City of Omaha
Combined Sewer Overflow
Annual Report
NPDES Permit No. NE0133680
October 1, 2015 through September 30, 2016

CSO!
Clean Solutions for Omaha

Report of Certification:

"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 gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the 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."

Robert G. Stubbe

Signature of Authorized Representative or Cognizant Official

12-27-16

Date

Robert G. Stubbe

Printed Name

Public Works Director

Title

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I. Introduction

A National Pollutant Discharge Elimination System (NPDES) Permit for City of Omaha Combined Sewer Overflows (NE0133680) issued by the Nebraska Department of Environmental Quality (NDEQ) was reissued in 2015 and is effective from October 1, 2015 thru September, 30 2020.

This Annual Report is for the period of October 1, 2015 through September 30, 2016 and is submitted in accordance with the CSO Permit in effect for that period. The report meets the requirements of the permit, which is to submit a report within 90 days following each yearly (Oct 1–Sept. 30) anniversary. Throughout the report, the permit will be referred to as the "CSO NPDES Permit" or "CSO Permit." All references to the CSO Permit are to that permit which was in effect from October 1, 2015 to September 30, 2020.

The CSO NPDES Permit contains the following language:

> "This permit specifically authorizes wet weather discharges from the City of Omaha's combined sewer system (CSS) through CSO outfalls according to the requirements, conditions, and limitations set forth in the permit. CSO outfalls are defined as designated overflow points in the combined sewer system (CSS) designed for the purpose of allowing the discharge of wet weather flows to receiving waters prior to receiving complete treatment in the City's Wastewater Treatment Plants."

Under the CSO Permit the City has 26 permitted CSO outfalls; 16 of these are associated with the Missouri River Wastewater Treatment Plant (MRWWTP) collection system, the other 10 are associated with the Papillion Creek Wastewater Treatment Plant (PCWWTP) collection system. At this time only CSO 102 at the MRWWTP undergoes treatment prior to discharge.[1]

This Annual Report includes actions, activities, and measures taken by the City of Omaha with regard to the Nine Minimum Controls (NMC), the Long Term Control Plan (LTCP) and its compliance schedule, CSO outfall monitoring and in-stream monitoring, . The last section is reserved for other information and includes narrative on reduction of overflows and deactivated CSO outfalls as well as any other information that benefits measuring the success of achieving improved water quality. Added this year is a Performance Report section for CSO outfall overflow accounting; any evaluations of controls achieving their intent; and demonstration of CSO overflows a result of a wet weather event.

The Environmental Services Branch of the City of Omaha Public Works Department oversees the administration of the CSO NPDES Permit and ensures that the City is in compliance with the permit requirements. The information provided in this report is a result of the cooperation among the Sewer Maintenance Division, Quality Control Division, PCWWTP and MRWWTP, and consultant engineers and City staff that make up the CSO Program Management Team.

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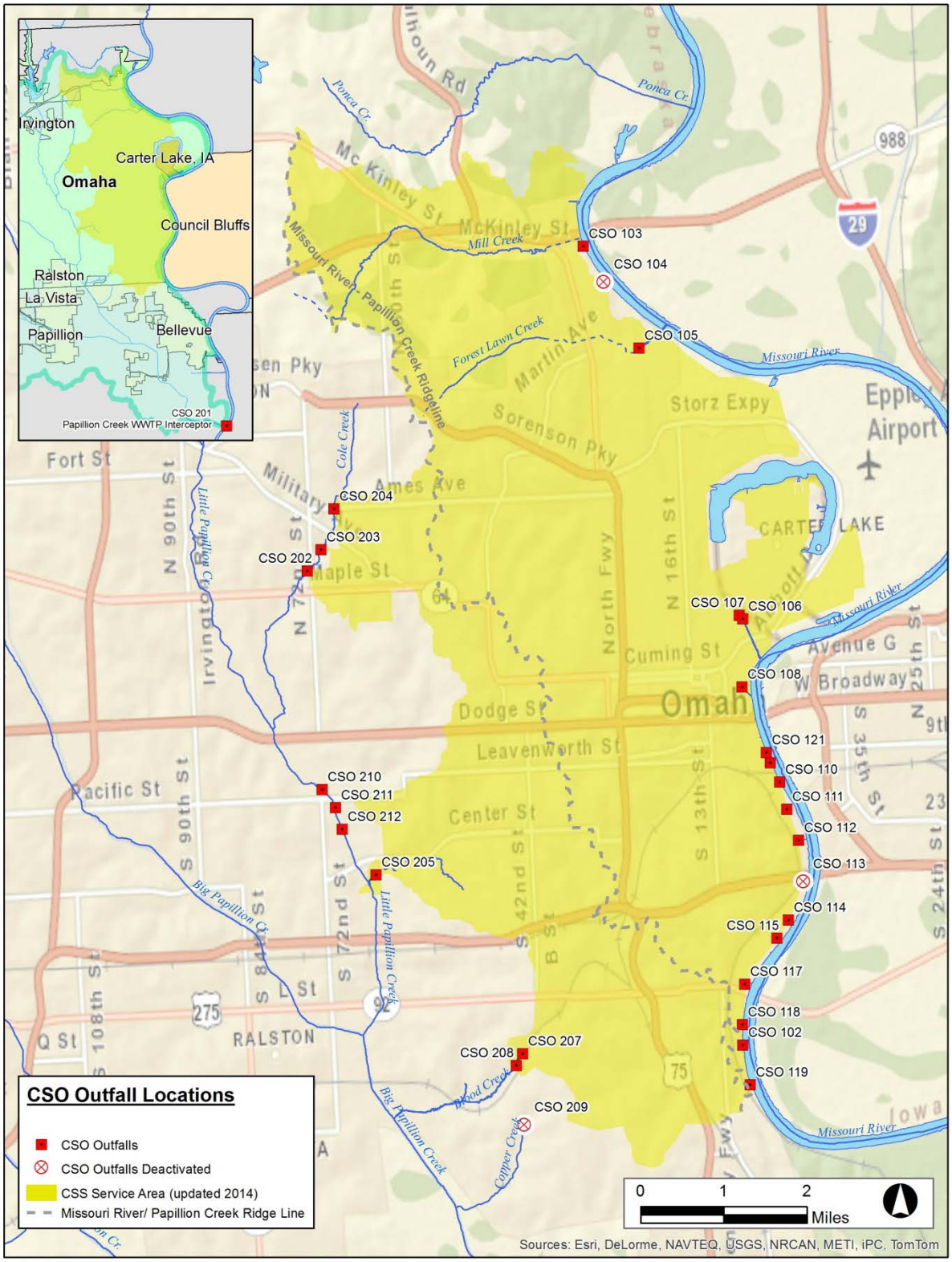
[1] The MRWWTP manages CSO Outfall 102 which, under approved conditions, discharges combined wastewater that has received primary treatment but not secondary treatment

Figure 1- 1: CSO Outfall Locations



II. Executive Summary

The 2016 CSO Annual Report summarizes information on activities, actions, and measures taken by the City of Omaha and the CSO Program Management Team (PMT) to comply with the CSO NPDES Permit. This includes efforts to maintain and manage the combined sewer treatment and collection system, as well as details on the implementation and management of the CSO LTCP. This section of the report is for the Executive Summary and information here is provided in six sections that follow the annual reporting requirements in the CSO NPDES Permit. These Sections are:

- Nine Minimum Controls (NMC)
- LTCP Documentation
- Compliance Schedule
- CSO Outfall Monitoring
- In-Stream Monitoring
- Other Information

Other information includes measures of success and other requested information that demonstrates the effective management of the wastewater collection and treatment systems in the Combined Sewer Service Area. In particular are summaries on reduction of CSO points and occurrences, other sewer separation projects to primarily relieve basement backups, and materials management associated with the construction projects.

A. Nine Minimum Controls (NMC)

The CSO NPDES Permit defines Nine Minimum Controls as "…operations and procedures that will reduce combined sewer overflows and their effects in receiving water quality that do not require significant engineering studies or major construction and are consistent with the complete LTCP." The City continues to implement the NMC plan, and work toward the goal of reducing CSOs and improving water quality. Following is a list of the NMCs along with a brief statement on items of relevance during this report period:

1. **Proper Operation and Maintenance (O&M):** As per standard practice, the Quality Control Division, the Sewer Maintenance Division, and the Wastewater Treatment Plants review the procedures relative to responding, and minimizing CSO impacts. The update for this year was slight modification to the Sewer Maintenance Call-out procedures for after-hours response and an update to the notification procedure for dry weather sewer overflows, provided in Attachment 1.
2. **Maximizing the Use of the Collection System for Storage**: As part of the compilation process of the annual report, the original NMC plan was revisited and assessed for adherence to the plan. This included a review of EPA's CSO Technology Fact Sheet (EPA 832-F-99-036). Large diameter pipe cleaning has been given more emphasis this year. No other simple modifications were identified for the system. The City will continue with their current practices to maximize the use of collection system by identifying and removing obstructions and addressing inflow and infiltration reduction.
3. **Review and Modification of Pretreatment Programs:** current practices to minimize impacts of industrial facilities continue to be followed and are administered through the Quality

Control Division (QCD). A total of 13 NPP permitted facilities are located in the CSS area and were operating during this permit year.

4. **Maximization of Flow to the POTWs for Treatment:** existing policies to maximize flow to the Missouri River Wastewater Treatment Plant and Papillion Creek Wastewater Treatment Plant are in place. As a goal for this NMC, the City continues to consider opportunities to maximize treatment of wet weather flows. The City also understands that more complex modifications are required at the WWTPs to receive additional flow and will pursue these goals more fully under the LTCP. During this reporting year, no additional simple modifications have been identified that would further maximize flow to the treatment facilities.
5. **Prohibition of CSOs during Dry Weather:** is a control that continues to be a high priority focus with strict response, reporting, and tracking processes. Five (5) overflows in the system were contained or re-entered the system and continued to treatment. Ten (10) overflows were reported during dry weather that reached waters of the State.
6. **Control of Solid and Floatable Materials in CSOs:** Simple measures were determined not feasible in the NMC plan and that more complex solutions need to be evaluated. The LTCP efforts will carry out proper evaluations as projects are implemented. No additional processes or controls have been implemented to the system this year with regard to solid and floatable materials.
7. **Pollution Prevention:** The management of this item is shared between several Divisions and work groups within the City. The City of Omaha municipal separate storm sewer system (MS4), details much of the efforts in an annual report, including inlet cleaning and grit removal. Efforts continue with Papillion Creek Watershed Partnership and *Keep Omaha Beautiful* for storm water pollution prevention and outreach. No additional pollution prevention measures have been implemented during this report period.
8. **Public Notification:** The *Standard Operating Procedure (SOP) for Reporting and Public Notification of Dry Weather Sewer Overflows and Bypasses* was followed for the year and had no media releases. CSO signs posted at each outfall continue to be maintained per standard procedure; however responsibility has moved to staff at Sewer Maintenance. Additional public information is continually available through a public website as part of the CSO Program. Section B of this executive summary contains information on the Public Participation Plan.
9. **Monitoring to characterize CSO impacts and the efficacy of CSO controls:** The City of Omaha continued to maintain and record combined sewer overflow events at the designated outfalls in the system. During this report period, there were no known beach closings or fish kills. There are no records of any wash-up of floatables. One significant rain event on August 28, 2016 resulted in nine (9) system backups into properties or establishments and 1additional on May 11. These records are documented and tracked by the Sewer Maintenance Division. Engineering staff evaluate the site and system conditions that may have contributed to the CSO Impacts on private properties. In some cases, back water valves are recommended and approved, in other cases a sewer system evaluation survey is completed and potentially identified for a capital project.

B. LTCP Documentation

Part V. of the CSO NPDES Permit requires the City to document and submit reports showing compliance with the conditions and requirements of this section. Included is a list of the required reporting elements under LTCP Documentation along with a brief description any items of significance for each element.

1. **Characterization and Modeling of the CSO System.** The combined sewer system (CSS) is sufficiently mapped in GIS with regular updates occurring as field differences are discovered or per as-built record drawings. Information from design consultants is incorporated into the City's GIS and Infoworks CSS model as final designs become available. Other characterization efforts of the CSS include water quality monitoring of select outfalls (CSO 102 at this time, with future plans at CSO 205), gathering of field data in project areas, and overflow occurrence monitoring at CSO points through the CSO Block program.

   The City continued flow monitoring of the Papio Interceptors, adding 3 permanent meters to the Cole Creek system. For the reporting year, there were 20 permanent flow monitoring sites, 50 temporary for the CSO model, 9 sites to support the inflow and infiltration study upstream of South Omaha Industrial Area Lift, and 17 additional sites for inflow and infiltration studies in sanitary systems along Little Papio Interceptor, upstream of CSO 205. Additionally, the City gathered precipitation data using 9 permanent city-managed and 8 temporary consultant-managed rain gauges, and a project for radar rainfall processing to support the CSO monitoring this report period.

2. **Public Participation Plan.** The City continues to maintain Lovgren Marketing Group as the Public Participation Coordinator during CSO implementation. This group coordinates many activities with the media, public officials, stakeholders, and other opportunities for public outreach. The focus is centered on two major efforts: (1) continued involvement, education and acceptance by the public about the need for the CSO Program and (2) the progress on the specific projects, in particular during construction. A detailed summary in in Attachment 3.

3. **Consideration of Sensitive Areas.** No additional sensitive areas have been discovered during this report period.

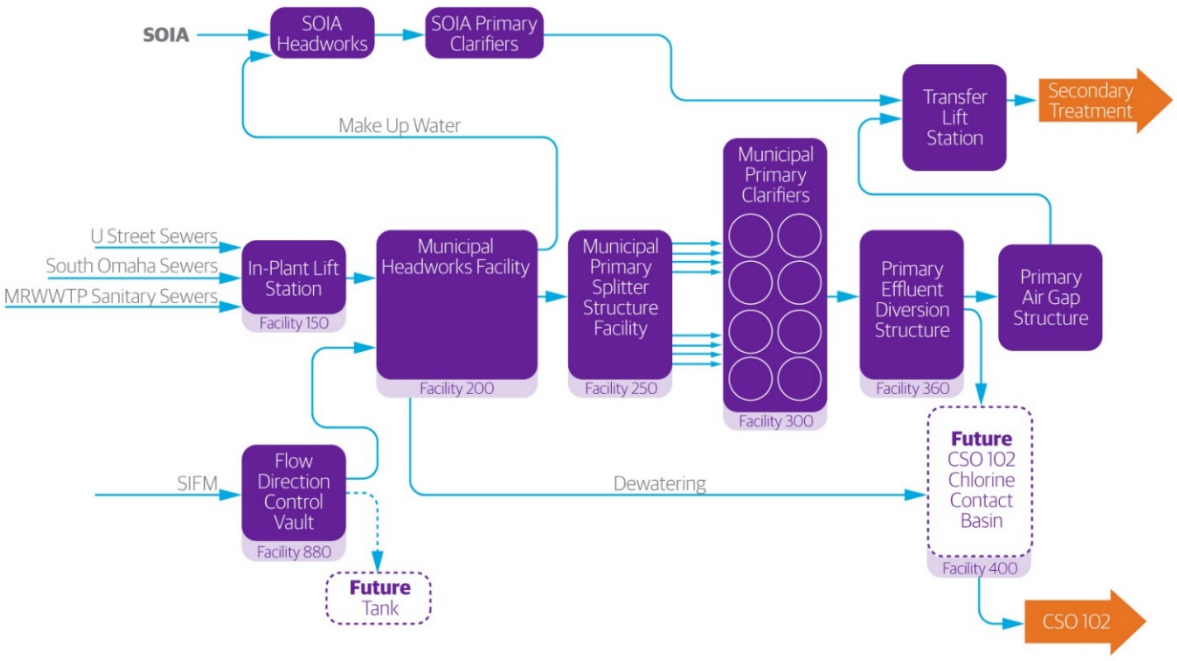
4. **Evaluation of Alternatives.** The City and PMT are in the process of re-evaluation of several of the projects in the Minne Lusa and Saddle Creek basins. These projects are being re-evaluated as a result of significant cost increases that resulted in the projects as developed longer be justified based on the Cost/benefits assumed for the LTCP. The PMT is currently evaluating possible alternatives that will achieve the regulatory requirement of 85% volume capture that are more cost effective. The City hopes to inform NDEQ of the project(s) to be implemented in the Saddle Creek Basin in early 2017 and in the Minne Lusa Basin in early 2018. In addition to these areas, the City is implementing an ongoing process that will review future projects to ensure that the projects envisioned in the 2009 LTCP and subsequent update in 2014 is still the most cost effective to address the CSOs.

5. **Cost/Performance Considerations.** On July 15, 2014, the City Council adopted an updated ordinance that established sewer rates for the period 2015—2018. A financial capability assessment for Omaha's wastewater enterprise fund was completed in May 2013. In 2016, Omaha contracted with a consultant to update the City's Rate Model that was originally

developed in 2006, and to perform a Financial Capability Assessment (FCA) to prepare for the next rate ordinance in 2018. This will assist the City in working with NDEQ to establish a framework to address issues related to Affordability of the program. It will also assist the City in estimating the impact of other regulatory and infrastructure needs that sewer fees must pay for. The most current estimate on the overall cost of the program is slightly over $2.0 billion.

6. **Operational Plan.** On November 13, 2015 a wet weather operations protocol was submitted to NDEQ. The Plan included a summary of the anticipated operation of the Plant once the construction is complete. The figure below includes the process flow during wet weather. The Municipal Headworks is in service receiving flows from the Monroe Street Lift Station and the In-Plant Lift Station. The Monroe Street flow is not represented separately on the diagram. The additional operational changes correspond to the completion of the Schedule B2 improvements when a post primary disinfection system is in place which will be in 2019. In addition, modifications to the plant to be able to treat 64 MGD through secondary treatment, and 150 MGD through primary are complete. However, until the SIFM is complete, the maximum flow will not be achievable.

Figure ES 2- 1: MRWWTP Operational Plan



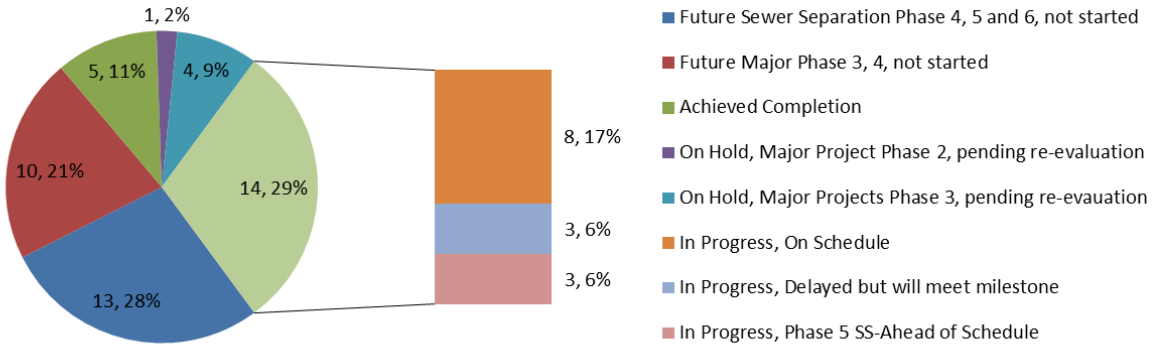
7. **Maximizing Treatment at the Existing POTW Treatment Facilities.** Major projects are planned during the next 5 years to maximize treatment of combined wastewater at the MRWWF. The City of Omaha continues to evaluate opportunities to maximize treatment at the MRWWTF as part of the adaptive management strategy for implementation of the LTCP. No new approaches have been identified during this report year. Projects related to current strategy are discussed in more detail in the relative progress report in Attachment 4. Any expansion of the treatment capacity of the PCWWTF is scheduled for evaluation after this permit term.

8. **Implementation Schedule.** During this permit reporting period, the City continued to implement projects and to work toward a schedule compliant with the 2027 deadline. The City developed a LTCP Update implementation schedule factoring in interrelationships of the projects, priorities, and construction sequencing. The schedule was also adjusted to conform to the City's financing capability and the effects of the extension of implementation brought about by the 2011 Flood. Included in this Annual Report are project specific progress reports on implementation of the CSO major projects and sewer separation projects set forth in the compliance schedule. See Section C of this executive summary for summary of Compliance Schedule.
9. **Post-Construction Compliance Monitoring Program.** The City's Post Construction Monitoring Program includes Outfall monitoring at designated CSO points, in-stream monitoring, and verification of separation projects. Additional information is provided in the Section E, In-Stream Monitoring and any results of studies performed that support the deactivation of a CSO outfall are included in Section F - Performance Report of the executive summary.

C. Compliance Schedule

A summary of construction activities, actions, and other measures completed according to the Compliance Schedule for Implementation of CSO Control Projects set forth in Part VI of the permit is included in this annual report. Annual Project Progress Reports are submitted in Attachment 4 for projects that had activity to report. Out of 47 projects listed in the current CSO NPDES Permit, 5 are complete, 14 in progress, and 5 due to have activity this year were placed on hold.

Figure ES 2- 2: Compliance Status of the 47 listed Projects in the Permit



D. CSO Outfall Monitoring

The Interim Requirements for CSO Outfall 102, as defined in Table 3, Part II of the NPDES Permit, are in effect for this Permit year. The conditions for approved bypass of combined sewer complied with these requirements. CSO 102 had 66 overflow events from October 1, 2015 through September 30, 2016. Results from the monitoring are reported on quarterly discharge monitoring reports. Interim Requirements for the monitoring of CSO Outfall 205, were not in effect this year.

E. In-stream Monitoring

The current NPDES Permit requires a summary of instream monitoring data consistent with the Implementation Monitoring Plan objectives to include monitoring station identification, stream identification, the list of parameters along with the monitoring results.

It is important to note that although In-Stream Monitoring was included as part of the *Draft-Implementation Monitoring Plan, March 2010*, it also states in the plan "Although not legally required by state or federal regulations, the City has included in-stream water quality monitoring as part of the water quality monitoring plan. An in-stream water quality monitoring network within portions of the Papillion Creek, its tributaries, and the Missouri River will provide water quality data that benefits both the CSO Program and the Stormwater Program." A permit modification was accepted by the NDEQ with regard to the City's MS4 NPDES Permit, April 5, 2016 that modified the Program Elements of the Storm Water Monitoring Plan. With that, the in-stream monitoring was removed from the plan, and alternate elements approved.

City staff monitored four sites along the Papillion Creek system and three sites along the Missouri River for water quality parameters. USGS continued water quality sampling for the City at four sites along Missouri River. There are five Missouri River sites altogether counting City and USGS in-stream sampling. Data provided by USGS for 2015 is approved. Data for 2016 is considered provisional.

F. Performance Report

As stated in the CSO permit, Part VIII, Section E, the performance report consists of A) reporting the number of times each CSO outfall has an overflow and an evaluation as to whether the controls are achieving their design intent. B) Documentation needs to be provided that demonstrates that each CSO overflow occurrence was the result of a wet weather event. C) Once in the term of the permit, provide the percent by volume of the combined sewage collected in the CSS during precipitation events on a system-wide annual average basis that is eliminated or captured for treatment.

CSO occurrences at CSOs along Missouri River were highest at CSO 109, MRWWTP, equal to 66 and lowest at Bridge Street equal to 3. Little Papio CSOs lowest count was at CSO 211, 66th and Pacific, and highest count of 63 at CSO 204, Cole Creek. LTCP Projects are complete for CSO 211 and CSO 103 and these CSOs are being monitored for further inflow reduction. An additional report is submitted this year to show that each CSO occurrence can be attributed to rain or snow melt. See attachment

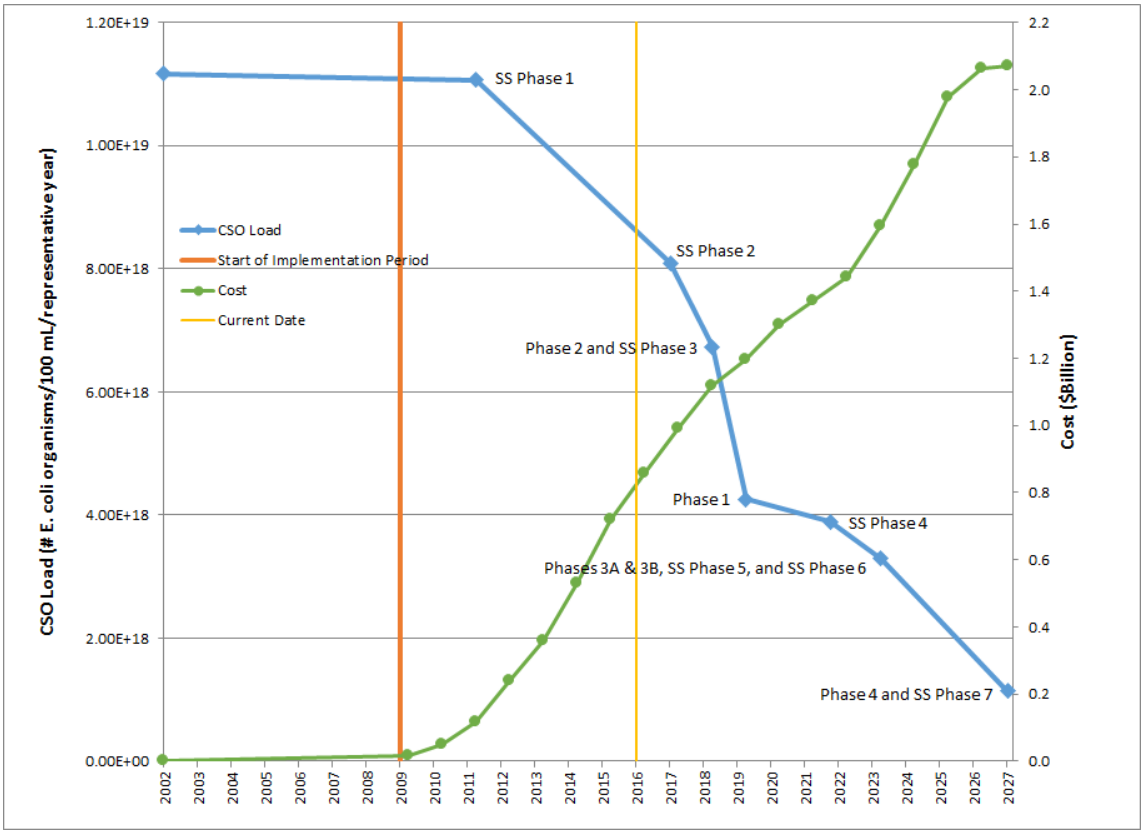
G. Other Information

The CSO NPDES Permit, Part VII.F, requires a section of the Annual Report be for other information. The City typically includes information in this section of the report that highlights factors relevant to the CSO Program not reported elsewhere. This section contains "measures of success" as well as discussion on affordability and other beneficial programs or efforts impacting the success of the CSO Program. Following is a list along with a brief description for each item discussed in this year's report:

1. Missouri River Bank Stabilization: A Project was kicked off this year to provide bank stabilization improvements at the Missouri River Wastewater Treatment Plant (MRWWTP). These improvements are needed in order to protect a portion of the existing MRWWTP and facilitate construction of additional improvements (OPW 52648, Missouri River Wastewater Treatment Plant Improvements – Schedule B2: Chlorine Contact Basin and Primary Clarifier Odor control) which are being bid and constructed separately.
2. On September 13, 2016 NDEQ representatives conducted an inspection with regard to compliance with the CSO NPDES Permit. The sites visited were MRWWTP Improvements, Schedule A1 and B1; South Interceptor Force Main-North Segment, and JCB and Miami Sewer Separation. The MRWWTP Bank Stabilization was also among the projects visited. NDEQ noted issues with pollution prevention and uncovered trash containers. Results of the inspection were submitted to the City on October 28, 2016. City addressed site issues.
3. NDEQ inspection report suggested documenting improvements and submitting them to the NDEQ. This Annual Report will serve as the response to the comments and suggestions. Attachment 6 is an excerpt from the 60 page NDEQ inspection report submitted to the City along with the City follow-up site inspections. The Construction Managers were onsite during the inspections and were made aware of the concerns with uncovered containers.
4. EPA Coordination Efforts: The City of Omaha continued its partnerships with the EPA Office of Research and Development office in Cincinnati, OH (EPA ORD) and various officials from EPA Region 7. A demonstration project at Sewer Maintenance Division, completed in 2014, includes pervious pavers and bio-retention and is being monitored by the USGS to measure the effectiveness.
5. Reduction in the Number of Overflow Events and CSO Outfalls: CSO 211 diversion structure near 66th and Pacific had a weir built on the on the outfall pipe and a reduction in CSOs of more than 50% on average. CSO 103 has also shown a significant reduction in the occurrences per rain event. More reduction will happen as the LTCP is implemented.
6. Receiving Water Quality: A significant reduction in E. coli load to the Missouri River occurred with the implementation of the SOIA Lift Station. Another major reduction will occur when the South Interceptor Force Main and Missouri River Wastewater Treatment Plant projects currently under construction are completed.Figure ES 2-2 indicates a prediction in the reduction of E. coli loading over time due to the implementation of the LTCP, according to the Update submitted 9/26/2014.

7. City of Omaha RNC Program: a program to separate localized combined sewer areas to primarily address basement backups. The projects this year include 49th & Caldwell Area Sewer Separation, almost complete at the time of this report. An additional project in the 18th and Fort Street area began Sewer System Evaluation Survey, Fall 2015, and continued with preliminary study and design in 2016.

Figure ES 2- 3:E.Coli Reduction over LTCP Implementation



8. Rate Information: In April of 2013 the City's rate consultant issued an updated cost of service study that recommended a schedule of rate increases for the period 2014-2018, approved July 2014. In The University of Cincinnati financial capability assessment for Omaha's wastewater enterprise fund, completed May of 2013 remains in consideration for future rate increases.

9. Material Management: During the 2016 reporting year, approximately 29,418 tons of the waste material from construction of capital projects associated with the CSO Program, mainly contaminated soil, were taken to the Waste Management Pheasant Point Landfill. C&D waste was disposed of locally in a C&D landfill. Approximately 15.084 tons were considered hazardous waste and taken to Waste Management's Emelle, Alabama facility. The City monitors and tracks contaminated soils and other waste material and use this report to update the NDEQ Waste Management Division.