

CITY OF ROSEVILLE

Sewer System Management Plan (SSMP)

Three-Year Audit for FY 15/16 – FY 17/18

Date: September 19

Prepared by: Michael Fisher, P.E., Water Works Engineers
 Tim Lewis, P.E., Water Works Engineers
 Mohsen Karbakhsh, E.I.T., Water Works Engineers

Assisted by: Chris Bracco, City Wastewater Superintendent
 Dan Pruden, City Wastewater Supervisor



Table of Contents

| | | |
|-----------|--|----|
| SECTION 1 | Audit Objectives | 3 |
| SECTION 2 | Agency Background / System Information | 4 |
| 2.1 | Review of Last SSMP Audit | 5 |
| 2.2 | Review of FY 15/16, FY 16/17, and FY 17/18..... | 11 |
| SECTION 3 | SSO Trends..... | 11 |
| 3.1 | Historical SSO Data | 11 |
| 3.2 | Performance Measures | 15 |
| SECTION 4 | Audit Procedure..... | 16 |
| 4.1 | Review of SSMP Compliance | 16 |
| 4.2 | Review of SSMP Effectiveness | 16 |
| SECTION 5 | Audit of SSMP Elements | 17 |
| 5.1 | Goals..... | 17 |
| 5.2 | Organization | 17 |
| 5.3 | Legal Authority | 19 |
| 5.4 | Operation and Maintenance Program | 21 |
| 5.5 | Design and Performance Provisions..... | 24 |
| 5.6 | Overflow Emergency Response Plan | 25 |
| 5.7 | FOG Control Program | 28 |
| 5.8 | System Evaluation and Capacity Assurance Plan | 30 |
| 5.9 | Monitoring, Measurement, and Program Modifications | 32 |
| 5.10 | SSMP Program Audits..... | 36 |
| 5.11 | Communication Program | 37 |
| SECTION 6 | Audit Summary | 38 |
| SECTION 7 | Appendices | 43 |
| 7.1 | Appendix – Historical SSO Data | A |
| 7.2 | Appendix – SSO Data Comparison Charts | B |
| 7.3 | Appendix – Structural SSO GIS Mapping | C |

| | | |
|-----|---|---|
| 7.4 | Appendix – Key Performance Indicators | D |
| 7.5 | Appendix – Change Log Example..... | E |

List of Tables

| | |
|---|----|
| Table 1 – Overview of Collection System | 4 |
| Table 2 – Summary of Findings from the Last SSMP Internal Audit..... | 5 |
| Table 3 – CIWQS and City SSO Historic Data | 11 |
| Table 4 – Regional Comparison of SSO Data | 13 |
| Table 5 – Leading Causes of SSOs in FY15-18 (results from FY13-15 in parenthesis) | 14 |
| Table 6 – Performance Measures..... | 15 |
| Table 7 – Compliance with SSS WDR D.13.i - Goals | 17 |
| Table 8 – Compliance with SSS WDR D.13.ii - Organization..... | 17 |
| Table 9 – Compliance with SSS WDR D.13.iii – Legal Authority | 19 |
| Table 10 – Compliance with SSS WDR D.13.iv – O&M Program | 21 |
| Table 11 – Performance Measures related to SSS WDR D.13.iv(b)..... | 22 |
| Table 12 – Performance Measures related to SSS WDR D.13.iv (c) | 23 |
| Table 13 – Compliance with SSS WDR D.13.v – Design and Performance Provisions..... | 24 |
| Table 14 – Compliance with SSS WDR D.13.vi - OERP | 25 |
| Table 15 – Compliance with SSS WDR D.13.vii – FOG Control Program | 28 |
| Table 16 – Compliance with SSS WDR D.13.viii - SECAP..... | 30 |
| Table 17 – Compliance with SSS WDR D.13.ix – MMM..... | 32 |
| Table 18 – Recommended Additional Performance Indicators | 33 |
| Table 19 – Current Performance Measures to Monitor SSO Trends..... | 35 |
| Table 20 – Compliance with SSS WDR D.13.x – SSMP Program Audits..... | 36 |
| Table 21 – Compliance with SSS WDR D.13.xi – Communications Program..... | 37 |
| Table 22 – Summary of SSMP Compliance Deficiencies..... | 39 |
| Table 23 – Summary of Audit Recommendations..... | 39 |

List of Figures

| | |
|--|----|
| Figure 1 – Number of SSOs per Fiscal Year..... | 12 |
| Figure 2 – Average Gallons per SSO | 13 |
| Figure 3 – Average SSO Volume per Cause | 14 |

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 2015-2016 (FY 15/16), 2016-2017 (FY 16/17), and 2017-2018 (FY 17/18). The goal of the SSMP is to provide a written framework and plan for properly managing, operating, and maintaining all parts of the sanitary sewer system (collection system). The SSMP will help the City minimizing sanitary sewer overflows (SSOs) and complying 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 SSMP audit evaluates the effectiveness of the SSMP, by reviewing the performance of the collection system against the performance measures used by the City to evaluate compliance with 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. Recently, the SWRCB is proposing a statewide sanitary sewer system order reissuance. The proposed reissuance, which will be built on the existing general order, is planned to be adopted in 2020, with a primary focus of reducing the statewide spill volume. This audit briefly discusses the proposed reissued order by the SWRCB and considers recommendations for future compliance.

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 (WWE) to conduct the FY 11/12-12/13 and FY 13/14-14/15 biennial audits. This audit reviews results of the FY 15/16, 16/17, and 17-18, which is a three-year program. The key objective of this Audit is to review the SSMP compliance, implementation, and effectiveness. This report includes the following key tasks:

1. Review records from previous Audits and confirm deficiencies have been addressed (SECTION 2).
2. Evaluate the City’s historical SSO data and performance measures listed in the SSMP (SECTION 3).
3. Using a standardized audit procedure detailed in 0 , identify deficiencies and provide recommendations that could improve the effectiveness of the SSMP and its compliance with the future reissue order.
4. Analyze the City’s preventative maintenance (PM) and rehabilitation and replacement (R&R) programs as it relates to the operation and maintenance of the collection system (Section 5.4).
5. Review the Sanitary Sewer Overflow Emergency Response Plan (SSEORP) for SSOs and identify improvements as needed (Section 5.6).
6. Document all findings during the Audit and retain it on file (SECTION 6).

SECTION 2 Agency Background / System Information

The City of Roseville, in Placer County, is located 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 43 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 6% since the last internal audit to now serve approximately 137,000 people. **Table 1** lists key information about the City collection system over the past three Audit periods.

Table 1 – Overview of Collection System

| Audit | FY 11/12 – 12/13 | FY 13/14 – 14/15 | FY 15/16 – 17/18* |
|-----------------------------------|-------------------------|--------------------------|---------------------------|
| Miles of Mainline | 485.52 | 501.11 | 515.7 |
| Miles of laterals (lower) | 235.3 | 238 | 266 |
| Pump stations | 14 | 15 | 16 |
| Sewer service lateral connections | 41,568 | 43,619 | 47,638 |
| Population served | 122,060 | 128,832 | 137,213 |
| WWC Staff | 25 | 28 | 29 |
| Annual Budget (FY1/ FY2/ FY3) | \$3,400,000/ \$3,800,00 | \$3,700,000/ \$4,000,000 | \$5,069,000/ \$5,279,0000 |
| Category 1 SSOs | 2 | 0 | 1 |
| Category 2 SSOs | 75 | 0 | 1 |
| Category 3 SSOs | - | 89 | 85 |

*Three-year audit

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. A small portion of the City’s collection system discharges outside of Roseville and into the Sacramento Area Sewer District (SASD) collection system, which 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 audit for of the City SSMP was conducted by WWE for FY 13/14-14/15 and was completed in June 2016. In the last Audit, a list of approximately 47 recommended actions to address deficiencies or improve the effectiveness of the City SSMP were listed. **Table 2** summarizes identified deficiencies and associated action items, along with a description of the status of the task (i.e., Completed, Ongoing Updates, In/No Progress, Considered) outlined in the last SSMP audit. 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 | Modify Appendix B-1: Add Wastewater Collections Supervisor Dan Pruden to Appendix B-1. | Completed |
| | 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. | Ongoing Progress |
| | 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. | Completed |
| | 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. | Completed |
| | Move the FOG Control Program SSMP responsibility into the WWC Superintendent category and the WWC Office Assistant category. | Completed |
| | 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. | In Progress |

| | | |
|---------------------|---|------------------|
| | Modify Appendix F-1 Flowchart: Follow the same recommendations written above. | Completed |
| 3 – Legal Authority | Update SSMP section 3.7 to include the Wastewater Service Contract and Operating Agreement between the City, SASD, and SRCSD. | Completed |
| 4 – O&M | Include the Mapping Update Policy Document as an appendix to the SSMP and post it to the City’s SSMP website page. | Completed |
| | 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. | Ongoing Progress |
| | 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. | No Progress |
| | 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. | No Progress |
| | 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. | Completed |
| | Modify SSMP Section 4.5 to include training on SSOERP. | Completed |
| 6 – OERP | 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. | In Progress |

| | | |
|-------------------------|--|-------------|
| | <p>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.).</p> | Completed |
| | <p>Modify SSOERP Section V Correct Cause (WWC Personnel) to include a discussion of whether a root-caused SSO could be classified as a Private Lateral Sewage Discharge (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.</p> | Completed |
| | <p>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.</p> | Completed |
| | <p>Modify SSOERP Appendix C – Water Quality Sampling Procedures to the meet the 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. | No Progress |
| | <p>Modify SSOERP Appendix C – Water Quality Sampling Procedures to include a list of all the required equipment that the employee would need to conduct proper sampling.</p> | No Progress |
| 7 – FOG Control Program | <p>List Maurice Chaney as the responsible party for the FOG Public Education Plan.</p> | Completed |
| | <p>Modify SSMP Section 7.3 to reflect the change in responsibilities from IWS to WWC.</p> | Completed |
| | <p>Modify SSMP Section 7.4 to reflect the change in responsibilities from IWS to WWC.</p> | Completed |

| | | |
|-----------|--|------------------|
| | Modify SSMP Section 7.6 to reflect the change in responsibilities from IWS to WWC. | Completed |
| | Modify SSMP Section 7.7 to reflect the change in oversight from IWS to WWC. | Completed |
| | 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. | Completed |
| | Modify the EU Engineering GIS database to include hotspot assets and FSEs and add them as layers to the maps that WWC receives. | Ongoing Progress |
| | 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. | Completed |
| | Modify SSMP Section 7.9 to reflect the change in responsibilities from IWS to WWC. | Completed |
| 8 – SECAP | 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. | No Progress |
| 9 – MMM | Update Appendix I on the City website with information from FY 13/14 and FY 14/15. | In Progress |
| | 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. | In 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. 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 | In Progress |

| | | |
|--------------------------|---|-------------|
| | 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. | In Progress |
| | 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. | In Progress |
| | 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. | Completed |
| 10 – SSMP Program Audits | Post the previous SSMP internal audit (FY 11/12 and FY 12/13) and this SSMP internal audit to the City website. | Completed |
| | Post the most recent City council SSMP recertification (from 2014) the City website. | Completed |
| | Schedule the next internal SSMP audit for July-August of 2017. | 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). This was also recommended during the previous audit but has not been implemented. | In Progress |
| | Revise Appendix J-2 (audit form) to provide areas in the tables for each SSMP element to assess 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. | In Progress |
| | Update the SSMP revision log and post on the website. | No Progress |

| | | |
|-------------------------------|---|--------------------|
| | <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> | <p>No Progress</p> |
| <p>11 - Communication</p> | <p>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.</p> | <p>No Progress</p> |
| | <p>Update SSMP Appendix K-4 with FY 13-15 EU marketing Plan budget & spending.</p> | <p>No Progress</p> |
| | <p>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.</p> | <p>No Progress</p> |
| | <p>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).</p> | <p>No Progress</p> |

2.2 Review of FY 15/16, FY 16/17, and FY 17/18

The City has prioritized eliminating SSOs from the collection system and was successful preventing Category 1 SSOs during the FY 15/16-16/17 period. However, during the FY 17/18, one Category 1 SSO occurred, which was resulted by an equipment failure (Vacuum truck). This incident caused 342 gal of spill, of which 97% was recovered and 7 gal of it reached the state’s surface waters. During this period, only one Category 2 SSOs occurred (FY 15/16), which was resulted by a pipe/structure failure. This event spilled 2020 gallons of sewage from a mainline, most of which was captured and recovered. In addition, the city experienced two Category 3 spills larger than 500 gallons, from which, one occurred on a mainline (caused by debris) and one occurred on a lower lateral, which was caused by roots. All remaining spills were less than 100 gallons, of which, four of them occurred on mainlines.

SECTION 3 SSO Trends

3.1 Historical SSO Data

A total of 85 Category 3 SSOs occurred during the audit period FY15/16 (38 SSOs), FY16/17 (23 SSOs), and FY17/18 (24 SSOs). **Appendix 7.1** of this report includes the date, location, type, volume, volume recovered, and recovery percentage of total volume of each SSO 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, for the three-year audit period. As shown, Table 3 shows how accurately CIWQS data reflect the City’s records, with few exceptions, details of which are listed in **Appendix 7.2**. 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 15/16 | Internal Records FY 15/16 | CIWQS Data FY 16/17 | Internal Records FY 16/17 | CIWQS Data FY 17/18 | Internal Records FY 17/18 |
|---|---------------------------|---------------------------------|---------------------------|---------------------------------|---------------------------|---------------------------------|
| Total number of potential SSO service calls received | - | 266 | - | 252 | - | 259 |
| Total number of SSOs reported | 39 | 39 | 23 | 23 | 25 | 25 |
| Total volume of SSOs [Gal] | 2525 | 2525 | 1081 | 1081 | 1531 | 1565 |
| Total volume of SSOs that reached waters of the state [Gal] | 0 | 0 | 0 | 0 | 7 | 7 |
| Volume of SSOs recovered [%] | 95% | 95% | 91% | 91% | 53% | 54% |
| Average SSO response time [h:mm] | 0:25 | 0:25 | 0:18 | 0:18 | 0:15 | 0:20 |
| Average SSO duration time [h:mm]* | 2:59 | 2:56 | 6:22 | 6:22 | 6:49 | 6:49 |

* Including long-duration SSO events (> 3 hours long) that increased the average SSO duration.

The following section 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 category and number of SSOs since FY 06/07. 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. **Figure 1** shows a declining trend on the total number of SSO events per year since FY 13/14 and is mostly limited to Category 3 SSOs.

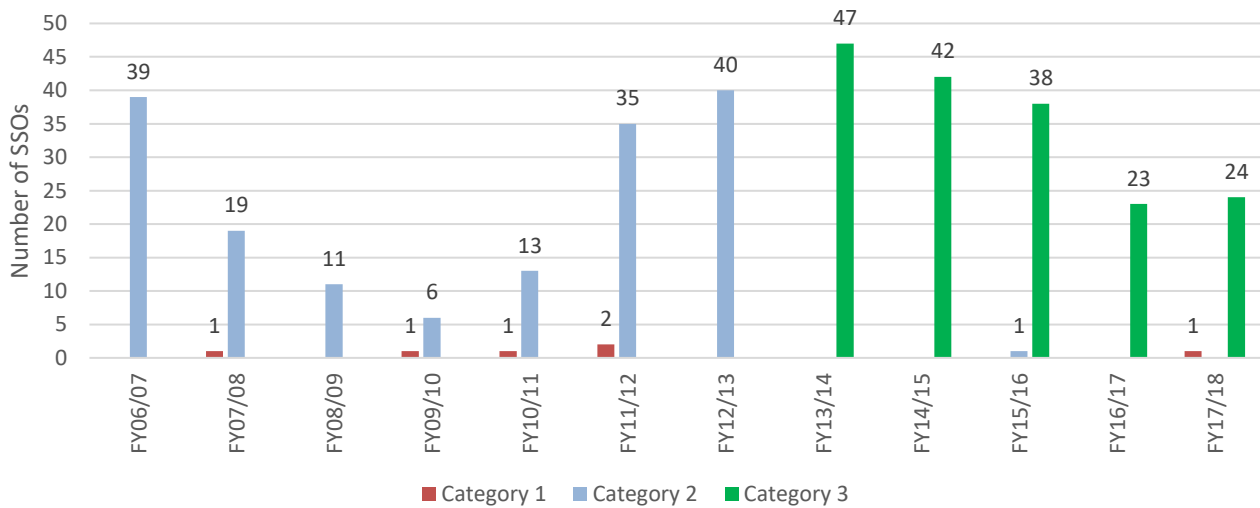


Figure 1 – Number of SSOs per Fiscal Year

With the goal of minimizing the spill volume, another valuable source of analysis is comparing average gallons spilled per SSO across fiscal years. **Figure 2** demonstrates average volume per SSO event since 2007, which equally weight out all spills and shows an annual average. Although, the number of SSO events has dropped over the years (See **Figure 1**), **Figure 2** indicates that the average spill volume per incident has been increased during this audit period. This trend was also observed by the SWRCB throughout the state. Although the number of statewide events has dropped over the years, but the spill volume has increased. Also, two wet seasons of FY 15/16 and 17/18 can also be clearly identified in **Figure 2**. In case of City of Roseville, it appeared that the high average volume was caused by the few high-volume spills occurred in FY15/16 and 17/18, majority of which was recovered. As mentioned, one of these high-volume incidents occurred by a main pipe/structure failure (FY 15/16: 2020 gallons) and the second largest spill was caused by roots in a lower lateral (FY 16/17: 760 gallons). Given the past records, **Figure 2** shows an average value of about 40 gal/SSO throughout the years. After reviewing the City’s performance measures, it appears that the resulted high average volumes were most likely incidental driven and were not related to the SSMP effectiveness or the system performance. In addition, analysis of the City’s SSO data showed that in about 18% of the events the City’s staff did not see an active spill, in other words, these spills were ended before arrival of the staff. These incidents correspond to 5% of the total spill volume during this audit period.

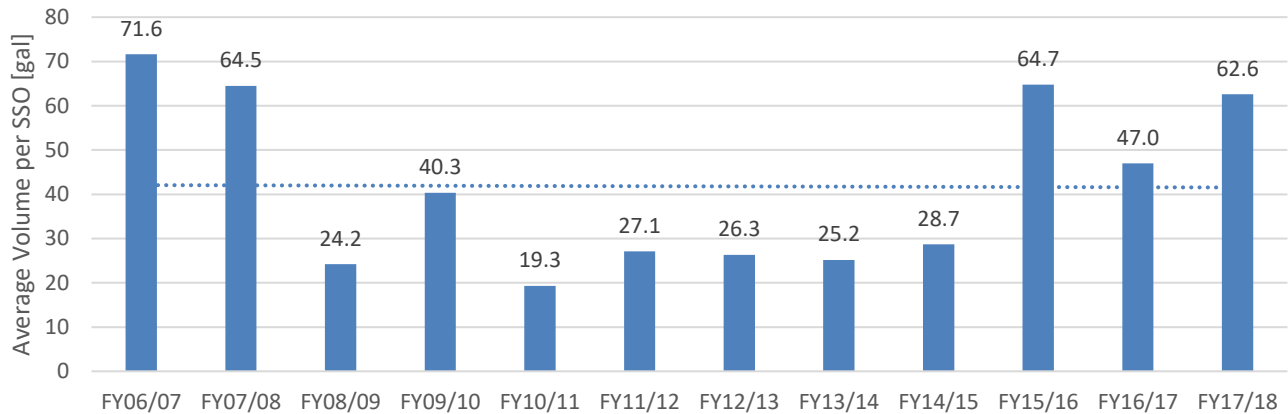


Figure 2 – Average Gallons per SSO

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

https://www.waterboards.ca.gov/water_issues/programs/sso/#prgm_docs

https://www.waterboards.ca.gov/board_info/exec_dir_rpts/

The board has not published similar data for fiscal years later than 2016. However, as shown in **Table 4**, 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 | | | Average Spill Volume per 100 miles [gallons] | | |
|-------------|---------------------------------|---------------|-------|--|---------------|--------|
| | City | Region 5 | State | City | Region 5 | 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 | 9.91 | 4.65 | 163 | 6,324 | 11,484 |
| 2015/16* | 4.99 | 8.76 | 4.01 | 323 | 7,484 | 25,134 |
| 2016/17 | 2.94 | Not Available | | 138 | Not Available | |
| 2017/18 | 3.20 | Not Available | | 196 | Not Available | |

* These values do not include laterals in the total system size.

Table 5 demonstrates the leading causes of SSOs in this audit period compared to the previous audit period (FY 13/14-14/15). Generally, given the three-year period, number of SSOs caused by roots has decreased, but the volume has increased by 23%, which resulted in a higher average SSO volume. Also, FOG related events have decreased significantly during this period. However, SSOs caused by debris and pipe/structure failure have experienced a notable volume increase comparing to the previous audit period. Furthermore, no Capacity-caused SSOs was observed in this audit period and only one accidental truck incident caused a Category 1 event.

Table 5 – Leading Causes of SSOs in FY15-18 (results from FY13-15 in parenthesis)

| By Number | | By Volume | | By Average Volume per SSO | |
|--------------|---------|--------------|-------------|---------------------------|-----------|
| Cause | Number | Cause | Gallons | Cause | Gallons |
| Roots | 62 (63) | Roots | 1576 (1281) | Roots | 25 (20) |
| FOG | 2 (5) | FOG | 67 (743) | FOG | 34 (149) |
| Debris | 15 (15) | Debris | 908 (314) | Debris | 61 (21) |
| Pipe Failure | 7 (6) | Pipe Failure | 2278 (50) | Pipe Failure | 325 (8) |
| Capacity | 0 (0) | Capacity | 0 (0) | Capacity | 0 (0) |
| Others* | 1 (0) | Others* | 342 (0) | Others* | 342 (0) |
| Total | 87 (89) | Total | 5171 (2388) | Total | 787 (198) |

*Includes a vacuum truck incident for this audit (past audit includes an SSO caused by an act of vandalism).

To track the leading SSO cause, WWE summarized the average SSO volume per cause for the past three audit periods, results of which are shown in **Figure 3**. The actions planned because of this SSMP Audit will target the leading causes to most effectively reduce the number and more importantly spill volume of SSOs. As shown here, the FY15/16-17/18 period has experienced similar average volume of root caused SSOs, lower FOG related spill volumes, and slightly higher debris caused spills. However, as shown here, pipe/structure failure caused SSOs and incidental SSOs have increased during this period and since these are typically corresponded with high volume spills over small number of SSOs, these averages are significantly higher than the rest.

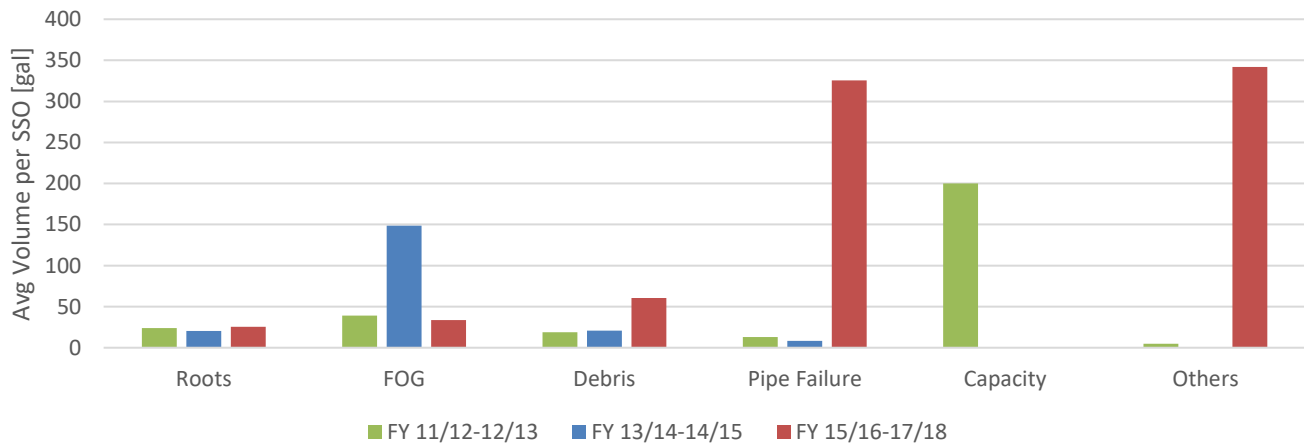


Figure 3 – Average SSO Volume per Cause

3.2 Performance Measures

To achieve proper operation and management of the sanitary sewer system and to prevent SSOs, the City utilizes multiple performance measures to assess the effectiveness of the SSMP. 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.)
- Average 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 SSO record were queried to analyze each performance measure from FY 11/12 to FY 17/18 and the data is shown in **Table 6** below. Overall, despite the decrease in the number of SSOs during this audit period, the City’s SSO average has increased compared to previous years, which was due to few high-volume incidents, caused by pipe/structure failure and accidental spills.

Table 6 – Performance Measures

| Performance Measures | | FY 11/12 | FY 12/13 | FY 13/14 | FY 14/15 | FY 15/16 | FY 16/17 | FY 17/18 |
|---------------------------------------|------------------------|----------|----------|----------|----------|----------|----------|----------|
| SSO Rate, SSOs/100 mi | | 4.88 | 5.85 | 6.39 | 5.71 | 4.99 | 2.94 | 3.20 |
| SSO Cause | FOG | 0 | 1 | 4 | 1 | 2 | 0 | 0 |
| | Roots | 18 | 30 | 32 | 31 | 30 | 20 | 12 |
| | Debris* | 8 | 2 | 8 | 2 | 4 | 2 | 9 |
| | Pipe/Structure Failure | 6 | 4 | 2 | 7 | 3 | 1 | 3 |
| | Vandalism | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Capacity | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| | Construction | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| | Unknown/Other | 2 | 3 | 1 | 0 | 0 | 0 | 1 |
| Average SSO Vol (gal) | | 27 | 26 | 25 | 29 | 65 | 47 | 63 |
| % of SSOs > 100 gal | | 2.8% | 2.3% | 2.1% | 4.7% | 2.6% | 4.3% | 8.0% |
| Category 1 % of Total SSOs | | 0% | 7% | 0% | 0% | 0% | 0% | 22.3% |
| % of Spill Volume Recovered | | 99% | 63% | 94% | 93% | 95% | 91% | 54% |
| % of Spill Vol Reaching Surface Water | | 0% | 37% | 0% | 0% | 0% | 0% | 0.4% |

*Includes non-dispersible and rags

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. Also, according to recent SWRCB WDR workshops, it is expected that the statewide general order reissuance, with the primary focus on reducing spill volume, emphasis on the following:

- **Requirements focused on spill volume:** Although the total number of spills has decreased over the past few years, the CIWQS data has shown that the state experienced higher volume of spills. While, this could be caused by the previous wet seasons, the proposed reissuance will likely require enrollees to demonstrate system-specific spill reduction programs.
- **Improved Data Quality:** With the goal of enhancing data accuracy, additional measures are being considered to provide higher quality spill volume data, such as maintaining certified operators and emphasizing on staff training.
- **Enhanced Order Enforceability:** To address poor performing systems and those with lack of SSMP implementation.
- **To Incentivize Order Compliance:** To recognize and acknowledge systems with good performance.
- **Effective Planning for System Resilience:** To ensure effective and adaptive planning for spill reduction.

This section details the procedures used to meet the existing order, while considering future expectations.

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 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

After 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 seven 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: Post Appendix A-1 – Roseville’s SSMP Development Plan and Implementation Schedule on the website.

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: 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.
 - Post the following Appendices on the website:
 - Appendix B-1 – Personnel Responsible for SSMP Elements
 - Appendix B-2 – Personnel Responsible for SSO Reporting
 - Appendix B-3 – Personnel Responsible for Responding to SSOs Weekly Standby

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 is outlined in Section 2.2 of the SSMP.
- Recommendations: No recommendations at this time.

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 to: 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 remained below the 40-minute target. Only 6 SSO response times were above 40 minutes during the audit period (1:48:00, 3:15:00, 0:45:00, 0:42:00, 0:45:00, and 0:45:00) which totaled 31 gallons in spills and the remaining 93% of the responses were under 40 min.
- 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.
 - Include Figure 2-2 flowchart as Appendix F to the SSOERP (Appendix F-1) and mention in the text.

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: Post Appendix C-1 – Pretreatment Program Enforcement Response Plan on the website.

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: Update the related links for Appendices C-3 and C-4 for sanitary sewer design and construction.

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: Post the following Appendices on the website:
 - Appendix C-5 – Joint Exercise of Powers Agreement for the South Placer Wastewater Authority
 - Appendix C-6 – Agreement Regarding the Operation and Use of the South Placer Regional Wastewater Facilities
 - Appendix C-7 – Wastewater Service Agreement by Contract and Operating Agreement between SASD, SRCSD and City of Roseville

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 to ensure mapping is correct and completed in GIS and made available to the required users. The mapping policy document is added to the SSMP as an appendix and is posted to the City’s SSMP website page.
- **Recommendations:** Post the following Appendices on the website:
 - Appendix D-1 – City of Roseville Sewer Map Grid System
 - Appendix D-9 – Mapping Update Policy

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.

According to **Table 6**, the City experienced a slight decrease in root-caused SSOs during the last years of the audit period, which explains the decrease in the total sewer lateral mechanical cleaning (eeled), as shown in **Table 11**. The City outperformed preventative maintenance targets and past performance measures as evident in **Table 11**, with the exception of mechanical root cleaning during FY 17/18, which may have been related to an equipment maintenance issue (see **Table 12**). 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 | FY13/14 | FY14/15 | FY15/16 | FY16/17 | FY17/18 |
|--|--------|---------|---------|---------|---------|---------|
| Total number of sewer maintenance field staff | NA | 23 | 24 | 24 | 24 | 26 |
| Sewer main flushed per year (miles) | 250 | 330 | 284 | 248 | 295 | 283 |
| Sewer laterals mechanically cleaned (eeced) per year (miles) | 8 | 13.89 | 14.69 | 14.77 | 7.41 | 1.07 |
| Average high velocity cleaning per crew per day [LF] | 1670 | 2393 | 2922 | 2618 | 3115 | 2998 |
| Average cost of hydro cleaning [\$/LF] | 0.36 | 0.30 | 0.32 | 0.33 | 0.29 | 0.32 |
| Average cost of sewer mechanical cleaning [\$/LF] | 1.60 | 1.23 | 1.20 | 0.77 | 0.94 | 1.66 |

- 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.
 - Update the following Appendices and post on the website:
 - Appendix D-2 – Maintenance Cleaning Schedule: Update with Maximo CCMS example
 - Appendix D-3 – CCTV Video Report
 - Appendix D-4 – SOP

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.

The city creates an asset group in their Maximo CCMS, based on their condition assessment and PACP scores. This ongoing list is prioritized and provided to Tech Services, when CIP budget is prepared, to put a CIPPP project together. Also, while performing routine hydro work in the grids, the vector group performs manhole inspections of each asset. Once there are enough manholes that require rehabilitation, the City produces a list with asset IDs that will be sent to Tech Services for manhole Rehabilitation CIP. In the past 6 years, the City has not discovered a substantial number of manholes to develop a manhole CIP project.

In accordance with the City-utilized performance measures related to inspection and R&R program activities as displayed in **Table 12**, the City has met or exceeded all inspection targets during this audit program. However, total miles of mainline rehabilitated during this three-year were less than the target. SSOs caused by structural failure during the audit period are overlaid with the City’s 2018 I/I study and shown in **Appendix 7.3**. As shown, most of these spills occurred in regions with older pipes, such as region 5, 15, and 17. These regions are also known for their higher I/I response and capacity issues during wet

seasons. The City has been actively performing I/I analysis and smoke testing to identify system defects in these regions, results of which are incorporated in CIP decision makings.

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

| Performance Measure | Target | FY13/14 | FY14/15 | FY15/16 | FY16/17 | FY17/18 |
|---|--------|---------|---------|---------|---------|---------|
| Total miles visually inspected per year (not CCTV) | 0.25 | 0.25 | 0.25 | 0.18 | 0.25 | 0.25 |
| Lateral CCTV inspected per year [miles] | 16 | 14.69 | 26 | 35.71 | 32.51 | 36.14 |
| Main CCTV inspected per year [miles] | 30 | 53.27 | 65 | 84.32 | 59.71 | 64.1 |
| Laterals rehabilitated per year [number] | 50 | 90 | 43 | 60 | 85 | 89 |
| Laterals rehabilitated or replaced per year [miles] | 0.25 | 0.39 | 0.16 | 0.27 | 0.66 | 0.42 |
| Mains Rehabilitated or replaced per year [miles] | 5 | 2.65 | 6 | 0 | 0 | 1.07 |
| Average Cost of CCTV (lateral) [\$/LF] | 1.34 | 1.46 | 1.11 | 1.15 | 1.04 | 1.00 |
| Average cost of CCTV (main) [\$/LF] | 0.53 | 0.55 | 0.41 | 0.41 | 0.36 | 0.40 |

- **Recommendations:**
 - Describe 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. This was also included during the previous audit but has not been completed.
 - Post Appendix D-8 – Technical Memorandum O&M Program SSMP Audit-Rehabilitation and Replacement Plan (Element IVC) on the website.

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 3 on the job accidents in FY 15/16, 3 in FY 16/17, and 4 in FY 17/18, which are less than previous audits. 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:** Update the following links:
 - The CWEA website link
 - Appendix D-5 – CWEA Certification Handbook link

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: Update and post the following Appendices on the website:
 - Appendix D-6 – Equipment Inventory List
 - Appendix D-7 – Critical Replace Parts List

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: Update Appendix E-1 – Sanitary Sewer Design link.

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:
 - Update Appendix E-2 – Sanitary Sewer System Construction link.
 - Post Appendix E-3 – Technical Memo, SSMP Preparedness Audit Design and Performance Provisions Element V on the website.

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 during the audit period was 22 minutes, with 25 minutes for FY 15/16, 18 minutes for FY 16/17, and 20 minutes for FY 17/18 (see **Table 3**). These response times are 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 59 gallons, with an average 82% recovered from the total SSO volume. Similarly, the average SSO duration length was 4:57 hours long, however there were 13 long-duration SSOs (over 3 hours) that caused the average SSO duration length to increase. One of these SSOs in FY 15/16 spilled from a main for 65 hours and resulted in volume spilled of 65 gallons. In all these instances, the City was notified very late, and once notified, stopped all long duration SSOs in under 30 minutes. The average City response time to SSO calls during the audit period was 22 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 Figure 6-2 – SSO Procedure Flow Chat, to report SSO category 1 larger than 1,000 gallons to Cal OES within 2 hours per WDR requirements (currently if > 50,000 gal).
 - Post Appendix F-1 – SSOERP on the website along with corresponding attachments.

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 C – Water Quality Sampling Procedures to 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. This was also recommended during the previous audit but has not been implemented.
 - 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. This was also recommended during the previous audit but has not been implemented.
 - 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. This was also recommended during the previous audit but has not been implemented.

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 | Yes | - |
| 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. Maurice Chaney is listed as responsible party for FOG public Education Plan in Appendix B-1.
- Recommendations: No modifications recommended at this time.

FOG Disposal Plan (SSMP 7.3)

- Level of Effectiveness: During the past audit periods 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.

[\(https://livesewersmart.com/\)](https://livesewersmart.com/)

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

- Recommendations: No modifications recommended at this time.

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: No modifications recommended at this time.

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: No modifications recommended at this time.

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. The City possesses effective tools to regulate FOG discharges via a robust FOG ordinance which also requires an

effective FSE inspection program. Under oversight from WWC, the City plans on inspecting at least 294 FSEs each fiscal year. During this audit, the city documented 181 FSE inspections for FY 16/17 and 231 for 17/18, which shows effectiveness of the FOG inspection and enforcement authority element of the SSMP.

- Recommendations: No modifications recommended at this time.

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 two during the three-year 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 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.

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: No modifications recommended at this time.

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. In addition, the City developed a new hydraulic model and System Evaluation and Capacity Assurance Plan (SECAP) in 2017, which was done by Woodard and Curran. The modeling efforts conducted in 2006 and 2017 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. In 2018, Water Works Engineers (WWE) conducted a follow up I/I study upon the existing 2017 model to further analyze results and identify basins and assets with high I/I response. The results of the 2018 I/I study is being actively used by the City as their I/I reduction program base.
- 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. This was also recommended during the previous audit but has not been implemented.

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 introduced in 2017 provides 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 to \$2.0 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 7.4**. Appendix I has effectively been used to identify and track the specific metrics each of the City’s four categories.
- Recommendations: No modifications recommended at this time.

Metrics to Monitor Effectiveness of SSMP (SSMP 9.3)

- Level of Effectiveness: The utility metrics listed in Appendix I-4 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:
 - Incorporate system and financial measures recommended in **Table 18**, from Appendix I-2 into Appendix I-4 and discard Appendix I-2 from the SSMP.
 - Update Appendix I-4 and modify it to include document location and review frequency.
 - Modify I-4 – Key Performance Indicators (KPI) FOG section, to reflect the change in responsibilities from IWS to WWC.

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:** Consider addition of recommended PM measures in **Table 18**, from Appendix I-2 into Appendix I-4 and discard Appendix I-2 from the SSMP. The goal is to produce a single living KPI document that can be used to evaluate the effectiveness of SSMP elements.

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 performance metrics that are included in Appendix I-4 of the SSMP and summarized in **Table 19**. This allows the City to quickly identify and respond to changing trends in SSOs over time. These metrics are monitored on a monthly, quarterly, semi-annual, and annual basis.
- **Recommendations:**
 - Update Appendix I-3 – SSO History (last update 2013).
 - Update SSO trends data in Appendix I-4 – KPI Benchmarking.
 - Consider addition of recommended SSO measures in **Table 18**, from Appendix I-2 into Appendix I-4 and discard Appendix I-2 from the SSMP. The goal is to produce a single living KPI document that can be used to evaluate the effectiveness of SSMP elements.

Table 18 –Recommended Additional Performance Indicators

| Description | Performance Indicator | Unit |
|--------------------|----------------------------------|-----------|
| System Information | Total System Length | miles |
| | Service Area | sq. miles |
| | Population | people |
| | # maintenance Holes | MHs |
| | # Pump Stations PS/ Lift Station | number |
| | Sewer < 8 inch | miles |
| | 8 inches < sewer < 15 inches | miles |
| | 15 inches < sewer < 21 inches | miles |
| | 21 inches < sewer < 42 inches | miles |
| | Average age of system | years |
| | New sewer main installation | miles |
| | New sewer lateral installation | miles |

| | WWC Staff | number |
|-----------------------|---|--------|
| Financial Information | Total annual division budget | \$ |
| | Total annual O&M budget | \$ |
| | O&M budget of annual | % |
| | Lift station O&M cost | \$ |
| | Lift station O&M cost of annual | % |
| | Annual capital for sewer rehab | \$ |
| | Sewer monthly rate for residents | \$ |
| O&M | Certified operators | number |
| | O&M field staff | number |
| | Average high velocity cleaning per crew per day | LF |
| | Total visually inspected per year (not CCTV) | miles |
| SSO | Number of SSO calls received | number |
| FOG | Public education outreach budget per year | \$ |
| | Public education outreach budget of annual | % |

Table 19 – 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 20 – 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 this SSMP internal audit to the City website.
 - Schedule the next internal SSMP audit for July-August of 2021.
 - Develop a description manual to replace Appendix J-1 and J-2 of the SSMP, to support each KPI element. This manual describes required information for KPI monitoring, including but not limited to:
 - Elements definition
 - How to fill each KPI items
 - Personnel responsible
 - Review frequency

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 change log and add it as an appendix to the SSMP, documenting all changes made to the SSMP since its last certification, indicating when an element was changed/updated and who authorized the change. An example of a change log is shown at **Appendix 7.5**. This was also recommended during the previous audit but has not been implemented.
- 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 21 – 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. This was also recommended during the previous audit but has not been implemented.
 - Post Appendices K-1 – WWC WDR awareness Program and K-2 – Sanitary sewer regulations/WDR PowerPoint presentations on the website.
 - Update Appendix K-3 – Two EU newsletters FOG/medications links.

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.

- Recommendations:
 - Update SSMP Appendix K-4 – FOG Outreach Program with marketing Plan budget & spending and post it on the website. Consider an additional metric to be used in the KPI that reflects the City’s performance in terms of FOG outreach program. Few additional metrics are recommended in **Table 18**. This was also recommended during the previous audit but has not been implemented.

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 an appendix. This was also recommended during the previous audit but has not been implemented.
 - 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). This was also recommended during the previous audit but has not been implemented.
 - Post Appendix K-5 – Funding agreement related to south placer regional wastewater facilities on the website.

SECTION 6 Audit Summary

This section summarizes the level of compliance of the SSMP with the SSMP requirements identified in subsection D.13 and the identified deficiencies as described in **Section 4.1. Table 22** summarizes the result of this evaluation.

Table 22 – 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. |

In addition, **Table 23** lists a summary of all recommendations for this audit.

Table 23 – Summary of Audit Recommendations

| SSMP Section | Recommendation | Suggested Timeline for Completion |
|--------------|---|-----------------------------------|
| 1.2 | Post Appendix A-1 – Roseville’s SSMP Development Plan and Implementation Schedule on the website. | |
| 2.1 | 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. | |
| 2.1 | Post the following Appendices on the website: <ul style="list-style-type: none"> o Appendix B-1 – Personnel Responsible for SSMP Elements o Appendix B-2 – Personnel Responsible for SSO Reporting o Appendix B-3 – Personnel Responsible for Responding to SSOs Weekly Standby | |
| 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. | |
| 2.3 | Include Figure 2-2 flowchart as Appendix F to the SSOERP (Appendix F-1) and mention in the text. | |
| 3.2 | Post Appendix C-1 – Pretreatment Program Enforcement Response Plan on the website. | |
| 3.3 | Update the related links for Appendices C-3 and C-4 for sanitary sewer design and construction. | |
| 3.7 | Post the following Appendices on the website: <ul style="list-style-type: none"> o Appendix C-5 – Joint Exercise of Powers Agreement for the South Placer Wastewater Authority o Appendix C-6 – Agreement Regarding the Operation and Use of the South Placer Regional Wastewater Facilities o Appendix C-7 – Wastewater Service Agreement by Contract and Operating Agreement between SASD, SRCSD and City of Roseville | |
| 4.2 | Post the following Appendices on the website: <ul style="list-style-type: none"> o Post Appendix D-1 – City of Roseville Sewer Map Grid System on the website. o Post Appendix D-9 – Mapping Update Policy on the website. | |
| 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. | |

| | | |
|-----|--|--|
| 4.3 | <p>Update the following Appendices and post on the website:</p> <ul style="list-style-type: none"> ○ Appendix D-2 – Maintenance Cleaning Schedule: Update with Maximo CCMS example ○ Appendix D-3 – CCTV Video Report ○ Appendix D-4 – SOP | |
| 4.4 | <p>Describe 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.</p> | |
| 4.4 | <p>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. This was also included during the previous audit but has not been completed.</p> | |
| 4.4 | <p>Post Appendix D-8 – Technical Memorandum O&M Program SSMP Audit-Rehabilitation and Replacement Plan (Element IVC) on the website.</p> | |
| 4.5 | <p>Update the following links:</p> <ul style="list-style-type: none"> ○ The CWEA website link. ○ Appendix D-5 – CWEA Certification Handbook link. | |
| 4.6 | <p>Update and post the following Appendices on the website:</p> <ul style="list-style-type: none"> ○ Appendix D-6 – Equipment Inventory List ○ Appendix D-7 – Critical Replace Parts List | |
| 5.2 | <p>Update Appendix E-1 – Sanitary Sewer Design link.</p> | |
| 5.3 | <p>Update Appendix E-2 – Sanitary Sewer System Construction link.</p> | |
| 5.3 | <p>Post Appendix E-3 – Technical Memo, SSMP Preparedness Audit Design and Performance Provisions Element V on the website.</p> | |
| 6.3 | <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. 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.</p> | |
| 6.3 | <p>Modify Figure 6-2 – SSO Procedure Flow Chat, to report SSO category 1 larger than 1,000 gallons to Cal OES within 2 hours per WDR requirements (currently if > 50,000 gal).</p> | |
| 6.3 | <p>Post Appendix F-1 – SSOERP on the website along with corresponding attachments</p> | |
| 6.7 | <p>Modify SSOERP Appendix C – Water Quality Sampling Procedures to the meet the 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. This was also recommended during the previous audit but has not been implemented. ○ 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. This was also recommended during the previous audit but has not been implemented. | |

| | | |
|------|--|--|
| 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. This was also recommended during the previous audit but has not been implemented. | |
| 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. | |
| 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. This was also recommended during the previous audit but has not been implemented. | |
| 9.3 | Incorporate system and financial measures recommended in Table 18, from Appendix I-2 into Appendix I-4 and discard Appendix I-2 from the SSMP. | |
| 9.3 | Update Appendix I-4 and modify it to include document location and review frequency. | |
| 9.3 | Modify I-4 – Key Performance Indicators (KPI) FOG section, to reflect the change in responsibilities from IWS to WWC. | |
| 9.4 | Consider addition of recommended PM measures in Table 18, from Appendix I-2 into Appendix I-4 and discard Appendix I-2 from the SSMP. The goal is to produce a single living KPI document that can be used to evaluate the effectiveness of SSMP elements. | |
| 9.6 | Update Appendix I-3 – SSO History (last update 2013). | |
| 9.6 | Update SSO trends data in Appendix I-4 – KPI Benchmarking. | |
| 9.6 | Consider addition of recommended SSO measures in Table 18, from Appendix I-2 into Appendix I-4 and discard Appendix I-2 from the SSMP. The goal is to produce a single living KPI document that can be used to evaluate the effectiveness of SSMP elements. | |
| 10.2 | Post this SSMP internal audit to the City website. | |
| 10.2 | Schedule the next internal SSMP audit for July-August of 2021. | |
| 10.2 | Develop a description manual to replace Appendix J-1 and J-2 of the SSMP, to support each KPI element. This manual describes required information for KPI monitoring, including but not limited to: <ul style="list-style-type: none"> ○ Elements definition ○ How to fill each KPI items ○ Personnel responsible ○ Review frequency | |
| 10.3 | Update the SSMP change log and add it as an appendix to the SSMP, documenting all changes made to the SSMP since its last certification, indicating when an element was changed/updated and who authorized the change. An example of a change log is shown at Appendix 7.5. This was also recommended during the previous audit but has not been implemented. | |
| 10.3 | 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. | |
| 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. This was also recommended during the previous audit but has not been implemented. | |
| 11.2 | Post Appendices K-1 – WWC WDR awareness Program and K-2 – Sanitary sewer regulations/WDR PowerPoint presentations on the website. | |
| 11.2 | Update Appendix K-3 – Two EU newsletters FOG/medications links. | |

| | | |
|------|--|--|
| 11.3 | Update SSMP Appendix K-4 – FOG Outreach Program with marketing Plan budget & spending and post it on the website. Consider an additional metric to be used in the KPI that reflects the City’s performance in terms of FOG outreach program. Few additional metrics are recommended in Table 18 . This was also recommended during the previous audit but has not been implemented. | |
| 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 an appendix. This was also recommended during the previous audit but has not been implemented. | |
| 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). This was also recommended during the previous audit but has not been implemented. | |
| 11.4 | Post Appendix K-5 – Funding agreement related to south placer regional wastewater facilities on the website. | |

SECTION 7 Appendices

- 7.1 Appendix – Historical SSO Data
- 7.2 Appendix – SSO Data Comparison Charts
- 7.3 Appendix – Structural SSO GIS Mapping
- 7.4 Appendix – Key Performance Indicators
- 7.5 Appendix – Change Log Example

7.1 Appendix – Historical SSO Data

Dated: FY 15/16, FY 16/17, and FY 17/18

Appendix 7.1 – Historical SSO Data for FY 15/16 to FY 17/18

| # | Event ID | Date of SSO | Address | Spill Type | Spill Volume [gal] | Spill Recovered [gal] | Spill Recovery [%] | Spill Cause | Location |
|----|----------|-------------|---------------------|------------|--------------------|-----------------------|--------------------|------------------------|----------|
| 1 | 825330 | 6/7/2016 | 208 King | Category 2 | 2020 | 2000 | 99% | Pipe/Structure Failure | Main |
| 2 | 818220 | 9/19/2015 | 217 Cedar St | Category 3 | 15 | 15 | 100% | Roots | LL |
| 3 | 818891 | 9/23/2015 | 218 Judah | Category 3 | 10 | 6 | 60% | Debris-Other | LL |
| 4 | 819343 | 10/13/2015 | 236 Elm St | Category 3 | 2 | 1 | 50% | Roots | LL |
| 5 | 817820 | 8/3/2015 | 271 Spyglass Hill | category 3 | 13 | 11 | 85% | Debris-Rags | LL |
| 6 | 822789 | 3/8/2016 | 319 Coronado | Category 3 | 3 | 3 | 100% | Debris-Rags | LL |
| 7 | 817564 | 7/20/2015 | 320 Grove St | Category 3 | 10 | 8 | 80% | Roots | LL |
| 8 | 821313 | 1/8/2016 | 405 Fourth St | Category 3 | 10 | 10 | 100% | Pipe/Structure Failure | LL |
| 9 | 824524 | 4/29/2016 | 407 Yosemite | Category 3 | 1 | 1 | 100% | Roots | LL |
| 10 | 819342 | 10/16/2015 | 409 Washington Blvd | Category 3 | 5 | 4 | 80% | Roots | LL |
| 11 | 826670 | 6/4/2016 | 417 Shannon Way | Category 3 | 5 | 4 | 80% | Roots | LL |
| 12 | 819344 | 10/20/2015 | 500 Oak St | Category 3 | 5 | 1 | 20% | Roots | LL |
| 13 | 820342 | 12/17/2015 | 503 Oak ridge | Category 3 | 59 | 59 | 100% | Roots | LL |
| 14 | 820369 | 12/18/2015 | 503 Bedford Ct | Category 3 | 79 | 79 | 100% | Roots | LL |
| 15 | 825184 | 5/10/2016 | 503 Loretto | Category 3 | 5 | 4 | 80% | Roots | LL |
| 16 | 817422 | 7/15/2015 | 505 Main St | Category 3 | 10 | 10 | 100% | Roots | LL |
| 17 | 820331 | 12/9/2015 | 524 Main St | Category 3 | 7 | 7 | 100% | Roots | LL |
| 18 | 822520 | 2/9/2016 | 603 Rigby Ct | Category 3 | 1 | 1 | 100% | Roots | LL |
| 19 | 818888 | 9/25/2015 | 705 Oak ridge | Category 3 | 7 | 3 | 43% | Roots | LL |
| 20 | 824651 | 5/4/2016 | 801 Vernon St | Category 3 | 6 | 6 | 100% | Debris-Rags | LL |
| 21 | 819957 | 11/24/2015 | 864 Portside | Category 3 | 3 | 2 | 67% | Roots | LL |
| 22 | 822330 | 2/8/2016 | 900 Main St | Category 3 | 28 | 23 | 82% | Roots | LL |
| 23 | 820975 | 12/28/2015 | 901 Herbert St | Category 3 | 65 | 12 | 18% | Grease | Main |
| 24 | 824652 | 5/9/2016 | 1010 Tamarack Ct | Category 3 | 2 | 1 | 50% | Grease | LL |
| 25 | 818514 | 9/19/2015 | 1011 Tamarack Ct | Category 3 | 14 | 14 | 100% | Pipe/Structure Failure | LL |
| 26 | 824373 | 4/15/2016 | 1013 Shearer St | Category 3 | 10 | 10 | 100% | Roots | LL |
| 27 | 823160 | 3/8/2016 | 1265 Pleasant Grove | Category 3 | 19 | 17 | 89% | Roots | LL |
| 28 | 821374 | 1/6/2016 | 1302 Hedgerow | Category 3 | 2 | 2 | 100% | Roots | LL |
| 29 | 819956 | 11/16/2015 | 1404 McBride | Category 3 | 2 | 0 | 0% | Roots | LL |
| 30 | 822332 | 2/9/2016 | 1428 Gregory Way | Category 3 | 25 | 22 | 88% | Roots | LL |
| 31 | 820220 | 11/27/2015 | 1444 Tiffany Cir | Category 3 | 5 | 4 | 80% | Roots | LL |
| 32 | 819955 | 11/13/2015 | 1528 Oak Tree | Category 3 | 4 | 1 | 25% | Roots | LL |
| 33 | 818299 | 9/7/2015 | 1538 E Colonial Pw | Category 3 | 21 | 21 | 100% | Roots | LL |
| 34 | 816746 | 7/4/2015 | 1601 Russell | Category 3 | 2 | 2 | 100% | Roots | LL |
| 35 | 825736 | 5/24/2016 | 1647 Ashford | Category 3 | 2 | 1 | 50% | Roots | LL |
| 36 | 819594 | 10/22/2015 | 1748 Hillingdon | Category 3 | 2 | 2 | 100% | Roots | LL |
| 37 | 818910 | 9/27/2015 | 4121 Enchanted Cir | Category 3 | 1 | 0 | 0% | Roots | LL |
| 38 | 821372 | 1/11/2016 | 6176 Crater Lake | Category 3 | 40 | 40 | 100% | Roots | LL |
| 39 | 823936 | 3/21/2016 | 7216 Pineschi | Category 3 | 5 | 4 | 80% | Roots | LL |
| 40 | 831836 | 12/27/2016 | 106 Estates | Category 3 | 2 | 2 | 100% | Roots | LL |
| 41 | 829712 | 11/7/2016 | 114 Vernon | Category 3 | 5 | 5 | 100% | Roots | LL |
| 42 | 832603 | 2/6/2017 | 117 Vallejo Ave | Category 3 | 45 | 38 | 84% | Debris-Rags | LL |
| 43 | 828212 | 9/13/2016 | 205 Bonny Knoll | Category 3 | 3 | 2 | 67% | Roots | LL |
| 44 | 829388 | 10/20/2016 | 300 James | Category 3 | 5 | 5 | 100% | Roots | LL |
| 45 | 829319 | 10/19/2016 | 302 Margaret Way | Category 3 | 2 | 2 | 100% | Roots | LL |

| | | | | | | | | | |
|----|--------|------------|-----------------------------|------------|-----|-----|------|------------------------|--------|
| 46 | 833704 | 2/28/2017 | 310 Sierra Blvd | Category 3 | 20 | 18 | 90% | Roots | LL |
| 47 | 834443 | 4/9/2017 | 333 Elfa St (Alley) | Category 3 | 17 | 17 | 100% | Roots | LL |
| 48 | 834223 | 3/29/2017 | 401 Coronado Ave | Category 3 | 5 | 5 | 100% | Roots | LL |
| 49 | 828445 | 9/21/2016 | 411 Greenridge | Category 3 | 18 | 16 | 89% | Roots | LL |
| 50 | 835208 | 5/9/2017 | 529 Dudley | Category 3 | 3 | 1 | 33% | Roots | LL |
| 51 | 828840 | 10/3/2016 | 602 Dove Wy | Category 3 | 8 | 7 | 88% | Debris-Rags | LL |
| 52 | 830389 | 11/25/2016 | 701 Sawyer Ct | Category 3 | 15 | 9 | 60% | Roots | LL |
| 53 | 830004 | 11/13/2016 | 800 Main St | Category 3 | 47 | 44 | 94% | Pipe/Structure Failure | LL |
| 54 | 827325 | 7/22/2016 | 854 Shearer St | Category 3 | 2 | 2 | 100% | Roots | LL |
| 55 | 832386 | 1/26/2017 | 1025 Enwood | Category 3 | 6 | 4 | 67% | Roots | LL |
| 56 | 830793 | 12/9/2016 | 1123 Augusta Wy | Category 3 | 4 | 3 | 75% | Roots | LL |
| 57 | 832142 | 1/25/2017 | 1166 Greenhill Dr | Category 3 | 17 | 15 | 88% | Roots | LL |
| 58 | 830807 | 12/13/2016 | 1217 McKinley Dr | Category 3 | 760 | 704 | 93% | Roots | LL |
| 59 | 829562 | 10/27/2016 | 1302 Coloma | Category 3 | 68 | 65 | 96% | Roots | LL |
| 60 | 835206 | 5/10/2017 | 1311 Wendy Ct | Category 3 | 4 | 4 | 100% | Roots | LL |
| 61 | 826874 | 7/26/2016 | 1402 Crestmont | Category 3 | 20 | 15 | 75% | Roots | LL |
| 62 | 827536 | 8/12/2016 | 1713 Tanglewood Ln | Category 3 | 5 | 3 | 60% | Roots | LL |
| 63 | 844166 | 1/18/2018 | 224 1/2 D St | Category 3 | 45 | 42 | 93% | Roots | LL |
| 64 | 840980 | 10/9/2017 | 245 Duranta | Category 3 | 10 | 8 | 80% | Debris-Other | Main |
| 65 | 842032 | 11/30/2017 | 250 S Harding | Category 3 | 58 | 58 | 100% | Roots | LL |
| 66 | 847009 | 4/10/2018 | 317 Princeton | Category 3 | 10 | 10 | 100% | Roots | LL |
| 67 | 847760 | 5/17/2018 | 326 Grove St | Category 3 | 3 | 0 | 0% | Debris-Rags | LL |
| 68 | 847278 | 4/18/2018 | 329 Alta Vista | Category 3 | 51 | 49 | 96% | Debris-Other | LL |
| 69 | 843124 | 12/17/2017 | 372 Circuit Dr | Category 3 | 5 | 1 | 20% | Roots | LL |
| 70 | 848005 | 5/24/2018 | 376 Circuit Dr | Category 3 | 3 | 1 | 33% | Roots | LL |
| 71 | 848614 | 5/31/2018 | 441 Briggs Ct | Category 3 | 86 | 81 | 94% | Pipe/Structure Failure | Main |
| 72 | 846885 | 4/4/2018 | 531 Vernon | Category 3 | 20 | 17 | 85% | Debris-Other | LL |
| 73 | 846248 | 3/2/2018 | 531 Vernon | Category 3 | 6 | 6 | 100% | Debris-Rags | LL |
| 74 | 841083 | 10/24/2017 | 615 Main St | Category 3 | 96 | 10 | 10% | Pipe/Structure Failure | LL |
| 75 | 843509 | 12/11/2017 | 710 Vernon | Category 3 | 8 | 4 | 50% | Debris-Other | LL |
| 76 | 848224 | 5/28/2018 | 1033 Coloma Way | Category 3 | 5 | 1 | 20% | Pipe/Structure Failure | LL |
| 77 | 840077 | 9/15/2017 | 1102 Fairfield Ave | Category 3 | 3 | 0 | 0% | Roots | LL |
| 78 | 843230 | 12/13/2017 | 1206 McKinley | Category 3 | 6 | 0 | 0% | Roots | LL |
| 79 | 848002 | 5/27/2018 | 1245 Vista Verde | Category 3 | 88 | 77 | 88% | Debris-Rags | LL |
| 80 | 843665 | 12/22/2017 | 1338 Blossom Hill Way | Category 3 | 45 | 45 | 100% | Roots | LL |
| 81 | 842779 | 12/7/2017 | 1338 Ridge Run | Category 3 | 52 | 51 | 98% | Debris-Other | LL |
| 82 | 849496 | 6/30/2018 | 1413 West Colonial Park Way | Category 3 | 9 | 1 | 11% | Roots | LL |
| 83 | 849045 | 6/26/2018 | 1552 Diamond Wood Cir | Category 3 | 19 | 0 | 0% | Roots | LL |
| 84 | 844961 | 2/8/2018 | 2204 McLaren Dr | Category 3 | 6 | 5 | 83% | Roots | LL |
| 85 | 847241 | 4/18/2018 | 8409 Early Way | Category 3 | 4 | 3 | 75% | Roots | LL |
| 86 | 840892 | 9/11/2017 | 9000 Washington Blvd | Category 3 | 585 | 40 | 7% | Debris-Other | Main |
| 87 | 843899 | 1/16/2018 | Darling Way Clinton Ave | Category 1 | 342 | 333 | 97% | Contractor Cause | Vactor |

7.2 Appendix – SSO Data Comparison Charts

2015/2016 SSO Data Comparison

| EVENT ID | Spill Volume | | Rec Volume | | SSO Duration | | Response Time | | Duration | Response | Cause | | Notes | |
|--------------|--------------|-------------|-------------|-------------|--------------|-----------------|-----------------|-------------------|-----------------|----------|----------|---------------------------------|------------------------|---------------------------------|
| | CIWQS | City | CIWQS | City | CIWQS | City | CIWQS | City | >3 hr | >40 min | CIWQS | City | | |
| 1 | 825330 | 2020 | 2020 | 2000 | 2000 | 1.048611 | 1.048611 | 0.00763889 | 0.007639 | 1 | 0 | Pipe Structural Problem/Failure | Pipe/Structure Failure | |
| 2 | 818220 | 15 | 15 | 15 | 15 | 0.010417 | 0.010417 | 0.02083333 | 0.020833 | 0 | 0 | Root Intrusion | Roots | |
| 3 | 818891 | 10 | 10 | 6 | 6 | 0.111111 | 0.111111 | 0.02222222 | 0.022222 | 0 | 0 | Non-Dispersables | Debris-Other | |
| 4 | 819343 | 2 | 2 | 1 | 1 | 0.011111 | 0.011111 | 0.00069444 | 0.000694 | 0 | 0 | Root Intrusion | Roots | |
| 5 | 817820 | 13 | 13 | 11 | 11 | 0.025694 | 0.025694 | 0.01527778 | 0.015278 | 0 | 0 | Non-Dispersables | Debris-Rags | |
| 6 | 822789 | 3 | 3 | 3 | 3 | 0.040972 | 0.040972 | 0.02013889 | 0.020139 | 0 | 0 | Non-Dispersables | Debris-Rags | |
| 7 | 817564 | 10 | 10 | 8 | 8 | 0.017361 | 0.017361 | 0.01875 | 0.018056 | 0 | 0 | Root Intrusion | Roots | |
| 8 | 821313 | 10 | 10 | 10 | 10 | 0.032639 | 0.032639 | 0.02083333 | 0.020833 | 0 | 0 | Pipe Structural Problem/Failure | Pipe/Structure Failure | |
| 9 | 824524 | 1 | 1 | 1 | 1 | 0.020833 | 0.020833 | 0.00694444 | 0.006944 | 0 | 0 | Root Intrusion | Roots | |
| 10 | 819342 | 5 | 5 | 4 | 4 | 0.01875 | 0.01875 | 0.0125 | 0.0125 | 0 | 0 | Root Intrusion | Roots | |
| 11 | 826670 | 5 | 5 | 4 | 4 | 0.024306 | 0.024306 | 0.01388889 | 0.013889 | 0 | 0 | Root Intrusion | Roots | |
| 12 | 819344 | 5 | 5 | 1 | 1 | 0.038194 | 0.038194 | 0.01458333 | 0.014583 | 0 | 0 | Root Intrusion | Roots | |
| 13 | 820342 | 59 | 59 | 59 | 59 | 0.055556 | 0.055556 | 0.00347222 | 0.003472 | 0 | 0 | Root Intrusion | Roots | |
| 14 | 820369 | 79 | 79 | 79 | 79 | 0.034722 | 0.034722 | 0.01666667 | 0.016667 | 0 | 0 | Root Intrusion | Roots | |
| 15 | 825184 | 5 | 5 | 4 | 4 | 0.018056 | 0.018056 | 0.00763889 | 0.006944 | 0 | 0 | Root Intrusion | Roots | |
| 16 | 817422 | 10 | 10 | 10 | 10 | 0.051389 | 0.051389 | 0.13472222 | 0.009722 | 0 | 0 | Root Intrusion | Roots | Incorrect arrival time in CIWQS |
| 17 | 820331 | 7 | 7 | 7 | 7 | 0.021528 | 0.021528 | 0.00138889 | 0.001389 | 0 | 0 | Root Intrusion | Roots | |
| 18 | 822520 | 1 | 1 | 0 | 1 | 0.085417 | 0.085417 | 0.075 | 0.075 | 0 | 1 | Root Intrusion | Roots | |
| 19 | 818888 | 7 | 7 | 3 | 3 | 0.041667 | 0.041667 | 0.01041667 | 0.135417 | 0 | 1 | Root Intrusion | Roots | |
| 20 | 824651 | 6 | 6 | 6 | 6 | 0.024306 | 0.024306 | 0.00694444 | 0.006944 | 0 | 0 | Debris-Rags | Debris-Rags | |
| 21 | 819957 | 3 | 3 | 2 | 2 | 0.001389 | 0.001389 | 0.01388889 | 0.013889 | 0 | 0 | Root Intrusion | Roots | |
| 22 | 822330 | 28 | 28 | 23 | 23 | 0.016667 | 0.016667 | 0.00416667 | 0.004167 | 0 | 0 | Root Intrusion | Roots | |
| 23 | 820975 | 65 | 65 | 12 | 12 | 2.791667 | 2.708333 | 0.00694444 | 0.006944 | 1 | 0 | Grease Deposition (FOG) | Grease | Incorrect start time in CIWQS |
| 24 | 824652 | 2 | 2 | 1 | 1 | 0.018056 | 0.018056 | 0.00694444 | 0.006944 | 0 | 0 | Grease Deposition (FOG) | Grease | |
| 25 | 818514 | 14 | 14 | 14 | 14 | 0.015972 | 0.015972 | 0.01111111 | 0.011111 | 0 | 0 | Pipe Structural Problem/Failure | Pipe/Structure Failure | |
| 26 | 824373 | 10 | 10 | 10 | 10 | 0.052083 | 0.052083 | 0.03125 | 0.03125 | 0 | 1 | Root Intrusion | Roots | |
| 27 | 823160 | 19 | 19 | 17 | 17 | 0.017361 | 0.017361 | 0.00694444 | 0.006944 | 0 | 0 | Root Intrusion | Roots | |
| 28 | 821374 | 2 | 2 | 2 | 2 | 0.03125 | 0.03125 | 0.02083333 | 0.020833 | 0 | 0 | Root Intrusion | Roots | |
| 29 | 819956 | 2 | 2 | 0 | 0 | 0.021528 | 0.021528 | 0.01111111 | 0.011111 | 0 | 0 | Root Intrusion | Roots | |
| 30 | 822332 | 25 | 25 | 22 | 22 | 0.031944 | 0.031944 | 0.01111111 | 0.011111 | 0 | 0 | Root Intrusion | Roots | |
| 31 | 820220 | 5 | 5 | 4 | 4 | 0.024306 | 0.024306 | 0.01388889 | 0.013889 | 0 | 0 | Root Intrusion | Roots | |
| 32 | 819955 | 4 | 4 | 1 | 1 | 0.052083 | 0.052083 | 0.01388889 | 0.013889 | 0 | 0 | Root Intrusion | Roots | |
| 33 | 818299 | 21 | 21 | 21 | 21 | 0.003472 | 0.003472 | 0.02291667 | 0.022917 | 0 | 0 | Root Intrusion | Roots | |
| 34 | 816746 | 2 | 2 | 2 | 2 | 0.000694 | 0.000694 | 0.025 | 0.025 | 0 | 0 | Root Intrusion | Roots | |
| 35 | 825736 | 2 | 2 | 1 | 1 | 0.024306 | 0.024306 | 0.01388889 | 0.013889 | 0 | 0 | Root Intrusion | Roots | |
| 36 | 819594 | 2 | 2 | 2 | 2 | 0.000694 | 0.000694 | 0.0125 | 0.0125 | 0 | 0 | Root Intrusion | Roots | |
| 37 | 818910 | 1 | 1 | 1 | 0 | 0.020833 | 0.020833 | 0.01041667 | 0.010417 | 0 | 0 | Root Intrusion | Roots | |
| 38 | 821372 | 40 | 40 | 40 | 40 | 0.002778 | 0.002778 | 0.02013889 | 0.020139 | 0 | 0 | Root Intrusion | Roots | |
| 39 | 823936 | 5 | 5 | 4 | 4 | 0.007639 | 0.007639 | 0.00972222 | 0.009722 | 0 | 0 | Root Intrusion | Roots | |
| Total | 2525 | 2525 | 2411 | 2411 | 2411 | 4.867361 | 4.784028 | 0.69722222 | 0.695833 | 2 | 3 | | | |
| 39 | | | 95% | 95% | | | | | | | | | | |
| Avg | | | | | | 2:59:43 | 2:56:38 | 0:25:45 | 0:25:42 | | | | | |

2016/2017 SSO Data Comparison

| | EVENT ID | Spill Volume | | Rec Volume | | SSO Duration | | Response Time | | Duration | Response | Cause | | Notes |
|----|--------------|--------------|------|------------|------|--------------|----------|---------------|----------|----------|----------|----------------------------------|------------------------|--------------------------|
| | | CIWQS | City | CIWQS | City | CIWQS | City | CIWQS | City | >3 hr | >40 min | CIWQS | City | |
| 1 | 831836 | 2 | 2 | 2 | 2 | 0.027778 | 0.027778 | 0.013889 | 0.013889 | 0 | 0 | Root Intrusion | Roots | |
| 2 | 829712 | 5 | 5 | 5 | 5 | 0.01875 | 0.01875 | 0.008333 | 0.008333 | 0 | 0 | Root Intrusion | Roots | |
| 3 | 832603 | 45 | 45 | 38 | 38 | 2.84375 | 2.84375 | 0.013889 | 0.008333 | 1 | 0 | Non-Dispersables | Debris-Rags | Incorrect Not time |
| 4 | 828212 | 3 | 3 | 2 | 2 | 0.004167 | 0.004167 | 0 | 0 | 0 | 0 | Root Intrusion | Roots | No notification |
| 5 | 829388 | 5 | 5 | 5 | 5 | 0.025694 | 0.025694 | 0.011806 | 0.011806 | 0 | 0 | Root Intrusion | Roots | |
| 6 | 829319 | 2 | 2 | 2 | 2 | 0.016667 | 0.016667 | 0.008333 | 0.008333 | 0 | 0 | Root Intrusion | Roots | |
| 7 | 833704 | 20 | 20 | 18 | 18 | 0.242361 | 0.242361 | 0.004167 | 0.004167 | 1 | 0 | Root Intrusion | Roots | |
| 8 | 834443 | 17 | 17 | 17 | 17 | 0.032639 | 0.032639 | 0.022222 | 0.022222 | 0 | 0 | Root Intrusion | Roots | |
| 9 | 834223 | 5 | 5 | 5 | 5 | 0.03125 | 0.03125 | 0.020833 | 0.020833 | 0 | 0 | Root Intrusion | Roots | |
| 10 | 828445 | 18 | 18 | 16 | 16 | 0.184028 | 0.184028 | 0.017361 | 0.017361 | 1 | 0 | Root Intrusion | Roots | |
| 11 | 835208 | 3 | 3 | 1 | 1 | 0.045139 | 0.045139 | 0.004861 | 0.004861 | 0 | 0 | Root Intrusion | Roots | |
| 12 | 828840 | 8 | 8 | 7 | 7 | 0.006944 | 0.006944 | 0.020139 | 0.01875 | 0 | 0 | Non-Dispersables | Debris-Rags | |
| 13 | 830389 | 15 | 15 | 9 | 9 | 0.006944 | 0.006944 | 0.017361 | 0.017361 | 0 | 0 | Root Intrusion | Roots | |
| 14 | 830004 | 47 | 47 | 44 | 44 | 0.089583 | 0.089583 | 0.014583 | 0.014583 | 0 | 0 | Root Intrusion | Pipe/Structure Failure | Incorrect cause in CIWQS |
| 15 | 827325 | 2 | 2 | 2 | 2 | 0.013889 | 0.013889 | 0.029167 | 0.029167 | 0 | 1 | Root Intrusion | Roots | |
| 16 | 832386 | 6 | 6 | 4 | 4 | 0.024306 | 0.024306 | 0.013889 | 0.013889 | 0 | 0 | Root Intrusion | Roots | |
| 17 | 830793 | 4 | 4 | 3 | 3 | 0.018056 | 0.018056 | 0.007639 | 0.007639 | 0 | 0 | Root Intrusion | Roots | |
| 18 | 832142 | 17 | 17 | 15 | 15 | 0.1875 | 0.1875 | 0.010417 | 0.010417 | 1 | 0 | Root Intrusion | Roots | |
| 19 | 830807 | 760 | 760 | 704 | 704 | 2.140278 | 2.140278 | 0.009722 | 0.009722 | 1 | 0 | Root Intrusion | Roots | |
| 20 | 829562 | 68 | 68 | 65 | 65 | 0.086806 | 0.086806 | 0.008333 | 0.008333 | 0 | 0 | Root Intrusion | Roots | |
| 21 | 835206 | 4 | 4 | 4 | 4 | 0.042361 | 0.042361 | 0.009722 | 0.009722 | 0 | 0 | Root Intrusion | Roots | |
| 22 | 826874 | 20 | 20 | 15 | 15 | 0.002778 | 0.002778 | 0.027778 | 0.025 | 0 | 0 | CS Maintance Caused Spill/Damage | Roots | Incorrect cause in CIWQS |
| 23 | 827536 | 5 | 5 | 3 | 3 | 0.010417 | 0.010417 | 0.003472 | 0.003472 | 0 | 0 | Root Intrusion | Roots | |
| | Total | 1081 | 1081 | 986 | 986 | 6.102083 | 6.102083 | 0.297917 | 0.288194 | 5 | 1 | | | |
| | 23 | | | 91% | 91% | | | | | | | | | |
| | Avg | | | | | 6:22:03 | 6:22:03 | 0:18:39 | 0:18:03 | | | | | |

2017/2018 SSO Data Comparison

| | EVENT ID | Spill Volume | | Rec Volume | | SSO Duration | | Response Time | | Duration >3 hr | Response >40 min | Cause | | Notes |
|--------------|----------|--------------|------|------------|------|--------------|----------|---------------|----------|----------------|------------------|--|------------------------|-----------------------------------|
| | | CIWQS | City | CIWQS | City | CIWQS | City | CIWQS | City | | | CIWQS | City | |
| 1 | 840077 | 3 | 3 | 0 | 0 | 0.018056 | 0.018056 | 0.007639 | 0.006944 | 0 | 0 | Root Intrusion | Roots | Incorrect not time in CIWQS |
| 2 | 840892 | 585 | 585 | 40 | 40 | 0.041667 | 0.027778 | 0 | 0.010417 | 0 | 0 | Debris from Construction | Debris-Other | Incorrect not time in CIWQS |
| 3 | 840980 | 10 | 10 | 8 | 8 | 0.020833 | 0.020833 | 0.008333 | 0.008333 | 0 | 0 | Debris from Construction | Debris-Other | |
| 4 | 841083 | 96 | 96 | 10 | 10 | 1.354167 | 1.354167 | 0.003472 | 0.003472 | 1 | 0 | Pipe Structural Problem/Failure | Pipe/Structure Failure | |
| 5 | 842032 | 58 | 58 | 58 | 58 | 0.006944 | 0.006944 | 0 | 0.006944 | 0 | 0 | Root Intrusion | Roots | Incorrect not time in CIWQS |
| 6 | 842779 | 52 | 52 | 51 | 51 | 0.029861 | 0.029861 | 0.015972 | 0.015972 | 0 | 0 | Debris-Wipes/Non-Dispersables | Debris-Other | |
| 7 | 843509 | 8 | 8 | 4 | 4 | 2.088194 | 2.088194 | 0.013889 | 0.013889 | 1 | 0 | Debris-Wipes/Non-Dispersables | Debris-Other | Event ID does not match CIWQS ID |
| 8 | 843124 | 5 | 5 | 1 | 1 | 0.017361 | 0.017361 | 0.03125 | 0.03125 | 0 | 1 | Root Intrusion | Roots | |
| 9 | 843230 | 6 | 6 | 0 | 0 | 0.026389 | 0.026389 | 0.015972 | 0.016667 | 0 | 0 | Root Intrusion | Roots | |
| 10 | 843665 | 11 | 45 | 11 | 45 | 0.005556 | 0.005556 | 0.020833 | 0.020833 | 0 | 0 | Root Intrusion | Roots | Incorrect volume reports on CIWQS |
| 11 | 843899 | 342 | 342 | 333 | 333 | 0.007639 | 0.007639 | 0 | 0 | 0 | 0 | Other (specify below) | Contractor Cause | |
| 12 | 844166 | 45 | 45 | 42 | 42 | 2.024306 | 2.024306 | 0.008333 | 0.008333 | 1 | 0 | Root Intrusion | Roots | |
| 13 | 844961 | 6 | 6 | 5 | 5 | 0.047222 | 0.047222 | 0.03125 | 0.03125 | 0 | 1 | Root Intrusion | Roots | |
| 14 | 846248 | 6 | 6 | 6 | 6 | 0.002083 | 0.002083 | 0 | 0.021528 | 0 | 0 | Debris-Rags | Debris-Rags | Incorrect not time in CIWQS |
| 15 | 846885 | 20 | 20 | 17 | 17 | 0.017361 | 0.017361 | 0.007639 | 0.007639 | 0 | 0 | Debris-Wipes/Non-Dispersables | Debris-Other | |
| 16 | 847009 | 10 | 10 | 10 | 10 | 0.071528 | 0.061111 | 0.025694 | 0.025694 | 0 | 0 | Root Intrusion | Roots | |
| 17 | 847241 | 4 | 4 | 3 | 3 | 0.170139 | 0.170139 | 0.00625 | 0.00625 | 1 | 0 | Root Intrusion | Roots | |
| 18 | 847278 | 51 | 51 | 49 | 49 | 0.035417 | 0.035417 | 0.025 | 0.025 | 0 | 0 | Debris-Wipes/Non-Dispersables | Debris-Other | |
| 19 | 847760 | 3 | 3 | 0 | 0 | 0.041667 | 0.041667 | 0 | 0 | 0 | 0 | Debris-Rags | Debris-Rags | |
| 20 | 848002 | 88 | 88 | 77 | 77 | 0.788194 | 0.788194 | 0.011806 | 0.017361 | 1 | 0 | Debris from Construction | Debris-Rags | |
| 21 | 848005 | 3 | 3 | 1 | 1 | 0.021528 | 0.021528 | 0.011111 | 0.011111 | 0 | 0 | Root Intrusion | Roots | |
| 22 | 848224 | 5 | 5 | 1 | 1 | 0.073611 | 0.073611 | 0.015278 | 0.015278 | 0 | 0 | Pipe Structural Problem/Failure | Pipe/Structure Failure | |
| 23 | 848614 | 86 | 86 | 81 | 81 | 0.202083 | 0.202083 | 0.011111 | 0.011111 | 1 | 0 | Pipe Structural Problem/Failure - Installation | Pipe/Structure Failure | |
| 24 | 849045 | 19 | 19 | 0 | 0 | 0.013889 | 0.013889 | 0.016667 | 0.016667 | 0 | 0 | Root Intrusion | Roots | Incorrect not time in CIWQS |
| 25 | 849496 | 9 | 9 | 1 | 1 | 0.00625 | 0.00625 | 0.024306 | 0.022222 | 0 | 0 | Root Intrusion | Roots | Incorrect not time in CIWQS |
| Total | | 1531 | 1565 | 809 | 843 | 7.131944 | 7.107639 | 0.311806 | 0.354167 | 6 | 2 | | | |
| 25 | | | | 53% | 54% | | | | | | | | | |
| Avg | | | | | | 6:50:48 | 6:49:24 | 0:17:58 | 0:20:24 | | | | | |

7.3 Appendix – Structural SSO GIS Mapping

A 7.3 **City of Roseville I&I Study - 2018**
 Existing Conditions
 Average RDII [gpd/idm] and Conduit Age [year]

● Structural Caused SSOs

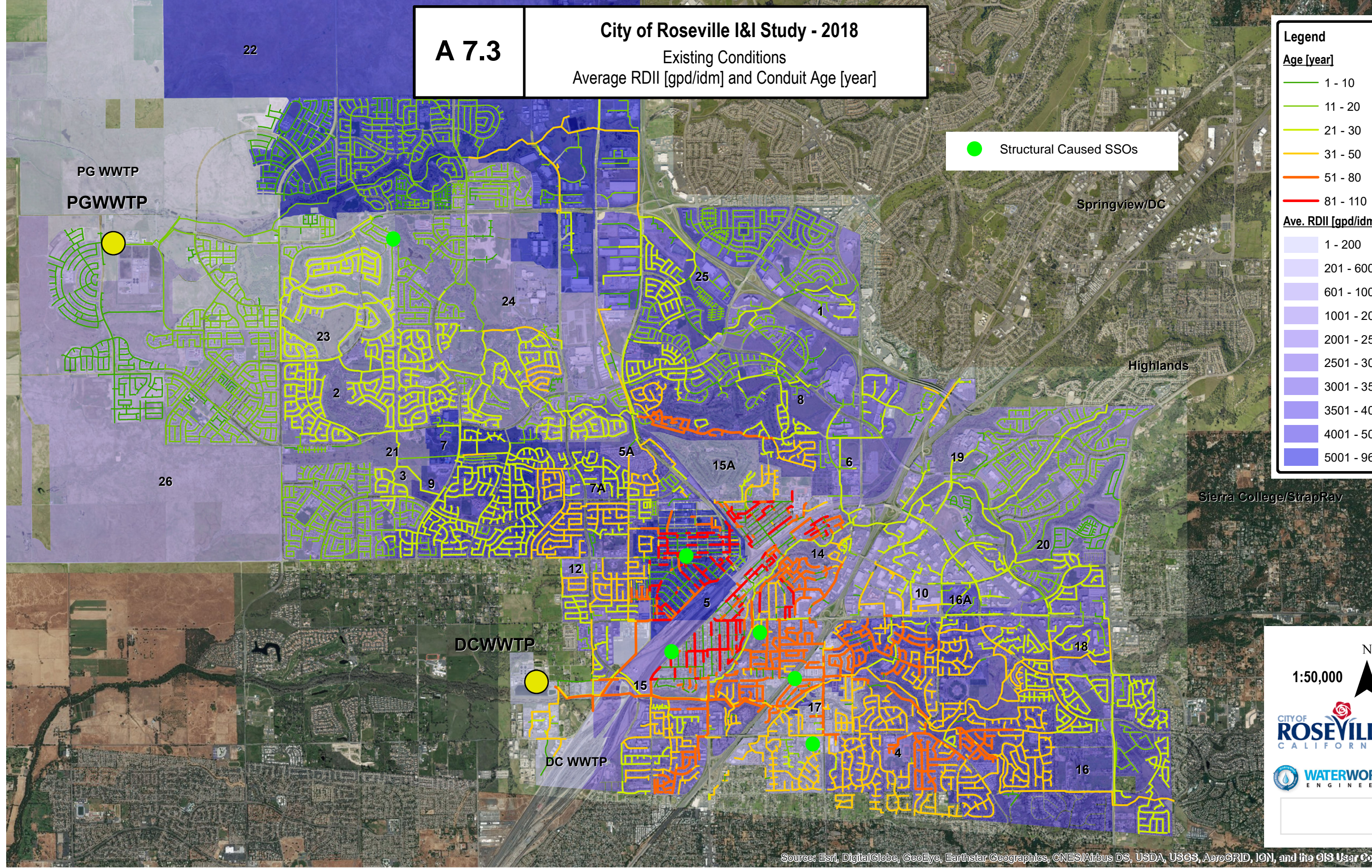
Legend

Age [year]

- 1 - 10
- 11 - 20
- 21 - 30
- 31 - 50
- 51 - 80
- 81 - 110

Ave. RDII [gpd/idm]

- 1 - 200
- 201 - 600
- 601 - 1000
- 1001 - 2000
- 2001 - 2500
- 2501 - 3000
- 3001 - 3500
- 3501 - 4000
- 4001 - 5000
- 5001 - 9629



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

1:50,000

N

CITY OF
ROSEVILLE
 CALIFORNIA

WATERWORKS
 ENGINEERS

7.4 Appendix – Key Performance Indicators

| SSS WDR Element | SSS WDR Ref. | Description | Performance Indicator | Unit | Target | KPI Data FY 14/15 | KPI Data FY 15/16 | KPI Data FY 16/17 | KPI Data FY 17/18 | KPI Data FY 18/19 | Audit Frequency | Responsible Party |
|--------------------------------|------------------------------|------------------------|--|---------|--------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-----------------------------|
| Organization | D.ii.c | Chain of Communication | Average response to customer inquiry | Minute | 40 | 19.58 | 23 | 20 | 17 | | Quarterly | WW Superintendent |
| | | | Total customer service requests | Number | 0 | 915 | 1549 | 533 | 302 | | Quarterly | WW Superintendent |
| | | | Total sewer odor complaints | Number | 0 | 9 | 43 | 50 | 39 | | Quarterly | WW Superintendent |
| | | | Average rating in customer service card | Number | 5 | 5 | 5 | 5 | 5 | | Quarterly | WW Superintendent |
| O&M | D.iv.a | Maps | Average response time to map update requests | Days | 90 | 90 | 90 | 90 | 90 | | Quarterly | WW Superintendent |
| | D.iv.b | PM Activities | Manholes Inspection performed | Number | 0 | 2493 | 3575 | 1547 | 1511 | | Quarterly | WW Superintendent |
| | | | Sewer main flushed per year | Miles | 250 | 284 | 248 | 295 | 283.12 | | Quarterly | WW Superintendent |
| | | | Sewer laterals mechanically cleaned (eeced) per year | staff | 8 | 14.32 | 14.77 | 7.41 | 1.07 | | Quarterly | WW Superintendent |
| | | | Working staff time to PM program | % | 80% | 85% | 82% | 82% | 84% | | Quarterly | WW Superintendent |
| | | | Number of customer accounts per WW employee | Number | 561 | 1517 | 1554 | 1772 | 1757 | | Quarterly | WW Superintendent |
| | | | Average cost of hydro cleaning | \$/lf | \$0.36 | \$0.32 | \$0.33 | \$0.29 | \$0.32 | | Annually | WW Superintendent |
| | | | Average cost of sewer mechanical cleaning | \$/lf | \$1.60 | \$1.20 | \$0.77 | \$0.94 | \$1.66 | | Annually | WW Superintendent |
| | D.iv.c | R&R Plan | Manholes rehabilitated | Number | 50 | 0 | 0 | 0 | 0 | | Quarterly | WW Superintendent |
| | | | Sewer main CCTV inspected per year | Miles | 30 | 75 | 84.32 | 59.71 | 64.1 | | Quarterly | WW Superintendent |
| | | | Sewer laterals CCTV inspected per year | Miles | 16 | 26 | 35.71 | 32.51 | 36.14 | | Quarterly | WW Superintendent |
| | | | Sewer cleanouts installed per year | Number | 75 | 76 | 83 | 144 | 141 | | Quarterly | WW Superintendent |
| | | | Sewer Laterals Rehabilitated | Number | 50 | 48 | 60 | 85 | 89 | | Quarterly | WW Superintendent |
| | | | Total miles rehabed or replaced per year (main) | Miles | 5 | 6 | 0 | 0 | 1.07 | | Annually | EU Engineering |
| | | | Total miles rehabed or replaced per year (lateral) | Miles | 0.25 | 0.16 | 0.27 | 0.66 | 0.42 | | Annually | EU Engineering |
| | | | Annual capitol budget sewer rehab/replacement | \$/M | \$1.80 | \$1.05 | \$1.36 | \$2.61 | \$2.25 | | Annually | WW Superintendent |
| | | | Average cost of CCTV main | \$/lf | \$0.53 | \$0.41 | \$0.41 | \$0.36 | \$0.40 | | Annually | WW Superintendent |
| | Average cost of CCTV lateral | S/lf | \$1.34 | \$1.11 | \$1.15 | \$1.04 | \$1.00 | | Annually | WW Superintendent | | |
| | D.iv.d | Training | On the job accidents | Number | 0 | 5 | 3 | 3 | 4 | | Quarterly | EU Safety Coordinator |
| | D.iv.e | Critical Parts | % of required numberof identified critical parts are stocked | % | 100 | 100 | 100 | 100 | 100 | | Annually | Materials Technician |
| Design | D.v.a&b | Construction | % of new sewer main accepted vs. inspected | % | 100 | 100 | 100 | 100 | 100 | | Annually | WW Supervisor |
| | | | % of new sewer lateral accepted vs. inspected | % | 100 | 100 | 100 | 100 | 100 | | Annually | WW Supervisor |
| OERP | D.vi.a | Notification | Average response time to SSO | Minutes | 40 | 20 | 23 | 20 | 17 | | Quarterly | WW Superintendent |
| | D.vi.b | SSO Response | Average SSO duration (main) | Minutes | 40 | n/a | 70 | 0 | 0 | | Quarterly | WW Superintendent |
| | | | Average SSO duration (lateral) | Minutes | 40 | n/a | 37 | 48 | 36 | | Quarterly | WW Superintendent |
| FOG | D.vii.a | Public Education | FOG public education outreach program events per year | Number | 4 | 3 | 4 | 3 | 3 | | Annually | Environmental Utilities PIO |
| | D.vii.b | FOG Disposal | Gallons of FOG curbside pickup per year | Gallons | 25 | 179.75 | 293.1 | 373.25 | 296 | | Quarterly | Refuse Division |
| | D.vii.d | BMPs & Devices | % of total FSE's with grease removal devices | % | 90 | 90 | 97 | 98 | 98 | | Annually | Ind Waste Technician |
| | | | % of total FSE's with a variance | % | 5 | 4 | 4 | 4 | 4 | | Annually | Ind Waste Technician |
| | D.vii.e | FOG Inspections | FSE FOG inspections per year | Number | 294 | n/a | n/a | 181 | 231 | | Quarterly | Ind Waste Technician |
| | | | Number of new FSE permits issued per year | Number | 5 | n/a | n/a | 40 | 46 | | Quarterly | Ind Waste Technician |
| | D.vii.f | Hot Spots | % of hotspot pipes CCTV inspected each year | % | 100% | 100% | 100% | 100% | 100% | | Annually | WW Supervisor |
| | | | Number of SSO's caused by hot spots | Number | 0 | 0 | 0 | 0 | 0 | | Quarterly | WW Superintendent |
| SSO volume casued by hot spots | | | Gallons | 0 | 0 | 0 | 0 | 0 | | Quarterly | WW Superintendent | |
| | | | Total number of SSO's mains and laterals | Number | 76 | 42 | 39 | 24 | 25 | | Quarterly | WW Superintendent |
| | | | Total volume SSO's mains and laterals | Gallons | 2000 | 1202 | 2523 | 1086 | 1565 | | Quarterly | WW Superintendent |

7.5 Appendix – Change Log Example

3.5 References

3.5.1 SSMP Sample Change Log

{Insert Enrollee Name}
Sewer System Management Plan
Change Log

| Date | SSMP Element/ Section | Description of Change/Revision Made | Change Authorized By: |
|------|-----------------------------|-------------------------------------|--------------------------|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |