City of Memphis

Annual Report
October 1, 2020 through September 30, 2021

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.

C Morrical

Christopher Morrical, P.E.

11/22/2021

Date

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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 only one change should be made which was submitted to EPA on March 6, 2019. As EPA disapproved the change, the City operates under the 2016 amended SORP. By letter dated March 5, 2021, the City submitted revisions that were deemed "form and not substance"
- Fats, Oil, and Grease (FOG) Management Program
    - The original FOG program was approved as part of the Consent Decree. A subsequent amendment was approved by EPA on April 22, 2014. Subsequent updates of "form and not substance" were submitted on May 30, 2019 and July 22, 2019. The City completed revisions on July 21, 2021 with a number of changes based upon the style of the new Administrator of Environmental Construction. Rather than evaluating whether all of the changes were to form versus substance, the City requested EPA's written approval.
    - 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: 27

- Number of NOVs per 100 food establishments: 0.39
- Number of food establishment grease removal equipment inspections: 6,922
- 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): 38,377, since CD inception
- Number of grease related SSOs: 193
  - 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. Increase in overflows are likely due to Covid; for instance, residents cooked more meals at home with potential for more incorrect and/or illicit grease disposal methods.

- 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 March 5, 2021 and the City determined that changes were "form" and not "substance".
- Gravity Sewer System O&M Program
  - Approved by EPA on November 9, 2017, with an update of "form and not substance" on November 14, 2019, the City continued implementation of the program. Inter-Jurisdictional Agreement Program
  - Approved by EPA on March 19, 2018, and the City began implementation of the approved program at this time.
  - The City of Memphis continued negotiations with a number of municipalities concerning the draft IJA's. The City of Memphis executed revisions to the IJA with the Town of Collierville on May 21, 2020. An agreement was reached with the City of Millington and the IJA has been submitted for execution. Negotiations are being finalized with the City of Lakeland. The City remains in discussion with the City of Bartlett and City of Germantown. Litigation is on-going regarding Memphis' decision to discontinue sewer service to the Horn Lake Sewer District (Mississippi).
- Continuing Sewer Assessment Program (CSAP)
  - Approved by EPA on November 5, 2018, with an update of "form and not substance" on June 8, 2020, the City continued implementation of the program.
  - 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 approximately 2,441of the estimated 2,808 miles of pipe contained within the WCTS. This equates to approximately 87% of the system being assessed and does not include the additional pipe assessed using the SL-RAT technology described in the CSAP. In accordance with the CD, the City is required to assess approximately 10% of the WCTS per year following approval of the CSAP in September 2014 (i.e., 70% of the WCTS should be assessed by September 2021). The current assessment rate of 87% places the City well ahead of the CD-required schedule. Within and outside the WCTS there are 96 lift stations all of which have been assessed. Additionally, eighty-two force mains have been assessed and one reassessment of those force mains

Due to the greater precision associated with the GIS information, the number of miles associated with the WCTS is subject to slight change. In its March 2, 2017, letter to EPA, the City stated that future reports and documents will utilize the total mileage of approximately 2,808 recognizing that the exact number may vary slightly over time as additional new information is developed. Accordingly, this report continues to be based upon 2,808 miles. Nevertheless, for your information, we note that our current estimate of the size of the WCTS is 2,814 miles.

- 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 sewer sheds 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 and CIPP construction projects were completed during this reporting period. The City issued a new contract to reassess lines located within areas prioritized in the IRP. The contract includes reassessment of approximately 170,000 LF of small and large diameter pipe. The City selected contractors, and the contractors began work in September 2020 and continued with approximately 64,600 LF that started in January 2021

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:

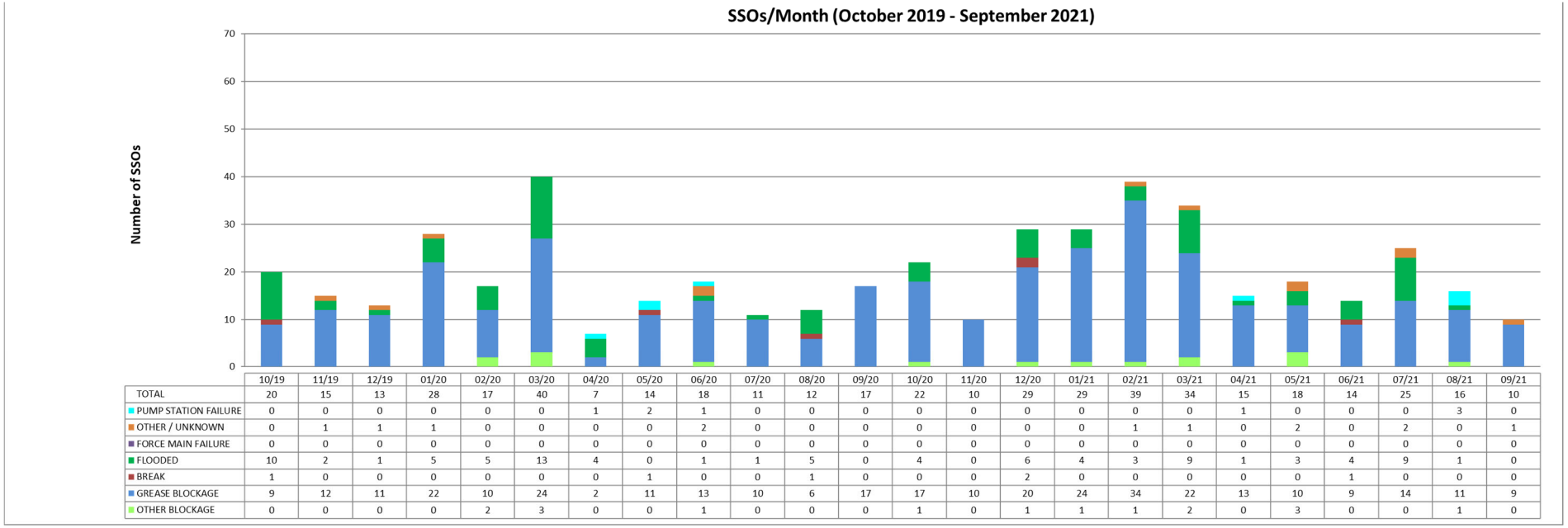
- Blockage
  - Related to FOG
  - Not related to FOG
- Break
- Flooded
- Force Main Failure
- Pump Station Failure
- Other / Unknown

The majority of SSOs (78%) shown in **Figure 1** were the result of grease blockages within the system. This trend is consistent with the findings in the previous Annual Reports. 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.

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. Hence, the graph begins on May 2013 and looks back at 12 months of data. 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. The long term trend line shows a decrease in overflows. The graph continues 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. The total volume each month is presented above each bar.

Figure 4 shows the monthly SSO duration during the previous twenty-four month period. 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.



	10/19	11/19	12/19	01/20	02/20	03/20	04/20	05/20	06/20	07/20	08/20	09/20	10/20	11/20	12/20	01/21	02/21	03/21	04/21	05/21	06/21	07/21	08/21	09/21
TOTAL	20	15	13	28	17	40	7	14	18	11	12	17	22	10	29	29	39	34	15	18	14	25	16	10
PUMP STATION FAILURE	0	0	0	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0
OTHER / UNKNOWN	0	1	1	1	0	0	0	0	2	0	0	0	0	0	0	0	1	1	0	2	0	2	0	1
FORCE MAIN FAILURE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FLOODED	10	2	1	5	5	13	4	0	1	1	5	0	4	0	6	4	3	9	1	3	4	9	1	0
BREAK	1	0	0	0	0	0	0	1	0	0	1	0	0	0	2	0	0	0	0	0	1	0	0	0
GREASE BLOCKAGE	9	12	11	22	10	24	2	11	13	10	6	17	17	10	20	24	34	22	13	10	9	14	11	9
OTHER BLOCKAGE	0	0	0	0	2	3	0	0	1	0	0	0	1	0	1	1	1	2	0	3	0	0	1	0

Figure 1 – SSOs by Cause

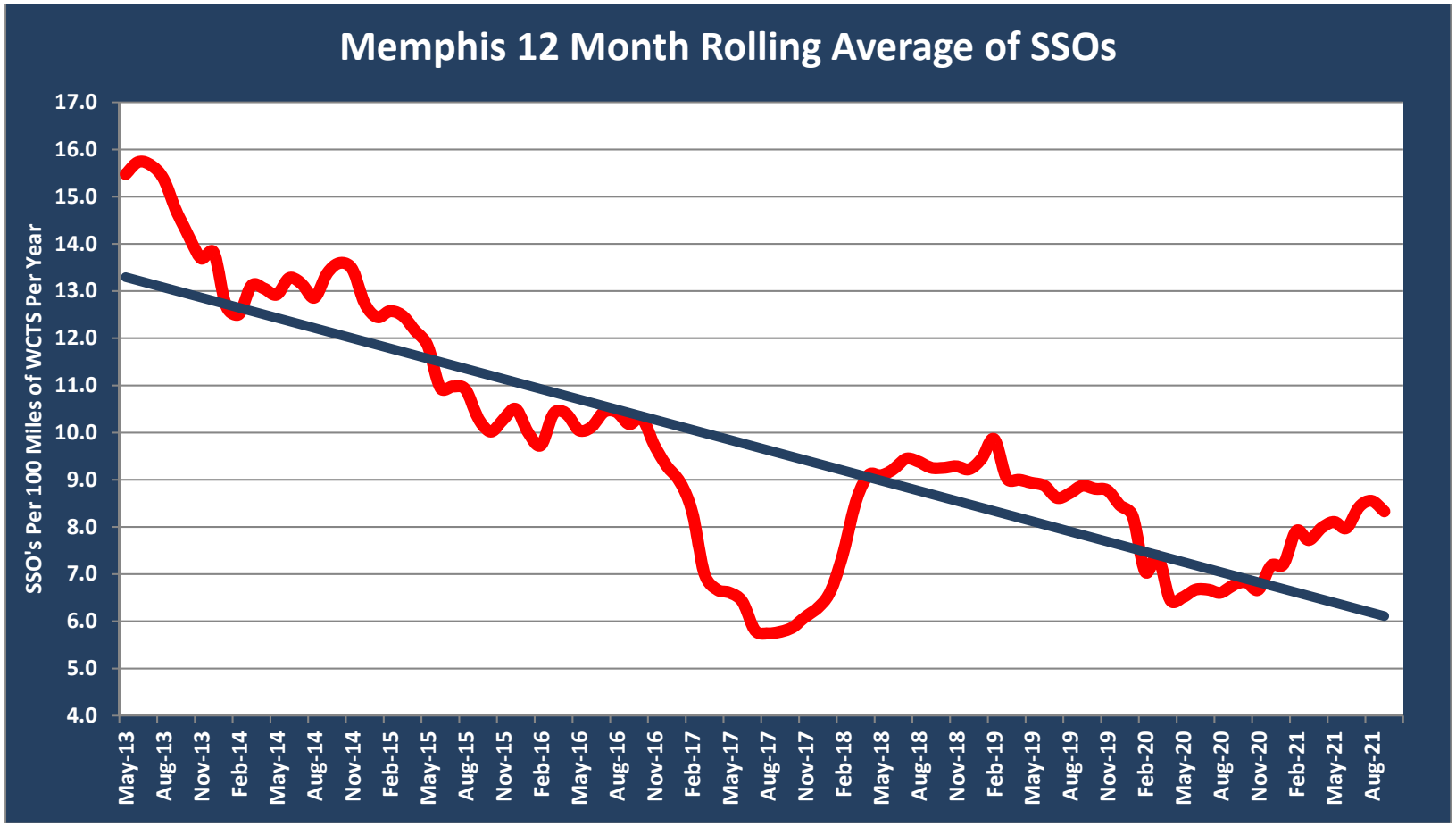


Figure 2 – Rolling Average of SSOs/Month

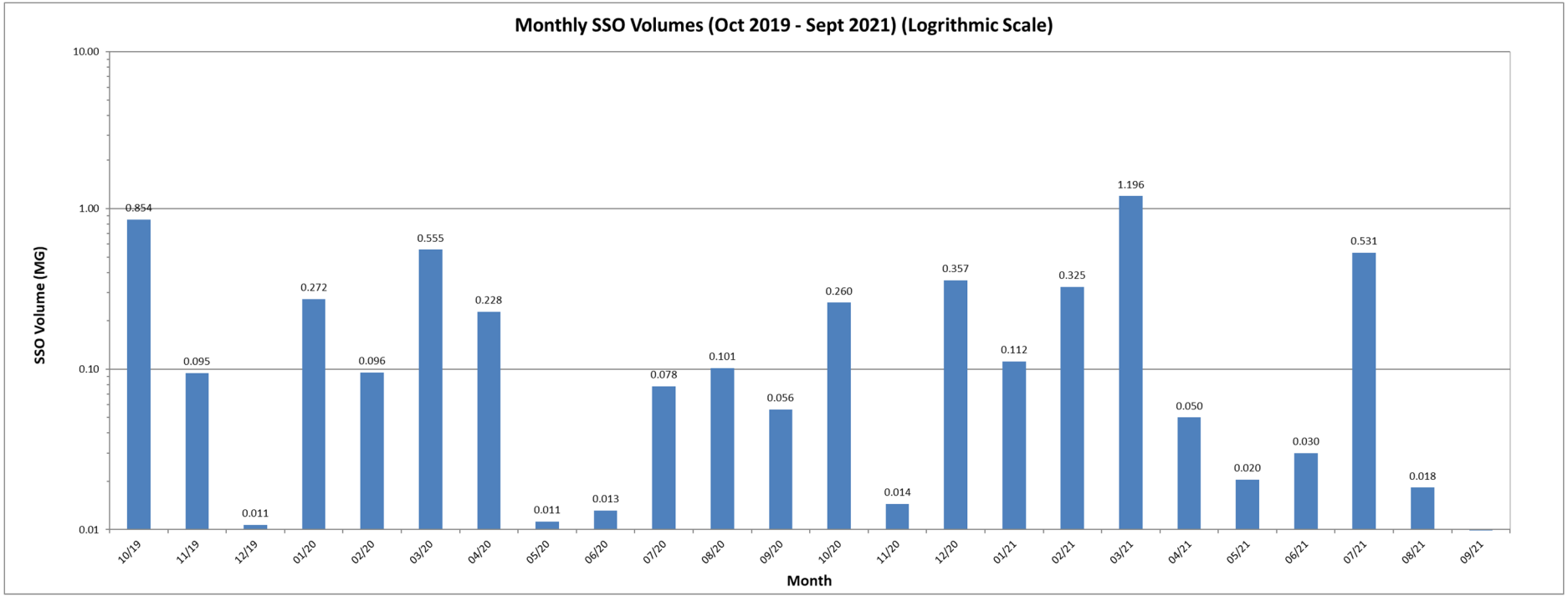


Figure 3 – Monthly SSO Volume

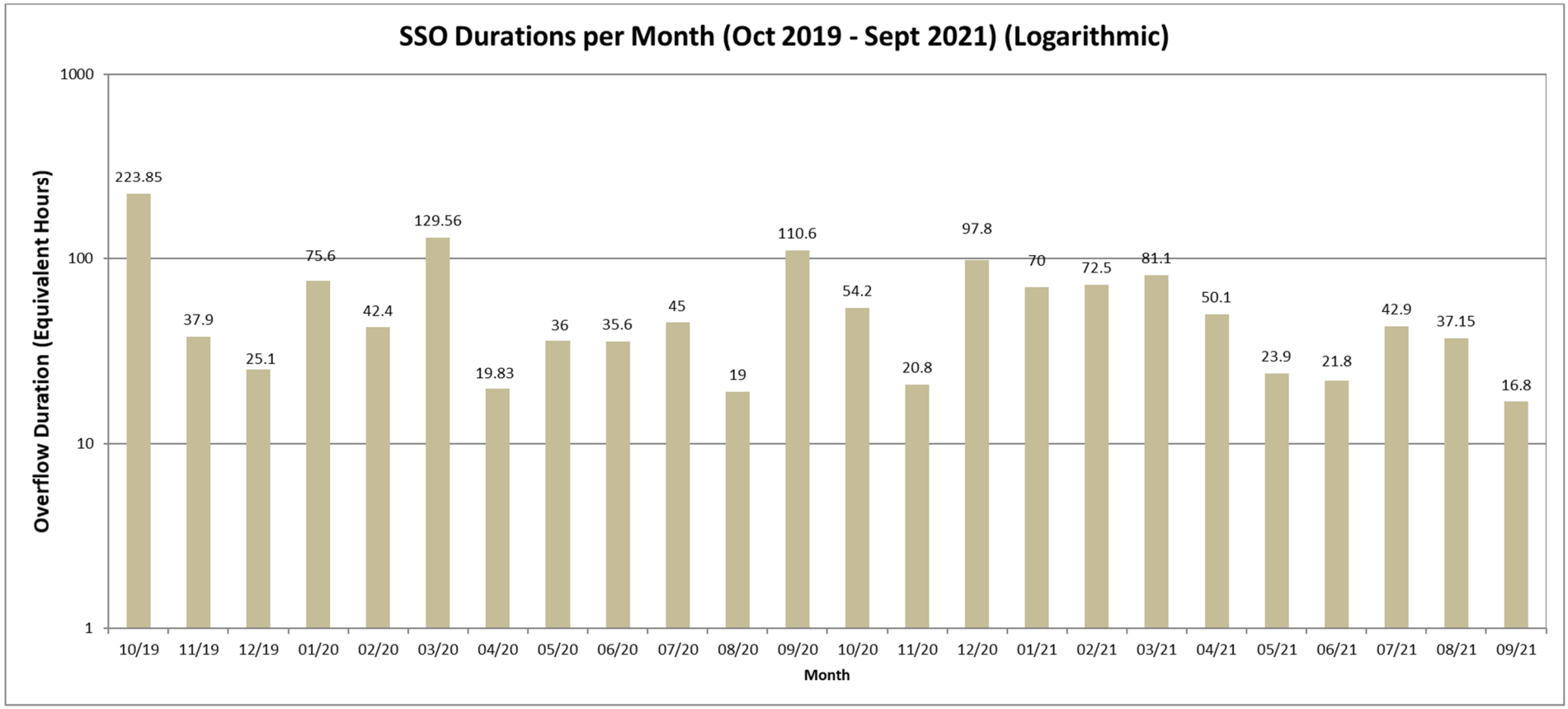


Figure 4 – Monthly SSO Duration