SSOs. However, setting goals for activities related to various SSMP elements and measuring performance against those goals, will help determine how success in those elements, relates to the overall effectiveness of limiting SSOs. Associating metrics with specific SSMP elements will allow for direct assessment of those elements and provide consistency in their evaluation in future audits. Appendix 7.2 of this internal audit contains a list of PI and associates each one with a SSMP element, a suggested audit frequency, and a person responsible for monitoring that PI. A sample Performance Indicator Assessment Form is included in Appendix 7.3 of this internal audit. Performance Indicator Assessment Forms can be developed for each metric and assessed periodically by the person responsible, according to the suggested audit frequency for that metric. At the time of the next internal SSMP audit, the completed Performance Indicator Assessment Forms can be used to evaluate the effectiveness of SSMP elements and included as attachments to the audit. This was also recommended during the previous audit but has not been implemented.	
9.3	Consider tracking additional metrics targeted at measuring the effectiveness of SSMP elements that do not currently have metrics associated with them. A list of potential performance measures listed by SSMP element is included in Appendix 7.2 of this internal audit. This was also recommended during the previous audit but has not been implemented.	
9.4	As discussed in the previous section, use data collected in SSMP Appendix I as a reference, and develop goals for metrics that track preventative maintenance activities and identify the person/position responsible for tracking data against those goals. See Appendix 7.2 for a list of potential performance indicators for preventative maintenance activities with responsible parties. This was also recommended during the previous audit but has not been implemented	
9.6	Using the data collected in SSMP Appendix I as a reference, set performance goals for the metrics used to illustrate SSO trends. See Appendix 7.2 for a list of potential performance indicators related to SSO trends. This was also recommended during the previous audit but has not been implemented.	
10.2	Post the previous SSMP internal audit (FY 11/12 and FY 12/13) and this SSMP internal audit to the City website.	
10.2	Post the most recent City council SSMP recertification (from 2014) the City website.	
10.2	Schedule the next internal SSMP audit for July-August of 2017	

10.2	<p>Revise Appendix J-1 to reflect recommendations for review of performance indicators (i.e., metrics associated with specific SSMP elements and the associated timelines). This was also recommended during the previous audit but has not been implemented.</p> <p>Revise Appendix J-2 (audit form) to provide areas in the tables for each SSMP element to conduct an assessment of both SSMP compliance to Regional Board requirements, and effectiveness of individual SSMP elements. Remove Kim Spears and IWS from the certification of audit table. This was also recommended during the previous audit but has not been implemented.</p>	
10.3	Update the SSMP revision log and post on the website.	
10.3	<p>Document the submittal process for proposed changes to the SSMP. The process may include the following; identify the individual who maintains the most current version of the SSMP, the steps in which suggested modifications are received (by internal staff or the public), how suggestions are routed to the individual/position responsible for the SSMP element associated with suggested modification, the process for review, and the process for updating the SSMP on the City website and documenting changes. This was also recommended during the previous audit but has not been implemented.</p>	
11.2	As of September 2013 the State Water board amended the MRP of the SSS WDR and the City produced a training PowerPoint to City staff, council, and stakeholders regarding the update. Attach the PowerPoint to the SSMP website.	
11.3	Update SSMP Appendix K-4 with FY 13-15 EU marketing Plan budget & spending	
11.4	Add the Agreement Regarding the Operation and Use of Wastewater Services between the Sacramento Area Sewer District (SASD) and the Sacramento Regional County Sanitation District (SRCSD) as attachment K-7 and modify the SSMP to mention it.	
11.4	Modify SSMP 11.4 to include the Agreement Regarding the Operation and Use of Wastewater Services between the Sacramento Area Sewer District (SASD) and the Sacramento Regional County Sanitation District (SRCSD).	

SECTION 7 Appendices

7.1 Appendix – Historical SSO Data

7.2 Appendix – Performance Indicators

7.3 Appendix – Sample Performance Indicator Assessment Form

7.1 Appendix – Historical SSO Data

Dated: FY 2013 - 2015

Date of SSO	Address of SSO	Spill Type	Spill Vol (Gal)	Spill Vol Recovered (Gal)	Spill Recovery %	Spill Cause
7/23/13	618 Lassen Way	Category 3	5	5	100%	Root intrusion
8/29/13	2012 Katherine Place	Category 3	5	5	100%	Root intrusion
8/29/13	605 Oak Street	Category 3	50	50	100%	Root intrusion
9/9/13	149 South Lincoln St	Category 3	2	1	50%	Root Intrusion
10/4/13	311 Evelyn Avenue	Category 3	8	8	100%	Debris-Rags
9/17/13	801 Main Street	Category 3	9	8	89%	Root Intrusion
10/11/13	116 Berry Street	Category 3	10	9	90%	Root Intrusion
10/11/13	528 Royer Street	Category 3	15	15	100%	Root Intrusion
10/11/13	509 Royer St	Category 3	3	3	100%	Root Intrusion
11/6/13	348 W Duranta	Category 3	3	1	33%	Root Intrusion
11/6/13	1004 Crete Way	Category 3	1	1	100%	Root Intrusion
11/6/13	109 Keehner Ave	Category 3	35	35	100%	Root Intrusion
11/8/13	308 Folsom Rd	Category 3	80	75	94%	Debris-General
11/12/13	Roseville St.	Category 3	25	25	100%	Grease Deposition (FOG)
11/6/13	900 Herbert Street	Category 3	5	1	20%	Root Intrusion
11/6/13	503 Sixth Street	Category 3	10	10	100%	Root Intrusion
11/13/13	312 Folsom Rd.	Category 3	10	10	100%	Root Intrusion
11/14/13	SMH C04-356	Category 3	10	10	100%	Grease Deposition (FOG)
12/16/13	214 Cedar	Category 3	2	1	50%	Root Intrusion
12/16/13	Folsom, Cross Street Sutter	Category 3	26	22	85%	Root Intrusion
12/16/13	900 Atlantic St.	Category 3	5	5	100%	Root Intrusion
12/16/13	335 Grove St.	Category 3	1	1	100%	Root Intrusion
12/17/13	607 Windsor	Category 3	5	5	100%	Root Intrusion
12/18/13	168 Donner	Category 3	5	5	100%	Grease Deposition (FOG)
12/17/13	503 Tahoe	Category 3	50	45	90%	Root Intrusion
1/16/14	153 Nevada	Category 3	2	1	50%	Root Intrusion
1/3/14	1044 Magnolia Wy	Category 3	2	2	100%	Root Intrusion
1/15/14	1207 Meadow Lane	Category 3	5	5	100%	Root Intrusion
1/9/14	620 Dawnridge	Category 3	5	5	100%	Root Intrusion

1/14/14	358 Circuit Dr.	Category 3	1	1	100%	Non-Dispersables
1/14/14	806 Joe Anne Lane	Category 3	5	5	100%	Debris-Rags
1/17/14	213 Church St.	Category 3	3	3	100%	Root Intrusion
1/29/14	358 Circuit	Category 3	6	6	100%	Other (specify below)
2/14/14	820 Shearer	Category 3	5	5	100%	Root Intrusion
2/24/14	730 Elefa	Category 3	570	570	100%	Root Intrusion
2/25/14	518 Dudley	Category 3	8	7	88%	Root Intrusion
4/10/14	311 Vernon St	Category 3	30	29	97%	Debris-Rags
4/14/14	211 S. Lincoln	Category 3	1	1	100%	Root Intrusion
4/16/14	1620 Santa Clara	Category 3	15	14	93%	Debris-Rags
4/25/14	204 Sutter Ave.	Category 3	5	4	80%	Root Intrusion
5/15/14	608 Encinal Ave.	Category 3	6	6	100%	Pipe Structural Problem/Failure
5/21/14	1498 Deerfield	Category 3	6	5	83%	Debris-Rags
5/23/14	200 N. Grant	Category 3	5	0	0%	Root Intrusion
6/20/14	1020 Church St	Category 3	5	5	100%	Debris-Rags
6/30/14	2001 Polley	Category 3	30	0	0%	Debris-Rags
7/1/14	1007 Hillcrest	Category 3	80	75	94%	Grease Deposition (FOG)
7/10/14	1809 Piedmont	Category 3	8	5	63%	Root Intrusion
7/15/14	1133 Smith In	Category 3	14	4	29%	Root Intrusion
8/26/14	1707 Sunningdale Dr	Category 3	10	10	100%	Root Intrusion
8/28/14	408 Garden Breeze Ct	Category 3	3	3	100%	Root Intrusion
9/24/14	201 N. Grant	Category 3	20	19	95%	Root Intrusion
9/25/14	1308 Plymouth Ct.	Category 3	100	100	100%	Debris-Rags
9/25/14	1007 Chisum Ct	Category 3	4	4	100%	Root Intrusion
9/25/14	1501 Cardinal Wy.	Category 3	2	2	100%	Root Intrusion
10/7/14	1007 Chisum Ct.	Category 3	2	1	50%	Debris from Construction
10/7/14	2588 McCloud	Category 3	77	77	100%	Root Intrusion
10/8/14	1789 Vista Creek	Category 3	2	1	50%	Pipe Structural Problem/Failure
10/21/14	115 Campo St.	Category 3	5	4	80%	Root Intrusion
10/29/14	7164 Marblethorpe	Category 3	36	11	31%	Root Intrusion

11/17/14	318 Earl	Category 3	18	18	100%	Root Intrusion
10/22/14	7040 Petersborough	Category 3	1	1	100%	Root Intrusion
11/20/14	319 Clinton	Category 3	5	4	80%	Root Intrusion
12/15/14	1198 Ravine View	Category 3	12	1	8%	Root Intrusion
12/11/14	1025 Douglas	Category 3	26	26	100%	Root Intrusion
12/5/14	312 B St.	Category 3	623	623	100%	Grease Deposition (FOG)
1/13/15	7337 Pineschi	Category 3	5	5	100%	Root Intrusion
12/23/14	97 Vernon St.	Category 3	22	19	86%	Root Intrusion
12/18/14	915 Main St	Category 3	17	17	100%	Root Intrusion
12/24/14	1748 Chilton Dr	Category 3	3	3	100%	Root Intrusion
1/14/15	212 C St.	Category 3	10	7	70%	Root Intrusion
1/14/15	1012 Melrose	Category 3	9	7	78%	Root Intrusion
2/23/15	1106 Windermere Av, Roseville Ca.	Category 3	10	8	80%	Root Intrusion
1/28/15	1211 Donahue	Category 3	10	10	100%	Pipe Structural Problem/Failure
2/10/15	504 Diamond Bar	Category 3	3	3	100%	Root Intrusion
2/23/15	1409 Oakmont	Category 3	11	11	100%	Root Intrusion
3/4/15	1212 Stiney Point	Category 3	1	1	100%	Root Intrusion
2/25/15	1044 Treasure Ln.	Category 3	2	2	100%	Debris-Rags
3/27/15	1700 Hiawatha	Category 3	21	5	24%	Non-Dispersables
3/13/15	605 Mayfair	Category 3	12	10	83%	Root Intrusion
4/16/15	114 Vernon St.	Category 3	43	43	100%	Root Intrusion
3/26/15	311 Main St	Category 3	17	16	94%	Pipe Structural Problem/Failure
4/16/15	332 Irene	Category 3	5	3	60%	Root Intrusion
4/16/15	313 Coronado	Category 3	10	10	100%	Pipe Structural Problem/Failure
5/21/15	213 Irene	Category 3	5	5	100%	Root Intrusion
5/13/15	411 Loretto Dr	Category 3	1	1	100%	Root Intrusion
6/3/15	214 Coronado Ave	Category 3	5	0	0%	Pipe Structural Problem/Failure
6/19/15	902 Avalon Ct	Category 3	5	5	100%	Root Intrusion
6/15/15	1415 McBride	Category 3	15	15	100%	Root Intrusion
7/9/15	2801 Courtside	Category 3	3	1	33%	Non-Dispersables

7.2 Appendix – Performance Indicators

SSS WDR Element	SSS WDR Ref.	Description	Performance Indicator	Unit	Target	City SSMP (section)	Utility Metrics (SSMP Appendix I)	WW Collections KPI.doc	Program / Performance Report FY12/13	Strategic Plan Data FY12/13.xls	Performance Metrics.xls	Suggested Audit Frequency	Suggested Responsible Party	
Organization	D.ii.c	Chain of communication	Average response time to customer inquiry	Minutes	40		Data	40	-	-	-	Quarterly	Office Assistant	
			Total customer service requests	Number	0	(9.6)	Data	-	-	-	-	Quarterly	Office Assistant	
			Total sewer odor complaints	Number	0	(9.6)	Data	-	-	-	-	Quarterly	Office Assistant	
			Average rating in feedback survey card	Number	5	-	Data	-	-	-	-	Quarterly	Office Assistant	
D.iv.b	PM activities	Manholes - cleaned & visually inspected per year	Number		(9.4)	-	-	-	-	-	-	Quarterly	WWC Supervisor	
		Sewer main - flushed per year	Miles	250	(9.4)	Data	250	250	250	-	-	Quarterly	WWC Supervisor	
		Service laterals - cleaned per year	Miles	8	-	-	-	8	-	-	-	Quarterly	WWC Supervisor	
		Service laterals - mechanically cleaned (eeced) per year	Miles	8	(9.4)	-	-	-	8	-	-	Quarterly	WWC Supervisor	
		Working staff time to PM program	%	80	-	-	-	80	-	-	-	Quarterly	WW Superintendent	
		Number of customer accounts per wastewater employee	Number	561	(9.4)	Data	-	-	-	-	-	Quarterly	WW Superintendent	
		Average cost of hydro cleaning	\$/lf	0.36	-	Data	-	-	-	-	-	Annually	WW Superintendent	
		Average cost of sewer mechanical cleaning	\$/lf	1.6	(9.4)	Data	-	-	-	-	-	Annually	WW Superintendent	
		Manholes - rehabilitated (i.e., lined with CIPP)	Number	25	-	-	-	25	-	-	-	Annually	Rehabilitation Manger	
		Sewer main - CCTV inspected per year	Miles	30	(9.4)	Data	30	30	30	-	-	Quarterly	WWC Supervisor	
		Service laterals - CCTV inspected per year	Miles	16	-	Data	-	8	16	-	-	Quarterly	WWC Supervisor	
		Service laterals - rehabilitated per year	Number	50	(9.4)	-	50	50	50	-	-	Quarterly	WW Superintendent	
		Cleanouts - installed per year	Number	100	-	-	100	100	75	-	-	Quarterly	WWC Supervisor	
		Total miles rehabed or replaced per year (main)	Miles	5	(9.6)	Data	-	-	-	-	-	Annually	Rehabilitation Manger	
		Total miles rehabed or replaced per year (lateral)	Miles	0.25	(9.6)	Data	-	-	-	-	-	Annually	Rehabilitation Manger	
		Annual capital budget for sewer rehab/replacement	\$M	1.8	-	Data	-	-	-	-	-	Annually	Rehabilitation Manger	
		Average cost of CCTV (main)	\$/lf	0.53	(9.4)	Data	-	-	-	-	-	Annually	WW Superintendent	
		Average cost of CCTV (lateral)	\$/lf	1.34	-	Data	-	-	-	-	-	Annually	WW Superintendent	
D.iv.d	Training	On-the-Job accidents	Number	0	-	-	-	0	0	-	Quarterly	Safety Manager		
D.iv.e	Critical Parts	% of required number of identified critical parts are stocked	%	100	-	-	-	-	-	-	Annually	Materials Technician		
Design	D.v.a & b	Construction	% of new sewer main construction accepted vs. inspected	%	100	(9.6)	Data	-	-	-	-	Annually	GIS Manager	
			% of new sewer lateral construction accepted vs. inspected	%	100	(9.6)	Data	-	-	-	-	Annually	GIS Manager	
OERP	D.vi.a	Notification	Average response time to SSO	Minutes	40	-	Data	-	-	-	-	Quarterly	WWC Supervisor	
	D.vi.b	SSO response	Average SSO duration (main)	Minutes	40	-	-	-	-	-	-	Quarterly	WWC Supervisor	
FOG	D.vii.a	Public education	Average SSO duration (lateral)	Minutes	40	-	-	-	-	-	-	Quarterly	WWC Supervisor	
	D.vii.b	FOG disposal	FOG public education outreach program events per year	Number	4	-	-	-	-	-	-	Annually	Administrative Analyst	
	D.vii.d	BMPs & Devices	Number of curbside FOG pickups per year	Number	25	-	-	-	-	-	-	Annually	Refuse Division	
			% of CCTV inspections with grease observations (DAGS, >20%)	%	5	-	-	-	-	-	-	Quarterly	WWC Supervisor	
	D.vii.e	FOG inspections	% of total FSEs with grease removal devices or waiver/variance	%	100	-	-	-	-	-	-	Annually	WW Superintendent	
			% of total FSEs with a variance	%	5	-	-	-	-	-	-	Annually	WW Superintendent	
	D.vii.f	Hot Spots	FSE FOG inspections per year	Number	319	-	-	-	-	-	-	Quarterly	WW Superintendent	
SECAP	D.viii.a	Evaluation	% of hot spot pipes CCTV inspected each year	%	100	-	-	-	-	-	-	Annually	WW Superintendent	
			Number of spills caused by hot spots	Number	0	-	-	-	-	-	-	Quarterly	WW Superintendent	
MMM	D.ix.e	SSO trends	Volume of spill volume caused hot spots	Gal	0	-	-	-	-	-	-	Quarterly	WW Superintendent	
			Frequency for capacity assurance evaluation (hydraulic model)	Years	10	App I	-	-	-	-	-	-	Annually	EU Engineering
			Total number of SSOs, mains and laterals	Number	76	(9.6)	Data	-	-	-	-	-	Quarterly	WW Superintendent
			Total SSO volume, mains and laterals	Gal	2000	(9.6)	Data	-	-	-	-	-	Quarterly	WW Superintendent
			% of total SSO volume recovered	%	100	-	Data	-	-	-	-	-	Quarterly	WW Superintendent
			Total number of wet weather SSOs	Number	0	(9.6)	Data	-	-	-	-	-	Quarterly	WW Superintendent
			Total volume of wet weather SSOs	Gal	0	(9.6)	Data	-	-	-	-	-	Quarterly	WW Superintendent
			% of SSOs caused by FOG (main)	%	1	(9.6)	Data	-	-	-	-	-	Quarterly	WW Superintendent
			% of SSOs caused by roots (main)	%	70	(9.6)	Data	-	-	-	-	-	Quarterly	WW Superintendent
			% of SSOs caused by Vandalism (main)	%	0	(9.6)	Data	-	-	-	-	-	Quarterly	WW Superintendent
			Number of SSOs caused by LS failures	Number	0	(9.6)	Data	-	-	-	-	-	Quarterly	WW Superintendent
			Number of SSOs caused by pipe failures	Number	0	(9.6)	Data	-	-	-	-	-	Quarterly	WW Superintendent
			% of SSO volume caused by FOG (lateral)	%	10	(9.6)	Data	-	-	-	-	-	Quarterly	WW Superintendent
			% of SSO volume caused by roots (lateral)	%	75	(9.6)	Data	-	-	-	-	-	Quarterly	WW Superintendent
			% of SSO volume caused by Vandalism (lateral)	%	0	(9.6)	Data	-	-	-	-	-	Quarterly	WW Superintendent
			Repeat SSOs within two years	Number	0	(9.6)	Data	0	-	-	-	-	Quarterly	WW Superintendent
			Category 1 SSOs	Number	0	-	-	0	0	-	-	-	Quarterly	WW Superintendent
			Category 2 SSOs	Number	6	-	-	-	-	-	-	-	Quarterly	WW Superintendent
			SSOs / 100 mi pipe / year - Category 3	Number	2.0	-	-	-	2.0	-	-	-	Quarterly	WW Superintendent
			SSOs / 100 mi pipe / year - Lateral	Number	15.0	-	-	-	8.0	-	-	8	Quarterly	WW Superintendent
SSOs / 100 mi pipe / year - Mainline	Number	0.6	-	-	-	0.6	-	-	0.6	Quarterly	WW Superintendent			
Flooding claims per year	Number	0	(9.6)	Data	-	-	-	-	-	Annually	WW Superintendent			
Total cost of claims per year	\$	0	(9.6)	Data	-	-	-	-	-	Annually	WW Superintendent			

Legend
Green Text Indicates the goal for the respective performance measure as stated in the associated document.
"Data" Indicates that is recorded and tracked but no goal is defined in the associated document.

7.3 Appendix – Sample Performance Indicator Assessment Form

Goal: MRP
(FY 2014 / 2015)

Responsible Person (RP): WWC Superintendent

Description of Performance Indicator(s) (PIs):

The State Water Board has recently concluded that the existing Monitoring and Reporting Program must be amended to remain adequate enough to advance the Sanitary Sewer Overflow Reduction Program objectives, assess compliance, and enforce the requirements of the Sanitary Sewer Systems Waste Discharge Requirements. The amended MRP will become effective on September 9, 2013 concurrent with the routine bimonthly CIWQS maintenance release. The Wastewater Collection Division is responsible for submitting, signing, and certifying all reports required by the SSS WDRs and the amended MRP order. The PIs listed below track the completion of tasks necessary for the City to remain compliant with the SSS WDRs.

PIs and Data Analysis Methods:

1. *Completion of unpopulated fields in revised "Collection System Questionnaire"*
Discussion & Scoring Criteria: The City has three (3) months after September 9, 2013 to complete all unpopulated fields in the revised "Collection System Questionnaire" before the CIWQS locks you out from all reporting. After the questionnaire is completed, the system will default back to the annual update requirement and lock you out from all reporting only if the questionnaire is not updated at least annually.

2. *Update of OERP section in SSMP*
Discussion & Scoring Criteria: The Overflow and Emergency Response Plan section of the City's SSMP must be updated in accordance with the amended MRP by January 21 2014, when a board review of the SSMP will take place.

PI	Exceeding Goal?	Met Goal?	Below Goal?
1	All unpopulated fields completed by December 9, 2013.	N/A	All or some of the unpopulated fields not completed by December 9, 2013.
2	OERP section fully updated in SSMP before review.	N/A	OERP section never, or only partially, updated before review.

Performance Tracking		
PI	Measured Value	Performance Assessment Comments
1		
2		

Recommendations for Programmatic or SSMP Updates

PI 1 – Completion of unpopulated fields in revised “Collection System Questionnaire”

Recommendation:

PI 2 – Update of OERP section in SSMP
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Recommendation:

Signature of Responsible Person: (sign when complete)
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Date:

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