SD1
Managing Northern Kentucky's
Wastewater and Storm Water

January 30, 2016

Director of the Division of Enforcement
Department for Environmental Protection
300 Fair Oaks Lane
Frankfort, KY 40601

Chief, Environmental Enforcement Section
Environmental and Natural Resources Division
U.S. Department of Justice
601 D street NW
Washington, DC 20005
DOJ Case No. 90-5-1-1-08591

Ms. Denisse Diaz, Chief
NPDES Permitting and Enforcement Branch
U.S. Environmental Protection Agency, Region 4
Atlanta Federal Center
61 Forsyth Street, S.W.
Atlanta, Georgia 30303

Re: Consent Decree Case No. 2:05-cv-00199-WOB

To Whom It May Concern:

Pursuant to the above-referenced Consent Decree, Sanitation District No. 1 (SD1) is required to submit quarterly reports that demonstrate SD1's compliance with the Consent Decree:

> **42. Quarterly Reports**. The District shall submit to the Cabinet/EPA a quarterly report that describes the District's progress in complying with this Consent Decree for the previous quarter no later than thirty days after the end of each calendar quarter. The first such report shall be submitted to the Cabinet/EPA no later than thirty days after the second full quarter after entry of this Consent Decree.

Information contained within the enclosed Quarterly Report describes SD1's compliance with Consent Decree Case No. 2:05-cv-00199-WOB for the period of October 1, 2015 through December 31, 2015. The report also contains an outlook for the upcoming calendar quarter period of January 1, 2016 through March 31, 2016. An annual review of 2015 with comparisons to previous years is included in the report, as well.

A certification as required by the Consent Decree is also enclosed (Consent Decree paragraph 38).

To the best of my knowledge and belief, the enclosed report is true, accurate, and complete, and further demonstrates SD1's commitment to the mission of protecting and enhancing the water resources and quality of life in Northern Kentucky.

If you have any questions or concerns, do not hesitate to contact me at 859-578-6762 or by e-mail at drager@sd1.org.

Best regards,

David E. Rager
Executive Director

DER/wck
Enclosures

Sanitation District No. 1
January 30, 2016

Consent Decree
Quarterly Report No. 33
(October 1, 2015 through December 31, 2015)

(This page intentionally left blank for double-sided printing.)

CERTIFICATION

Consent Decree Quarterly Report No. 33
Consent Decree Case No. 2:05-cv-00199-WOB

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.

David E. Rager
Executive Director

Date 1/28/16

COMMONWEALTH OF KENTUCKY

)ss.

COUNTY OF Kenton

The foregoing instrument was acknowledged before me this 28 day of January, 2016 by David E. Rager, Executive Director of Sanitation District. No. 1.

Angela M. Cook
NOTARY PUBLIC

Kenton County, Kentucky

My commission expires: 7-30-16

Angela M. Cook
Notary Public
Kentucky, State at Large
Comm. Exp. 07-30-16
Notary ID 471543

(This page intentionally left blank for double-sided printing.)

CONSENT DECREE
QUARTERLY REPORT NO. 33

January 30, 2016

Sanitation District No. 1
1045 Eaton Drive
Ft. Wright, KY 41017

TABLE OF CONTENTS

TABLES

FIGURES

LIST OF ACRONYMS AND ABBREVIATIONS

AWWA	American Water Works Association
Cabinet	Kentucky Energy and Environment Cabinet
CSAP	Continuous Sewer Assessment Program
CSO	Combined Sewer Overflow
CVG	Cincinnati-Northern Kentucky International Airport
EPA	U.S. Environmental Protection Agency
KDOW	Kentucky Division of Water
KYTC	Kentucky Transportation Cabinet
LDSAP	Large Diameter Sewer Assessment Program
O&M	Operations and Maintenance
SD1	Sanitation District No. 1
SSO	Sanitary Sewer Overflow

SECTION 1. INTRODUCTION

1.1 Purpose

This Quarterly Report is submitted to fulfill the requirements of Sanitation District No. 1's (SD1) Consent Decree as entered on April 18, 2007. This Consent Decree is a legal agreement with the U.S. Environmental Protection Agency (EPA) and the Kentucky Energy and Environment Cabinet (Cabinet). The purpose of the Consent Decree is to address sanitary sewer overflows (SSOs) in SD1's sanitary sewer system and combined sewer overflows (CSOs) in the combined sewer system in an effort to improve water quality throughout SD1's service area. Specifically, Section V Reporting Requirements, states that:

> **42. Quarterly Reports.** The District shall submit to the Cabinet/EPA a quarterly report that describes the District's progress in complying with this Consent Decree for the previous quarter no later than thirty days after the end of each calendar quarter.

1.2 Report Period

Information contained within this report describes SD1's compliance with Consent Decree Case No. 2:05-cv-00199-WOB for the period of October 1, 2015 through December 31, 2015. This report also contains an outlook for the upcoming calendar quarter period of January 1, 2016 through March 31, 2016.

1.3 Consent Decree Compliance Schedule

A comprehensive compliance schedule for meeting the requirements of the Consent Decree can be found in Appendix A.

A more detailed listing of the projects and activities conducted to comply with the requirements of the Consent Decree, including schedules, project updates for the current reporting period, and planned activity for the following quarter can be found in Appendix B. Appendix B also provides the status of the projects proposed in the first five years of the final Watershed Plans for Northern Kentucky, submitted on March 31,

2011, approved by a letter from the Cabinet and EPA dated February 14, 2014, and resubmitted March 14, 2014 with agreed revisions as requested in the February 14, 2014 letter.

Initial Watershed Projects

As shown in Appendix B, SD1 has completed the Initial Watershed Projects. A request to remove a project (Western Regional – Richwood project C-039-00) was included in the revised Watershed Plans, submitted on March 31, 2011. Approval of the request to remove the project was granted in a letter dated May 13, 2013 from the Cabinet and the EPA. SD1 submitted its final Initial Watershed Projects Annual Report on June 7, 2013.

Pump Station Backup Power Plan

As shown in Appendix B, SD1 has completed the Pump Station Operation Plan for Backup Power, before the Consent Decree deadline of December 31, 2015. SD1 submitted its Pump Station Operation Plan for Backup Power on December 14, 2007 and received regulatory approval on May 14, 2008. Of the 127 pump stations identified in the plan, 15 are permanently eliminated, and 112 have fully implemented backup power solutions to mitigate overflows due to power failure.

The schedule provided in Appendix B of this report only identifies 110 pump stations, because 17 of the 127 pump stations that required backup power were completed prior to the approval of the plan in 2007. The 17 projects that were identified as complete in Table 3.1 of the Pump Station Operation Plan for Backup Power, submitted on December 14, 2007, are not included in the final schedule provided in Appendix B of this report.

SECTION 2. OVERFLOW DATA

This section of the Quarterly Report presents SD1's estimates of overflow activity in the collection systems.

Overflow Categories

For reporting and system performance measurement purposes, SD1 has categorized sewer overflows throughout the service area into five distinct categories:

- *SSOs Due to Wet-Weather Capacity Issues*: Recurring and inactive overflows from SD1's sanitary sewer system due to a lack of capacity during wet weather. This category includes wet-weather discharges at pump stations that may or may not have a constructed bypass. Overflows are determined to be "recurring" if they have been observed to overflow twice in a running twelve month period. Overflows are determined to be "inactive" until they occur more than once in a running twelve month period. Inactive overflows are generally under investigation as suspected or predicted hydraulic model overflow points in the collection system.

- *SSOs Due to Operational Issues*: Overflows from SD1's sanitary sewer system, including pump stations that are not a result of wet weather capacity issues. Many of these are one-time, dry-weather occurrences caused by temporary system issues that are investigated and corrected as soon as practicable.

- *Wet-Weather CSOs*: Wet-weather discharges from the combined sewer system.

- *Dry-Weather CSOs*: Dry-weather discharges from the combined sewer system.

- *Building Backups:* The release of raw sewage from a service lateral into a building in SD1's service area. Building backups can be caused by several factors, such as constrained capacity during wet weather, or a blockage or collapse in the private service lateral or public main line. Building backups can be determined to be associated with the public sewer system, or can be due to other causes beyond the control of SD1.

Quantitative Estimates

SD1 uses three general methods for developing quantitative overflow estimates:

- Field inspections are conducted after wet-weather events to identify activations and determine cleanup needs. This inspection program has been in place since 2005 and is expanded as warranted for ongoing reporting and sewer overflow response cleanup. SD1's Collection Systems Department: Asset Maintenance and Infrastructure Capital Planning Department: Wet Weather crews continue to perform routine inspections after rain events at prioritized recurring, inactive, and

suspected SSO locations to understand and verify overflow activity. This is part of SD1's ongoing efforts to characterize and verify overflows throughout the collection system, ensure that they are categorized accurately, and cleaned up after rain events. Proper characterization of the overflows ensures that the hydraulic models that SD1 utilizes are maintained and improved upon, which will help identify the most appropriate and effective solutions.

- Simple hydraulic estimating with the Manning's Gravity Flow and Pipe Calculation is used to report overflows from pump stations with constructed bypasses, and industry standard volume estimation techniques and calculations are used for spills or any witnessed overflows from a manhole. The only exception to this calculation methodology is at the Lakeview Pump Station, which has a metered bypass pipe.

- SD1's collection systems hydraulic models are used for quarterly activation and volume estimations of wet-weather CSOs and SSOs. SD1 completed a year-long flow monitoring program in 2008, consisting of more than 245 flow meters and 45 rain gauges installed throughout the combined and separate sewer systems, that was utilized to update the calibration of SD1's system-wide hydraulic models. This calibration was undertaken to provide a model network that could confidently be used as an accurate tool in preparing SD1's Watershed Plans. Currently, SD1 maintains approximately 70 flow meters and 25 rain gauges throughout the year, which are used to continuously update and refine the models. Additionally, the models are being used to provide information about the current performance of SD1's system. With the historical and current flow monitoring and inspection data collected, SD1 maintains its highly calibrated network of hydraulic models to provide an accurate representation of the sewer system. This tool confidently provides estimates of overflow activations and volumes from the sewer system as a result of wet weather. The models are updated on a quarterly basis to incorporate rehabilitation and maintenance activities, completed capital projects, private developments, data gathered from GPS surveys, and mapping of discovered infrastructure. This process ensures that the models are kept up-to-date and accurately reflect the current state of the collection system. This approach is consistent with SD1's commitment to provide the best available information on overflow activity.

For this submittal, SD1 has collected rainfall data from a series of 23 rain gauges located across the system, to simulate the wet weather that occurred between October 1, 2015 and December 31, 2015. The results of the model simulations have been summarized and included as an estimate of the frequency and total volume of the overflow locations within SD1's system for this period. For the modeled locations, these results are not a summary of observed or confirmed activations, but are a confident estimate of the overflow statistics based on the calibrated and verified models.

Precipitation Data

Rainfall statistics are an important component of overflow reporting, as rainfall conditions represent an uncontrolled variable impacting SD1's wet-weather CSO and SSO activity. Quarterly CSO and SSO activations and volumes change over time due to natural variations in rainfall patterns and antecedent moisture conditions. Over time, SD1 expects system improvements to show a clear trend in reduced overflow activity. However, reviewing overflow reports for any individual quarter, relative to the previous quarter, also requires careful review of the rainfall associated with each period, in order to understand the impact of shifting rainfall patterns. For this reason, storm event summaries are included in all overflow reporting submittals. The data in Table 2.1 is from the Cincinnati-Northern Kentucky International Airport (CVG) rain gauge, maintained by the National Weather Service.

Table 2.1 Summary of Storm Events
(October 1, 2015 through December 31, 2015)

Month	Approximate # of Storm Events[1]	Rainfall (in)
October	8	4.31
November	8	4.25
December	10	6.09
Total	**26**	**14.65**

[1] A storm event is defined as at least 0.01" of rain with a minimum inter-event time of 7 hours.

The historical average of fourth quarter rainfall volume from 1951 through 2005 at CVG is approximately 9.2 inches. For further comparison, the typical year (1970) used for system characterization is approximately 8.1 inches of rainfall during the fourth quarter. SD1's recorded volume of rainfall for the fourth quarter of 2015, 14.65 inches, is

approximately 60 percent greater than the historical 50-year average and 80 percent greater than the typical year's fourth quarter.

The remainder of this section reports overflows that occurred throughout SD1's service area during the period of October 1, 2015 through December 31, 2015. A cumulative accounting of SD1's overflow activity throughout 2015 and annual comparisons from 2008 to 2015 can be found in Appendix C.

2.1 SSOs Due to Wet Weather Capacity Issues

As previously described, this section describes recurring and inactive overflows from SD1's sanitary sewer system that were due to lack of capacity during wet weather. This includes wet-weather discharges at pump stations that may or may not have a constructed bypass. Overflows are determined to be "recurring" if they have been observed to overflow twice in a running twelve month period. Overflows are determined to be "inactive" until they have been observed to overflow more than once in a running twelve month period. Inactive overflows are generally under investigation as suspected or predicted hydraulic model overflow points in the collection system.

Recurring Wet-Weather SSOs

Modeled activation and volume statistics for SD1's 145 recurring wet-weather SSO locations can be found in Appendix E. Revisions to the locations of SD1's recurring wet-weather SSOs are reported in the first quarterly report of every year. Therefore, any revisions to the current recurring wet-weather SSO list will be published in Consent Decree Quarterly Report No. 34, due on April 30, 2016.

Recurring Wet Weather SSO Pump Stations Listed in the Consent Decree

In addition to the 145 recurring wet-weather SSOs, there are also 14 pump stations identified in the Consent Decree that have historically documented recurring wet-weather capacity issues. As described previously, SD1 uses the Manning's Gravity Flow and Pipe Calculation to estimate pump station overflow volumes.

Typically, the only exception to the pump station overflow estimation methodology is at the Lakeview Pump Station, which has a metered bypass pipe. However, the bypass flow meter faulted out during the two overflow events recorded at Lakeview Pump

Station on December 23 and December 27, 2015. The estimations provided for Lakeview Pump Station for this quarter have been provided using the Manning's Gravity Flow and Pipe Calculation. The Lakeview Pump Station flow meter is currently being evaluated to determine if a new maintenance routine is necessary for its continued operation. Prolonged periods in which the meter is not recording any overflow appear to be causing malfunctions due to dry conditions. Until the flow meter is operating properly, all estimations at Lakeview Pump Station will be based on the Manning's Calculation.

Table 2.2 provides the total number of wet-weather SSO occurrences and estimated volumes, during the fourth quarter of 2015, for each of the Consent Decree listed pump stations.

Table 2.2 Discharges from Consent Decree Pump Stations Due to Lack of Capacity during Wet Weather
(October 1, 2015 through December 31, 2015)

Name of Pump Station	Number of Wet-Weather Related Discharge Occurrences	Total Estimated Volume (gallons)
Lakeview	2	612,000
Alex-Licking	0	0
Allen Fork	0	0
Crestview	0	0
Harrison Harbor	0	0
Highland Acres	0	0
Kentucky Aire	0	0
Riley Road	0	0
Ripple Creek	0	0
South Hampton	0	0
South Park	0	0
Sunset	0	0
Taylorsport	0	0
Union	0	0
TOTAL	**2**	**612,000**

Gray denotes where required capital improvements have been made to pump stations.

Wet Weather SSO Pump Stations Not Listed in the Consent Decree

In addition to tracking the recurring wet-weather SSOs at the pump stations listed in the Consent Decree, SD1 continuously monitors all pump stations throughout the service area for recurring wet-weather capacity issues. During the current reporting period, three pump stations not listed in the Consent Decree experienced capacity

issues during wet weather. The three pump stations discharged a total of 13 times in 12 separate wet-weather events, for an approximate total of 1,647,000 gallons of SSO.

Table 2.3 provides the total number of wet-weather SSO occurrences and estimated volumes, during the fourth quarter of 2015, for each of the pump stations not listed in the Consent Decree.

Table 2.3 Discharges from Pump Stations not Listed in the Consent Decree Due to Lack of Capacity during Wet Weather
(October 1, 2015 through December 31, 2015)

Name of Pump Station	Number of Wet-Weather Related Discharge Occurrences	Total Estimated Volume (gallons)
Bullitsville	1	9,000
Highland Heights	10	1,626,700
Mafred	2	11,300
TOTAL	**13**	**1,647,000**

Inactive Wet Weather SSOs

No inactive wet-weather SSOs were observed during the current reporting period.

2.2 SSOs Due to Operational Issues

As previously mentioned, this category of overflows includes discharges from SD1's sanitary sewer system that are not a result of wet-weather capacity issues. Many of these are one-time, dry-weather occurrences caused by temporary system issues or mechanical failures that are investigated and corrected as soon as possible.

During the fourth quarter of 2015, there were a total of 11 SSOs due to operational issues throughout SD1's service area. A total estimated overflow volume of 139,900 gallons discharged during these incidents.

Figure 2.1 demonstrates the primary causes of the overflows and Figure 2.2 demonstrates the corresponding volumes.

Figure 2.1 Occurrences of SSO Due to Operational Issues per Cause
(October 1, 2015 through December 31, 2015)

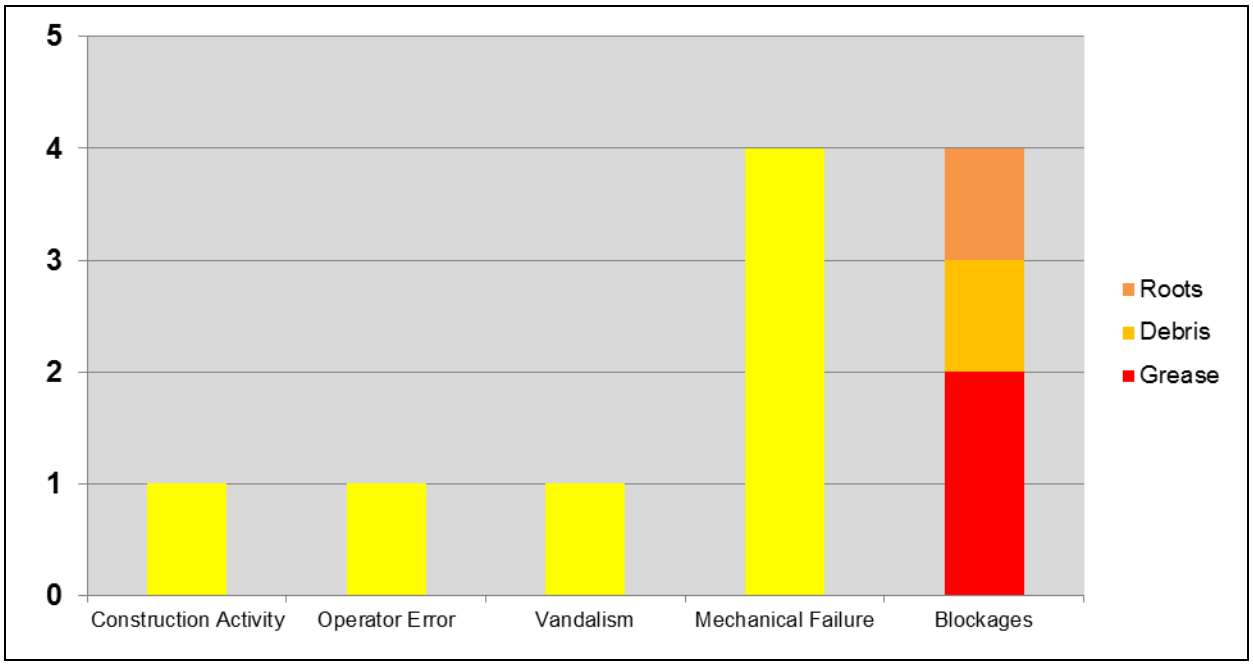
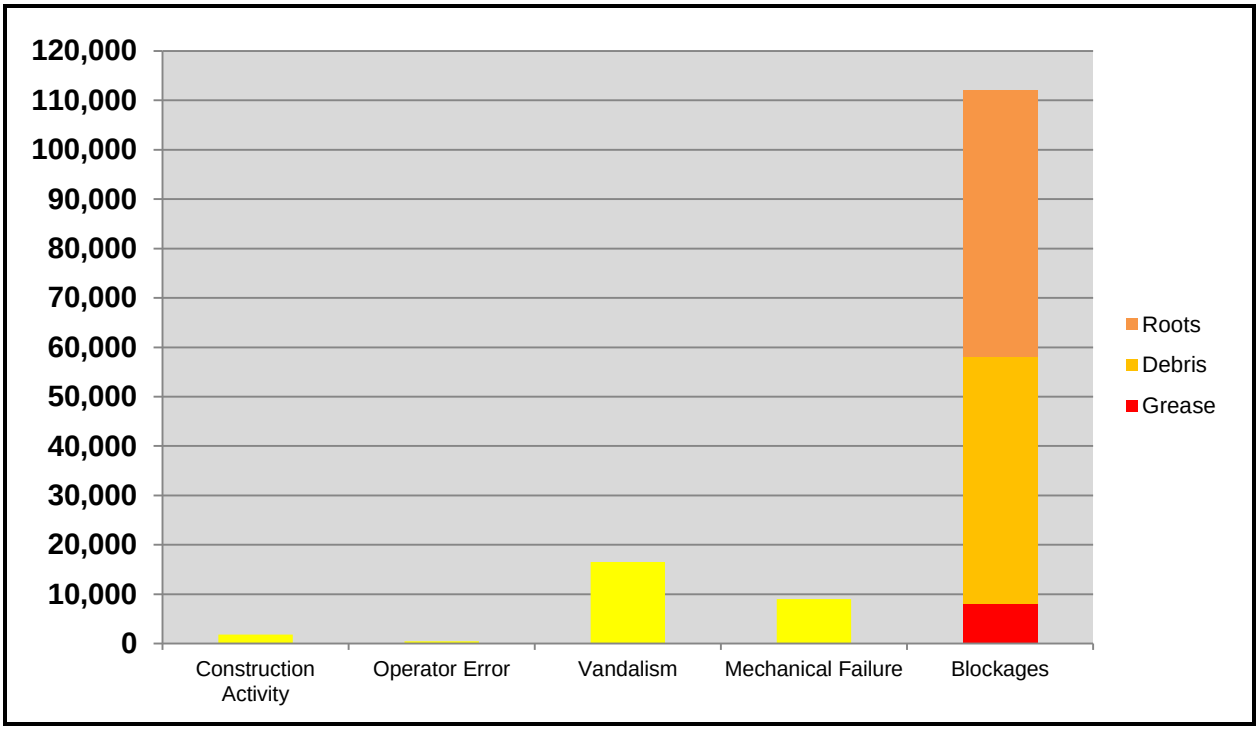


Figure 2.2 Gallons of SSO Due to Operational Issues per Cause
(October 1, 2015 through December 31, 2015)



These SSOs were immediately acted upon and the problems repaired. The sewers where blockages occurred were put into the Continuous Sewer Assessment Program (CSAP) to be inspected and cleaned as determined by the CSAP logic, which also provides appropriate next actions to permanently address the cause of the blockages. All overflow events are recorded in Lucity and are periodically reviewed to identify if any trends or localized problem areas (such as past overflows or proximity to recurring wet-weather SSOs) exist that warrant the need for a larger-scale inspection or rehabilitation project.

2.3 Wet Weather CSOs

Included in Appendix F are the modeled activation and volume statistics for SD1's 95 CSOs. This data was generated from the hydraulic modeling program previously described in Section 2.1.

2.4 Dry Weather CSOs

During the current reporting period, there were four dry-weather CSOs observed by SD1.

One dry-weather CSO was due to a blockage of grease between the regulator and the interceptor on Washington Street, in the City of Bellevue.

The three remaining dry-weather CSOs were related to the bypass pumping operation of the ongoing construction project to replace a collapsed 24-inch clay pipe on Riviera Drive, along Taylor Creek, in the City of Bellevue. Refer to Quarterly Report No. 30 and No. 32 for thorough descriptions of the ongoing project. SD1 has installed a real-time flow meter in the CSO regulator upstream of the Riviera project, with the capability to alarm staff when the pipe is experiencing surcharged conditions. The flow meter provides SD1 with notice of impending overflow and the capability to respond faster to bypass pumping failures, in order to minimize the impacts of dry-weather CSOs in Taylor Creek.

Table 2.4 provides the dates, causes, volume estimates, and corrective actions associated with the four dry-dry weather CSOs observed in the fourth quarter of 2015.

Table 2.4 Dry Weather CSOs
(October 1, 2015 through December 31, 2015)

Date	Manhole ID#	Location	Overflow Cause	Volume Estimate	Corrective Action Taken
10/19/15	0650098	Bellevue Riviera Drive Wildcat CSO	Vandalism of bypass pump valves	852,000 gallons	SD1's contractor repaired the vandalized valves on the bypass pump, and installed locks so they cannot be tampered with again. The netbag on the end of the CSO outfall was replaced and all solid debris was removed from the bank of the creek. See Figure 2.3
10/21/15	0610072	Bellevue Washington Street CSO	Blockage of grease, roots, and debris	7,000 gallons	Grease was jetted out of the mainline between the regulator and the interceptor. The line was then televised to identify the source of the blockage. A rootball was discovered near a buried manhole, downstream of the regulator. The rootball was sawed out and jetted, and the discovered buried manhole is scheduled to be raised. Additionally, 183 FOG letters were mailed to residents and businesses upstream of the dry weather CSO. A sample of the standard FOG letter can be found in Appendix H of the CMOM FY2015 Annual Report.
12/4/15	0650098	Bellevue Riviera Drive Wildcat CSO	Equipment Malfunction of bypass pump	288,200 gallons	SD1's contractor immediately responded and performed corrective maintenance on the bypass pump. The netbag on the end of the CSO outfall was replaced and all solid debris was removed from the bank of the creek. See Figure 2.3

Date	Manhole ID#	Location	Overflow Cause	Volume Estimate	Corrective Action Taken
12/9/15	0650098	Bellevue Riviera Drive Wildcat CSO	Equipment Malfunction of bypass pump	35,900 gallons	SD1's contractor immediately responded and performed corrective maintenance on the bypass pump. The netbag on the end of the CSO outfall was replaced and all solid debris was removed from the bank of the creek. See Figure 2.3

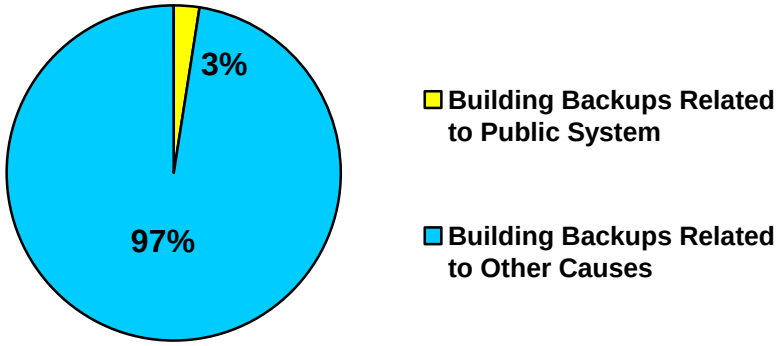
Figure 2.3 is a photograph of the netbag on the end of the Wildcat CSO outfall pipe at Taylor Creek. The netbag captures solids from the wet and dry weather CSOs and is regularly replaced with routine CSO inspections.

Figure 2.3 Wildcat CSO Netbag Captures Solids

2.5 Building Backups

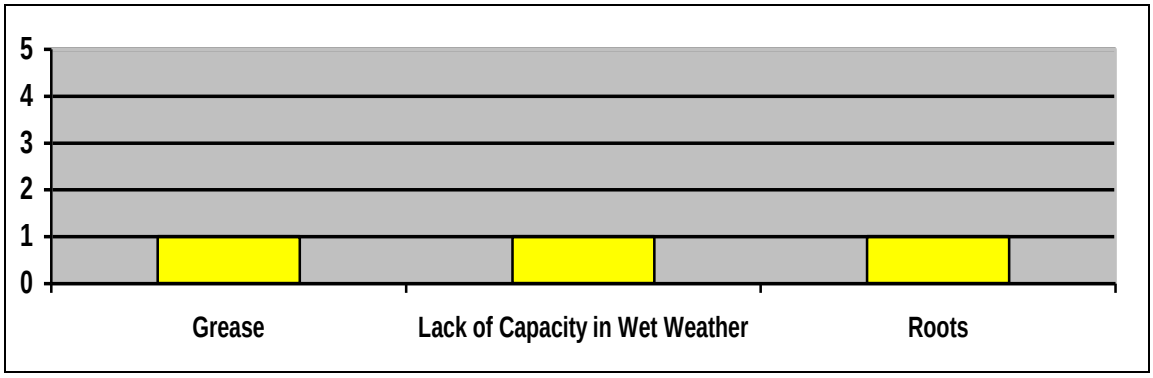
During the current reporting period, there were approximately 116 building backups throughout SD1's service area. Of these 116 backups**,** approximately three were related to the condition or operation of the public sewers and 113 were caused by other issues, as shown in Figure 2.3. The building backups determined not to be related to the condition or operation of the public sewers, were caused by blockages in private service laterals and internal plumbing issues.

Figure 2.4 Building Backups: Public System vs. Other Causes
(October 1, 2015 through December 31, 2015)



The causes of the three building backups determined to be related to the condition or operation of the public sewer lines are detailed in Figure 2.4.

Figure 2.5 Occurrences of Public System Related Building Backups per Cause
(October 1, 2015 through December 31, 2015)



The sewers where blockages occurred were put into or updated in SD1's CSAP to be inspected and cleaned, as determined by the program logic, which also provides appropriate next actions to permanently address the cause of the blockages.

All building backups are recorded in Lucity and are periodically reviewed to identify if any trends or localized problem areas exist that warrants the need for a larger-scale inspection routine, rehabilitation, or repair project.

SECTION 3. ANNUAL REVIEW OF OVERFLOW DATA

The activities, programs and projects SD1 implements are intended to reduce the frequency and volume of SSOs and CSOs throughout SD1's service area. These efforts include Capacity, Management, Operations and Maintenance programs, implementation of the Nine Minimum Controls for CSOs, and various capital improvement projects. As a means to gauge the benefits of these efforts, this section accounts for the reductions or increases in annual overflow activity from year to year and provides an analysis as to what has contributed to these changes. Rainfall and Ohio River stage level data considered in this analysis is also provided, as each represents an uncontrolled variable that significantly impacts SD1's wet-weather CSO and SSO activity. In general, focus on 2014 and 2015 data are included for detailed comparison in year-to-year statistics, while data prior to 2014 is included for historical reference. Additional summary comparisons of SD1's overflow data since 2008 can be found in Appendix C.

3.1 Summary of Precipitation Data

As previously mentioned in Section 2, CSO and SSO activations and volumes will constantly change over time, with or without system improvements, due to natural variations in rainfall patterns, the associated groundwater levels, and antecedent moisture conditions. Therefore, SD1 must take into consideration the influence of precipitation to determine the actual impact of system improvements.

Rainfall Conditions

The rainfall volume data in Tables 3.1 and 3.2 are based on total rainfall data recorded at the Cincinnati-Northern Kentucky International Airport (CVG). The storm event data is based on an estimate of the number of events observed at the rain gauges within the SD1 system. An event is defined as a period of time where rainfall is bracketed by at least seven hours of no rainfall. The daily precipitation statistics in Figures 3.1 and 3.2 are derived from daily rainfall totals measured by a rain gauge at CVG. The historical annual average rainfall from 1950 to 2005 at CVG is 41.05 inches, according to the National Weather Service.

Table 3.1 Rain Events and Total Rainfall by Quarter (2012 through 2015)

	2012			2013			2014			2015		
Qtr.	**# of Storm Events**	**Rainfall (in)**	**Avg. Storm (in)**	**# of Storm Events**	**Rainfall (in)**	**Avg. Storm (in)**	**# of Storm Events**	**Rainfall (in)**	**Avg. Storm (in)**	**# of Storm Events**	**Rainfall (in)**	**Avg. Storm (in)**
1st	22	9.69	0.44	28	9.31	0.33	30	7.85	0.26	22	10.47	0.48
2nd	19	9.04	0.48	31	14.39	0.46	28	15.74	0.56	36	12.49	0.35
3rd	21	10.13	0.48	15	14.17	0.94	25	10.00	0.40	31	9.77	0.32
4th	25	9.75	0.39	27	12.76	0.47	27	8.63	0.31	26	14.65	0.56
Total	**87**	**38.61**	**0.45**	**101**	**50.63**	**0.50**	**110**	**42.22**	**0.38**	**115**	**47.38**	**0.41**

Table 3.2 Rain Events and Total Rainfall Change from 2014 to 2015

	Change from 2014 to 2015	
Qtr.	**# of Storm Events**	**Rainfall (in)**
1st	-8	2.62
2nd	8	-3.25
3rd	6	-0.23
4th	-1	6.02
Total	**5**	**5.16**

Figure 3.1 Daily Precipitation (2012 through 2015)

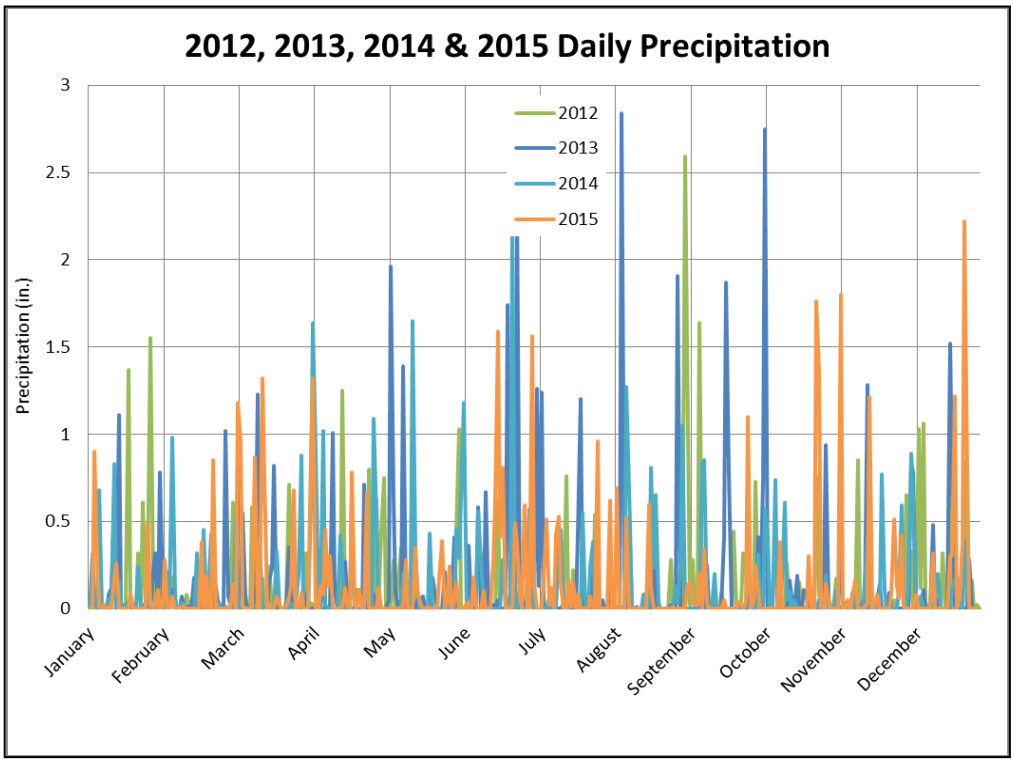
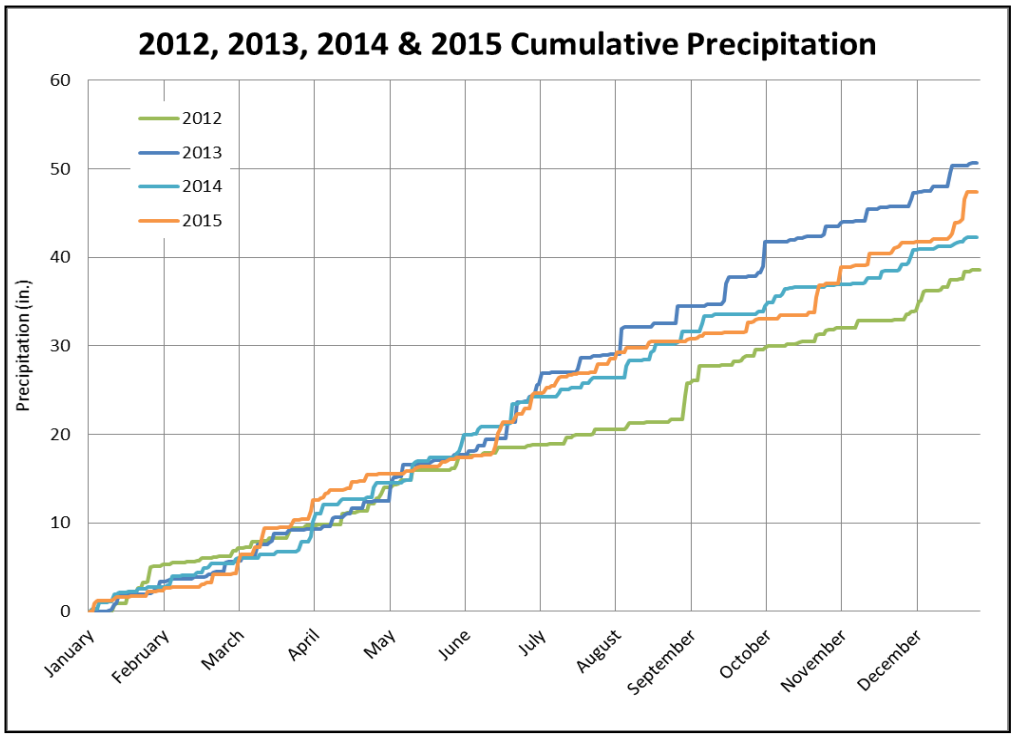


Figure 3.2 Cumulative Precipitation (2012 through 2015)



The cumulative depth of rainfall in 2015 was 47.4 inches and represented a 12 percent increase in rainfall from 2014. The number of rainfall events in 2015 increased 5 percent from 2014, and on average, storms had slightly higher rainfall intensities in 2015 compared to 2014. The most intense storm in 2015 was approximately a 5-year 1-hour event in July. The 2015 fourth quarter rainfall total of 14.65 inches represents one of the wettest fourth quarters on record. The cumulative rainfall depth in 2015 of 47.38 inches is 17 percent higher than the typical year rainfall amount of 40.8 inches; however, the average storm size of 0.41 inches per storm compares closely with the typical year average storm size of 0.40 inches per storm. Reviewing rainfall over the past several years reveals that totals in 2015 compare closely with 2013 with both years showing higher rainfall totals than average. The rainfall totals from 2012 and 2014 tracked more closely to the typical year. A discussion and summary of the above presented information and how it relates to changes in overflow frequency and volume is included in Section 3.2 of this report.

Ohio River Impacts

SD1's system is influenced in multiple ways by the local Ohio River stage level. In addition to increasing groundwater levels that cause additional infiltration to occur, SD1's system operation is also impacted when the river stage is above 41 feet, as shown in Figure 3.3. When the Ohio River reaches the Army Corps of Engineers' specified river stages during flood conditions, flood gates on the CSO outfalls are closed to isolate the sewer system from high river water. Other sewer system flood gates are opened or closed to isolate portions of the interceptor and combined sewers to re-route sewer flows to the flood pumping stations. The flood pumping stations and gates were designed to operate by the Army Corps of Engineers to protect the cities from flooding internally due to elevated river levels, or during rain events when the flows in the combined sewers cannot flow out into the river due to the elevated river levels. SD1 continues to work on eliminating river water intrusion through a program to install duckbill-style check valves on CSO outfalls, effective up to river levels of 47 feet.

Table 3.3 shows the number of days each quarter that the river stage exceeded 41 feet from 2012 to 2015. On average, the Ohio River is at or above 41 feet for 26 days of the year, based upon the daily river stage readings from 1970 to 2005.

Figure 3.3 Daily River Stage (2012 through 2015)

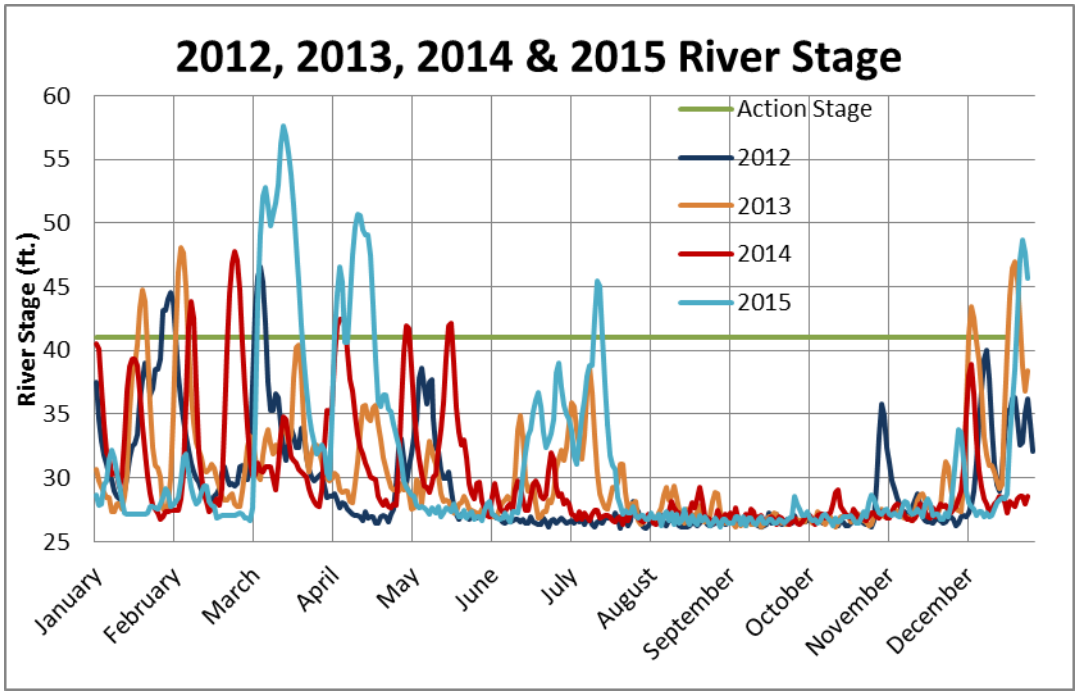


Table 3.3 Number of Days Ohio River Stage Level above 41 Feet (2012 through 2015)

Quarter	2012	2013	2014	2015
1	11	8	8	18
2	0	0	8	14
3	0	0	0	4
4	0	8	0	5
Total	**11**	**16**	**16**	**41**

In 2015 the Ohio River stage level of 41 feet was exceeded for 41 days, 15 days more than the 35-year average. During the three years prior to 2015, Northern Kentucky experienced high river conditions that were below the 35-year average of 26 days. The Ohio River stage exceedances above 41 feet occurred in every quarter of 2015. The third quarter exceedances are especially rare as this has only happened five times since 1970. Additionally, the 18 consecutive days of high river in the first quarter have only occurred nine times since 1970. During the first quarter, the Ohio River also reached 57 feet, which has only occurred once since 1970. The historic nature of the

high river events in 2015 had a substantial impact on the SD1 collection system. A summary of the above presented information and how it relates to changes in CSO overflow frequency and volume is included in Section 3.4 of this report.

3.2 Review of SSOs Due to Wet Weather Capacity Issues

3.2.1 Recurring Wet Weather SSOs

Table 3.4 provides a summary of the number of activations and corresponding volume of recurring wet-weather SSOs from 2008 through 2015, including recurring wet-weather overflows that occurred at pump stations.

Table 3.4 Recurring Wet Weather SSOs by Quarter (2008 through 2015)

		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	**Total**
2008	Activations	285	211	24	56	**576**
	Volume (MG)	103	39	2	14	**158**
2009	Activations	152	175	147	177	**651**
	Volume (MG)	26	24	20	35	**105**
2010	Activations	128	351	123	134	**736**
	Volume (MG)	30	55	14	41	**140**
2011	Activations	428	1,097	256	441	**2,222**
	Volume (MG)	106	232	23	124	**485**
2012	Activations	340	129	427	171	**1,067**
	Volume (MG)	52	8	43	20	**123**
2013	Activations	132	281	491	330	**1,234**
	Volume (MG)	23	23	62	66	**174**
2014	Activations	66	247	109	40	**462**
	Volume (MG)	11	22	2	6	**41**
2015	Activations	141	224	217	381	**963**
	Volume (MG)	32	28	13	60	**133**

Table 3.5 below provides the change in wet-weather SSO activations and volume from 2014 to 2015. Generally, 2015 was a wetter year than 2014 and produced almost three times the wet-weather SSO volume experienced in 2014. Only the second quarter of 2015 experienced less SSO activity than in 2014, but the SSO volume remained approximately the same. All other 2015 quarters produced significantly more wet weather and SSO than in 2014, particularly the fourth quarter.

Table 3.5 Recurring Wet Weather SSOs Change from 2014 to 2015

	Change from 2014 to 2015	
Qtr.	**Activations**	**Volume (MG)**
1st	72	19
2nd	-24	5
3rd	108	11
4th	324	51
Total	**480**	**86**

Recurring wet-weather SSO activity was significantly higher in 2015, as SSO activations were up 104 percent and volumes were up 210 percent from 2014. This increase is partially attributable to higher rainfall totals and storm intensities, which led to higher groundwater inflow and infiltration contributions. On average, groundwater levels were higher in 2015 compared to 2014, particularly in the fourth quarter. Another significant contributor to higher SSO activity in 2015 was model improvement. Several updates and calibration refinements were made throughout the year, particularly in the Licking River Siphon area. These updates and calibration refinements led to a 13 percent increase in SSO activations, and a 28 percent increase in total SSO volume in 2015. The continuous model calibrations ensures the highest level of confidence in the most recent simulations, but will also introduce variance when comparing the current year's overflow predictions to those of previous years. However, since 2011 the model, and the monitoring operations that support the model calibrations, generally indicate a decreasing trend in SSO activations and volume. SD1's capital improvement and collection system management programs are clearly having the intended impacts on wet-weather SSO activity. Appendix G provides the wet-weather SSO trends, since SD1 entered into the Consent Decree.

3.2.1 Inactive Wet Weather SSOs

SD1 has performed wet-weather SSO investigations since 2005, but has only tracked inactive wet-weather overflow occurrences for inclusion in the Quarterly Reports since the beginning of 2009. In 2011, a total of 36 inactive overflows were identified with an estimated overflow volume of 1.24 million gallons. Most of the inactive overflows identified in 2011 were verified by routine wet-weather SSO inspections, and were added to the Recurring SSO list. The verification process and the subsequent revisions to the Recurring SSO list, in 2012, accounts for the sharp decline in inactive wet-weather SSOs. SD1 did record three inactive SSOs during 2015 after more than two years of no observed Inactive SSOs. The three inactive SSOs were related to the historic high river levels in the first quarter of 2015. SD1 does not anticipate recurring activity at the three new inactive SSOs during normal river conditions, or average high river conditions. The continued absence of inactive SSOs during normal river conditions indicates a thorough hydraulic understanding of the system and existing wet-weather capacity issues.

SD1 anticipates that the number of activations and volumes for this category of overflows will vary year-to-year, depending on the size of the rain events that occur and antecedent moisture conditions. Inactive SSOs are generally under investigation as suspected or predicted hydraulic model overflow points that must be confirmed with regular inspections.

3.3 Review of SSOs Due to Operational Issues

Historically, SD1 has used a metric called Wastewater Collection System Integrity, from the American Water Works Association's (AWWA) 2007 Annual Survey Data & Analyses Report, to measure how its annual SSOs due to operational issues compare to the rest of the wastewater industry. The AWWA continues to update these benchmarks on an annual basis. In the past, SD1 has been consistently in the top quartile (3.8 failures, per 100 miles of pipe, per year) of the utilities AWWA has surveyed in the Southern Region for its 2007 report. However, SD1 began comparing itself against all survey participants from the more current 2011 AWWA Annual Survey. The 2011 AWWA survey compiled failure rates from 45 wastewater utilities across the country and found the top quartile to be 2.5 failures, per 100 miles of collection system piping, per year. SD1 currently operates and maintains more than 1,600 miles of

collection system piping, which equates to an annual nation-wide top-quartile benchmark of 40 SSOs per year due to operational issues. As shown in Table 3.6 below, SD1 was in the industry's nation-wide top-quartile in 2012 and 2014, and just shy of the top quartile in 2015. It should be noted, however, that the AWWA benchmark for Wastewater Collection System Integrity does not include pump station failures, but SD1 does include pump station failures in its tally of SSOs Due to Operational Issues.

Table 3.6 provides a summary of the number of activations and corresponding volume of SSOs due to operational issues from 2008 to 2015.

Table 3.6 SSOs Due to Operational Issues (2008 through 2015)

Year	Total Number of Occurrences	Total Volume (Million Gallons)
2008	143	5.05
2009	108	31.44
2010	63	3.49
2011	66	8.03
2012	38	0.32
2013	55	33.18
2014	39	1.35
2015	44	2.03
Change from 2014 to 2015	**5**	**0.68**

3.4 Review of Wet Weather CSOs

The number of CSO activations and total volume substantially increased from 2014 to 2015, primarily due to increased rainfall totals and a greater than average number of high river days in 2015. The first and fourth quarters of 2015 provided the largest difference, as both quarters had significantly more rainfall and high river days, which significantly impacted the total CSO volumes. In 2014 there were no high river conditions in the third and fourth quarters, and prolonged dry periods led to all-time low overflow activity for the year. In 2015, every quarter experienced high river days, and the first quarter of 2015 experienced an historic stage during 18 consecutive days of high river conditions.

The number of storm events, cumulative rainfall, and average storm size all slightly increased in 2015, compared to the previous year. Additionally, higher groundwater

inflow and infiltration contributed to the increased CSO activity. These factors led to approximately 101 percent more wet-weather CSO volume and approximately 16 percent more wet-weather CSO activations in 2015 than in 2014.

Table 3.7 provides a summary of the number of activations and corresponding volume of CSOs occurring from 2008 through 2015.

Table 3.7 Recurring Wet Weather CSOs by Quarter (2008 through 2015)

		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	**Total**
2008	Activations	943	899	542	504	**2,888**
	Volume (MG)	1,798	685	119	267	**2,869**
2009	Activations	607	1,244	828	610	**3,289**
	Volume (MG)	266	436	397	403	**1,502**
2010	Activations	456	971	461	444	**2,332**
	Volume (MG)	426	435	279	435	**1,575**
2011	Activations	600	1,538	795	705	**3,638**
	Volume (MG)	1,097	2,029	319	1,152	**4,597**
2012	Activations	640	650	781	621	**2,692**
	Volume (MG)	547	196	353	328	**1,424**
2013	Activations	588	1,063	879	633	**3,163**
	Volume (MG)	471	351	666	618	**2,106**
2014	Activations	484	846	848	528	**2,706**
	Volume (MG)	273	485	196	194	**1,148**
2015	Activations	420	1042	904	768	**3,134**
	Volume (MG)	752	591	333	654	**2,310**

Table 3.8 provides the quarterly differences in modeled activation and volume between for 2014 and 2015.

Table 3.8 Recurring Wet Weather CSOs Changes from 2014 to 2015

	Changes from 2014 to 2015	
Qtr.	**Activations**	**Volume (MG)**
1st	-64	479
2nd	196	106
3rd	56	137
4th	240	440
Total	**428**	**1,162**

3.5 Review of Dry Weather CSOs

Table 3.9 provides a summary of dry-weather CSOs that occurred from 2008 to 2015.

Table 3.9 Dry Weather CSOs (2008 through 2015)

Year	Total Number of Occurrences	Total Volume (Million Gallons)
2008	15	9
2009	8	0.104
2010	5	0.264
2011	2	1.790
2012	4	0.104
2013	5	0.017
2014	3	7.309
2015	9	1.416
Change from 2014 to 2015	**6**	**-5.893**

Two of the dry-weather CSOs in 2014 were unavoidable discharges related to a landslide and a barge accident, and confirmed to be probable Force Majeure events in a letter from the Cabinet and EPA dated November 24, 2014. The combined volume of these Force Majeure dry-weather CSOs was 7,308,000 gallons.

In 2015, SD1 experienced recurring dry-weather CSO issues related to the replacement of the collapsed Riviera Drive interceptor, along Taylor Creek, in the City of Bellevue. Detailed descriptions of the collapse, the subsequent complications, and SD1's

corrective actions have been provided in Quarterly Reports No. 30 and No. 32, as well as Section 2.4 of this report. Of the uncharacteristically high annual total of nine dry-weather CSOs, six are directly related to the collapse of the interceptor and the emergency construction project. Many of the complications that have led to the six dry-weather CSOs during the reconstruction of the interceptor have been unforeseeable, such as vandalism and excessive debris from historically high river conditions, and may qualify for Force Majeure consideration.

3.6 Review of O&M Activities

SD1's CSAP prioritizes which sewers in the combined sewer system need inspection, cleaning and repair or rehabilitation. Regularly scheduled O&M activities for key assets in the combined sewer system ensure that sewers are kept clean and unobstructed to reduce overflows or downstream blockages at the diversion locations.

On the following page, Table 3.10 demonstrates SD1's commitment to continually improve the performance of its collection systems, through regular assessment, maintenance, repair, and replacement. All 2015 totals in Table 3.10 are subject to revision, as quality control on work order records from December, 2015 was still being performed during the production of this report.

(This space intentionally left blank.)

Table 3.10 O&M and Rehab/Replacement Activities (2008 through 2015)

O&M Activity	2008	2009	2010	2011	2012	2013	2014	2015	Total
Manholes Inspected	5,985	4,688	1,285	1,852	1,871	1,258	399	342	**17,680**
Manholes Repaired	485	332	320	656	407	314	200	221	**2,935**
Manholes Replaced	55	59	96	30	38	33	12	13	**336**
New Manholes Installed[1]	26	53	39	50	49	35	32	10	**294**
Sewer Lines Cleaned - Feet	706,441	530,303	657,709	375,303	511,118	613,968	623,905	447,181	**4,465,928**
Sewer Lines Inspected (Initial and Follow-up) - Total Feet	1,414,803	1,411,818	1,095,080	978,484	1,204,988	1,523,239	1,391,897	2,041,135	**11,061,444**
Sewer Lines Rehabilitated - Feet of CIPP[2]	953	2,251	29,528	84,717	51,100	59,137	32,782	27,586	**288,054**
Sewer Lines Repaired and Replaced - Feet[1]	18,442	17,658	27,157	11,392	31,391	12,680	5,577	2,430	**126,727**

[1]Does not include manholes installed or lines repaired or replaced as part of CIP projects or new development.
[2]SD1 entered into a cured-in-place-pipe lining contract, which account for increases in lineal footage rehabilitated 2010 through 2012.

As part of SD1's Nine Minimum Control programs for solids & floatable control and the reduction of dry-weather CSOs, SD1 implemented an ongoing catch basin retrofit program to trap debris and an associated inspection and cleaning program. SD1 inspects each catch basin in the combined system at least once per year to look for potential grit and debris issues, as well as structural condition issues. In addition, SD1 has constructed five large grit pits along the Ohio River and Licking River interceptors to remove grit and other solids from the sewers. These grit pits continue to effectively trap and remove debris from the interceptors and maximize flow to the treatment plant.

Table 3.11, summarizes the activities that ensure that the combined sewer system will perform as effectively as possible. All 2015 totals in Table 3.11 are subject to revision, as quality control on work order records from December, 2015 was still being performed during the production of this report.

Table 3.11 Combined Sewer System O&M Activities (2008 through 2015)

O&M Activity	2008	2009	2010	2011	2012	2013	2014	2015	Total
Catch Basin Cleanings	1,211	888	786	1,392	1,431	1,393	539	1,035	8,675
Catch Basin Cleaning (Yards of Debris Removed)	N/A	427	469	525	466	630	307	437	3,261
Catch Basins Inspections[1]	2,057	3,328	4,070	4,125	3,750	4,072	5,038	2,066	28,506
New Catch Basin Installations	0	5	2	2	7	5	1	0	22
Catch Basins Replaced	159	224	140	90	105	59	27	17	821
Catch Basins Repaired	128	65	78	211	85	59	25	75	726
Grit Pit Cleaning (Yards of Debris Removed)	358	439	355	365	415	408	340	213	2,893

[1]*Includes basins owned by SD1, the State of Kentucky, municipalities, counties and privately owned basins.*

3.7 Review of Building Backups

Table 3.12 provides a summary of the building backups reported from 2008 to 2015.

Table 3.12 Building Backups: Public System vs. Other Causes (2008 through 2014)

Backup Cause	2008	2009	2010	2011	2012	2013	2014	2015
Public System	39	36	36	146	44	44	57	25
Other Causes	402	482	644	513	428	627	514	530
Total	**441**	**518**	**680**	**659**	**472**	**671**	**571**	**555**

The approximate number of building backups that were related to the condition or operation of the public sewer system decreased nearly 66 percent in 2015 from 2014's total, despite more rainfall, more ground water impacts, and historically high river levels. This decrease is attributed to the effectiveness of the SD1 CSAP program. The 25 building backups in 2015 that were determined to be related to the public system represents the lowest annual total on record, since SD1 entered into the Consent Decree in 2007. The 25 backups in 2015 were due to the following:

- Blockage of debris (9 backups)

- Blockage of grease (5 backups)
- Lack of capacity during wet weather (3 backups)
- Blockage of roots (2 backups)
- Construction (2 backups)
- Defective pipe (2 backups)
- Vactor truck blew water into building (2 backups)

The sewers where these blockages occurred were put into or updated in SD1's CSAP to be inspected and cleaned as determined by the program logic, which also provides appropriate next actions to permanently address the cause of the blockages.

All building backups are recorded in Lucity and are periodically reviewed to identify if any trends or localized problem areas exist that warrants the need for a larger-scale inspection routine, rehabilitation, or repair project.

APPENDIX A:

Consent Decree Compliance Schedule

(This page intentionally left blank for double-sided printing.)

Consent Decree Compliance Schedule

	CONSENT DECREE ACTIVITY	PERCENT COMPLETE	DUE DATE	DATE OF COMPLETION
	ASSESSED STIPULATED PENALTY			
✓	$14,000 for 9 DWOs occuring April 18, 2009 through June 30, 2010	100%	1/9/2011	12/21/2010
	CIVIL PENALTY			
✓	Pay Civil Penalties to EPPC and US EPA	100%	06/18/07	06/18/07
	CMOM PROGRAM REQUIREMENTS – 2007 through 2015			
✓	Submit CMOM Program Self-Assessment	100%	10/18/07	10/17/07
✓	Submit Grease Control Program	100%	10/18/07	09/17/07
✓	Submit Pump Station Backup Power Plan	100%	04/18/08	12/14/07
✓	Submit Sewer Overflow Response Plan (SORP)	100%	10/18/07	10/09/07
Submit CMOM Annual Report				
✓	CMOM Annual Report 1	100%	12/31/07	12/28/07
✓	CMOM Annual Report 2	100%	12/31/08	12/19/08
✓	CMOM Annual Report 3	100%	12/31/09	12/18/09
✓	CMOM Annual Report 4	100%	12/31/10	12/21/10
✓	CMOM Annual Report 5	100%	12/31/11	12/21/11
✓	CMOM Annual Report 6	100%	12/31/12	12/31/12
✓	CMOM Annual Report 7	100%	12/31/13	12/31/13
✓	CMOM Annual Report 8	100%	12/31/14	12/31/14
✓	CMOM Annual Report 9	100%	12/31/15	12/31/15
	CMOM Annual Report 10	0%	12/31/16	
Phased Grease Control Implementation				
✓	Phase 1 Tasks	100%	01/08/09	01/08/09
✓	Phase 2 Tasks	100%	01/08/10	01/08/10
✓	Phase 3 Tasks	100%	01/08/11	01/08/11
✓	Phase 4 Tasks / Full Implementation	100%	01/08/12	12/31/11
Complete Pump Station Backup Power Projects (110 Total)		100%	12/31/2015	10/30/15
Complete SORP Annual Review				
✓	SORP Annual Review 1	100%	05/14/09	07/10/09
✓	SORP Annual Review 2	100%	11/10/10	10/01/10
✓	SORP Annual Review 3	100%	11/10/11	11/10/11
✓	SORP Annual Review 4	100%	11/10/12	11/10/12
✓	SORP Annual Review 5	100%	11/10/13	11/08/13
✓	SORP Annual Review 6	100%	11/10/14	11/11/14
✓	SORP Annual Review 7	100%	11/10/15	11/10/15
	SORP Annual Review 8	0%	11/10/16	
	INITIAL WATERSHED PROJECTS			
✓	Complete Initial Watershed Projects (51 Total)	100%	12/31/14	06/06/12
Submit Initial Watershed Projects Annual Report				
✓	Initial Watershed Projects Annual Report 1	100%	04/18/08	04/08/08
✓	Initial Watershed Projects Annual Report 2	100%	06/07/09	06/05/09
✓	Initial Watershed Projects Annual Report 3	100%	06/07/10	06/04/10
✓	Initial Watershed Projects Annual Report 4	100%	06/07/11	06/07/11
✓	Initial Watershed Projects Annual Report 5	100%	06/07/12	06/07/12
✓	Initial Watershed Projects Annual Report 6 (Final Submission)	100%	06/07/13	06/06/13
	NMC PROGRAM REQUIREMENTS – 2007 through 2015			
✓	Submit NMC Documentation of Compliance	100%	04/18/08	03/12/08
✓	Complete Additional NMC Compliance Activities (51 Total)	100%	04/18/09	4/18/09[1]
Submit NMC Annual Report				
✓	NMC Annual Compliance Report 1	100%	09/04/09	05/11/09
✓	NMC Annual Compliance Report 2	100%	09/04/10	06/04/10
✓	NMC Annual Compliance Report 3	100%	09/04/11	06/21/11
✓	NMC Annual Compliance Report 4	100%	09/04/12	07/02/12
✓	NMC Annual Compliance Report 5	100%	09/04/13	09/04/13
✓	NMC Annual Compliance Report 6	100%	09/04/14	09/04/14
✓	NMC Annual Compliance Report 7	100%	09/04/15	094/04/15
	NMC Annual Compliance Report 8	0%	09/04/16	

Consent Decree Compliance Schedule

	CONSENT DECREE ACTIVITY	PERCENT COMPLETE	DUE DATE	DATE OF COMPLETION
	PUBLIC PARTICIPATION			
✓	Watershed Summit	100%	N/A	08/30/07
✓	Watershed Community Council Meeting 1	100%	N/A	11/27/07
✓	Watershed Community Council Meeting 2	100%	N/A	02/26/08
✓	Watershed Community Council Meeting 3	100%	N/A	05/20/08
✓	Watershed Community Council Meeting 4	100%	N/A	08/19/08
✓	Watershed Community Council Meeting 5	100%	N/A	11/18/08
✓	Watershed Community Council Meeting 6	100%	N/A	02/17/09
✓	Watershed Community Council Meeting 7	100%	N/A	05/20/10
✓	Watershed Community Council Meeting 8	100%	N/A	11/03/10
	PUMP STATION OVERFLOW ELIMINATION PLAN (PSOEP) – 2007 through 2015			
✓	Submit PSOEP	100%	10/18/07	09/18/07
Submit PSOEP Annual Report				
✓	PSOEP Annual Report 1	100%	05/14/09	05/11/09
✓	PSOEP Annual Report 2	100%	05/14/10	05/14/10
✓	PSOEP Annual Report 3	100%	05/14/11	05/13/11
✓	PSOEP Annual Report 4	100%	05/14/12	05/14/12
✓	PSOEP Annual Report 5	100%	05/14/13	05/14/13
✓	PSOEP Annual Report 6	100%	05/14/14	05/13/13
✓	PSOEP Annual Report 7	100%	05/14/15	05/14/15
	PSOEP Annual Report 8	0%	05/14/16	
	REPORTING – 2007 through 2015			
Submit Quarterly Report				
✓	Submit Quarterly Report 1	100%	01/30/08	01/30/08
✓	Submit Quarterly Report 2	100%	04/30/08	04/30/08
✓	Submit Quarterly Report 3	100%	07/30/08	07/30/08
✓	Submit Quarterly Report 4	100%	10/30/08	10/30/08
✓	Submit Quarterly Report 5	100%	01/30/09	01/30/09
✓	Submit Quarterly Report 6	100%	04/30/09	04/30/09
✓	Submit Quarterly Report 7	100%	07/30/09	07/30/09
✓	Submit Quarterly Report 8	100%	10/30/09	10/30/09
✓	Submit Quarterly Report 9	100%	01/30/10	01/29/10
✓	Submit Quarterly Report 10	100%	04/30/10	04/30/10
✓	Submit Quarterly Report 11	100%	07/30/10	07/30/10
✓	Submit Quarterly Report 12	100%	10/30/10	10/29/10
✓	Submit Quarterly Report 13	100%	01/30/11	01/28/11
✓	Submit Quarterly Report 14	100%	04/30/11	04/29/11
✓	Submit Quarterly Report 15	100%	07/30/11	07/29/11
✓	Submit Quarterly Report 16	100%	10/30/11	10/28/11
✓	Submit Quarterly Report 17	100%	01/30/12	01/30/12
✓	Submit Quarterly Report 18	100%	04/30/12	04/30/12
✓	Submit Quarterly Report 19	100%	07/30/12	07/30/12
✓	Submit Quarterly Report 20	100%	10/30/12	10/30/12
✓	Submit Quarterly Report 21	100%	01/30/13	01/30/13
✓	Submit Quarterly Report 22	100%	04/30/13	04/30/13
✓	Submit Quarterly Report 23	100%	07/30/13	07/30/13
✓	Submit Quarterly Report 24	100%	10/30/13	10/30/13
✓	Submit Quarterly Report 25	100%	01/30/14	01/30/14
✓	Submit Quarterly Report 26	100%	04/30/14	04/30/14
✓	Submit Quarterly Report 27	100%	07/30/14	07/30/14
✓	Submit Quarterly Report 28	100%	10/30/14	10/30/14
✓	Submit Quarterly Report 29	100%	01/30/15	01/30/15
✓	Submit Quarterly Report 30	100%	04/30/15	04/30/15
✓	Submit Quarterly Report 31	100%	07/30/15	07/30/15
✓	Submit Quarterly Report 32	100%	10/30/15	10/30/15
✓	Submit Quarterly Report 33	100%	01/30/16	01/29/16
	Submit Quarterly Report 34	0%	04/30/16	

Consent Decree Compliance Schedule

	CONSENT DECREE ACTIVITY	PERCENT COMPLETE	DUE DATE	DATE OF COMPLETION
	STATE ENVIRONMENTAL PROJECTS			
✓	Setup 6 Separate Escrow Accounts	100%	10/18/07	10/18/07
✓	Conservancies	100%	04/18/12	04/18/12
✓	*Boone County*	100%	04/18/12	03/26/12
✓	*Campbell County*	100%	04/18/12	02/23/12
✓	*Kenton County*	100%	04/18/12	04/17/12
✓	Licking River Watershed Watch	100%	04/18/12	09/28/11
✓	Split Rock	100%	04/18/12	12/18/08
✓	Education Programs	100%	04/18/12	08/04/11
✓	State Environmental Project Completion Report	100%	06/17/12	06/15/12
	SUPPLEMENTAL PROJECTS			
✓	Supplemental Environmental Projects	100%	04/18/12	04/12/12
✓	SEP Completion Reports	100%	06/17/12	06/15/12
	WATERSHED PLANS			
Framework for Developing Watershed Plans				
✓	Obtain Public Input on Framework for Watershed Plans	100%	04/09/08	04/09/08
✓	Submit Framework for Watershed Plans	100%	04/18/08	04/17/08
First Round Watershed Plans				
✓	Obtain Public Input on First Round of Watershed Plans	100%	06/27/09	06/08/09
✓	*Public Comment Period (5/7/09-6/8/09)*	100%	06/08/09	06/08/09
✓	*Boone County Public Meeting*	100%	N/A	05/14/09
✓	*Campbell County Public Meeting*	100%	N/A	05/19/09
✓	*Kenton County Public Meeting*	100%	N/A	05/21/09
✓	Submit First Round of Watershed Plans	100%	06/30/09	06/30/09
✓	Resubmit First Round of Watershed Plans	100%	03/31/11	03/31/11
✓	Resubmit First Round of Watershed Plans - Revision	100%	10/03/13	10/01/13
✓	Final Submission of First Round of Watershed Plans	100%	03/15/14	03/14/14
Second Round Watershed Plans				
	Obtain Public Input on Second Round of Watershed Plans	0%	To Be Determined[2]	
	Submit Second Round of Watershed Plans	0%	To Be Determined[2]	
Third Round Watershed Plans				
	Obtain Public Input on Third Round of Watershed Plans	0%	To Be Determined[2]	
	Submit Third Round of Watershed Plans	0%	To Be Determined[2]	
	Consent Decree Compliance			
	Consent Decree Compliance - Percentage of Term Complete	49%	12/31/25	

[1] *Project schedules for three of the 51 projects were extended beyond 4/18/2009, as described in the 2009 NMC Annual Report. The three projects were complete as of December 2009.*

[2] *Deadline is dependent on the approval date of each Watershed Plan.*

(This page intentionally left blank for double-sided printing.)

APPENDIX B:

Watershed Improvement Projects

(This page intentionally left blank for double-sided printing.)

Initial Watershed Projects

CIP Title	Basin	Scheduled Completion Date	Actual Completion Date	Status
Initial Watershed Projects				
Strawberry PS Elimination	North	2006	2005	Complete
Beechwood Outfall Sewer Replacement	North	2007	2007	Complete
Eastern Regional - Contract 1--Pond Creek Force Main and Gravity Sewer to Eastern Regional WRF	East	2008	2007	Complete
Eastern Regional - Contract 2--Kahn's Gravity Sewer and Gravity Sewer to the Pond Creek PS	East	2008	2007	Complete
US 27 at Summit Assessment	East	2008	2006	Complete
Eastern Regional - Contract 4--Alex-Licking Gravity Sewer & Force Main to Contract 1	East	2009	2008	Complete
Eastern Regional - Contract 6--Pond Creek PS	East	2008	2007	Complete
Eastern Regional - Contract 8A--Alex-Licking PS	East	2009	2009	Complete
Parkside PS Relocation	East	2008	2007	Complete
Eastern Regional Water Reclamation Facility	East	2008	2008	Complete
Highland Heights PS Study	East	2006	2006	Complete
Wilson/Waterworks Road Relief Sewer Study	East	2008	2007	Complete
Pinehill/Skyview Terrace Sewer	East	2006	2005	Complete
Eastern Regional - Contract 7--Riley Road #2 PS	East	2009	2009	Complete
Eastern Regional - Contract 3--Riley Force Main and Gravity Sewer to the ERWRF	East	2009	2010	Complete
Western Regional - KDOT - Turkeyfoot Road Force Main	West	2006	2005	Complete
Western Regional - Union Sewer (North and South)	West	2013	2008	Complete
American Sign PS Rehabilitation	West	2008	2008	Complete
Allen Fork Collection System - Phase I Improvements	West	2009	2007	Complete
Duncan Drive Assessment Project	West	2007	2006	Complete
Western Regional - Sunnybrook Sewer	West	2013	2010	Complete
Western Regional - Gunpowder Interceptor Sewer	West	2013	2010	Complete
Banklick PS Screening Facility	Central	2006	2005	Complete
Stevenson Road Relief Sewer Project Phase II	Central	2006	2006	Complete
Latonia Combined Sewer Separation	Central	2009	2007	Complete
Licking River Sewer Crossing Study	Central	2007	2007	Complete
McMillan PS Removal	Central	2006	2005	Complete
Meyer Road PS Rehabilitation	Central	2008	2008	Complete
Macke PS Rehabilitation	Central	2008	2008	Complete

Updated: January 30, 2016

Initial Watershed Projects

CIP Title	Basin	Scheduled Completion Date	Actual Completion Date	Status
Initial Watershed Projects				
Richwood PS Improvements	Central	2006	2005	Complete
Patton Street Sewer Study	Central	2006	2006	Complete
South Hills Outfall	Central	2008	2007	Complete
Grit Chamber Projects	Multiple	2010	2008	Complete
Fort Wright Illicit Discharge Removal	Multiple	2007	2006	Complete
Fort Wright Sanitary Sewer Rehabilitation Phase 1	Multiple	2007	2006	Complete
Fort Wright Outfall Sewer - Phase II	Multiple	2006	2006	Complete
Dry Creek Treatment Plant - Grit Removal Modifications	Multiple	2006	2005	Complete
Large Diameter Sewer Assessment Program - Phase III	Multiple	2007	2006	Complete
Brookwood Subdivision SSES Study	Multiple	2006	2006	Complete
Southern Kenton Drainage Study	Multiple	2007	2006	Complete
Wilson Road Sewer Assessment Project	Multiple	2006	2005	Complete
Apple Drive Sewer Outfall	Multiple	2006	2006	Complete
Bluegrass Swim Club Sewer Separation	Multiple	2008	2007	Complete
Eastern Regional – Sunset Pump Station and Force Main Improvements	East	2010	2010	Complete
Western Regional Conveyance System to Western Regional WRF	West	2013	2012	Complete
Western Regional Water Reclamation Facility	West	2013	2012	Complete
Western Regional - Narrows Road Diversion PS	West	2013	2012	Complete
Western Regional - Frogtown Interceptor Sewer (from Sunnybrook Dr. to Frogtown Rd.)	West	2014	2012	Complete
Western Regional - South Fork Gunpowder Interceptor Sewer and Rosetta Sewer	West	2013	2012	Complete
Western Regional - Turkeyfoot Industrial Road Force Main	West	2013	2012	Complete
Western Regional - Richwood Sewer and Force Main	West	Removed from Initial Watershed Projects. Approved in letter from Cabinet dated May 13, 2013.		

Watershed Plan Projects: Five Year Program

System-wide Programs

CIP Title	Basin	Project Description	Target Project Benefit	Scheduled Completion Date	Actual Completion Date	Past Activity for 10/01/2015 to 12/31/2015	Planned Activity for 01/01/2016 to 03/31/2016
(Schedules listed in this section are subject to change based on the approval of SD1's Watershed Plans.)							
Priority Inflow and Infiltration Source Identification & Removal Program							
Lakeview I/I Source Identification & Removal	Central	SSES activities and I/I removal in areas where found to be cost effecitve and feasible upstream of the Lakeview Pump Station	Reduce I/I and SSOs in Lakeview PS service area	Beyond 2016	n/a	Initial Design	Initial Design
Licking River Siphon Source Identification and Removal	Central	SSES activities and I/I removal in areas where found to be cost effecitve and feasible upstream of the Licking River Siphon	Reduce I/I and SSOs in Licking River Siphon area	Beyond 2016	n/a	Initial Design	Initial Design
Taylor Creek Source Identification and Removal	East	SSES activities and I/I removal in areas where found to be cost effecitve and feasible in the Taylor Creek area	Reduce I/I and SSOs in Taylor Creek area	Beyond 2016	n/a	Initial Design	Initial Design
Green Programs (DRIP & GrIPP)							
Boone Woods YMCA Detention Model	North	Partnership with Northern Kentucky University Center for Applied Ecology to retrofit a detention basin on Boone Woods YMCA property	Improve Water Quality	2010	2010	Complete	
City of Covington: 12th Street Bioswale	North	Partnership with City of Covington to install street planters leading to a bioswale and rain garden along 12th Street	Reduce CSO volume	2011	2011	Complete	
City of Covington: Main Strasse Gateway Biofiltration Swale	North	Partnership with City of Covington and Transit Authority of Northern Kentucky to install biolfiltration swales on city property at the Bakewell parking lot	Reduce CSO volume	2012	2013	Complete	
Notre Dame Academy Basin Retrofit	North	Partnership with Notre Dame Academy to retrofit an existing detention basin on school property	Reduce CSO volume	2009	2009	Complete	
City of Ft. Thomas: Rossford Park Rain Garden	East	Partnership with City of Ft. Thomas to install rain gardens at Rossford Park	Improve Water Quality	2012	2012	Complete	
City of Ft. Thomas: Memorial Parkway Bioswale	East	Partnership with City of Ft. Thomas to install a bioswale at the Northern Kentucky Water District property located along Memorial Parkway.	Improve Water Quality	2010	2010	Complete	
Kenton County School District: Turkeyfoot Middle School	Central	Partnership with Kenton County School District to install rain garden at Turkeyfoot Middle School	Improve Water Quality	2010	2010	Complete	
City of Covington: Madison Ave. Rain Garden	North	Partnership with City of Covington to install two rain gardens or street planters within the right-of-way along Madison Avenue	Reduce CSO volume	2013	2013	Complete	
Kenton County Public Library: Mary Ann Morgan Branch	North	Partnership with Kenton County Library to install rain gardens and permeable pavers on site at the Mary Ann Mongan Branch	Reduce CSO volume	2013	2013	Complete	
Demonstration Projects (Pilot Projects & Innovative Technology Testing)							
St. Elizabeth Detention Basin Retrofit	North	Modification of an existing dry detention basin located on property owned by St. Elizabeth Medical Center.	Reduce CSO volume in the Willow Run Sewershed	2009	2009	Complete Post-Construction Monitoring	
Prisoner's Lake Rainwater Harvesting	North	Construction of a small storm water pumping station and force main to capture storm water runoff from Prisoner's Lake that will be re-used in an irrigation pond for a small public golf course.	Manage storm water entering the CSS	2010	2010	Complete	
Terraced Reforestation	North	Construction of a series of vegetated, terraced berms within the I-71/75 right-of-way in the City of Covington.	Manage storm water entering the CSS	2010	2011	Complete Post-Construction Monitoring	
Watershed Controls Pilot Projects - Regional and Decentralized Controls							
Regional Project: Banklick Regional Wetlands	Central	Constructed wetland that treats flow diverted from Banklick Creek to reduce bacteria concentrations.	Improve water quality of Banklick Creek	2011	2011	Complete Post-Construction Monitoring	
Decentralized Control Project	Central	Storm water control measures such as wetlands, biofiltration basins, and enhanced retention serving upstream drainage areas smaller than one square mile, but typically greater than five acres	Improve water quality of local streams	Beyond 2016	n/a	Initial Design	Initial Design

Watershed Plan Projects: Five Year Program

Specific Basin Projects

CIP Title	Basin	Project Description	Target Project Benefit	Scheduled Completion Date	Actual Completion Date	Past Activity for 10/01/2015 to 12/31/2015	Planned Activity for 01/01/2016 to 03/31/2016
(Schedules listed in this section are subject to change based on the approval of SD1's Watershed Plans.)							
Van Deren Sanitary Sewer Improvements	North	Sanitary and storm sewer improvements in a 100 home area to separate common manholes and remove illicit connections and I/I	Reduce SSOs and illicit discharges in Lakeside Park	2011	2011	Complete	
Avon Drive Sanitary Sewer Improvements	North	Replacement of 570 LF of 12-inch sewer with 24-inch pipe and installation of new storm sewer	Reduce SSOs in Lakeside Park	2010	2010	Complete	
Willow Run Direct Entry Point Bar Racks	North	Installed bar racks on 10 direct entry points where open storm channels discharge into sewer system	Reduce debris entry into system, maintain capacity and reduce blockages	2009	2010	Complete	
KYTC Basin - Green Infrastructure Retrofit	North	Conversion of traditional detention basin near I-75 to provide greater detention and infiltration by modifying the outlet structure and other improvements	CSO reduction, informs future green infrastructure design	2012	2011	Complete Post-Construction Monitoring	
Lakeview PS Pump Replacement	Central	Replaceament of 8 pumps at the Lakeview pump station along with piping and electrical improvements to provide a reliable peak capacity of 22.5 MGD	Reduce SSOs at Lakeview PS and increase PS reliability	2014	2013	Complete	
Church Street (gray, green, and watershed controls) Phase 1	Central	The separation of street load on six streets, new biofiltration basin and installation of approximately 1,300 linear feet of new 72-inch sewer.	Reduce CSO frequency and volume into Banklick Creek and improve structural integrity of sewer infrastructure.	2014	Ph 1 - 2015	Ph 1 - Complete Post-Contruction Monitoring	
					Ph 2 - n/a	Ph 2 - Construction	Ph 2 - Construction
Vernon Lane – Public & Private Source I/I Removal	Central	Combination of private I/I removal, sewer rehabilitation, manhole lining, and stormwater BMPs in area comprising approximatley 270 homes	Eliminate Vernon Ln. SSO and improve water quality	Beyond 2016	Ph 1 - 2014	Ph 1 - Complete Post-Contruction Monitoring	
					Ph 2 - n/a	Ph 2 - Construction	Ph 2 - Construction
Ash Street PS and Forcemain	East	Construction of a new approximately 7 MGD pump station in Silver Grove and new force main to the Riley Rd. Pump Station in Alexandria. Also includes new force main to redirect flow from the Silver Grove PS to the Ash St. PS	Reduce overflows from Silver Grove CSO and SSO reduction in the Highland Heights PS and Silver Grove PS service areas.	2017	n/a	Final Design	Final Design
Riviera Sewer Replacement	East	Replacement of approximately 4,100 LF of deteriorated 24-inch pipe in the Taylor Creek area	Reduce CSOs into Taylor Creek and address structural issues	Beyond 2016	n/a	Initial Design	Initial Design
		Emergency repair of approximately 1,300 LF of collapsed 24-inch pipe. Upsize to 54-inch pipe.	Replace collapsed ineterceptor and provide additional capacity.	2016	n/a	Construction	Construction
Lakeside Park – Public Sewer Rehab and Private Source Removal	North	Combinbination of private I/I removal, sewer rehabilitation/replacment and manhole lining, and	Eliminate SSOs in Lakside Park	Beyond 2016	Ph 1 -2014	Ph 1 - Complete	
					Ph 2- n/a	Ph 2 - In Progress	Ph 2 - In Progress
Willow Run Dynamic Control Facility	North	Construction of a dynamic weir facility at the Willow Run overflow diversion to provide in-line storage	CSO reduction using in-line storage	Beyond 2016	n/a	Initial Design	Initial Design

Other Committed Projects

CIP Title	Basin	Project Description	Target Project Benefit	Scheduled Completion Date	Actual Completion Date	Past Activity for 10/01/2015 to 12/31/2015	Planned Activity for 01/01/2016 to 03/31/2016
(Schedules listed in this section are subject to change based on the approval of SD1's Watershed Plans.)							
Donnemeyer Improvements, Newport Pavilion Improvements, Bellevue Relief Sewer, Wilson/Waterworks Road, Covert Run	East	Multiple sewer projects including replacement with larger 18-30 -inch diameter sewers in the Taylor Creek area. Also included private source removal	Reduce CSO and SSO in Taylor Creek area and address basement flooding	2011	2011	Complete	
Dry Creek WWTP Headworks Improvements	North	Construction of a new 110 MGD headworks facility at the Dry Creek WWTP	Increase reliability and wet weather treatment cpacity at Dry Creek WWTP	2013	2013	Complete	

Pump Station Backup Power Plan

CIP Title	Basin	Original Proposed Solution	Updated Solution	Scheduled Completion Date	Actual Completion Date	Final Status as of October 2015
Category 1 Projects (4 total projects)						
Alex Licking	East	Permanent Generator	n/a	2008	2008	Complete
American Sign	West	Permanent Generator	n/a	2008	2008	Complete
Riley Road	East	Permanent Generator	n/a	2009	2009	Complete
Sunset	East	Permanent Generator	Backup Dry Prime Pump with a Diesel	2010	2010	Complete
CIP Title	**Basin**	**Original Proposed Solution**	**Updated Solution**	**Scheduled Completion Date**	**Actual Completion Date**	**Final Status as of October 2015**
Category 2 Projects (21 total projects)						
Kahns	East	PS Elimination	n/a	2007	2007	Complete
Meadow Hill	Central	PS Elimination Study	PS Elimination	Study - 2008 2012 - 2015	2008 2010	Complete
Riley Road No. 1 Riley Road No. 2	East	PS Elimination	n/a	2009	2009	Complete
Riverwatch PS	North	PS Elimination Study	PS Elimination	Study - 2008 2012 - 2015	2008 2008	Complete Complete
South Park Industrial	North	PS Elimination Study	Backup Dry Prime Pump with a Diesel	Study - 2008 2012 - 2015	2008 2010	Complete Complete
Wedgewood Dr	Central	PS Elimination Study	Electrical hook up for portable generator	Study - 2008 2015	2008 2015	Complete Complete
Willow Bend No. 2	West	PS Elimination Study	PS Elimination	Study - 2008 2013	2008 2013	Complete Complete
Army Reserve	East	PS Elimination Study	Electrical hook up for portable generator	Study - 2008 2013-2014	2008 2014	Complete Complete
Eagles Landing	West	PS Elimination Study	Electrical hook up for portable generator	Study - 2008 2013-2014	2008 2014	Complete Complete
Evergreen	Central	PS Elimination Study	Electrical hook up for portable generator	Study - 2008 2014	2008 2014	Complete Complete
Lamphill	East	PS Elimination Study	Electrical hook up for portable generator	Study - 2008 2011	2008 2011	Complete Complete
Mill House Crossing	Central	PS Elimination Study	Backup Dry Prime Pump with a Diesel	Study - 2008 2012	2008 2012	Complete Complete
Ridgefield	North	PS Elimination Study	Backup Dry Prime Pump with a Diesel	Study - 2008 2014	2008 2014	Complete Complete
War Admiral	West	PS Elimination Study	PS Elimination	Study - 2008 2012 - 2015	2008 2011	Complete Complete
Blackstone	West	PS Elimination Study	Electrical hook up for portable generator	Study - 2008 2015	2008 2015	Complete Complete
Dublin Green No. 1	West	PS Elimination Study	PS Elimination	Study - 2008 2015	2008 2012	Complete Complete
Fowler Creek	West	PS Elimination	These stations were eliminated after the Western Regional collection system became operational.	2013	2011	Complete
Gammon Calmet	West	PS Elimination		2013	2012	Complete
Gunpowder	West	PS Elimination		2013	2012	Complete
Union	West	PS Elimination		2013	2012	Complete

Updated: January 30, 2016

Pump Station Backup Power Plan

CIP Title	Basin	Original Proposed Solution	Updated Solution	Scheduled Completion Date	Actual Completion Date	Final Status as of October 2015
Category 3 Projects (24 total projects)						
Airport Exchange Ind Park	North	Permanent Generator	n/a	2009	2009	Complete
Barrs Branch	East	Permanent Generator	Portable Generator	2009	2009	Complete
Cedar Point	East	Permanent Generator	n/a	2009	2009	Complete
Bullitsville	North	Permanent Generator	n/a	2008	2008	Complete
Catalpa	Central	Permanent Generator	n/a	2009	2009	Complete
Centerplex	East	Permanent Generator	n/a	2008	2008	Complete
Hempsteade	West	Permanent Generator	n/a	2009	2009	Complete
Highland Heights	East	Portable Generator	n/a	2009	2009	Complete
Dublin Green No. 2	West	Permanent Generator	n/a	2009	2009	Complete
Brookwood	East	Permanent Generator	n/a	2009	2009	Complete
Ky Aire	West	Permanent Generator	n/a	2008	2007	Complete
Levi	West	Permanent Generator	n/a	2008	2007	Complete
Maple Ave	Central	Permanent Generator	n/a	2009	2009	Complete
Sand Run	North	Permanent Generator	n/a	2008	2008	Complete
Saturn	West	Permanent Generator	n/a	2009	2009	Complete
Second Street	Central	Permanent Generator	n/a	2009	2009	Complete
Skyport	North	Permanent Generator	n/a	2008	2008	Complete
South Hampton	West	Permanent Generator	n/a	2008	2007	Complete
Thornwilde	North	Permanent Generator	n/a	2008	2008	Complete
Bunning Lane	East	PS Elimination Study	Electrical hook up for portable generator	2015	2015	Complete
Kees	East	Permanent Generator	Backup Dry Prime Pump with a Diesel	2011	2011	Complete
Overlook	East	Permanent Generator	Electrical hook up for portable generator	2015	2015	Complete
Riverview Farms	North	Permanent Generator	Electrical hook up for portable generator	2015	2015	Complete
Stillwater	East	Permanent Generator	Electrical hook up for portable generator	2015	2015	Complete

Pump Station Backup Power Plan

CIP Title	Basin	Original Proposed Solution	Updated Solution	Scheduled Completion Date	Actual Completion Date	Final Status as of October 2015
Category 4 Projects (50 total projects)						
Banklick	Central	Permanent Generator	n/a	2009-2014	2009	Complete
Cedar	Central	Permanent Generator	n/a	2009-2014	2009	Complete
Fowler Ridge	Central	Permanent Generator	Backup Dry Prime Pump with a Diesel	2009-2014	2010	Complete
Lassing Green	West	Permanent Generator	n/a	2009-2014	2009	Complete
Leathers Rd	Central	Permanent Generator	Backup Dry Prime Pump with a Diesel	2009-2014	2010	Complete
Marshall Rd	Central	Permanent Generator	n/a	2009-2014	2010	Complete
Mineola Pike	North	Permanent Generator	Backup Dry Prime Pump with a Diesel	2009-2014	2010	Complete
Newport Steel Mill	East	Permanent Generator	n/a	2009-2014	2009	Complete
Paul Rd	East	Permanent Generator	Portable Generator	2009-2014	2010	Complete
Rosewood Lane	East	Permanent Generator	Backup Dry Prime Pump with a Diesel	2009-2014	2010	Complete
Shadow Lake	East	Permanent Generator	Backup Dry Prime Pump with a Diesel	2009-2014	2009	Complete
Wolf Rd	Central	Permanent Generator	Backup Dry Prime Pump with a Diesel	2009-2014	2009	Complete
Air Park West	North	Permanent Generator	Backup Dry Prime Pump with a Diesel	2009-2014	2011	Complete
Arbortech	North	Permanent Generator	Backup Dry Prime Pump with a Diesel	2012	2012	Complete
Arborwood	North	Permanent Generator	Backup Dry Prime Pump with a Diesel	2014	2014	Complete
Brandtly Ridge	Central	Permanent Generator	Backup Dry Prime Pump with a Diesel	2012	2012	Complete
Brentwood	North	Permanent Generator	Electrical hook up for portable generator	2015	2014	Complete
Brushup Lane	West	Permanent Generator	PS Elimination	2012	2012	Complete
Carlisle Ave	East	Permanent Generator	Backup Dry Prime Pump with a Diesel	2014	2014	Complete
Cinnamon Ridge	West	Permanent Generator	Backup Dry Prime Pump with a Diesel	2012	2012	Complete
Cold Spring Crossing	East	Permanent Generator	Permanent Generator	2014	2014	Complete
Cold Spring Plaza	East	Permanent Generator	Backup Dry Prime Pump with a Diesel	2012	2012	Complete
Darma Ct	East	Permanent Generator	Electrical hook up for portable generator	2013-2014	2014	Complete
Deer Creek No. 1	North	Permanent Generator	Backup Dry Prime Pump with a Diesel	2009-2014	2011	Complete
Deer Creek No. 2	North	Permanent Generator	Backup Dry Prime Pump with a Diesel	2009-2014	2011	Complete
Eighth Street	Central	Connect to Grid Power	Permanent Generator	2015	2015	Complete
Gerrard Ave	East	Permanent Generator	Portable Generator	2009-2014	2011	Complete
Golf Course	Central	Permanent Generator	Electrical hook up for portable generator	2012	2012	Complete
Hampton Ridge	West	Permanent Generator	Electrical hook up for portable generator	2015	2015	Complete
Harrison Harbor	East	Permanent Generator	Portable Generator	2009-2014	2011	Complete

Pump Station Backup Power Plan

CIP Title	Basin	Original Proposed Solution	Updated Solution	Scheduled Completion Date	Actual Completion Date	Final Status as of October 2015
Category 4 Projects (continued)						
Harvest Hill	Central	Permanent Generator	Backup Dry Prime Pump with a Diesel	2014	2014	Complete
ICH	Central	Permanent Generator	Electrical hook up for portable generator	2011	2011	Complete
IDI	North	Permanent Generator	Electrical hook up for portable generator	2012	2012	Complete
Independence Station Rd	Central	Permanent Generator	Backup Dry Prime Pump with a Diesel	2009-2014	2011	Complete
Jefferson Ave	East	Permanent Generator	Portable Generator	2009-2014	2011	Complete
Jericho Rd	Central	Permanent Generator	Electrical hook up for portable generator	2011	2011	Complete
Jonathan	West	Permanent Generator	Electrical hook up for portable generator	2015	2015	Complete
Litton	North	Permanent Generator	Electrical hook up for portable generator	2012	2012	Complete
Ohio Ave	East	Permanent Generator	Portable Generator	2009-2014	2011	Complete
Orchard Estates	West	Permanent Generator	Backup Dry Prime Pump with a Diesel	2014	2014	Complete
Parkside No. 2	East	Permanent Generator	Electrical hook up for portable generator	2012	2012	Complete
Patton Street	Central	Dual Utility Power Feed	Permanent Generator	2015	2014	Complete
Ria Vista	North	Permanent Generator	Electrical hook up for portable generator	2011	2011	Complete
Silver Grove	East	Permanent Generator	Permanent Generator	2015	2015	Complete
St Annes	East	Permanent Generator	Backup Dry Prime Pump with a Diesel	2014	2014	Complete
Sycamore	West	Permanent Generator	PS Elimination	2015	2012	Complete
Taylor Mill Rd	Central	Permanent Generator	Electrical hook up for portable generator	2011	2011	Complete
Wilder	East	Permanent Generator	Backup Dry Prime Pump with a Diesel	2014	2014	Complete
Wyndemere	North	Permanent Generator	Electrical hook up for portable generator	2012	2012	Complete
Youell Rd	West	Permanent Generator	Electrical hook up for portable generator	2012	2012	Complete

Pump Station Backup Power Plan

CIP Title	Basin	Original Proposed Solution	Updated Solution	Scheduled Completion Date	Actual Completion Date	Final Status as of October 2015
Category 5 Projects (6 total projects)						
Keavy	Central	Permanent Generator	Backup Dry Prime Pump with a Diesel	2010-2015	2010	Complete
Meadow Lane	Central	Permanent Generator	Backup Dry Prime Pump with a Diesel	2010-2015	2009	Complete
Cardinal Cove	North	Permanent Generator	Permanent Generator	2015	2013	Complete
Crestview	East	Permanent Generator	Backup Dry Prime Pump with a Diesel	2015	2015	Complete
Ripple Creek	East	PS Elimination Study	PS Elimination	2010-2015	2010	Complete
Winters Lane No. 2	East	Permanent Generator	Electrical hook up for portable generator	2014	2014	Complete
CIP Title	**Basin**	**Original Proposed Solution**	**Updated Solution**	**Scheduled Completion Date**	**Actual Completion Date**	**Final Status as of October 2015**
Category 6 Projects (5 total projects)						
Enzweiller	East	Permanent Generator	n/a	2012-2015	2009	Complete
Mafred	Central	Permanent Generator	Backup Dry Prime Pump with a Diesel	2012-2015	2009	Complete
Ridgeway	Central	Permanent Generator	Backup Dry Prime Pump with a Diesel	2012-2015	2009	Complete
Richwood	West	Permanent Generator	Backup Dry Prime Pump with a Diesel	2012	2012	Complete
Twin Lakes	Central	Permanent Generator	Backup Dry Prime Pump with a Diesel	2014	2014	Complete

Progress Summary	Number
2007 Complete Projects	4
2008 Complete Projects	8
2009 Complete Projects	24
2010 Complete Projects	11
2011 Complete Projects	16
2012 Complete Projects	18
2013 Complete Projects	2
2014 Complete Projects	16
2015 Complete Projects	11
Total Complete	**110**

Pump Station Overflow Elimination Plan

CIP Title	Basin	Scheduled Completion Date	Actual Completion Date	Activity for 10/01/2015 to 12/31/2015	Planned Activity for 01/01/2016 to 03/31/2016
Pump Station Overflow Elimination Projects					
Alex-Licking	East	12/31/2010	2008	Complete	Complete
Allen Fork	North	12/31/2015	2014	Complete	Complete
Crestview	East	12/31/2015	2015	Complete	Complete
Harrison Harbor	East	12/31/2010	*See PS Oveflow Elimination Annual Report May 11, 2009	Complete	Complete
Highland Acres	West	12/31/2010	2010	Complete	Complete
Kentucky Aire	West	12/31/2013	2014	Complete	Complete
Riley Road No.1	East	12/31/2010	2009	Complete	Complete
Ripple Creek	Central	12/31/2010	2010	Complete	Complete
South Hampton	West	3/31/2013	2012	Complete	Complete
South Park	North	12/31/2010	2010	Complete	Complete
Sunset	Central	12/31/2010	2010	Complete	Complete
Taylorsport	North	12/31/2010	2004	Complete	Complete
Union	West	3/31/2013	2012	Complete	Complete
Lakeview	Central	12/31/2023[1]	n/a	In-Progress	In-Progress

[1] *Revised deadline approved in letter from Cabinet dated May 13, 2013.*

Updated: January 30, 2016

APPENDIX C:

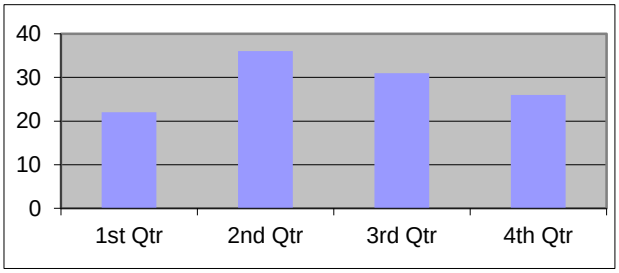
Cumulative and Annual Overflow Data

(This page intentionally left blank for double-sided printing.)

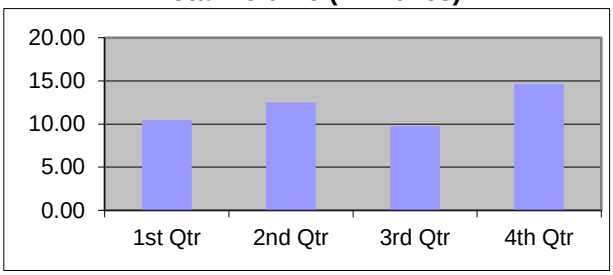
Cumulative Overflow Data
January 1, 2015 through December 31, 2015

Rainfall

Total Occurrences

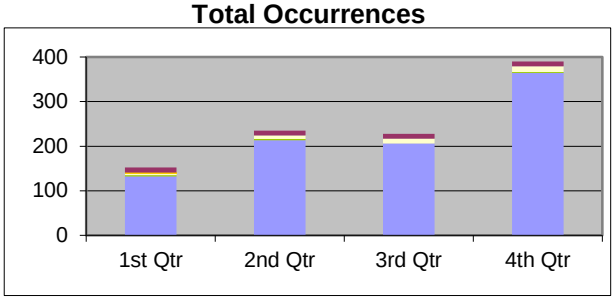


Total Volume (In Inches)

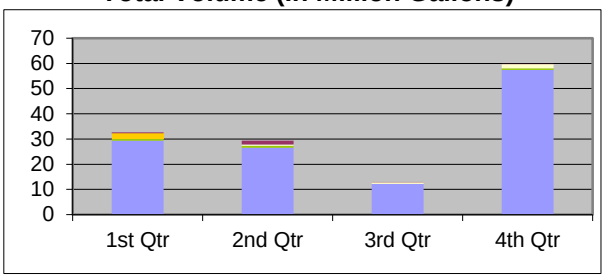


SSOs - Due to Wet Weather (WW) and Operational Issues

Total Occurrences



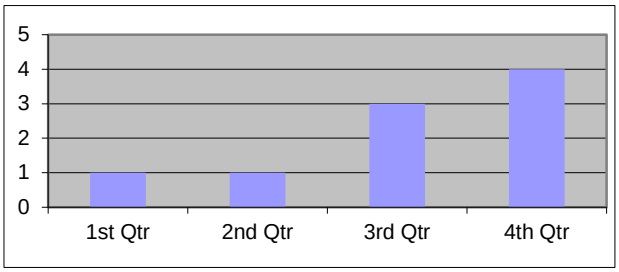
Total Volume (In Million Gallons)



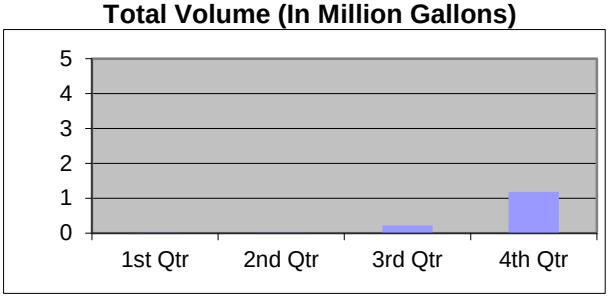
Recurring WW SSOs
Recurring WW CD Pump Station Overflows
Recurring WW Other Pump Station Overflows
Inactive WW Overflows
SSOs Due to Operational Issues

Dry Weather CSOs

Total Occurrences

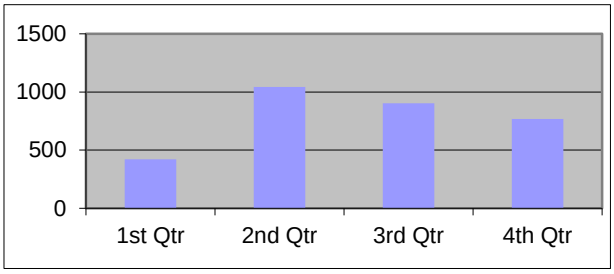


Total Volume (In Million Gallons)

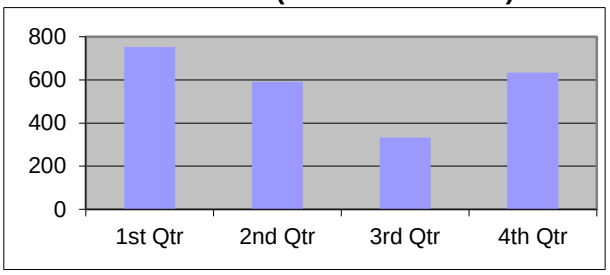


Wet Weather CSOs

Total Occurrences

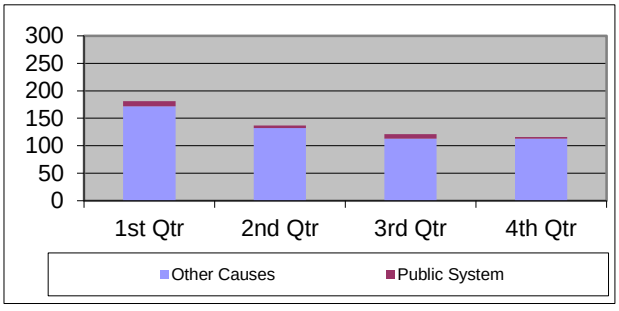


Total Volume (In Million Gallons)



Building Backups

Total Occurrences



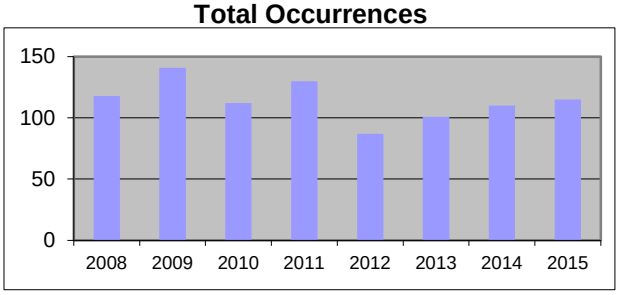
2015 Overflow Summary			
	Occurrences	**Volume**	
Rainfall	115	47.380	inches
Recurring WW SSOs	958	130.476	MG
Inactive WW SSOs	3	2.118	MG
Operational SSOs	44	2.034	MG
Dry Weather CSOs	9	1.416	MG
Wet Weather CSOs	3134	2309.590	MG
Building Backups (Other Causes)		530	
Building Backups (Public System)		25	

Updated: January 30, 2016

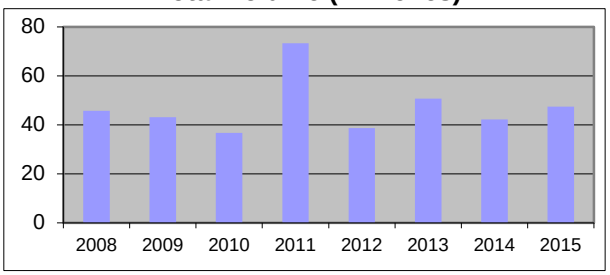
Annual Cumulative Overflow Data
2008 through 2015

Rainfall

Total Occurrences

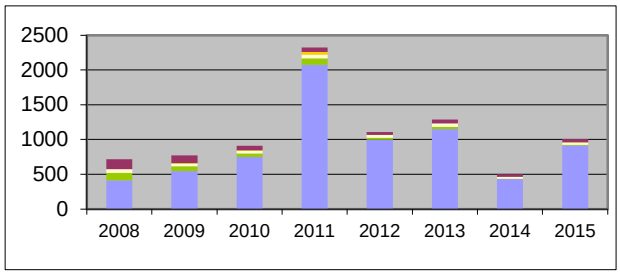


Total Volume (In Inches)

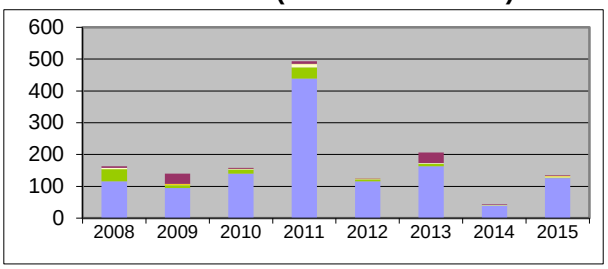


SSOs - Due to Wet Weather (WW) and Operational Issues

Total Occurrences



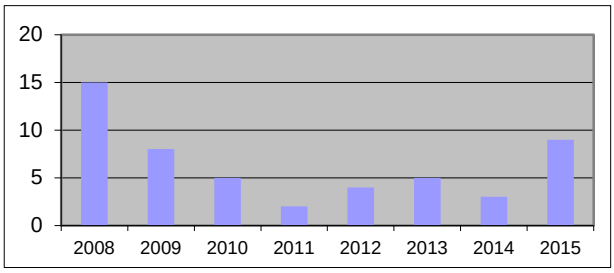
Total Volume (In Million Gallons)



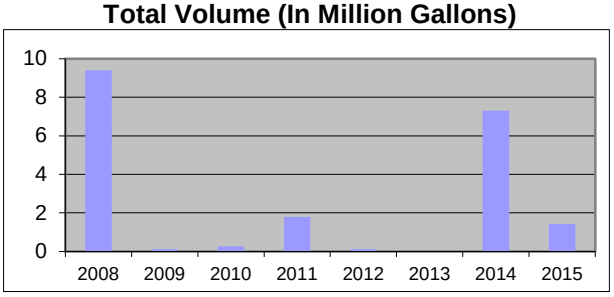
Recurring WW SSOs
Recurring WW CD Pump Station Overflows
Recurring WW Other Pump Station Overflows
Inactive WW Overflows
SSOs Due to Operational Issues

Dry Weather CSOs

Total Occurrences

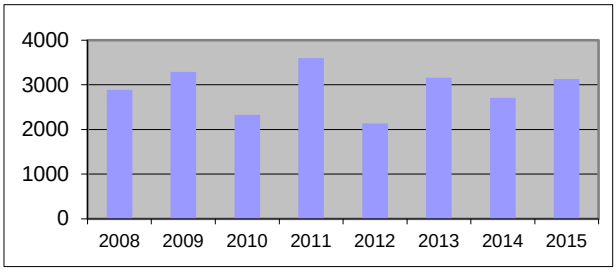


Total Volume (In Million Gallons)

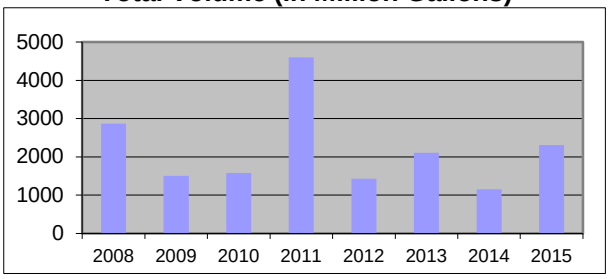


Wet Weather CSOs

Total Occurrences

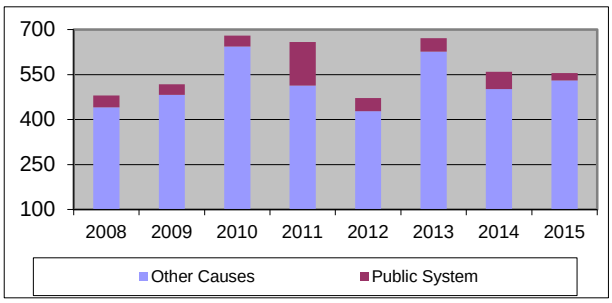


Total Volume (In Million Gallons)



Building Backups

Total Occurrences



Change from 2014 to 2015			
	Occurrences	**Volume**	
Rainfall	5	5.16	inches
Recurring WW SSOs	495	88.900	MG
Inactive WW SSOs	3	2.118	MG
Operational SSOs	5	0.684	MG
Dry Weather CSOs	6	-5.893	MG
Wet Weather CSOs	428	1161.94	MG
Building Backups (Other Causes)		28	
Building Backups (Public System)		-32	

Updated: January 30, 2016

APPENDIX D:

Recurring Wet Weather SSOs

(This page intentionally left blank for double-sided printing.)

Recurring Wet Weather SSOs					
No.	**MHID**	**City**	**County**	**Model Predicted Overflow Activations**	**Model Predicted Overflow Volume (MG)**
1	0020006	Silver Grove	Campbell	12	3.00
2	0020007	Silver Grove	Campbell	7	0.16
3	0020008	Campbell County	Campbell	6	0.11
4	0020032	Campbell County	Campbell	3	0.31
5	0040003	Fort Thomas	Campbell	3	0.09
6	0050022	Fort Thomas	Campbell	7	0.30
7	0060001	Campbell County	Campbell	4	0.25
8	0060002	Campbell County	Campbell	3	0.02
9	0060004	Campbell County	Campbell	3	0.09
10	0110002	Fort Thomas	Campbell	0	0.00
11	0110010	Highland Heights	Campbell	6	0.46
12	0120018	Highland Heights	Campbell	0	0.00
13	0150003	Wilder	Campbell	0	0.00
14	0150005	Wilder	Campbell	0	0.00
15	0150009	Wilder	Campbell	7	1.51
16	0150063	Wilder	Campbell	7	0.02
17	0150064	Wilder	Campbell	8	1.02
18	0150065	Wilder	Campbell	8	1.19
19	0150085	Fort Thomas	Campbell	0	0.00
20	0150086	Fort Thomas	Campbell	4	0.37
21	0150087	Fort Thomas	Campbell	0	0.00
22	0150356	Southgate	Campbell	0	0.00
23	0150399	Wilder	Campbell	9	3.60
24	0200003	Fort Thomas	Campbell	0	0.00
25	0220056	Fort Thomas	Campbell	4	0.06
26	0220058	Fort Thomas	Campbell	4	0.03
27	0230016	Fort Thomas	Campbell	3	0.01
28	0260001	Fort Thomas	Campbell	3	0.03
29	0270020	Fort Thomas	Campbell	0	0.00
30	0270026	Fort Thomas	Campbell	6	0.15
31	0270062	Fort Thomas	Campbell	0	0.00
32	0270103	Fort Thomas	Campbell	0	0.00
33	0280001	Fort Thomas	Campbell	2	0.00
34	0300035	Fort Thomas	Campbell	3	0.04
35	0360004	Dayton	Campbell	0	0.00
36	0360074	Dayton	Campbell	0	0.00
37	0370001	Fort Thomas	Campbell	3	0.05
38	0380005	Fort Thomas	Campbell	3	0.07
39	0400002	Fort Thomas	Campbell	7	0.30
40	0400017	Fort Thomas	Campbell	0	0.00
41	0400034	Fort Thomas	Campbell	2	0.01
42	0410010	Fort Thomas	Campbell	5	0.11
43	0410036	Fort Thomas	Campbell	0	0.00
44	0430006	Newport	Campbell	5	0.08
45	0490073	Newport	Campbell	1	0.00
46	0500047	Newport	Campbell	3	0.18
47	0530083	Newport	Campbell	5	0.32
48	0860001	Wilder	Campbell	13	26.10
49	0860003	Wilder	Campbell	0	0.00
50	0860016	Wilder	Campbell	0	0.00

Recurring Wet Weather SSOs					
No.	**MHID**	**City**	**County**	**Model Predicted Overflow Activations**	**Model Predicted Overflow Volume (MG)**
51	1010002	Fort Thomas	Campbell	3	0.04
52	1010027	Fort Thomas	Campbell	2	0.01
53	1090069	Edgewood	Kenton	2	0.00
54	1110025	Erlanger	Kenton	1	0.00
55	1110067	Erlanger	Kenton	2	0.20
56	1110161	Erlanger	Kenton	1	0.01
57	1110174	Elsmere	Kenton	1	0.00
58	1110275	Elsmere	Kenton	0	0.00
59	1110294	Erlanger	Kenton	2	0.03
60	1190001	Erlanger	Kenton	1	0.00
61	1190012	Erlanger	Kenton	5	0.35
62	1210018	Erlanger	Kenton	0	0.00
63	1220016	Erlanger	Kenton	4	0.02
64	1220054	Erlanger	Kenton	4	0.26
65	1230019	Erlanger	Kenton	0	0.00
66	1240008	Erlanger	Kenton	8	0.38
67	1240012	Erlanger	Kenton	1	0.00
68	1330022	Park Hills	Kenton	0	0.00
69	1550036	Fort Mitchell	Kenton	0	0.00
70	1550053	Fort Mitchell	Kenton	0	0.00
71	1560016	Fort Mitchell	Kenton	1	0.00
72	1560019	Fort Mitchell	Kenton	0	0.00
73	1560074	Fort Mitchell	Kenton	0	0.00
74	1560092	Fort Mitchell	Kenton	3	0.12
75	1560121	Fort Mitchell	Kenton	0	0.00
76	1600029	Lakeside Park	Kenton	0	0.00
77	1610102	Fort Mitchell	Kenton	0	0.00
78	1690043	Fort Wright	Kenton	4	0.06
79	1690072	Fort Wright	Kenton	2	0.00
80	1700006	Ludlow	Kenton	4	0.13
81	1700008	Covington	Kenton	0	0.00
82	1700025	Park Hills	Kenton	2	0.01
83	1730086	Kenton County	Kenton	5	1.17
84	1730100	Crescent Springs	Kenton	3	0.11
85	1730103	Fort Mitchell	Kenton	3	0.21
86	1760047	Edgewood	Kenton	6	0.34
87	1760048	Edgewood	Kenton	4	0.24
88	1790003	Crescent Springs	Kenton	3	0.04
89	1830020	Boone County	Boone	0	0.00
90	1830067	Boone County	Boone	0	0.00
91	1850140	Covington	Kenton	3	4.02
92	1850141	Covington	Kenton	8	1.67
93	1860108	Taylor Mill	Kenton	4	0.14
94	1870013	Covington	Kenton	0	0.00
95	1870014	Covington	Kenton	0	0.00
96	1920086	Cold Spring	Campbell	1	0.01
97	1920097	Cold Spring	Campbell	2	0.04
98	1920163	Cold Spring	Campbell	0	0.00
99	1940006	Fort Wright	Kenton	3	0.30

Recurring Wet Weather SSOs					
No.	**MHID**	**City**	**County**	**Model Predicted Overflow Activations**	**Model Predicted Overflow Volume (MG)**
100	1950014	Fort Wright	Kenton	4	0.78
101	1950232	Fort Wright	Kenton	0	0.00
102	1960002	Fort Wright	Kenton	4	0.52
103	1990018	Covington	Kenton	2	0.37
104	2020035	Taylor Mill	Kenton	4	0.19
105	2020203	Covington	Kenton	1	0.00
106	2040040	Edgewood	Kenton	0	0.00
107	2070012	Elsmere	Kenton	0	0.00
108	2070019	Elsmere	Kenton	4	0.15
109	2090008	Elsmere	Kenton	7	0.45
110	2100002	Elsmere	Kenton	1	0.02
111	2100007	Elsmere	Kenton	0	0.00
112	2100036	Elsmere	Kenton	2	0.01
113	2100037	Elsmere	Kenton	0	0.00
114	2100057	Elsmere	Kenton	2	0.00
115	2100106	Elsmere	Kenton	4	0.15
116	2100128	Elsmere	Kenton	0	0.00
117	2100129	Elsmere	Kenton	7	1.46
118	2110001	Elsmere	Kenton	6	0.21
119	2110002	Elsmere	Kenton	5	0.10
120	2110006	Elsmere	Kenton	0	0.00
121	2120001	Elsmere	Kenton	4	0.02
122	2120041	Elsmere	Kenton	0	0.00
123	2130026	Erlanger	Kenton	0	0.00
124	2130027	Erlanger	Kenton	1	0.01
125	2130028	Erlanger	Kenton	0	0.00
126	2130286	Erlanger	Kenton	0	0.00
127	2160004	Fort Mitchell	Kenton	3	0.01
128	2160005	Fort Mitchell	Kenton	3	0.01
129	2160006	Fort Mitchell	Kenton	1	0.00
130	2170008	Crestview Hills	Kenton	3	0.01
131	2170013	Lakeside Park	Kenton	2	0.00
132	2170097	Crestview Hills	Kenton	4	0.08
133	2280010	Kenton County	Kenton	0	0.00
134	2280011	Kenton County	Kenton	0	0.00
135	2280016	Independence	Kenton	0	0.00
136	2280023	Kenton County	Kenton	1	0.03
137	2290001	Crescent Springs	Kenton	2	0.06
138	2300011	Erlanger	Kenton	2	0.04
139	2300016	Erlanger	Kenton	0	0.00
140	2300019	Erlanger	Kenton	2	0.18
141	2300121	Independence	Kenton	6	1.13
142	2300123	Kenton County	Kenton	5	0.57
143	2301219	Erlanger	Kenton	5	0.94
144	2301274	Erlanger	Kenton	0	0.00
145	2400001	Boone County	Boone	0	0.00
			TOTAL	364	57.44

Threshold for model activation is 0.01 MGD and 0.001 MG

(This page intentionally left blank for double-sided printing.)

APPENDIX E:

Wet Weather CSOs

(This page intentionally left blank for double-sided printing.)

Wet Weather CSOs				
No.	CSO ID	KPDES Permit #	Model Predicted Activations	Model Predicted Overflow Volume (MG)
1	0010220	To Be Permitted	7	0.67
2	0030031	KY0021466 - Outfall 10	0	0.00
3	0200069	KY0021466 - Outfall 11	10	0.37
4	0330100	KY0021466 - Outfall 12	0	0.00
5	0340050	KY0021466 - Outfall 14	7	0.20
6	0340051	KY0021466 - Outfall 13	8	0.11
7	0360079	To Be Permitted	5	0.88
8	0540157	To Be Permitted	13	0.30
9	0540156	To Be Permitted	12	0.32
10	0540158	To Be Permitted	1	0.01
11	0550134	To Be Permitted	3	0.03
12	0570089	KY0021466 - Outfall 16	4	4.73
13	0570090	KY0021466 - Outfall 17	2	0.00
14	0600094	KY0021466 - Outfall 18	13	0.44
15	0600096	To Be Permitted	6	0.05
16	0600097	KY0021466 - Outfall 19	11	1.12
17	0600104	To Be Permitted	1	0.00
18	0610071	KY0021466 - Outfall 21	15	9.23
19	0610072	KY0021466 - Outfall 20	5	0.10
20	0620075	KY0021466 - Outfall 23	16	2.85
21	0620077	KY0021466 - Outfall 22	6	0.09
22	0630054	To Be Permitted	0	0.00
23	0630061	KY0021466 - Outfall 83	11	0.57
24	0640090	KY0021466 - Outfall 24	16	56.01
25	0650054	To Be Permitted	0	0.00
26	0650090	KY0021466 - Outfall 26	1	0.00
27	0650098	To Be Permitted	14	25.43
28	0650100	KY0021466 - Outfall 25	5	0.04
29	0660085	To Be Permitted	0	0.00
30	0690059	To Be Permitted	0	0.00
31	0690067	To Be Permitted	8	0.06
32	0730129	To Be Permitted	18	0.65
33	0770096	KY0021466 - Outfall 28	10	0.64
34	0790084	KY0021466 - Outfall 31	20	5.01
35	0790086	KY0021466 - Outfall 29	16	38.94
36	0840111	To Be Permitted	3	0.14
37	0840112	To Be Permitted	15	1.11
38	0840116	KY0021466 - Outfall 27	18	2.26
39	0870078	KY0021466 - Outfall 33	5	0.34
40	0870079	KY0021466 - Outfall 34	18	11.85
41	0880081	KY0021466 - Outfall 36	17	10.28
42	0880082	KY0021466 - Outfall 35	8	0.48
43	0890081	To Be Permitted	0	0.00
44	0910065	KY0021466 - Outfall 38	15	73.18
45	0910066	To Be Permitted	0	0.00
46	0910068	KY0021466 - Outfall 37	16	23.74
47	0910084	To Be Permitted	7	0.20

Wet Weather CSOs				
No.	CSO ID	KPDES Permit #	Model Predicted Activations	Model Predicted Overflow Volume (MG)
48	0930102	KY0021466 - Outfall 43	0	0.00
49	0930103	KY0021466 - Outfall 42	4	0.05
50	0930104	KY0021466 - Outfall 40	3	0.09
51	0930105	KY0021466 - Outfall 41	20	12.04
52	0930106	KY0021466 - Outfall 39	1	0.00
53	0960063	KY0021466 - Outfall 45	5	5.53
54	0960064	KY0021466 - Outfall 44	3	0.03
55	0980073	KY0021466 - Outfall 46	5	0.07
56	0980080	KY0021466 - Outfall 47	3	0.03
57	0980081	KY0021466 - Outfall 48	25	19.51
58	1320112	To Be Permitted	0	0.00
59	1350155	KY0021466 - Outfall 49	3	0.05
60	1380132	To Be Permitted	3	0.09
61	1380146	To Be Permitted	3	0.01
62	1420141	KY0021466 - Outfall 50	13	0.30
63	1420142	KY0021466 - Outfall 51	21	30.91
64	1420144	KY0021466 - Outfall 52	0	0.00
65	1420145	KY0021466 - Outfall 53	0	0.00
66	1420146	KY0021466 - Outfall 54	1	0.00
67	1420147	KY0021466 - Outfall 55	6	0.13
68	1440204	KY0021466 - Outfall 59	4	0.07
69	1440206	KY0021466 - Outfall 61	11	1.39
70	1440207	To Be Permitted	1	0.00
71	1440209	KY0021466 - Outfall 56	28	33.66
72	1440508	KY0021466 - Outfall 60	9	0.34
73	1470089	KY0021466 - Outfall 62	4	0.11
74	1470093	KY0021466 - Outfall 63	16	19.51
75	1480185	To Be Permitted	11	1.20
76	1480187	KY0021466 - Outfall 30	18	192.97
77	1490132	KY0021466 - Outfall 65	5	0.81
78	1490172	KY0021466 - Outfall 64	0	0.00
79	1500131	KY0021466 - Outfall 66	14	4.03
80	1510133	To Be Permitted	0	0.00
81	1710114	KY0021466 - Outfall 69	6	0.20
82	1710116	KY0021466 - Outfall 68	16	5.89
83	1710119	KY0021466 - Outfall 70	10	3.04
84	1710121	KY0021466 - Outfall 71	9	1.78
85	1710124	KY0021466 - Outfall 72	9	2.32
86	1720109	KY0021466 - Outfall 73	14	7.65
87	1730259	KY0021466 - Outfall 75	9	1.26
88	1730262	To Be Permitted	3	0.01
89	1730263	KY0021466 - Outfall 74	13	1.07
90	1840130	To Be Permitted	11	0.61
91	1850158	KY0021466 - Outfall 76	9	11.83
92	1870193	KY0021466 - Outfall 78	11	0.79
93	1870194	KY0021466 - Outfall 79	5	0.12
94	1880090	KY0021466 - Outfall 81	10	1.75

Wet Weather CSOs				
No.	CSO ID	KPDES Permit #	Model Predicted Activations	Model Predicted Overflow Volume (MG)
95	1880091	KY0021466 - Outfall 80	7	0.61
		TOTAL	768	634.29

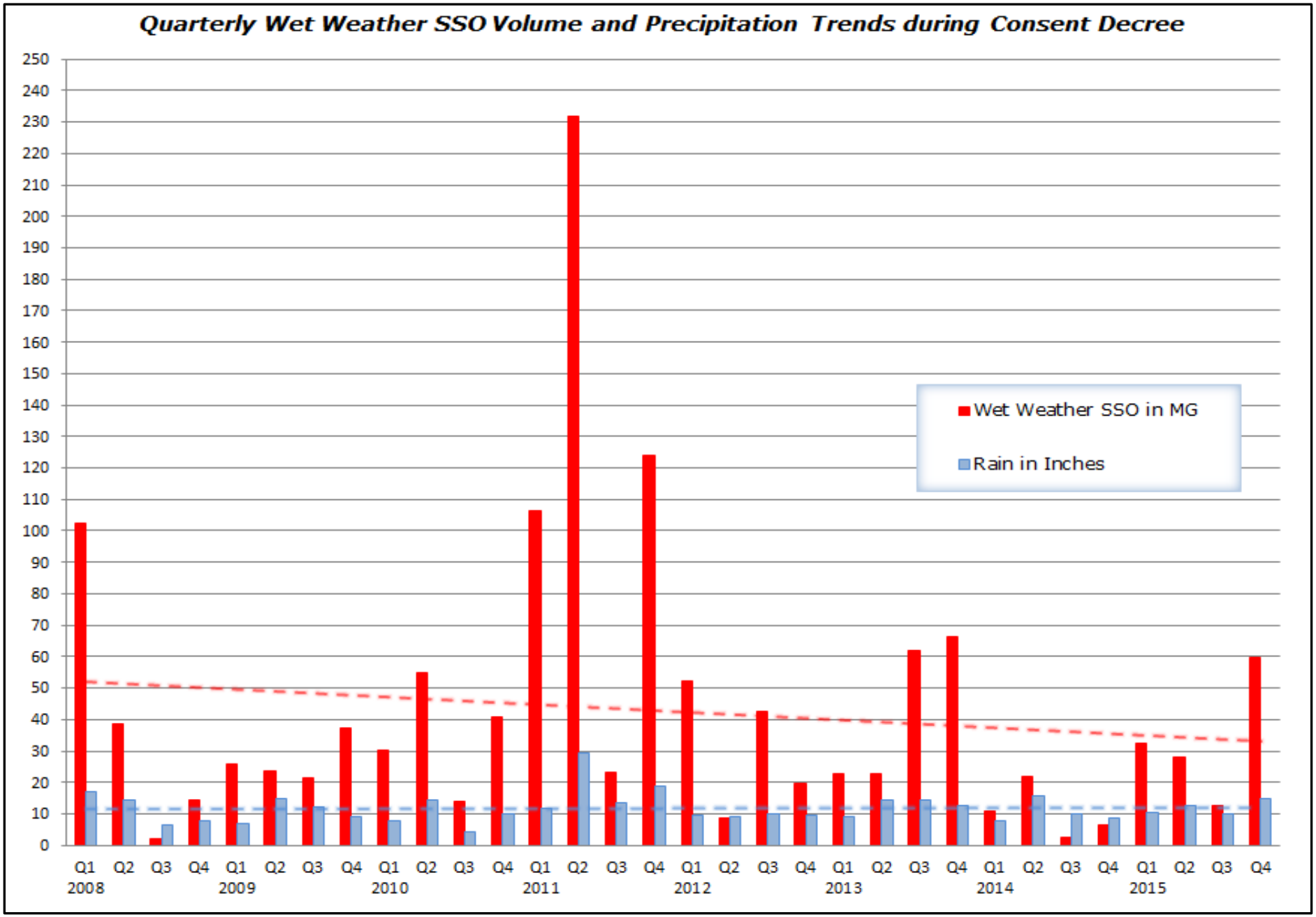
Threshold for model activation is 0.01 MGD and 0.001 MG

(This page intentionally left blank for double-sided printing.)

APPENDIX F:

Quarterly Trends of Rainfall and Wet Weather SSO Volumes

(This page intentionally left blank for double-sided printing.)


Quarterly Wet Weather SSO Volume and Precipitation Trends during Consent Decree
250
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Wet Weather SSO in MG
Rain in Inches
Q1 2008
Q2
Q3
Q4
Q1 2009
Q2
Q3
Q4
Q1 2010
Q2
Q3
Q4
Q1 2011
Q2
Q3
Q4
Q1 2012
Q2
Q3
Q4
Q1 2013
Q2
Q3
Q4
Q1 2014
Q2
Q3
Q4
Q1 2015
Q2
Q3
Q4