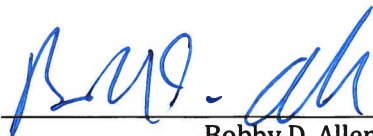


# City of Memphis

## Annual Report

October 1, 2018 through September 30, 2019

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.



Bobby D. Allen, P.E.

11-25-19

Date

# Annual Report

October 1, 2018 through September 30, 2019

On September 20, 2012, the United States District Court for the Western District of Tennessee entered a Consent Decree between the City of Memphis (the City) and the United States, the State of Tennessee, and the Tennessee Clean Water Network.

To fulfill the reporting requirements defined in Paragraph VIII.26. of the Consent Decree, the City has prepared this Annual Report, which includes the following information:

- A summary of Management, Operations, and Maintenance (MOM) programs implemented or modified pursuant to the Consent Decree, including a comparison of actual performance with any performance measures that have been established.
- A trend analysis of the number, volume, duration, and cause of sanitary sewer overflow (SSO) events for the previous twenty-four month period.

## 1. Summary of MOM Programs

The Consent Decree, as shown in Paragraph V.10, describes the following MOM Programs that are required to be developed and/or implemented by the City. These include the following:

- Sewer Overflow Response Plan (SORP)
  - Approved by EPA on March 11, 2011, with an update of “form and not substance” on March 30, 2016, and implemented for the full reporting period. The program was reviewed February 2019 and the City determined that no changes were needed.
- Fats, Oil, and Grease (FOG) Management Program
  - Approved by EPA on April 22, 2014, with an update of “form and not substance” on May 30, 2019 and July 22, 2019 and implemented for the reporting period.
  - Performance measures described in the FOG Management Program are presented below, along with the actual performance over the reporting period for those items.
    - Commercial FOG Prevention Measures
      - Number of Notice of Violations (NOVs) issued for failure to comply with Food Establishment Wastewater Discharge permits: 122
      - Number of NOVs per 100 food establishments: 1.8
      - Number of food establishment grease removal equipment inspections: 6,725
      - Number of follow-up inspections: 232

- General Public FOG Prevention Measures
- Number of FOG public education packets distributed (door hangers and “can the grease” lids): 33,749 since CD inception
- Number of grease-related SSOs: 168
  - Note that grease-related SSOs are those identified at the time of the SSO as related to grease, although additional causes, such as roots or an offset joint, may also have contributed to the overflow.
- Lift Station and Force Main Operations and Maintenance (O&M) Program
  - Approved by EPA on March 13, 2017, and implemented for the full reporting period. The program was reviewed February 2019 and the City determined that no changes were needed.
- Gravity Sewer System O&M Program
  - Approved by EPA on November 9, 2017, and the City began implementation of the approved program at this time.
- Inter-Jurisdictional Agreement Program
  - Approved by EPA on March 19, 2018, and the City began implementation of the approved program at this time.
- Continuing Sewer Assessment Program (CSAP)
  - Revised version submitted on June 13, 2018.
  - Approved by EPA on November 5, 2018, and the City began implementation of the approved program at this time.
  - As described in Paragraph V.10.f of the Consent Decree, the City is required to assess approximately 10 percent of the wastewater collection and transmission system (WCTS) on average per year following the approval of the CSAP. Also as stipulated in the Consent Decree, the City may include any assessment activity that is conducted after April 1, 2011, as part of the calculation. Through the end of this reporting period, the City has assessed more than 63% of the system’s gravity mains and associated manholes which well exceeds the requirements of the CSAP.
  - The CSAP outlines Year 1 and Year 2 Priority Areas for assessment to be completed by deadlines specified in the document. The Year 1 area was completed by the September 10, 2015, deadline and the Year 2 was completed by the September 10, 2016, deadline. Additionally, assessment was conducted on areas outside of these boundaries to complete sewersheds in their entirety.
- Infrastructure Rehabilitation Program (IRP)
  - The IRP was approved by EPA on July 13, 2016 and the City began implementation of the approved program at this time.

- The City continued to prioritize rehabilitation issues in accordance with the approved IRP and continued rehabilitation in the North and South Priority Rehabilitation Areas (as designated in Appendix G of the CD). The Group 1 Relay construction project consists of approximately 19,000 linear feet of 6-inch and 8-inch pipe replacement, approximately 11,500 linear feet have been completed, and the project is anticipated to be completed at the beginning of 2020. The Group 1 CIPP project consists of rehabilitation of approximately 54,000 linear feet of 8" to 36" diameter gravity mains. The contractor is in the process of completing point repairs to allow CIPP to be installed.

## 2. Sanitary Sewer Overflow Trend Analysis

As required in the Consent Decree, a trend analysis of the number, volume, duration and cause of SSO events was performed which includes four graphs (all located at the end of this report).

**Figure 1** shows monthly SSO events for the previous twenty-four months as a result of the following causes:

- Blockage
  - Related to FOG
  - Not related to FOG
- Break
- Flooded
- Force Main Failure
- Pump Station Failure
- Other / Unknown

The majority of SSOs (70%) shown in **Figure 1** were the result of blockages within the system. This trend is consistent with the findings in the previous Annual Report. These blockages have been organized by those caused by FOG and those caused primarily by other factors such as roots, debris, mud, sand, rocks, or other foreign material obstructing the pipe. During this reporting period, 168 SSOs were related to FOG blockages which is a 7% decrease of the 181 FOG SSOs from the last reporting period.

**Figure 2** presents a rolling annual average of SSOs per 100 miles of WCTS per month for a given 12-month period. The graph begins with the number of SSOs per 100 miles of WCTS per month for a rolling twelve months average starting June 2012 and ending May 2013. The graph continues through the end of this reporting period. As each successive month is added to the annual average, the first month is dropped, creating the rolling 12-month average. This graph better demonstrates SSO trends by eliminating the inconsistent pattern of SSOs month to month and year to year. Similarly, to the trend found in the previous Annual Report, the number of SSOs continues to decrease as evidenced by the trend line. The graph was changed to indicate the SSOs per 100 miles as an industry standard.

**Figure 3** shows the monthly SSO volumes for the previous twenty-four months, reported in million gallons. In March of 2018, a pump failed at the Stiles Treatment Plant and caused backups and overflows to occur on several sewer lines that flow to the plant. Additionally, in February of 2019 two SSOs occurred near Highway 51 causing a larger volume of overflow. Because these events

contributed to a much larger SSO volume than typical months, the figure is presented on a logarithmic scale to accurately display all of the volume data. The total volume each month is presented above each bar as to avoid any confusion.

**Figure 4** shows the monthly SSO duration during the previous twenty-four month period. Similar to Figure 3, the pump failure at the Stiles Treatment Plant in March 2018 and the two SSOs near Highway 51 in February 2019 resulted in large durations. Because these events contributed to a much longer duration for SSO's than typical months, the figure is presented on a logarithmic scale. The durations shown are a summation of the total amount of time overflows were occurring within the system at all overflow locations. This data is provided in the units of overflow equivalent hours. For instance, if two overflows related to blockages occur concurrently for two hours each, the overflow duration for that day is four overflow equivalent hours.

SSOs/Month (October 2017 - September 2019)

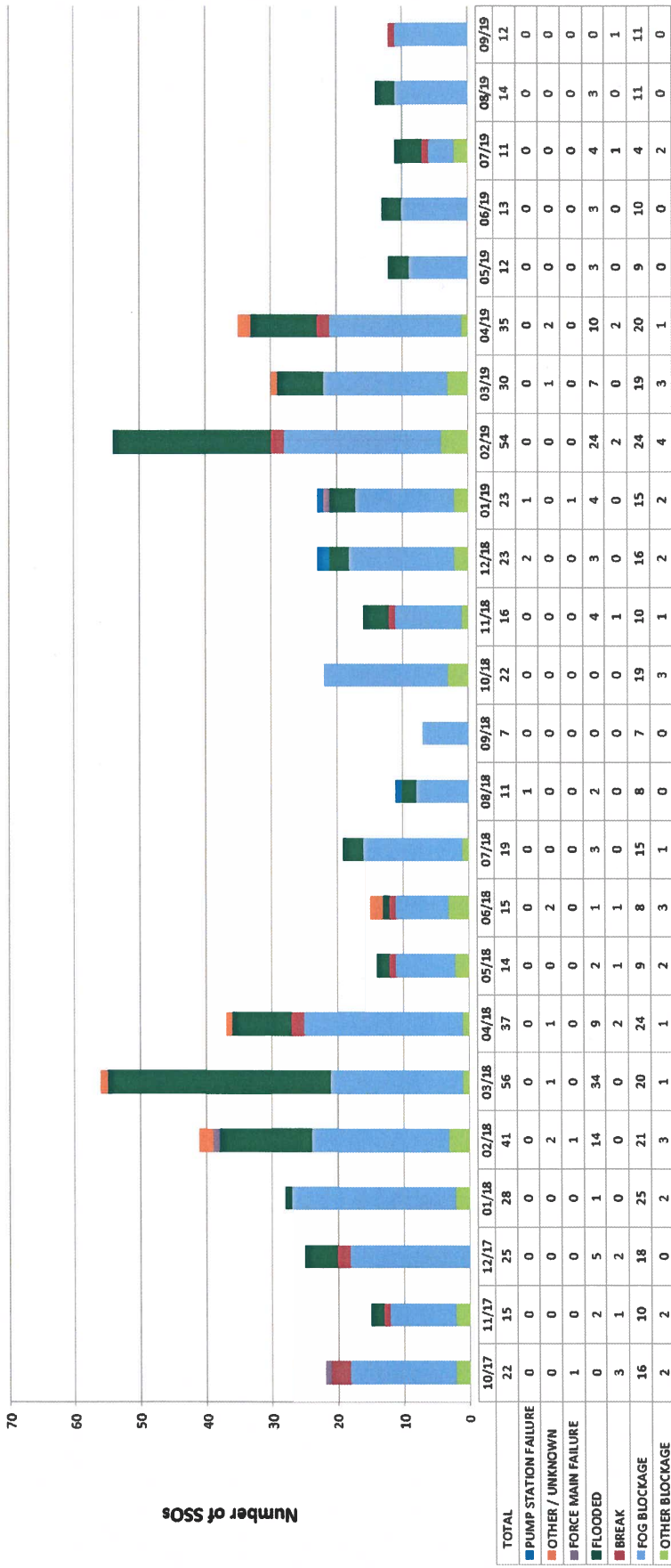


Figure 1 – SSOs by Cause

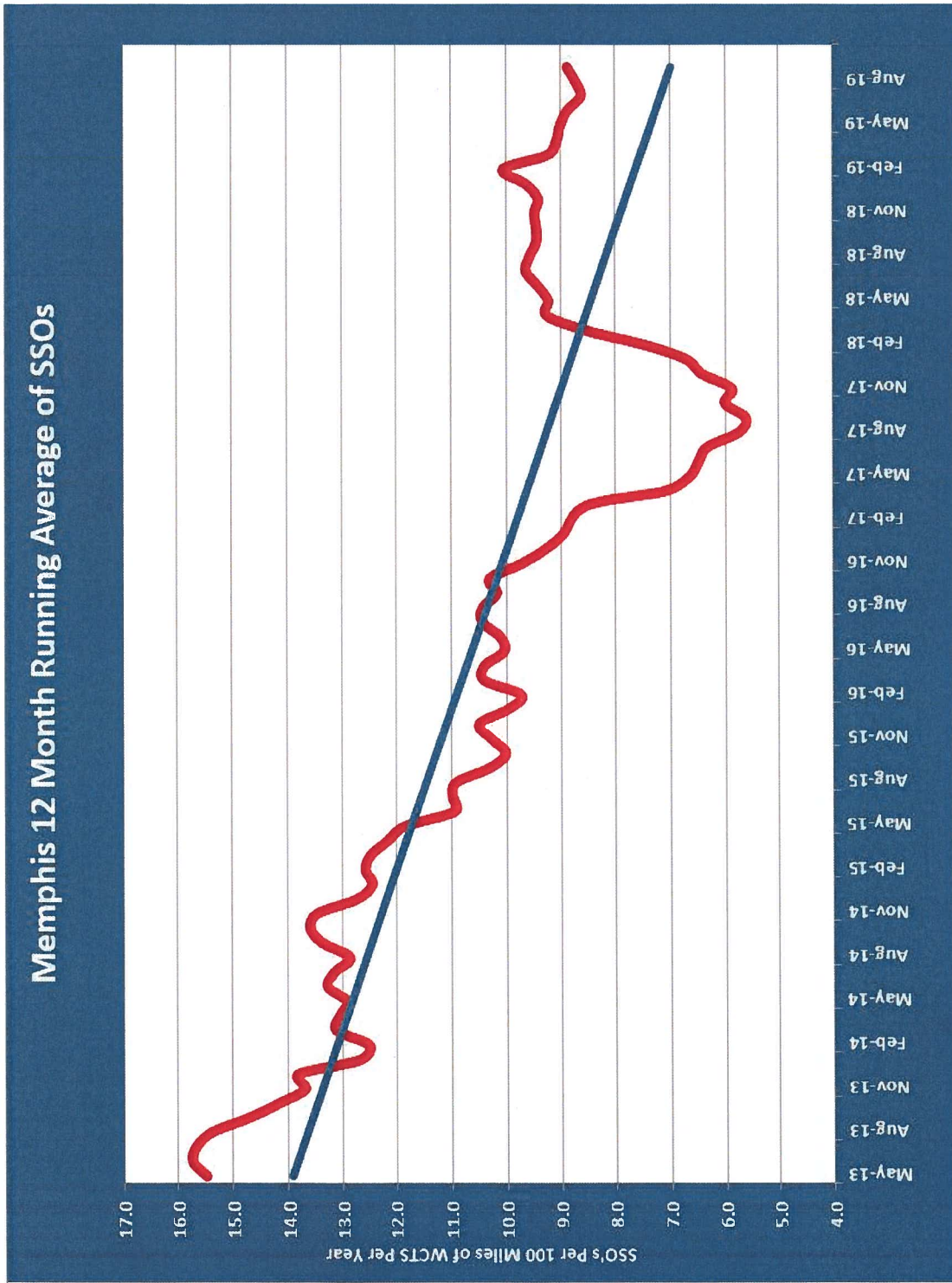
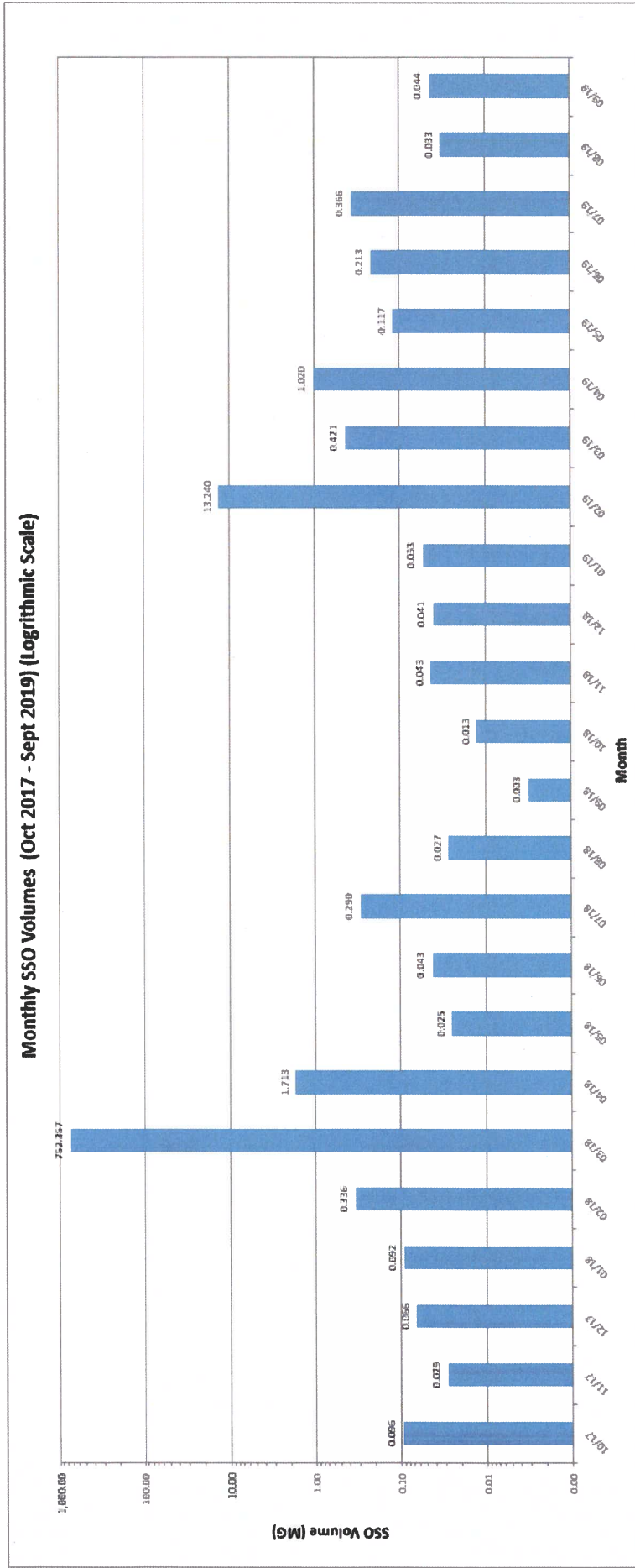


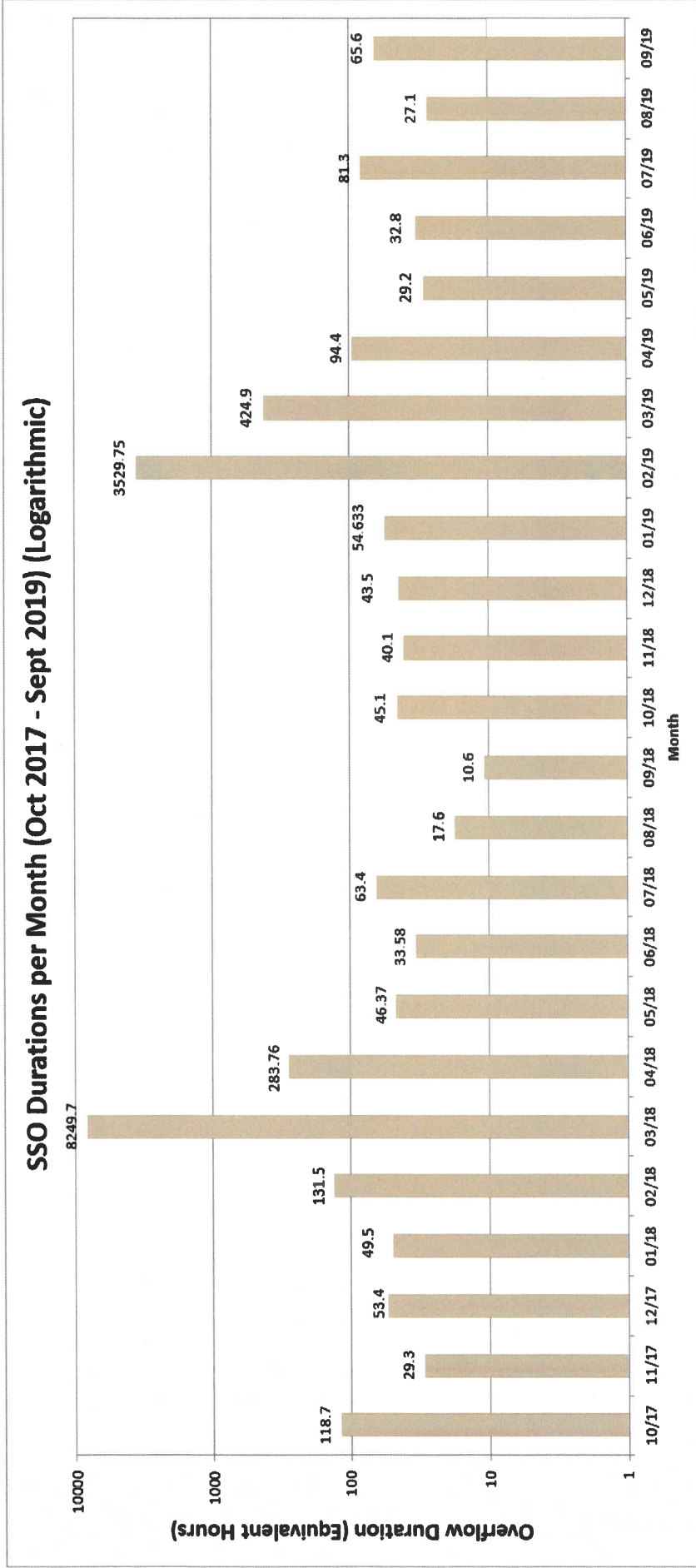
Figure 2 – Rolling Average of SSOs/100 Miles/Month



\* A pump failure at the Stiles Treatment Plant was the cause of approximately 752M gallons of SSOs in March 2018. Additionally, two large volume overflows occurred near Highway 51 that increased the volume total in February 2019.

Figure 3 – Monthly SSO Volume





\* A pump failure at the Stiles Treatment Plant was the cause of the increased number of hours of SSO duration in March 2018. Additionally, two overflows occurred near Highway 51 that increased the number of hours of SSO duration in February 2019.

**Figure 4 – Monthly SSO Duration**