



City of Chattanooga

Mayor Andy Berke

February 28, 2020

VIA CERTIFIED MAIL

Ms. Sara Janovitz
Environmental Engineer
Clean Water Enforcement Branch
US EPA-Region 4
61 Forsyth Street, SW
Atlanta, GA 30303

**Re: *United States of America et. al. v. City of Chattanooga, No. 1:12-cv-0024*
Annual Report No. 7 – January 2019 to December 2019**

Dear Ms. Janovitz:

On behalf of the City of Chattanooga, Tennessee (“City”), and in accordance with the Consent Decree entered by the United States District Court for the Eastern District of Tennessee (Southern Division), on April 24, 2013, in the case styled the United States of America et. al. v. City of Chattanooga, No. 1:12-cv-0024 (“Consent Decree”), we are submitting to both the Environmental Protection Agency (“EPA”) and the Tennessee Department of Environment and Conservation (“TDEC”) the fifth annual report required pursuant to paragraph 40 of the Consent Decree. This report is also being submitted in accordance with the letter from Denise Diaz, dated September 16, 2013, establishing the dates for reporting under the Consent Decree.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering such information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Ms. Sara Janovitz
February 28, 2020
Page Two

Please let me know if you have any questions regarding our submittal.

Sincerely,



Jeffrey A. Rose, P.E.
Director, Waste Resources Division

Enclosure

cc: Karl Fingerhood, Esq., US DOJ
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Annual Report No. 7

January 1 - December 31, 2019

Prepared for

**Environmental Protection Agency and
Tennessee Department of Environment and
Conservation**

City of Chattanooga
Waste Resources Division
Consent Decree Program
Case No. 1:12-cv-00245

Prepared by

City of Chattanooga
Waste Resources Division

Submitted by

Jacobs

Jacobs Engineering Group Inc.
Consent Decree Program Manager

Chattanooga, Tennessee
February 28, 2020

Table of Contents

| | | |
|------------|----------------------------------|----------|
| 1.0 | Introduction | 1 |
| 1.1 | Purpose | 1 |
| 1.2 | Requirements | 1 |
| 2.0 | CMOM Programs | 2 |
| 3.0 | SSO Trends Analysis | 9 |

Tables

| | | |
|-----|---|----|
| 2-1 | CMOM Program Summary | 3 |
| 3-1 | SSOs Attributed to Unavoidable Construction | 10 |
| 3-2 | SSOs Attributed to Mechanical Failure | 10 |
| 3-3 | SSOs Attributed to Other Factors | 10 |

Figures

| | | |
|-----|--------------------------------|----|
| 3-1 | SSO Events by Year..... | 9 |
| 3-2 | SSO Events by Cause..... | 13 |
| 3-3 | Quarterly SSO Quantities | 14 |
| 3-4 | Quarterly SSO Durations..... | 15 |
| 3-5 | Quarterly SSO Volumes | 16 |

Acronyms and Abbreviations

| | |
|--------|--|
| AOP | Additional Operational Plan |
| BOD | Biochemical Oxygen Demand |
| CAP | Capacity Assurance Program |
| CD | Consent Decree |
| CMOM | Capacity, Management, Maintenance and Operations |
| CSOTF | Combined Sewer Overflow Treatment Facility |
| DO | Dissolved Oxygen |
| EPA | Environmental Protection Agency |
| FOG | Fats, Oils, and Grease |
| FSE | Food Service Establishment |
| IJA | Inter-Jurisdictional Agreement |
| ISS | Interceptor Sewer System |
| KPI | Key Performance Indicator |
| MBWWTP | Moccasin Bend Wastewater Treatment Plant |
| MG | Million Gallons |
| MH | Manhole |
| N/A | Not Applicable |
| No. | Number |
| NOAA | National Oceanic and Atmospheric Administration |
| NPDES | National Pollutant Discharge Elimination System |
| PCCMP | Post Construction Compliance Monitoring Program |
| PM | Preventive Maintenance |
| PS | Pump Station |
| SORP | Sewer Overflow Response Protocol |
| SSO | Sanitary Sewer Overflow |
| TDEC | Tennessee Department of Environment and Conservation |
| TSS | Total Suspended Solids |
| WQS | Water Quality Standards |

1.0 Introduction

1.1 Purpose

On April 24, 2013, the City of Chattanooga (“City”) entered into a Consent Decree with the United States and the State of Tennessee, in the case styled *United States of America et. al. v. City of Chattanooga, No. 1:12-cv-00245* (“CD”). Pursuant to Section IX of the CD, the City is required to submit annual reports on a yearly basis to the Environmental Protection Agency (“EPA”) and Tennessee Department of Environment and Conservation (“TDEC”). Chattanooga has prepared this report to satisfy the reporting requirements found in Paragraph 40 of the CD, which covers the period from January 1, 2019 through December 31, 2019 (“Reporting Period”). This report is also being submitted in accordance with the letter from Denise Diaz, dated September 16, 2013, establishing the dates for the reporting under the CD.

1.2 Requirements

As detailed in Section IX of the CD, the City is required to report a summary of Capacity, Management, Operations and Management (“CMOM”) Program as implemented or modified pursuant to the CD, including a comparison of actual performance with any performance measures that have been established. Additionally, the 1st five annual reports included a trends analysis of the number, volume, duration, and cause of Chattanooga’s Sanitary Sewer Overflow (“SSO”) events for a 24-month rolling period, updated to reflect the SSO events that occurred during the previous 12-month period. Since the 6th annual report last year, this trends analysis covers SSO events spanning a 5-year rolling period.

2.0 CMOM Programs

The City has completed the development of its CMOM program pursuant to Paragraph 20 of the CD. As of the end of the last Reporting Period, all nine (9) of the nine CMOM programs have been developed by Chattanooga, submitted to TDEC and EPA, and approved. Table 2-1 on the following page summarizes the status of the CMOM Programs, including updates and key performance indicators (“KPIs”) related to implementation of those that have received EPA approval.

**Table 2-1
CMOM Program Summary**

| January 1, 2019 - December 31, 2019 | | | | | | |
|---|---|---------------------------------|---|--|---|--|
| CMOM Program | CMOM Program Status | CD Reference | CMOM Program KPI | CMOM KPI Purpose | Established Performance Measure | Actual Measured Performance |
| Sewer Overflow Response Protocol ("SORP") | Approved by EPA and TDEC 5/29/2014 | Section VI, Paragraph 20(a)(ii) | Maintain records of all sanitary sewer overflow ("SSO") responses and response times | Reduce response times to respond to SSOs to reduce SSO impacts | Reduce SSO response time to within one hour after notification of event | Average SSO response time for 2019 was ~8.86 minutes |
| Sewer Overflow Response Protocol ("SORP") | Approved by EPA and TDEC 5/29/2014 | Section VI, Paragraph 20(a)(ii) | Provide notice to TDEC as required by National Pollutant Discharge Elimination ("NPDES") Permit within 24 hours of being made aware of an SSO event | Improve timeliness of SSO reporting to TDEC | Notify TDEC of SSO events within 24 hours after being made aware of event | All 24-hour reports were made to TDEC within the 24-hour time period |
| Gravity Line Preventive Maintenance Program | Approved by EPA and TDEC 12/3/2014 Updated and reapproved by EPA 9/25/2017 | Section VI, Paragraph 20(d) | Annual Chemical Root Control Footage | Reduce the impacts of roots on system performance | Treat 50,000 feet/year | 59,282 feet were treated in 2019 |
| Gravity Line Preventive Maintenance Program | Approved by EPA and TDEC 12/3/2014 Revised and reapproved by EPA 9/25/2017 | Section VI, Paragraph 20(d) | Footage of Pipeline Hydraulically Cleaned During the Calendar Year | Improve the gravity system performance | 1,000,000 feet/year | 1,282,518 feet in 2019 |

**Table 2-1
CMOM Program Summary**

| January 1, 2019 - December 31, 2019 | | | | | | |
|---|---|-----------------------------|---|--|---|--|
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| Gravity Line Preventive Maintenance Program | Approved by EPA and TDEC 12/3/2014 Revised and reapproved by EPA 9/25/2017 | Section VI, Paragraph 20(d) | Number of MACP Level 1 Manhole Inspections During the Calendar Year | Complete Level 1 inspections to improve system performance | 1,000/year until 2017 and then 2,000/year | 2,354 inspections in 2019 |
| Gravity Line Preventive Maintenance Program | Approved by EPA and TDEC 12/3/2014 Revised and reapproved by EPA 9/25/2017 | Section VI, Paragraph 20(d) | Number of MACP Level 2 Manhole Inspections During the Calendar Year | Complete Level 2 inspections to improve system performance | 900/year until 2017 and then 500/year | 970 inspections in 2019 |
| Gravity Line Preventive Maintenance Program | Approved by EPA and TDEC 12/3/2014 Revised and reapproved by EPA 9/25/2017 | Section VI, Paragraph 20(d) | The Number of SSOs caused by the build-up of debris, sediment, roots, and grease in the collection system | Measure effectiveness of gravity maintenance program | A reduction in maintenance-related SSOs | There were 51 SSOs associated with blockages in 2019 as compared to 21 in 2018 |

**Table 2-1
CMOM Program Summary**

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|---|--|-----------------------------|--|---|---|--|
| CMOM Program | CMOM Program Status | CD Reference | CMOM Program KPI | CMOM KPI Purpose | Established Performance Measure | Actual Measured Performance |
| Gravity Line Preventive Maintenance Program | Approved by EPA and TDEC 12/3/2014 Revised and Revised by EPA 9/25/2017 | Section VI, Paragraph 20(d) | Footage of pipelines and frequency that preventive maintenance hydraulic cleaning is performed | Complete gravity line maintenance to improve system performance | Preventive Hydraulic Line Cleaning Frequency Maximum ft. 2 months – 25,000 ft. 4 months – 50,000 ft. 6 months – 50,000 ft. 8 months – 50,000 ft. 12 months- 225,000 ft. 18 months- 250,000 ft. 36 months- 350,000 ft. | Preventive Hydraulic Line Cleaning Frequency Actual ft. 2 months- 0 ft. 4 months- 0 ft. 6 months- 69,563 ft. 8 months- 62,147 ft. 12 months- 1,401,826 ft. 18 months- 2,495,902 ft. 36 months- 2,787,168 ft. |
| Fats, Oils, and Grease (“FOG”) Management Program | Approved by EPA and TDEC 7/21/2015 | Section VI, Paragraph 20(c) | Number of FOG-related SSOs | Measure FOG program effectiveness | Yearly Reduction in FOG-related SSOs | There were 15 SSOs associated with grease blockages |
| Fats, Oils, and Grease (“FOG”) Management Program | Approved by EPA and TDEC 7/21/2015 | Section VI, Paragraph 20(c) | Number of annual inspections vs the total number of Food Service Establishments (“FSEs”) | Measure FOG Program Workload | 100% | 69% |

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CMOM Program Summary**

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|---|------------------------------------|-----------------------------|--|---|--|---|
| CMOM Program | CMOM Program Status | CD Reference | CMOM Program KPI | CMOM KPI Purpose | Established Performance Measure | Actual Measured Performance |
| Fats, Oils, and Grease ("FOG") Management Program | Approved by EPA and TDEC 7/21/2015 | Section VI, Paragraph 20(c) | Number of annual Noncompliance Notifications vs the total inspections | Evaluate the FOG Program effectiveness | Below 15% | 9% of total inspections yielded a non-compliance notification |
| Fats, Oils, and Grease ("FOG") Management Program | Approved by EPA and TDEC 7/21/2015 | Section VI, Paragraph 20(c) | FOG Hot Spots | Reduce the number of FOG hot spot areas | Reduce linear footage by 10% | 0% reduction |
| Fats, Oils, and Grease ("FOG") Management Program | Approved by EPA and TDEC 7/21/2015 | Section VI, Paragraph 20(c) | Number of FSEs Added Annually | Measure FOG program effectiveness | Have every existing FSE included in Program so only new ones are added | 55 FSEs were added during the reporting period |
| Fats, Oils, and Grease ("FOG") Management Program | Approved by EPA and TDEC 7/21/2015 | Section VI, Paragraph 20(c) | Annual FOG Management Program Update Completed on Time | Improve FOG program effectiveness | Complete Annually | 100% |
| Fats, Oils, and Grease ("FOG") Management Program | Approved by EPA and TDEC 7/21/2015 | Section VI, Paragraph 20(c) | Number of Pretreatment Program Employees Trained on FOG Management Program | Improve employee program knowledge through training | 100% | 100% |

**Table 2-1
CMOM Program Summary**

| January 1, 2019 - December 31, 2019 | | | | | | |
|---|--|-----------------------------|---|--|---|---|
| CMOM Program | CMOM Program Status | CD Reference | CMOM Program KPI | CMOM KPI Purpose | Established Performance Measure | Actual Measured Performance |
| Pump Station Operations Program | Approved by EPA and TDEC 10/22/2015 Revised and reapproved by EPA 9/25/2017 | Section VI, Paragraph 20(e) | Pump Station ("PS") Operational Checks | Improve pump station performance | 95% adherence to PS/CSOTF visit schedule | 98% completed on time |
| Pump Station Preventive Maintenance Program | Approved by EPA and TDEC 3/17/2015 Revised and reapproved by EPA 9/25/2017 | Section VI, Paragraph 20(f) | Preventive Maintenance ("PM") Completion Schedule | Measure PM program effectiveness | 95% adherence to PM schedule | 97% completed on time |
| Pump Station Preventive Maintenance Program | Approved by EPA and TDEC 3/17/2015 Revised and reapproved by EPA 9/25/2017 | Section VI, Paragraph 20(f) | Number of Preventable Work Orders | Measure work order program effectiveness | Less than 5 preventable work orders per month | Total of 21 and average of 1.75 preventable work orders per month, as compared to 3.3 per month in 2018 |
| Pump Station Preventive Maintenance Program | Approved by EPA and TDEC 3/17/2015 Revised and reapproved by EPA 9/25/2017 | Section VI, Paragraph 20(f) | Track Work Orders Found Via PM Activities | Evaluate effectiveness of the PM program | Track the number of CMs generated as a result of a PM | 6.35 for 2019 overall (145 CMs and 2285 PMs) |
| Pump Station Preventive Maintenance Program | Approved by EPA and TDEC 3/17/2015 Revised and reapproved by EPA 9/25/2017 | Section VI, Paragraph 20(f) | Track the Age of Work Orders | Improve work order process | No work orders older than 6 months | Average of 74.5 work orders older than 6 months in 2019 (3% of total work orders) |

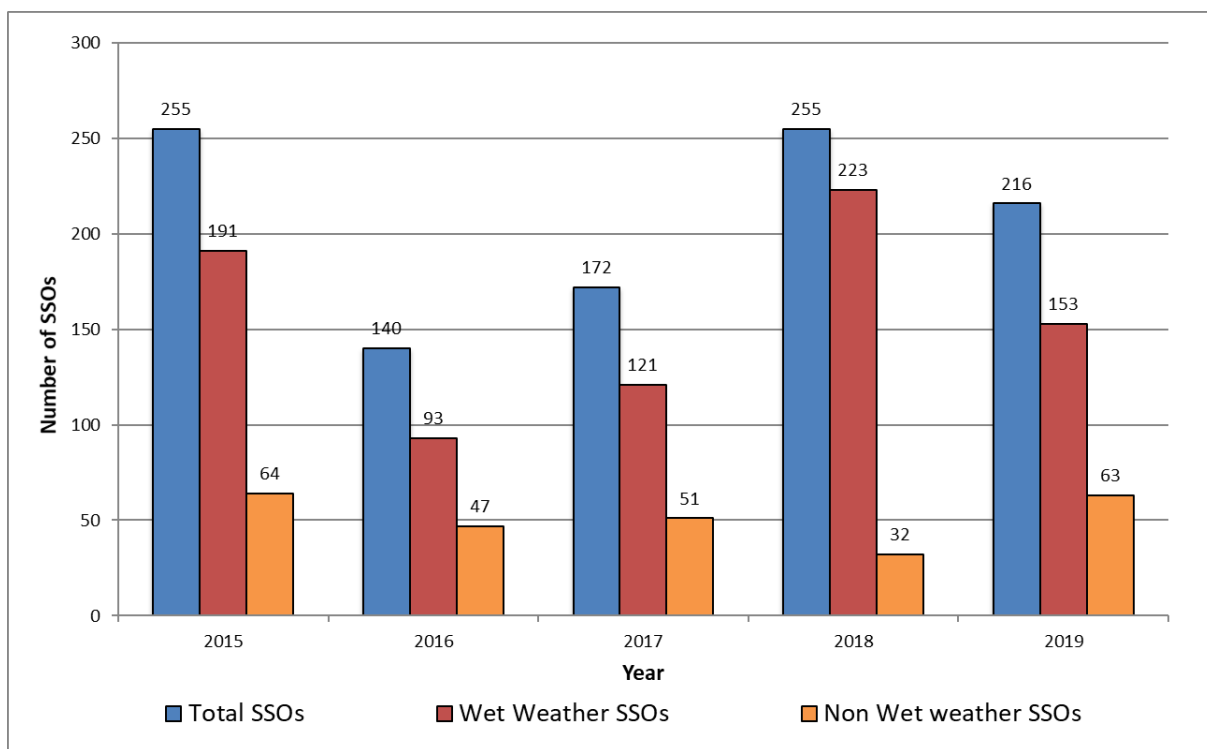
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CMOM Program Summary**

| January 1, 2019 - December 31, 2019 | | | | | | |
|---|---|-----------------------------|---|--|--|--|
| CMOM Program | CMOM Program Status | CD Reference | CMOM Program KPI | CMOM KPI Purpose | Established Performance Measure | Actual Measured Performance |
| Pump Station Preventive Maintenance Program | Approved by EPA and TDEC 3/17/2015 Revised and reapproved by EPA 9/25/2017 | Section VI, Paragraph 20(f) | Percentage of Emergency Work Orders | Track the reliability of the City assets | Less than 10% of the work orders are emergencies | Emergency work orders were 0% of total work orders written |
| Pump Station Preventive Maintenance Program | Approved by EPA and TDEC 3/17/2015 Revised and reapproved by EPA 9/25/2017 | Section VI, Paragraph 20(f) | Work Orders Awaiting Parts | Improve work order program | No Work Orders Older than 30 days Awaiting Parts | 33 total requests with an average delivery time of 14 days |
| Pump Station Preventive Maintenance Program | Approved by EPA and TDEC 3/17/2015 Revised and reapproved by EPA 9/25/2017 | Section VI, Paragraph 20(f) | Work Backlog | Measure work order program effectiveness | Not more than 6 weeks of work | 84% of work orders written were closed |
| Pump Station Preventive Maintenance Program | Approved by EPA and TDEC 3/17/2015 Revised and reapproved by EPA 9/25/2017 | Section VI, Paragraph 20(f) | Overtime as a Percent of Total Hours Worked | Improve pump station program by measuring overall overtime usage | Less than 5% | 12.44% OT |
| Capacity Assurance Program ("CAP") | Approved by EPA and TDEC 10/13/2016 | Section VI, Paragraph 20(h) | Applicable CD components to be identified during program implementation | N/A | N/A | N/A |

3.0 SSO Trends Analysis

The City conducted a trends analysis of the cause, duration, and volume of SSO events for the 60-month period spanning January 1, 2015 through December 31, 2019. Rainfall data collected during the same time period was included in the analysis to illustrate the effects of heavy, sustained rainfall on the occurrence, duration, and volume of the recorded SSO events. Figure 3-1 below provides a summary of SSO events by year for the reporting period:

Figure 3-1
SSO Events by Year



As illustrated in Figure 3-1, there was an upward trend in SSO events (+7%), including wet weather (+15%), and a downward trend (-12%) of non-wet weather SSOs, from 2015 to 2019. However, there was also a corresponding greater upward trend in rainfall (+27%), as described further in this section below. The majority of SSO events during the reporting period were wet-weather related (72%). This downward trend of non-wet weather SSOs is attributed to the continued implementation of the CMOM program. Based on averaged data from the 13 rain gauges installed throughout Chattanooga, the observed rainfall in 2019 was 23% higher than normal and approximately the same as 2015 and 2018. These above normal conditions produced one storm event in 2019 that had total rainfall significantly larger than the 2-year 24-hour design storm event of 3.67 inches as defined in the CD. This event began on February 19, 2019 and had a rainfall total of 6.63 inches, or 10% of the overall 2019 rainfall. There were 53 SSOs associated

with this event, or 35% of the total wet weather SSOs in 2019. This is significant because Chattanooga is developing its wastewater infrastructure to the 2-year 24-hour design storm event, in accordance with the CD, and this event exceeds that standard.

In addition to higher than normal rainfall, the Influent Pump Station (“IPS”) at the Moccasin Bend Wastewater Treatment Plant (“MBWWTP”) shut down due to power failure for 45 minutes on October 31, 2019 during an ongoing wet weather event. Modeling shows that this SSO would not have occurred in the absence of the power failure. This SSO is shown in Table 3-1.

Table 3-1

SSO Attributed to Power Failure

| Start Date | Start Time | Location | Source | Estimated Duration (hrs) | Estimated Volume (gal) | SSO Destination | Cause |
|------------|------------|--------------------------------|-----------|--------------------------|------------------------|-----------------|-------------|
| 31-Oct-19 | 10:30 AM | 122 Rowland Gap Rd (West Bank) | West Bank | 10.83 | 2,273,000 | Tennessee River | Wet Weather |

There was also a mechanical failure at the IPS and Influent Relief Pump Station (IRPS) at the MBWWTP. There were issues with starting pumps at the IPS, and pump No.4 failed at the IRPS, causing an SSO. This SSO is shown in Table 3-2.

Table 3-2

SSO Attributed to Mechanical Failure

| Start Date | Start Time | Location | Source | Estimated Duration (hrs) | Estimated Volume (gal) | SSO Destination | Cause |
|------------|------------|--------------------------------|-----------|--------------------------|------------------------|-----------------|-------------|
| 7-Jul-19 | 1:00 PM | 122 Rowland Gap Rd (West Bank) | West Bank | 0.02 | 50 | Tennessee River | Wet Weather |

On November 30, 2019, the fine screens at the IPS became clogged with leaves, resulting in a reduced capacity of 113 MGD and an SSO. This SSO is shown in Table 3-3.

Table 3-3

SSOs Attributed to Other Factors

| Start Date | Start Time | Location | Source | Estimated Duration (hrs) | Estimated Volume (gal) | SSO Destination | Cause |
|------------|------------|--------------------------------|-----------|--------------------------|------------------------|-----------------|-------------|
| 30-Nov-19 | 7:40 PM | 122 Rowland Gap Rd (West Bank) | West Bank | 2.1 | 553,326 | Tennessee River | Wet Weather |

Figure 3-2 depicts SSO events by cause per quarter for the reporting period. Wet weather was the leading cause of SSOs, followed by blockages. While the 2019 rainfall (64.56 inches) was comparable to 2015 (64.16 inches) and 2018 (65.93 inches), there were significantly less SSOs (216), including wet weather (153), in 2019 than in 2015 and 2018. This trend reflects all of the improvements that have been made in the collection system under the CD.

Figure 3-3 depicts total SSO events and rainfall accumulation per quarter. Looking at the overall, five-year, and quarterly trends, there has been a 2% increase in the number of SSOs since 2015. This is largely due to wet weather SSOs. At the same time, however, there has been a 27% increase in rainfall since 2015, which generates the rain derived inflow and infiltration ("I/I") causing these SSOs. The significant number of SSOs for the first quarter of 2019 (131) was caused by heavy rainfall. This quarter recorded the highest quarterly amount of rainfall in the last five years. Prior to the event that started on February 19, 2019, more than 11 inches of rainfall had been recorded since the start of the year. The cumulative rainfall in January and February was twice the normal rainfall for those two months. In the City's assessment, these kinds of events are outliers and not indicative of true system performance.

Figure 3-4 depicts cumulative SSO duration and rainfall accumulation per quarter or the sum of the durations of each SSO event that was recorded per quarter for the reporting period. There is an increasing trend in cumulative SSO duration in the 5-year span (+68%); however, this trend is significantly inflated by the extreme storm event that occurred in February 2019. In addition, SSO duration has been impacted by the implementation of the SORP under the CD. The response team has shortened their response time. Therefore, longer SSO durations were due to the rain events discussed above.

Figure 3-5 depicts cumulative SSO volume and rainfall accumulation per quarter or the sum of the volumes of each SSO event that was recorded per quarter for the reporting period. Looking at the overall, five-year, and quarterly trends, there has been an increase in rainfall by 27% and a decrease in total SSO volume of 78%. This shows that the efforts taken under the CD, including Early Action Capital Improvement Projects and the implementation of the CMOM programs, are having a positive impact on system performance.

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Figure 3-2
SSO Events by Cause

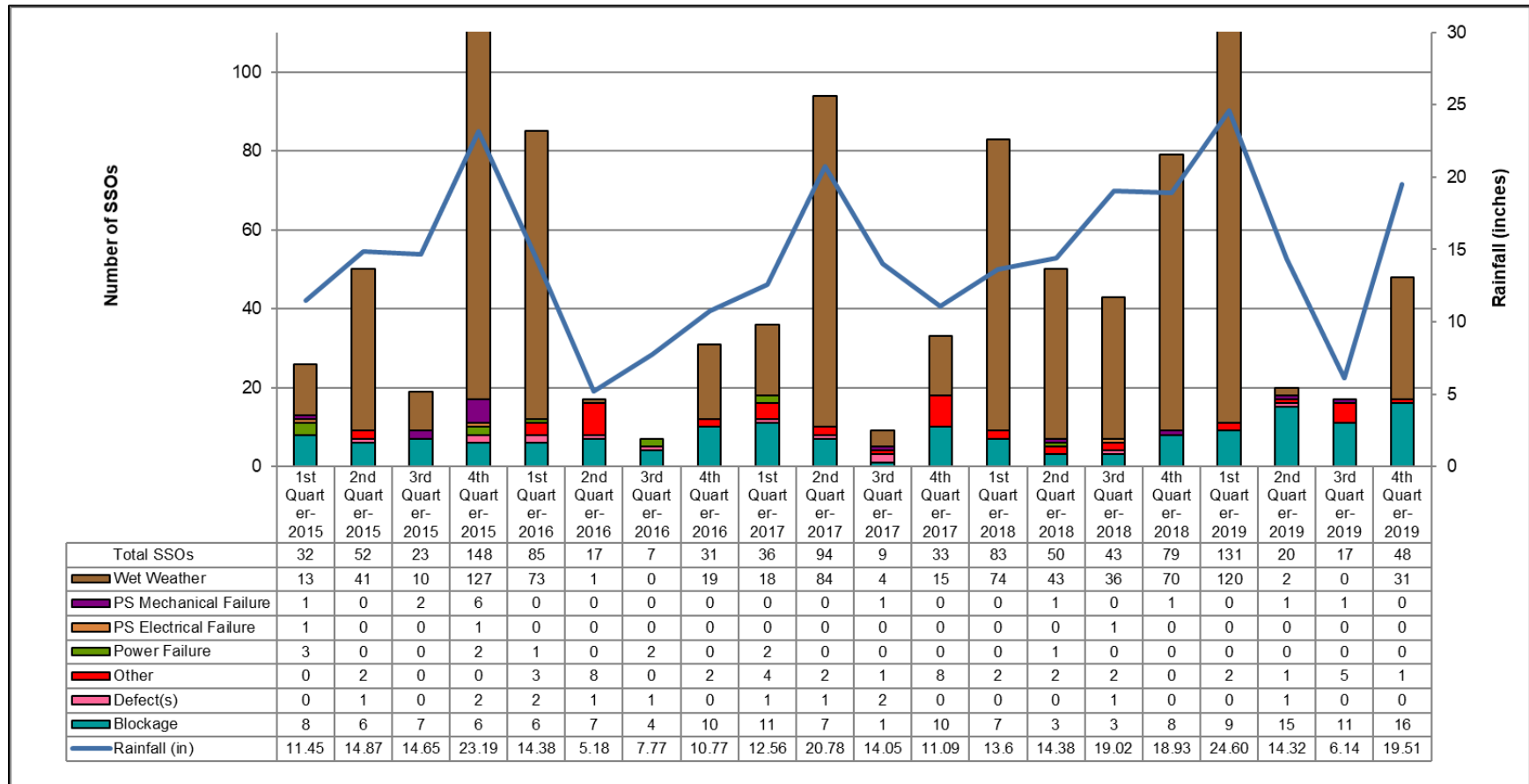


Figure 3-3
Quarterly SSO Quantities

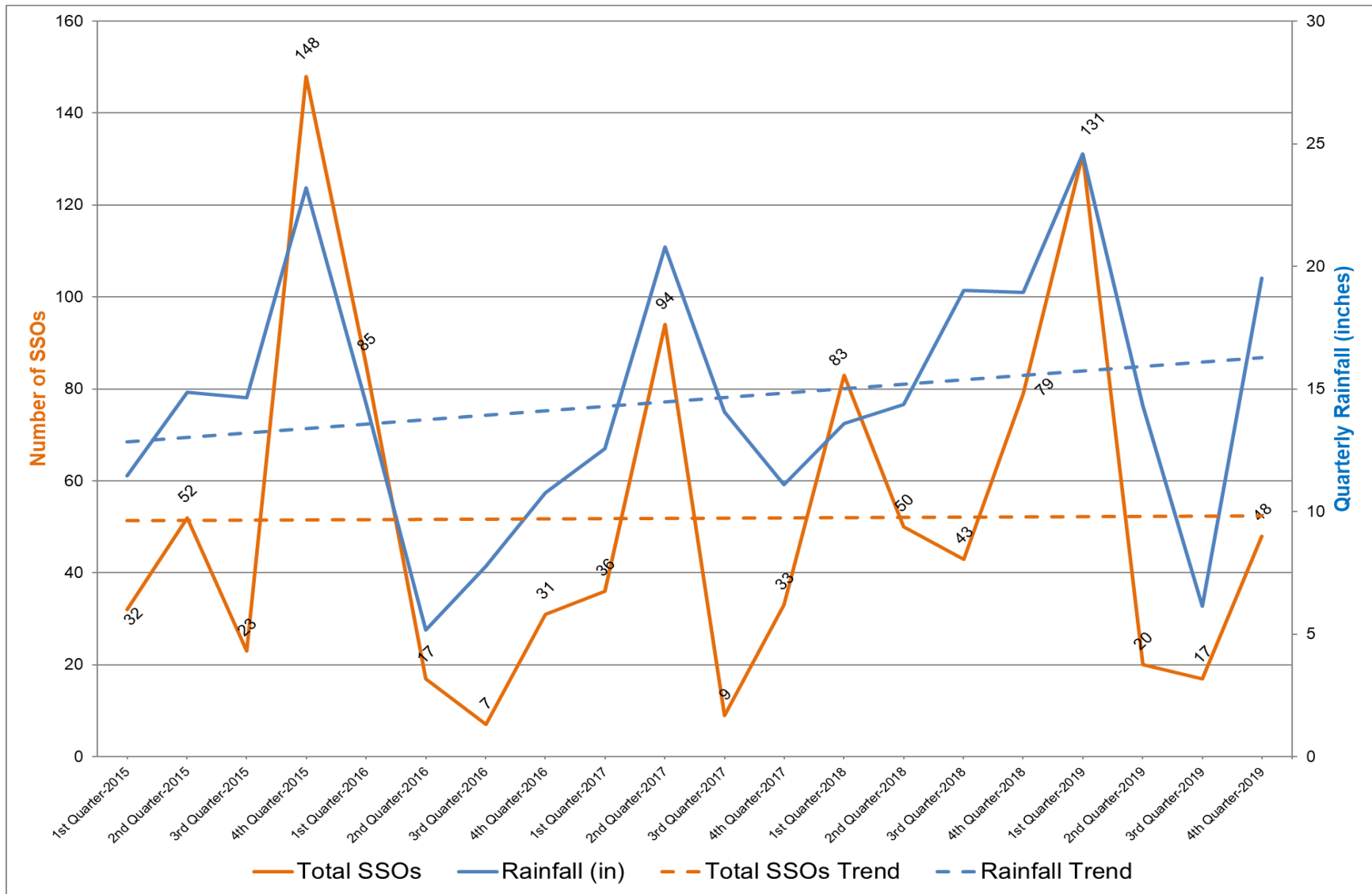


Figure 3-4
Quarterly SSO Durations

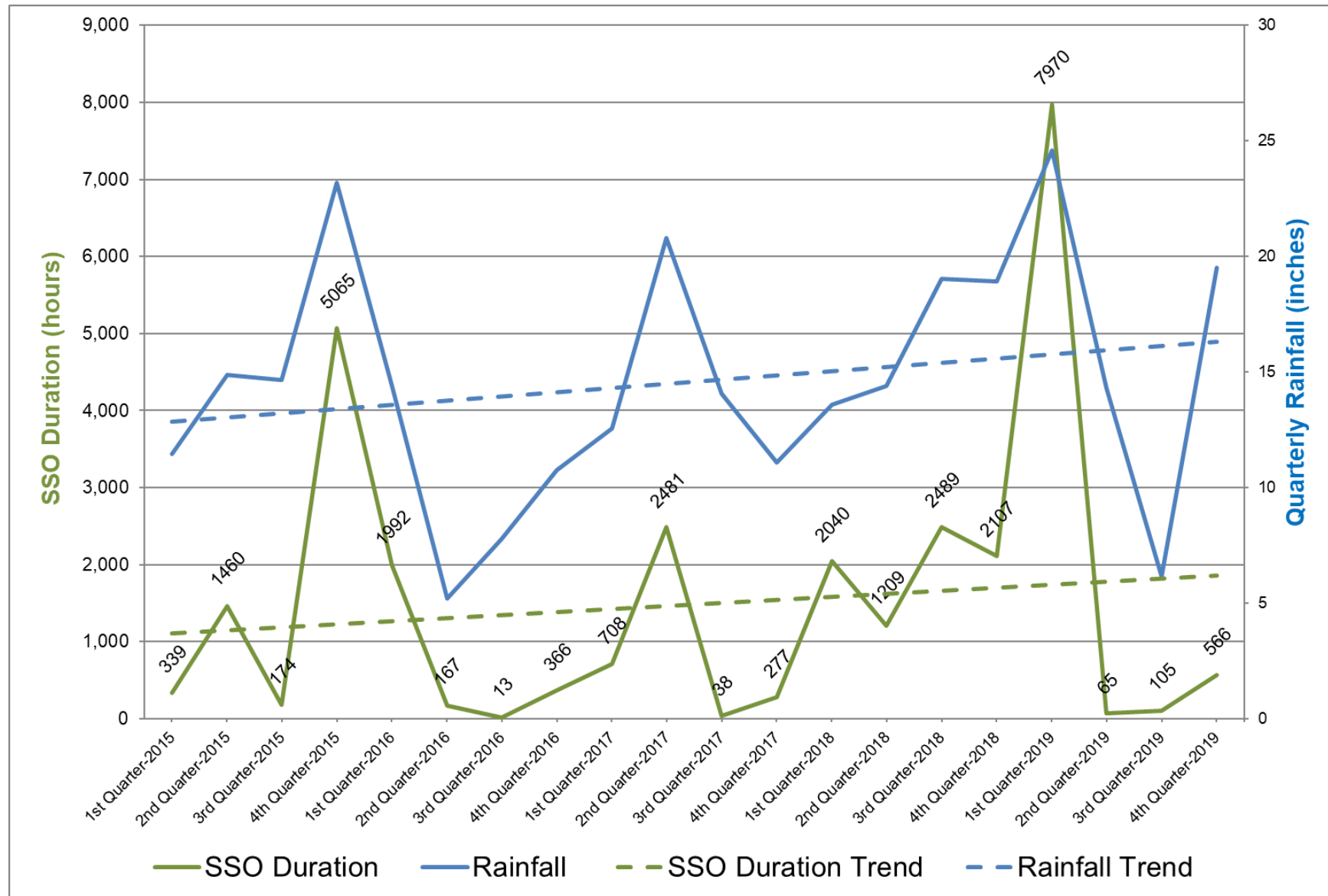


Figure 3-5
Quarterly SSO Volume

