

City of Memphis


Semi-Annual Report

October 1, 2019 through March 31,
2020

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.



Date

COVID-19 Statement: This report identifies in a number of places anticipated activities in the next reporting period or other future activities. Those discussions do not take into consideration the potential impact of the covid-19 pandemic on the City's activities. Instead of constantly repeating the potential impact of covid-19 in each of the sections, we are providing an upfront statement here that applies to all future activities discussed in this report. The ability of the City to undertake the identified implementation activities may be impacted by the covid-19 pandemic.

Section 1

Introduction

On September 20, 2012, the United States District Court for the Western District of Tennessee entered a CD (CD) 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.25. of the CD, the City has prepared this Semi-Annual Report, which includes the following information:

- A description of projects and activities completed, and milestones achieved during the previous six-month period pursuant to the requirements of the CD.
- A summary of significant projects and activities anticipated to be performed, and milestones anticipated to be achieved, in the next six-month period pursuant to the requirements of the CD.
- Additional information determined to be appropriate to demonstrate implementation of the remedial actions required under the CD.

This report is organized into six sections:

- **Section 1** provides an introduction.
- **Section 2** documents recent progress and anticipated continuing activities related to development and implementation of the Management, Operations, and Maintenance (MOM) Programs noted in the CD.
- **Section 3** identifies recent progress and anticipated continuing activities related to the Priority Rehabilitation Projects noted in the CD.
- **Sections 4 and 5** provide a summary of additional actions that the City has recently completed and anticipates completing over the next six months.
- **Sections 6** identifies past CD projects and non-CD projects performed.

Section 2

Management, Operations, and Maintenance Programs

As defined in Paragraph V.10 of the CD, the City shall develop and implement specific Management, Operations, and Maintenance (MOM) Programs. These MOM Programs are listed below along with a summary of activities completed in the previous six months and activities anticipated to be performed during the upcoming six months. A chart showing the status of compliance is presented as **Figure 2-1**.

2.1 Sewer Overflow Response Plan

Activities Completed During Previous Reporting Periods

The City submitted a Sewer Overflow Response Plan (SORP) to the U.S. Environmental Protection Agency (EPA) and Tennessee Department of Environment and Conservation (TDEC) on March 11, 2011, before the CD was entered. A copy of the SORP is included in Appendix B of the CD.

The City updated Section 3 of the document and submitted to EPA on March 30, 2016. The City identified these updates as “form” and not of “substance”. A copy of the document was submitted to the public document repository.

The City reviewed the SORP in February 2019 and determined that no changes were necessary other than the one change it submitted in March 2019. Based upon prior discussion with EPA, by letter dated March 6, 2019 the City updated Section 7.1 of the SORP. The City was notified by EPA by letter dated May 20, 2019 that the change submitted on March 6, 2019 was not approved. The City operated under the approved SORP as modified in 2016.

Progress During This Reporting Period

The City continued operating under the approved SORP.

Anticipated Activities in The Next Reporting Period

The City will continue to operate under the approved SORP.

2.2 Fats, Oils, and Grease Management Program

Activities Completed During Previous Reporting Periods

The City submitted a Fats, Oils, and Grease (FOG) Management Program (FOG Program) to EPA and TDEC on March 11, 2011, before the CD was entered. A copy of the FOG Program is included in Appendix C of the CD.

In 2013, the City made minor changes in form, not substance, to the FOG Program and submitted to EPA on October 30, 2013. Subsequently, on April 22, 2014 EPA approved the updated FOG Program submitted by the City.

The City reviewed the approved updated FOG Program and made additional minor changes of form and not substance. These changes were submitted to EPA on January 18, 2017.

Based upon prior discussion with EPA, by letter dated March 6, 2019 the City updated Section 1.1 Purpose of the FOG Program.

The City was notified by EPA by letter dated May 20, 2019 that the change submitted on March 6, 2019 was not approved. The City submitted revisions to the FOG to the EPA dated May 30, 2019. The City subsequently submitted a letter dated July 22, 2019 where the City further provided minor changes to the FOG Program identifying these updates as “form” not of “substance.” A copy of the document was submitted to the public document repository on July 22, 2019. The City operated under the processes described in the FOG Program as updated.

Progress During This Reporting Period

The City continued to operate under the FOG Program as modified on July 22, 2019. In addition to conducting inspection and reporting activities, the City has continued public outreach efforts, such as the use of vehicle wraps and bus stop advertising and the distribution of “Can the Grease” door hangers and can lids to discourage residents from discarding cooking oils and other FOG in the sewer system.

Anticipated Activities in The Next Reporting Period

The City will continue to operate under the FOG Program as modified on July 22, 2019.

2.3 Lift Station and Force Main O&M Program

Activities Completed During Previous Reporting Periods

On February 5, 2015, the City received comments from EPA on the Lift Station and Force Main Operations and Maintenance Program (LSFM O&M Program). The City revised the LSFM O&M Program to address these comments and submitted the revised version to EPA and TDEC on April 8, 2015. The City received the approval letter from the EPA dated March 13, 2017 and began to implement the approved program. The City reviewed the LSFM O&M Program in February 2019 and determined that no changes were necessary other than the one change it submitted in March 2019. Based upon prior discussion with EPA, by letter dated March 6, 2019 the City updated Section 1, second paragraph, of the LSFMOM Program. The City was notified by EPA on May 20, 2019 that the change submitted on March 6, 2019 was not approved. The City operated under the LSFM Program as approved on March 13, 2017

Progress During This Reporting Period Anticipated Activities

The City will continue to operate under the LSFM Program as approved March 13, 2017.

2.4 Gravity Sewer System O&M Program

Activities Completed During Previous Reporting Periods

On February 4, 2015, the City received comments from EPA on the Gravity Sewer Operations and Maintenance Program (GS O&M Program). The City revised the GS O&M Program to address these comments and submitted the revised version to EPA and TDEC on April 8, 2015. The City received

new comments from EPA on March 13, 2017 and submitted responses on May 16, 2017. These responses were discussed during a July 19, 2017 meeting between the City and EPA and TDEC, and the City submitted follow-up changes on August 21, 2017. The City received approval of the revised GS O&M Program on November 9, 2017. Based upon prior discussion with EPA, by letter dated March 6, 2019 the City updated Section 1, second paragraph, of the GSSOM Program. The City was notified by EPA on May 20, 2019 that the changes submitted on March 6, 2019 were not approved. The City continued to operate and maintain the gravity sewer system in accordance with the approved GS O&M Program.

Progress During This Reporting Period

The City updated sections on November 14, 2019. The City continued to operate and maintain the gravity sewer system in accordance with the GS O&M Program.

Anticipated Activities in The Next Reporting Period

The City will continue to operate and maintain the gravity sewer system in accordance with the GS O&M Program as modified on November 14, 2019.

2.5 Inter-Jurisdictional Agreement Program

Activities Completed During Previous Reporting Periods

The City continued negotiations with the Town of Collierville, City of Millington, and City of Lakeland concerning the draft IJAs. Also, the City continued discussions with the Horn Lake Creek Basin Sewer District ("Sewer District") and the Mississippi Department of Environmental Quality ("MDEQ") regarding the draft IJA provided for the Sewer District and MDEQ's review.

Progress During This Reporting Period

The City provided the Town of Collierville a final draft of the IJA on March 9, 2020 for review and execution. Also, the City continued negotiations with the City of Millington and City of Lakeland.

The City participated in a conference call with TDEC, MDEQ, EPA, and the Horn Lake Creek Basin Sewer District on October 16, 2019 to discuss the draft IJA within the context of pretreatment issues. The City and MDEQ agreed to further analyze certain pretreatment matters raised during the call and to consider addressing pretreatment issues within a separate Memorandum of Agreement. The City of Memphis and Horn Lake Sewer District filed separate declaratory judgment actions against each other in federal court in Tennessee and Mississippi, respectively, with regard to the non-renewal of the existing sewer service agreements entered into between the parties and set to naturally expire in 2023. The parties have agreed to table discussions concerning the remaining issues addressed within the draft IJA.

The City remains in discussions with the City of Bartlett concerning the draft IJA that was previously issued and has initiated discussions with the City of Germantown about entering into an IJA.

Anticipated Activities In The Next Reporting Period

The IJA with the Town of Collierville is expected to be presented for approval by the Collierville Board of Mayor and Alderman in May or June 2020 following execution by the City. Also, the City expects to finalize its negotiations with the City of Millington and City of Lakeland. The City intends to engage in more extensive negotiations with the City of Bartlett and City of Germantown concerning a draft IJA during the next reporting period. In light of pending litigation, we will continue to evaluate and monitor matters pertaining to the Horn Lake Sewer District and MDEQ.

2.6 Continuing Sewer Assessment Program

Activities Completed During Previous Reporting Periods

The Continuing Sewer Assessment Program (CSAP) was approved on September 10, 2014. The Year 1 and Year 2 priority areas specifically outlined in the CSAP were completed during previous reporting periods in accordance with the CD Year 1 and Year 2 deadlines and the City is continuing to assess the Wastewater Collection and Transmission System (WCTS) outside of the specified areas. The City submitted a revision to the CSAP on June 8, 2018. The City identified this an update of “form” and not of “substance”. The City received approval of the revised CSAP in a letter from the EPA dated November 5, 2018 and began to implement the approved program.

Progress During This Reporting Period

The City continued to implement the November 5, 2018 approved CSAP in accordance with the CD.

Anticipated Activities In The Next Reporting Period

The City will continue implementation of the November 5, 2018 approved CSAP. It is anticipated that the CSAP will be reviewed to determine if modifications are needed.

2.7 Infrastructure Rehabilitation Program

Activities Completed During Previous Reporting Periods

The City completed the development of the Infrastructure Rehabilitation Program (IRP), as required in Paragraph V.10.g of the CD and submitted the document to EPA and TDEC for review on February 25, 2015. The EPA approved the IRP on July 13, 2016.

Progress During This Reporting Period

The City continued to prioritize rehabilitation in accordance with the IRP and rehabilitation in the North and South Priority Rehabilitation Areas (as designated in Appendix G of the CD) through the Group 1 Relay and Group 1 Cured-in-Place-Pipe (CIPP) construction contracts. Group 1 Relay project consists of approximately 19,000 linear feet (LF) of 6” and 8” pipe replacement. In this reporting period, approximately, 8,700 linear feet were completed. Group 1 CIPP project consists of rehabilitation of approximately 54,000 linear feet of 8” to 36” diameter gravity mains. In this reporting period, approximately 8,600 LF and associated point repairs were completed.

Anticipated Activities in The Next Reporting Period

The City will continue to prioritize rehabilitation in accordance with the IRP. Rehabilitation of prioritized assets designated in Appendix G is anticipated to continue.

**Figure 2-1
MOM Programs Progress**

Program	CD Reference	CD Milestone	Progress During This Reporting Period						Anticipated Activities In The Next Reporting Period					
			Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Sewer Overflow Response Program	V.10.a	-	Continued to implement program.						Continue to implement program.					
Fats, Oils, and Grease Management Program	V.10.b	-	Continue to implement program.						Continue to implement program.					
Lift Station & Force Main O&M Program	V.10.c	9/19/2013	Continued to implement program.						Continue to implement program.					
SCADA installation at lift stations	V.10.c.iii	3/19/2013	Previously completed. SCADA is operational.											
Gravity Sewer System O&M Program	V.10.d	9/19/2013	Continued to implement program.						Continue to implement program.					
Inter-Jurisdictional Agreement Program	V.10.e	3/19/2018	Continued to implement program.						Continue to implement program.					
Continuing Sewer Assessment Program	V.10.f	9/19/2013	Continued to implement program.						Continue to implement Program.					
Infrastructure Rehabilitation Program	V.10.g	3/9/2015	Continued to implement program.						Continue to implement program.					

Section 3

Priority Rehabilitation Projects

As defined in Paragraph V.11 of the CD, the City shall complete various Priority Rehabilitation Projects. These projects are listed below along with a summary of activities completed in the previous six months and activities anticipated to be performed during the upcoming six months. A chart showing the status of compliance is presented as **Figure 3-1**.

3.1 Priority Areas Projects

Paragraphs V.10.f and V.11.a of the CD identify areas of the WCTS that are to be assessed during the first- and second years following approval of the CSAP. These areas are shown in Appendix E and F of the CD, respectively. Additionally, Appendix G identifies North and South Priority Rehabilitation Areas that will be completed within six years and seven months of the IRP approval received on July 13, 2016 (i.e., completed by February 13, 2023). The projects that were procured to comply with this section is a mainline relay project (Group 1 Relay) which consist of approximately 19,000 LF of 6" and 8" diameter gravity mains with new 8" diameter pipe and a trenchless rehabilitation (Group 1 CIPP) which consist of CIPP rehabilitation of approximately 54,000 LF of 8" to 36" diameter gravity mains.

The Interim Priority Areas Project Report was submitted to USEPA and TDEC on October 11, 2018 and was approved by USEPA on November 5, 2018.

Activities Completed During Previous Reporting Periods

The Group 1 Relay project continued in the North and South Priority Rehabilitation Areas with approximately 11,300 LF of relay and associated point repairs completed.

Progress During This Reporting Period

In this reporting period, approximately 8,700 LF of relay has been completed for Group 1 Relay. Additionally, approximately 8,600 LF of lining and associated point repairs have been completed for Group 1 CIPP. In addition, 1-point repair was completed in Year 2 (Appendix F) area in preparation for annual City paving projects to minimize post-paving construction.

Anticipated Activities in The Next Reporting Period

Group 1 Relay and Group 1 CIPP projects are anticipated to continue.

3.2 Critical Infrastructure Areas Projects

Activities Completed During Previous Reporting Periods

As discussed in Paragraph V.11.b of the CD, three areas within the WCTS were identified to receive prioritized rehabilitation due to the critical nature of the infrastructure and the potential consequences of large sanitary sewer overflow volumes in the event of a failure. A map showing the locations of these areas is included as Appendix H of the CD. Rehabilitation of these areas was completed during previous reporting periods and prior to the revised completion date of October 22, 2017. The Final Critical Areas Projects draft report was submitted to EPA and TDEC on April 23, 2018 and placed in the Public Document Repository. As such, these projects are now included in

Section 6.1 Projects Completed in Previous Reporting Periods. Table 3-1 displays the progress completed as of this reporting period and the anticipated progress of the next reporting period.

3.3 Prior Assessment Areas Projects

As discussed in Paragraph V.11.c of the CD, four additional rehabilitation projects were identified based on previous inspection and assessment activities. These projects were to be completed by September 20, 2016, i.e., four years after the effective date of the CD. The four projects were completed during previous reporting periods and prior to the September 20, 2016 date established in the CD. As such, these projects continue to be included in Section 6.1 Projects Completed in Previous Reporting Periods. Table 3-1 displays the progress completed as of this reporting period and the anticipated progress of the next reporting period.

Figure 3-1
Priority Rehabilitation Projects Progress

Project	CD Reference	CD Milestone	Progress Last Six Months						Anticipated Activities Next Six Months					
			Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Priority Area Projects	V.11.a	9/9/2015 9/9/2016 Via implementation of IRP 2/13/2023 8/13/2018 - 10/13/2018 Within six months of rehabilitation projects completion	Previously completed.						Previously completed.					
Assess areas identified in Appendix E			Previously completed.						Previously completed.					
Assess Year 2 areas (including Appendix F)			Previously completed.						Previously completed.					
Prioritize areas identified in Appendix G			Previously completed.						Previously completed.					
Complete Appendix G rehabilitation projects			Rehabilitation of Appendix G areas continued.						Rehabilitation of Appendix G areas anticipated to continue.					
Interim Priority Areas Project Report			Previously completed.						Previously completed.					
Final Priority Areas Project Report	No work this period.						No work is anticipated.							
Critical Infrastructure Areas Projects	V.11.b	4/23/2018 4/23/2018	Previously completed.						Previously completed.					
Complete Appendix H rehabilitation projects			Previously completed.						Previously completed.					
Final Critical Areas Project Report	Previously completed.						Previously completed.							
Priority Assessment Area Projects	V.11.c.(i) V.11.c.(ii) V.11.c.(iii) V.11.c.(iv)	9/19/2016 9/19/2016 9/19/2016 9/19/2016	Previously completed.						Previously completed.					
Nonconnah Interceptor			Previously completed.						Previously completed.					
Mud Island Manholes			Previously completed.						Previously completed.					
Burchart-Horn Manholes			Previously completed.						Previously completed.					
Wolf River Interceptor	Previously completed.						Previously completed.							

Section 4

Additional Measures

In addition to the projects and activities described in the previous sections, the measures described below are related to the City's ongoing CD compliance.

4.1 M.C. Stiles WWTP Foam Study and Outfall Improvements

As described in Paragraph V.12 of the CD, the City was required to implement the M.C. Stiles Wastewater Treatment Plant (WWTP) Foam Study and Outfall Improvements Work Plan that was included as Appendix I of the CD. On May 19, 2014, the first amendment of the CD, which identified a preferred alternative design consisting of a vortex structure and which included a revised construction schedule, was approved and filed with the court. The vortex structure was completed, and plant effluent flow was directed through the vortex on September 19, 2017. This project has been moved to Section 6.1 Projects Completed in Previous Reporting Periods.

4.2 State Projects

As stated in previous Semi-Annual Reports, the two State Projects: The Color Study and the Geographic Information System, have already been completed and therefore have been moved to Section 6.1 Projects Completed in Previous Reporting Periods.

4.3 Program Administration Activities

Since entering into the CD, the City has conducted several administrative activities for the implementation of the CD program, known as the Sewer Assessment and Rehabilitation Program (SARP10).

Activities Completed During Past and This Reporting Periods

- **Coordination with Emergency Personnel:** Through the condition assessment and rehabilitation work, the City and SARP10 staff coordinate with fire and police departments' leadership to keep them abreast of on-going activities and work locations.
- **Coordination with Special Projects:** The SARP10 Team has been working closely with City personnel to identify upcoming City special projects that may require coordination with future sewer improvements. The sewer lines associated with the projects are assessed in advance using CCTV inspection to identify areas in need of repair. The repairs are subsequently conducted to avoid disrupting future construction activities and to avoid patching associated paved areas.
- **Street Paving Projects:** The SARP10 Team has been working closely with City and State personnel to identify upcoming street paving projects. The sewer lines associated with these streets are assessed in advance using CCTV inspection to identify areas in need of repair, and required repairs are subsequently made to avoid patching newly paved areas. During this reporting period a total of 34 point repairs and 67 manhole adjustments were completed ahead of paving.

- **Workforce Development:** The City has implemented a workforce development program. The program is comprised of five-stages: assess, recruit, train, place, and retain. The assessment phase identifies the types of jobs that will be needed to complete the CD- related work and that could be filled by local personnel. Subsequently, potential candidates are identified and screened. These personnel are provided training as necessary to avail them for potential employment by contractors working on CD-related projects.
- SARP10 has a program called the “Green Team” which goes door-to-door to distribute information for upcoming condition assessment work. During the previous reporting periods, the Green Team distributed information for phase assessment work.

As a result of this program and other initiatives, approximately 175 or more personnel have obtained full-time employment with SARP10 program companies or assessment and rehabilitation contractors working on the program for the City.

- **Public Relations:** After consulting with leaders of various neighborhood associations, the Program determined that distributing emails with relevant information instead of conducting public meetings to the affected neighborhoods was a more efficient use of resources while remaining effective at disseminating the information. SARP10 continues to utilize a website to provide current information, tentative schedules for work, and assessment and rehabilitation contracts.

Activities Anticipated to be Performed During the Next Reporting Period

Implementation of the activities described above are expected to continue through the upcoming reporting period.

4.5 Ongoing CSAP Activities

As of March 31 2020, the City has assessed approximately 1,883 of the estimated 2,808 miles of pipe contained within the WCTS. This equates to approximately 67% of the system (this number does not include the pipe assessed using the SL-RAT technology described in Section 5.2.10). 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., 55% of the WCTS should be assessed by March 2020). The current assessment rate of 67% places the City well ahead of the CD-required schedule. All 102 lift stations have been assessed and 38 force mains have been assessed to date.

Activities Completed During Previous Reporting Periods

The City divided the WCTS into 13 watershed basins and subsequently divided these basins into 131 sub-basins and is assessing these areas in phases. To date, assessment has been completed in the pilot area and in Phase 1-5 areas, and assessment continued in Phase 6 and Fletcher Creek areas. The phases were completed based on the historical sanitary sewer overflow (SSO) occurrences starting with the areas identified in Appendix E, then the area in Appendix F and proceeding from there in general to the next highest SSO area. In addition, the City is doing other work outside the WCTS.

Activities Completed During This Reporting Period

Approximately 443,519 LF of gravity sewer was assessed in the combined Phase 6 and Fletcher Creek areas. Phase 6 consists of approximately 1.59 million LF of smaller-diameter pipe assessment and 300,000 LF of large-diameter pipe assessment. Approximately 371,497 linear feet of small-diameter pipe and 19,917 linear feet of large-diameter pipe were assessed in Phase 6 areas.

Condition assessment continued in the Fletcher Creek area, which includes a small section outside the WCTS, and consists of approximately 1.2 million LF of smaller-diameter pipe assessment and 65,000 LF of larger-diameter pipe assessment. Approximately 52,105 linear feet of small-diameter pipes were assessed in Fletcher Creek areas.

Twenty lift stations were assessed during this reporting period. There was no force main assessment that occurred during the reporting period”

Activities Anticipated to be Performed During the Next Reporting Period

It is anticipated that assessment work will be completed in the Phase 6 and Fletcher Creek areas. It is anticipated that procurement of the Phase 7 SSES contract will be completed. In addition, it is anticipated that assessment of the force mains will continue.

4.6 City-Wide Master Plan

The City has undertaken a wastewater master plan for the key sewer sheds within the WCTS.

Activities Completed During the Previous Reporting Period

Work continued on the model and master plans.

Activities Completed During This Reporting Period

Work continued on the model and master plans.

Activities Anticipated to be Performed During the Next Reporting Period

Work will proceed during the next reporting period.

Section 5

Infrastructure Rehabilitation Projects

5.1 Priority Rehabilitation Areas

Pursuant to the CD and IRP requirements, the City shall complete the rehabilitation projects within the priority areas identified in Appendix G of the CD by February 13, 2023, i.e., within six years and seven months after EPA's approval of the IRP which occurred on July 13, 2016.

Activities Completed During Previous Reporting Period

The Group 1 Relay work continued. Additionally, 1 manhole was adjusted to grade and 4 point repairs were completed.

Activities Completed During This Reporting Period

The Group 1 Relay work continued in the North and South Priority Rehabilitation Areas in accordance with the IRP.

Additionally, 4 manholes were grade-adjusted (i.e., for accessibility) bringing the total to 184; and 25 point repairs were completed, bringing the total to 63 for the North and South Priority Rehabilitation Areas.

The procurement process for the Group 1 CIPP rehabilitation project was completed and a contract was awarded.

Activities Anticipated to be Performed During the Next Reporting Period

It is anticipated that the City will continue the Group 1 Relay and Group 1 CIPP work on the prioritized projects in accordance with the IRP.

5.2 Other Rehabilitation Projects

Although not required by the CD, the City has started rehabilitation projects in areas of the WCTS outside of the Priority Rehabilitation Areas.

5.2.1 Point Repairs and Manhole Adjustments

Point repair and manhole adjustment contracts have been procured in order for the City to address high value sewer line defects and buried manholes in real-time so as to address defects that could be causing or that are likely to cause SSOs and to also facilitate access for condition assessment field testing activities.

Activities Completed During Previous Reporting Period

- Point Repair Contract: Approximately 186 point repairs were completed.
- Manhole Adjustment Contract: Approximately 284 manholes were adjusted.

Activities Completed During This Reporting Period

- Point Repair Contract: Approximately 75 point repairs were completed.
- Manhole Adjustment Contract: Approximately 291 manholes were adjusted.

Activities Anticipated to be Performed During the Next Reporting Period

It is anticipated that both the point repair and manhole adjustment contracts will continue.

5.2.2 Fletcher Creek Stabilization

An exposed 42-inch sanitary sewer was discovered in an open channel tributary to Fletcher Creek. As a result, a contractor was mobilized to implement remedial measures to stabilize the sewer line. Subsequently, an engineering firm was engaged to design a more permanent solution. Construction of the temporary stabilization and reinforcement of the 42-inch sanitary sewer interceptor was completed and is being monitored,

5.2.3 Lift Station Rehab Design

Upon review of the assessment data, five lift stations were scheduled for rehabilitation. Three of the five lift station rehabilitation designs have been completed and bid for construction. The remaining two lift station rehabilitation designs are in progress.

A second group of 11 lift stations has been scheduled for rehabilitation and the designs are in progress.

5.2.4 Loosahatchie Diversion Design

Early in the SARP10 Program, the City identified the New and Old Loosahatchie Interceptors as a priority for condition assessment. These sewer lines were assessed utilizing CCTV and sonar equipment. Furthermore, a calibrated hydraulic model was built in an effort to understand why historic SSO's were occurring. As part of the model calibration, flow meters were installed to capture flows and depths in the sewer lines. The decision was made to divert flow from the Old Loosahatchie Interceptor to the New Loosahatchie Interceptor via 7,900 linear feet of 54-inch gravity sewer. The diversion sends flow from downstream of N. Watkins St. on the Old Loosahatchie interceptor to the New Loosahatchie. The design was completed and will be moved to Section 6.1 in next report.

5.2.5 Pilot Stream Crossing Evaluation

Two basins were chosen for a pilot study to evaluate where sewer lines cross an open channel stormwater conveyance. The goal of the evaluation is to verify sewer line crossings and determine the conditions of the pipe and stream banks near the crossing. A consultant was hired to perform a desktop analysis and subsequent field evaluation of the crossings in a pilot area. Subsequently, potential crossings in the Priority Rehabilitation areas were completed and evaluation in other parts of the WCTS are ongoing.

5.2.6 SL-RAT Acoustic Assessment

SARP10 began performing acoustic assessment of gravity sewer mains using the Sewer Line Rapid Assessment Tool (SL-RAT) method. The acoustic testing is a very quick and efficient method for determining if there are obstructions in the pipe that might impede flow. If the SL-RAT assessment indicates that there is some type of obstruction in the pipe (such as roots or grease) further assessment may be engaged. This project was completed and as such will be moved to Section 6.1 in future Semi-Annual Reports.

5.2.7 Gayoso Force Main

The City of Memphis is undergoing a new design of the Gayoso Force Main to reclaim the original design capacity. The force main has been sliplined in the past which reduced the original capacity of the force main. A design consultant was selected and began work on the design documents for replacement of the existing force main. The 90% design plans have been submitted and design is expected to be completed during the next reporting period.

5.2.8 Front Street Gate Barrier

The Front Street Interceptor, that formerly flowed to the Mississippi River and now flows to the North Treatment Plant, was identified to be studied for alternatives to install a second barrier additional to the gate at the end of the outfall. The installation of a second barrier is to assure greater integrity and prevent a catastrophic event. The barrier plans were finalized during this reporting period. Construction will occur during a low water period.

5.2.9 Stream Crossing Stabilization

There are several locations in the WCTS where a gravity sewer line crosses an open channel stormwater conveyance. SAR10 completed field assessments and identified nine crossings to complete stabilization of the channels. The Notice to Proceed was issued in February 2019 and a professional services firm was contracted to complete the design for the stabilization at each crossing. The design is in progress.

5.2.10 Shelby Oaks Main Re-Route

A collapse of a 12-inch gravity sewer line was discovered at the site and a bypass system was installed until permanent measures were completed. A design was developed, and the realignment completed. Construction work associated with the realignment and activities were started late January and was completed early March with only minor restoration remaining. This project will be moved to Section 6.1 in future Semi-Annual Reports.

5.2.11 Mud Island Emergency CIPP

A collapse in a gravity sewer line on the Mud Island Interceptor was discovered. A contract was awarded, and the contractor began and completed the work. The work consisted of installing approximately 1,800-lf of CIPP in a 60-inch interceptor. Construction work associated with the repair other activities started early October and was completed at the end of November with only minor restoration remaining. This project will be moved to Section 6.1 in future Semi-Annual Reports.

5.2.12 Front Street Cleaning

The Front Street Interceptor was assessed, and it was determined that heavy cleaning was needed. As a result, the City issued a bid and awarded a contract to clean approximately 4,000 LF of the interceptor. During this reporting period, the contractor mobilized to the site and began cleaning operations. Through the end of this reporting period, approximately 1,600 LF of the interceptor have been cleaned.

5.2.13 Group 4 CIPP

By utilizing the prioritization methods outlined in the IRP, the City identified rehabilitation to be completed in the southern downtown portion of the City. The City procured and received bids for this work through Group 4 CIPP on January 31, 2019. This project consists of approximately 47,000 LF of CIPP with associated point repairs and rehabilitation of approximately 375 manholes. The NTP was issued on April 15, 2019 and contractor has completed approximately 24,000 LF of CIPP. This project is anticipated to be completed during the next reporting period.

5.2.14 Gravity Sewer Improvements Design Package A

Five sites within the WCTS were identified for rehabilitation. A contract was awarded, and design started on these projects. The notice to proceed was issued on February 25, 2019. This design is in progress and is estimated to be completed in the future reporting period.

5.2.15 Wolf River 120 Sewer Interceptor Design

The 96" diameter pipe of the Wolf River Interceptor, from M.C. Stiles Wastewater Treatment Plant to the joining at the Cypress Creek Interceptor, has been identified as in need of replacement. A new 120" diameter parallel pipe is currently being designed for replacement of approximately 14,000 LF of the most downgradient section

5.2.16 Cane Creek/ Pine Hills

During SSES Inspection, a utility bore through a gravity line was identified. A point repair was completed to remove the cross bore. During this repair, the existing pipe was noticed to have several roots and corrosion issues. Approximately 100 LF of the pipe was relayed. Due to the location under the interstate and condition of the pipe, CIPP rehabilitation was selected for the remaining 200 LF. The contractor began construction work and is anticipated to complete this portion during the next reporting period.

5.2.17 Loosahatchie Diversion Construction

The Construction portion of the Loosahatchie Diversion began once the design was developed and procurement began. The project was bid and awarded as part of procurement, and the contractor mobilized the crews and equipment and set up at the project site. Access roads, well points, silt fencing, and site work was completed. Additionally, boring under the Loosahatchie River began and one of the siphon barrels was completed. High river water levels have delayed progress of the construction.

Section 6

Past Consent Decree Projects and Non-Consent Decree Projects

6.1 Projects Completed in Previous Reporting Periods

The following projects have been completed during previous reporting periods and included in previous Semi-Annual Reports:

- Cane Creek and Hickory Hill Pilot Assessment Area (last included in April 2015 – Sept 2015 Semi-Annual Report)
- Critical Infrastructure Areas Projects (last included in April 2018 – September 2018 Semi-Annual Report)
 - The first critical area completed rehabilitation of the 42-inch through 48-inch Wolf River Interceptor, in 2012.
 - The second critical area completed rehabilitation of a portion of the 96-inch interceptor at the entrance/exit ramp located at Mile 51 of Interstate 240, in 2017.
 - The third critical area completed rehabilitation on the 84-inch interceptor located where McLean Boulevard crosses the Wolf River and Interstate 40, in 2012.

Prior Assessment Areas Projects (last included in April 2016 – September 2016 Semi-Annual Report):

- Cured-in-Place Pipe (CIPP) lining of the Nonconnah Interceptor Between Manholes Numbered N06-119 and N06-127
- Rehabilitation or replacement of manholes on Mud Island that include manhole number M10-005 plus the two (2) manholes immediately downstream and repair of the liner in the corresponding portion of the 60-inch interceptor near these manholes
- Rehabilitation of approximately sixty-four (64) manholes identified as having heavy or medium corrosion in Appendix B of a June 6, 2006 study report prepared by Buchart-Horn on behalf of Memphis
- CIPP lining on segments of the Wolf River Interceptor between demarcation points W05-120 and W05-130
- M.C. Stiles WWTP Foam Study and Outfall Improvements (last included in April 2018 – September 2018 Semi-Annual Report)
- Loosahatchie Interceptor Assessment (last included in April 2018 – September 2018 Semi-Annual Report).
- State Projects (last included in April 2016 – Sept 2016 Semi-Annual Report):
 - Color Study

- Geographic Information System (GIS)
- Snowden Assessment and Rehabilitation (last included in April 2016 – Sept 2016 Semi- Annual Report)
- Woodview Subdivision Rehabilitation (last included in April 2016 – Sept 2016 Semi- Annual Report)
- Lick Creek Interceptor CIPP (last included in April 2016 – Sept 2016 Semi-Annual Report)
- Loosahatchie Interceptor Replacement (last included in April 2016 – Sept 2016 Semi- Annual Report)
- St. Elmo Pipe Bursting (last included in April 2016 – Sept 2016 Semi-Annual Report)
- John’s Creek Interceptor Repair and Evaluation (last included in October 2017 – March 2018 Semi-Annual Report)
- Black Bayou Stream Crossing Rehabilitation Project (last included in April 2018 – September 2018 Semi-Annual Report)
- Barksdale Siphon Redesign and Construction Project (last included in September 2018 – April 2019 Semi-Annual Report)
- Rodney Baber Project (last included in April 2019 – September 2019)

6.2 Other Rehabilitation Projects Completed by City of Memphis

In addition to the assessment projects completed under the SARP10 program, the City routinely completes improvement projects of the WCTS. During this reporting period, the City estimates that in addition to the SARP10 program work, it has rehabbed 22,422 LF of pipe with CIPP. Since September 2012 (effective date of CD), the City has otherwise installed approximately 171,574 LF of CIPP and rehabilitated 10 lift stations (Gayoso, Big Orange, Genyth, N. Watkins, Jack Carley, Valero, Kimbrough, Wilson, Harbor, and South Mendenhall).