SD1
Managing Northern Kentucky's
Wastewater and Storm Water

October 30, 2018

Director of the Division of Enforcement
Department for Environmental Protection
300 Sower Blvd.
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

Mr. Daniel J. O'Lone, Acting 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 No. 44 describes SD1's compliance with Consent Decree Case No. 2:05-cv-00199-WOB for the period of July 1,

2018 through September 30, 2018. The report also contains an outlook for the upcoming calendar quarter period of October 1, 2018 through December 31, 2018.

A certification, as required by the Consent Decree (paragraph 68), is also enclosed.

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 859-578-7465 or by e-mail at achaney@sd1.org.

Best regards,

Adam Chaney
Executive Director

AC/wck
Enclosures

Sanitation District No. 1
October 30, 2018

Consent Decree
Quarterly Report No. 44
(July 1, 2018 through September 30, 2018)

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CERTIFICATION

Consent Decree Quarterly Report No. 44
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.

Adam Chaney
Executive Director

10-29-18
Date

COMMONWEALTH OF KENTUCKY

)ss.

COUNTY OF Kenton

The foregoing instrument was acknowledged before me this 29 day of Oct, 2018 by Adam Chaney, Executive Director of Sanitation District No. 1.

Angela M Cooke
NOTARY PUBLIC

Kenton County, Kentucky

My commission expires: 9-1-20

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CONSENT DECREE
QUARTERLY REPORT NO. 44

October 30, 2018

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

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LIST OF ACRONYMS AND ABBREVIATIONS

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
NWS	National Weather Service
SD1	Sanitation District No. 1
SORP	Sewer Overflow Response Plan
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. The 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 July 1, 2018 through September 30, 2018. This report also contains an outlook for the upcoming calendar quarter period of October 1, 2018 through December 31, 2018.

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 next quarter, can be found in Appendix B.

Additionally, Appendix B provides a schedule of the projects proposed in the first five years of the Watershed Plans for Northern Kentucky, as well as status updates on CSO

and SSO reduction projects that have not been formally proposed. The Watershed Plans were submitted on March 31, 2011, approved by the Cabinet and EPA in a letter dated February 14, 2014, and resubmitted March 14, 2014 with agreed to revisions, as requested in the February 14, 2014 letter.

Initial Watershed Projects

As shown in Appendix B, SD1 has completed its Initial Watershed Projects. A request to remove a project (Western Regional – Richwood 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 EPA. SD1 submitted its final Initial Watershed Projects Annual Report on June 7, 2013.

Pump Station Operation Plan for Backup Power

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, 20 have been permanently eliminated and 107 have fully implemented backup power solutions to mitigate overflows due to power failures.

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 that are not a result of wet-weather capacity issues, including releases from pump stations. 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 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 performed after wet-weather events to identify evidence of activations. This inspection program has been in place since 2005 and is adjusted, as needed, for record keeping and sewer overflow response cleanup. SD1's Collection Systems Department and Infrastructure Capital Planning Department perform routine inspections after rain events at prioritized Recurring and Inactive SSO locations to confirm overflow activity, and assess the need for

sewer overflow response cleanup. Generally, SD1 conducts post-wet-weather inspections of SSOs when cumulative rainfall depth exceeds one inch or two inches for a single storm event. Most SSOs are inspected in the one-inch storm event. Less active SSOs, as determined by modeling and inspection histories, are inspected in the two-inch storm event. Similarly, all CSOs are inspected when the combined sewer system experiences half an inch of cumulative rainfall in a single storm event. Immediately following a storm event, SD1's network of wireless rain gauges is used to determine which sewersheds were impacted, and if enough rain fell in a specific sewershed to warrant field inspections. Inspection routes are fixed to sewersheds, to better account for spatial variation in storm magnitude and intensity across the District's approximate 200 square-mile service area. Political boundaries and average rainfalls are not used to determine when and where inspections are performed. If an isolated region of the service area experiences rainfall that triggers an inspection, SSO assessment efforts are focused only on the portion of the collection system that may be impacted by the isolated storm. This continuous inspection effort to verify overflow activity throughout the collection system ensures accurate record keeping, appropriate cleanup response, and characterization of capacity issues for wet-weather modeling. The field-based characterization of overflows ensures that the hydraulic model SD1 utilizes is effectively maintained and improved upon, which helps identify the most appropriate solutions for overflow mitigation.

- Simple hydraulic estimating, using the Manning's Gravity Flow and Pipe Calculation, to report overflows from pump stations with constructed bypasses, and industry standard volume estimations techniques and calculations are used for spills or for any witnessed overflow from a manhole. The only exceptions to this calculation methodology are at the Lakeview Pump Station and, as of January 2016, at the Highland Heights Pump Station. These two pump stations have flow meters in the bypass pipes that are used as the primary sources of overflow volumes estimation. If a flow meter malfunctions at one of these pump stations during an overflow, the Manning's Gravity Flow and Pipe Calculation will be used as the default method of volume estimation. These methods have been used historically for reporting purposes.

- SD1's 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 separated systems, 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 23 rain gauges throughout the year, which are used to continuously update and refine the models and investigate capacity issues. Additionally, the models are being used to provide information about the current performance of SD1's system on a quarterly basis. With the historical and current flow monitoring and inspection data, SD1 maintains its highly calibrated network of hydraulic models to provide an accurate representation of the collection system. These modeling and monitoring tools confidently provide estimates of overflow activations and volumes from the sewer systems as a result of wet weather. The models are continuously revised 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 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 July 1, 2018 and September 30, 2018. The results of the model simulations have been summarized and included in this report as estimates of the frequency and total volume of the overflow locations within SD1's service area. These results are not a summary of observed or confirmed activations, but are a confident estimate of the overflow statistics based on SD1's continuously 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 overflow 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 previous quarters, 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 (NWS), in northeast Boone County.

Table 2.1 Summary of Storm Events at CVG, per National Weather Service
(July 1, 2018 through September 30, 2018)

Month	Approximate # of Storm Events[1]	Rainfall (in)
July	5	3.59
August	9	8.21
September	8	6.76
Total	**22**	**18.56**

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

The average cumulative rainfall depth at CVG for the third quarter, from 1951 to 2005, is approximately 10.13 inches. The NWS's recorded cumulative rainfall depth of 18.56 inches for the third quarter of 2018 is approximately 83 percent greater than the average.

Additionally, the 8.21 inches of rain recorded in August is a new record for that month. The previous record for total depth of rainfall at CVG in August was 7.71 inches in 1982.

The remainder of this section provides overflow summaries for SD1's service area during the period of July 1, 2018 through September 30, 2018. Annual comparisons and a cumulative accounting of the rainfall recorded at CVG and SD1's overflows, from January 2008 through the current reporting period, can be found in Appendix C.

2.1 SSOs Due to Wet-Weather Capacity Issues

This section summarizes the Recurring and Inactive overflows from SD1's sanitary sewer system, due to lack of capacity during wet weather. Wet-weather discharges at pump stations are also included in this section. Sanitary Sewer Overflows are classified as Recurring if evidence of overflow is observed at least twice in a twelve month period,

within the last two years. A single observation of overflow evidence is classified as an Inactive SSO, until overflow evidence is confirmed more than once in a twelve month period. An Inactive SSO will generally be under investigation for a minimum two years. Inactive SSOs may also be suspected or predicted hydraulic model overflow points, where little or no visual evidence of overflow has been found in the field to confirm the model prediction. All Inactive SSOs are investigated until they are confirmed to be either Recurring or Eliminated.

Recurring Wet-Weather SSOs

For the third quarter of 2018, modeled activation and volume statistics of SD1's 132 Recurring SSOs can be found in Appendix D. The Recurring SSO list is updated annually in the first Quarterly Report of every year to reflect the latest information from continuous system characterization. Annual updates to the list are based upon field inspections, flow monitoring, and hydraulic modeling. Additionally, the variation in annual precipitation also significantly influences the annual revisions to the Recurring SSO list.

During the third quarter of 2018, SD1 performed approximately 499 post-wet-weather inspections at Recurring and Inactive SSOs. Approximately 127 of the 499 post-wet-weather inspections confirmed overflow evidence. There were four storm events that prompted the post-wet-weather inspections in the third quarter. The storm dates, the largest recorded rainfall depths in the service area, and the approximate return periods are provided below:

- July 20-22: 3.73 inches in the City of Union, Boone County (5yr-48hr)
- July 31: 1.89 inches in the City of Fort Thomas, Campbell County (1yr-6hr)
- August 15-16: 4.99 inches in Burlington, Boone County (25yr-48hr)
- September 7-10: 7.82 inches in Burlington, Boone County (100yr-72hr)

Recurring Wet-Weather SSO Pump Stations Listed in the Consent Decree

In addition to the 132 Recurring SSOs, there are 14 pump stations listed in the Consent Decree that have historically experienced recurring wet-weather capacity issues.

As previously described, Lakeview Pump Station is the only pump station listed in the Consent Decree that has a metered bypass to calculate overflow volumes. All other overflow volumes at Consent Decree listed pump stations are estimated with the

Manning's Gravity Flow and Pipe Calculation, using the overflow start/stop times provided by telemetry.

Table 2.2 lists each of the 14 pump stations identified in Exhibit E of the Consent Decree, and demonstrates their observed wet-weather SSO occurrences and estimated discharge volumes for the third quarter of 2018.

Table 2.2 Discharges from Consent Decree Pump Stations, due to Lack of Capacity during Wet Weather
(July 1, 2018 through September 30, 2018)

Name of Pump Station	Number of Wet-Weather Related Discharge Occurrences	Total Estimated Volume (gallons)
Lakeview	3	6,806,900
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	**3**	**6,806,900**

Gray shading denotes where remedial measures have been completed for Exhibit E pump stations.

Lakeview Pump Station Operational Issues during Wet Weather

On April 30, 2018, a discharge valve at the Lakeview Pump Station malfunctioned, leaving one of the four pump sets temporarily out of service. SD1 replaced an actuator and repaired discharge pipes, allowing the fourth pump set to be returned to service on September 12, 2018. While performing the repairs, the reduced pumping capacity of Lakeview Pump Station was compounded by historic storms in August and September, which produced larger than normal SSO volumes. In particular, following the wettest August on record, a 24-hour 25-year storm event from September 8 to September 10, produced approximately 5 inches of rain at the Lakeview Pump Station rain gauge. This one storm event is responsible for approximately 5.2 million gallons of SSO at the

Lakeview Pump Station. More than 90 percent of the total SSO volume provided in Table 2.2 spilled during the repairs.

Recurring 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. There are currently eight pump stations not listed in the Consent Decree that have experienced recurring wet-weather capacity issues in the past two years.

Six of the eight pump stations were active in the third quarter of 2018. Table 2.3 provides a summary of the activity at the six pump stations.

The Highland Heights Pump Station has a flow meter installed in the bypass pipe to calculate discharge volumes when the Ohio River is below action stage. Discharges from the Highland Heights Pump Station during high river conditions or during meter malfunctions are estimated using the Manning's Gravity Flow and Pipe Calculation. All other pump station overflow volumes provided in Table 2.3 have been estimated with the Manning's Gravity Flow and Pipe Calculation, using the overflow start/stop times provided by telemetry.

Table 2.3 Discharges from Recurring SSO Pump Stations Not Listed in the Consent Decree, due to Lack of Capacity during Wet Weather
(July 1, 2018 through September 30, 2018)

Name of Pump Station	Number of Wet-Weather Related Discharge Occurrences	Total Estimated Volume (gallons)
Bullitsville	2	17,100
Enzweiler	1	9,150
Highland Heights	7	6,831,600
Keavey	2	30,950
Mafred	2	18,900
Winter's Lane No.2	1	7,450
TOTAL	**15**	**6,915,150**

Inactive Wet-Weather SSOs

No Inactive SSOs were observed by SD1 during the third quarter of 2018.

2.2 SSOs Due to Operational Issues

This category of SSO includes discharges from SD1's sanitary sewer collection system and 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 failures that are investigated and corrected as soon as possible. Operational failures may also occur during wet weather.

During the current reporting period, there were a total of 12 SSOs due to operational issues throughout SD1's service area. The combined total volume of the 12 operational SSOs was approximately 84,050 gallons.

Figure 2.1 and Figure 2.2 demonstrate, respectively, the primary causes and estimated discharge volumes of the 12 operational SSOs that were observed in the third quarter of 2018.

Figure 2.1 Occurrences of SSO due to Operational Issues, per Cause
(July 1, 2018 through September 30, 2018)

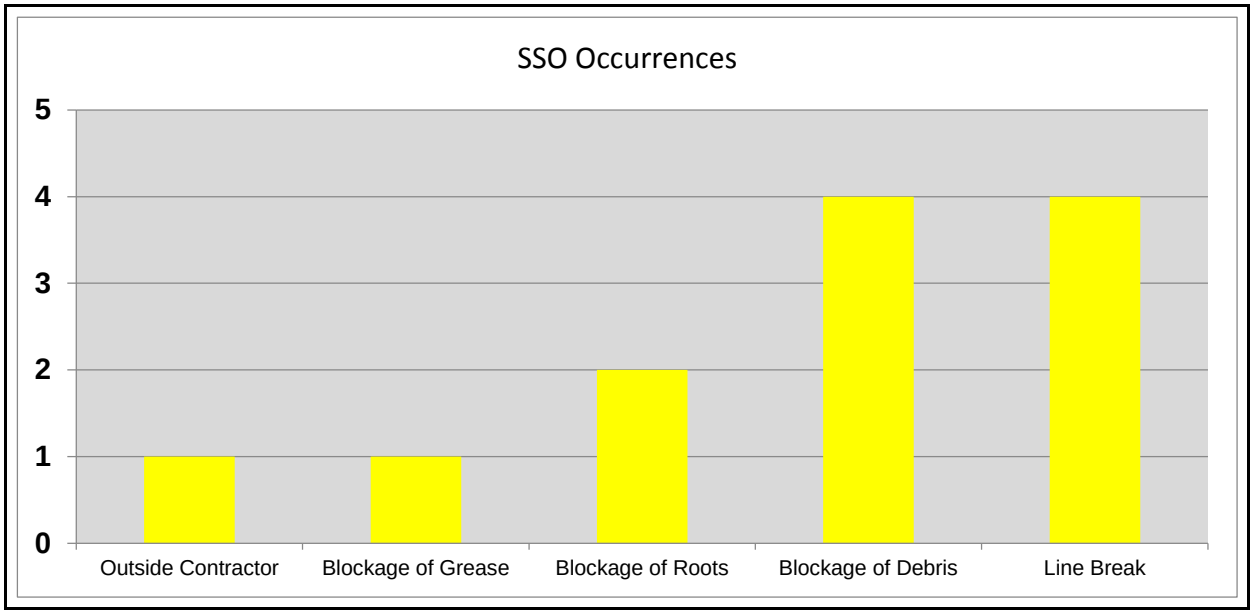
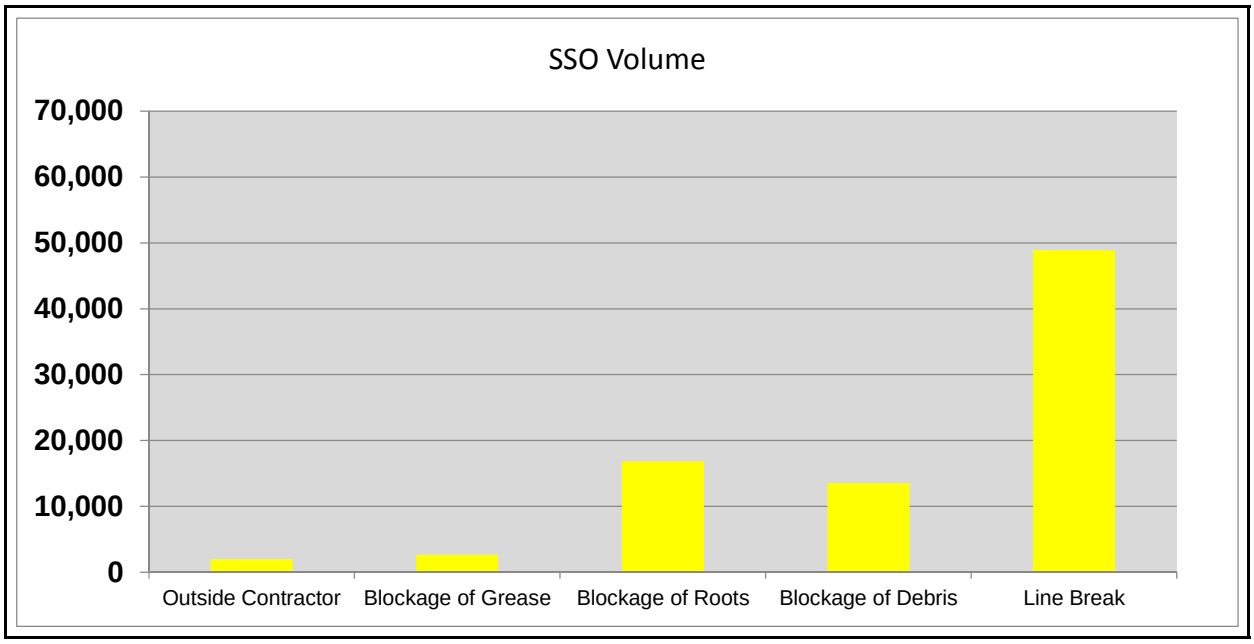


Figure 2.2 Gallons of SSO due to Operational Issues, per Cause
(July 1, 2018 through September 30, 2018)



The problems that led to these Operational SSOs were acted upon and corrected as soon as possible, in accordance with SD1's Sewer Overflow Response Plan (SORP). The sewers where structural or maintenance failures occurred were put into or updated in 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 causes of asset failure. Observed overflow events are recorded in SD1's asset management database, Lucity, and are periodically reviewed to identify if any trends or localized problem areas exist that warrant the need for increased inspections, new preventative maintenance routines, or capital improvement projects.

2.3 Wet-Weather CSOs

Included in Appendix E are the modeled activation and volume statistics of SD1's 95 CSOs, for the third quarter of 2018.

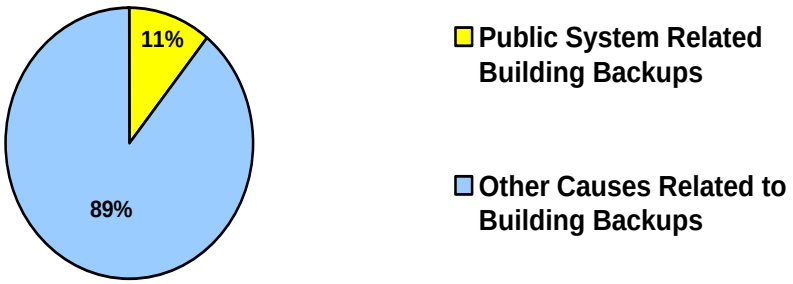
2.4 Dry-Weather CSOs

No dry-weather CSOs were observed by SD1 in the third quarter of 2018.

2.5 Building Backups

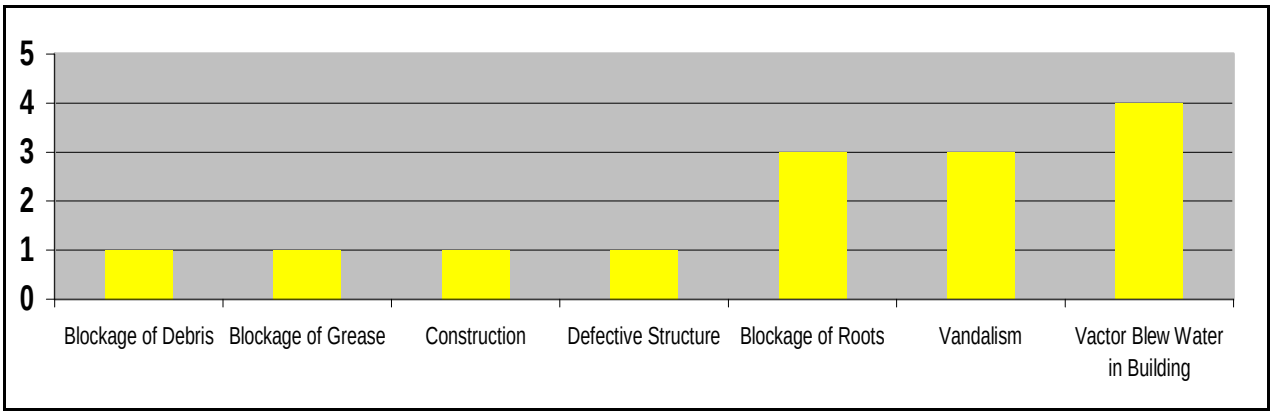
During the third quarter of 2018, there were approximately 114 building backups reported in SD1's service area. Of the 114 backups**,** approximately 14 were determined to be related to the condition or operation of the public sewers and 100 were caused by other issues. The building backups that were not related to the condition or operation of the public sewers, under normal circumstances, were caused by blockages in private service laterals and internal plumbing. Figure 2.3 provides an illustration of the percentages of building backups determined to be related to public or private systems.

Figure 2.3 Building Backups: Public System vs. Other Causes
(July 1, 2018 through September 30, 2018)



The causes of the 14 building backups that were determined to be related to the condition or operation of the public sewer lines, under normal circumstances, are detailed in Figure 2.4.

Figure 2.4 Occurrences of Public System Related Building Backups, per Cause
(July 1, 2018 through September 30, 2018)



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 that provides appropriate next actions for maintenance issues.

All known building backups are recorded in SD1's asset management database, Lucity, and are periodically reviewed to identify if any trends or localized problem areas exist that warrant the need for a larger-scale inspection routine or improvement project.

APPENDIX A:

Consent Decree Compliance Schedule

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	CONSENT DECREE ACTIVITY	PERCENT COMPLETE	DUE DATE	DATE OF COMPLETION
	ASSESSED STIPULATED PENALTIES			
✓	$14,000 for 9 DWOs occuring April 18, 2009 through June 30, 2010	100%	1/9/2011	12/21/2010
✓	$22,000 for 11 DWOs occuring July 1, 2010 through June 30, 2014	100%	1/2/2015	12/8/2015
	CIVIL PENALTY			
✓	Pay Civil Penalties to EPPC and US EPA	100%	06/18/07	06/18/07
	CMOM PROGRAM REQUIREMENTS – 2007 through 2018			
✓	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	100%	12/31/16	12/31/16
✓	CMOM Annual Report 11	100%	12/31/17	12/29/17
	CMOM Annual Report 12	5%	12/31/18	
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%	12/31/15	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	100%	11/10/16	11/08/16
✓	SORP Annual Review 9	100%	11/10/17	09/05/17
	SORP Annual Review 10	75%	11/10/18	
	INITIAL WATERSHED PROJECTS			
✓	Complete Initial Watershed Projects (50 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 2018			
✓	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	09/04/15
✓	NMC Annual Compliance Report 8	100%	09/04/16	09/02/16
✓	NMC Annual Compliance Report 9	100%	09/04/17	09/02/17
✓	NMC Annual Compliance Report 10	100%	09/04/18	09/04/18
	NMC Annual Compliance Report 11	0%	09/04/19	

	CONSENT DECREE ACTIVITY	PERCENT COMPLETE	DUE DATE	DATE OF COMPLETION
	PUMP STATION OVERFLOW ELIMINATION PLAN (PSOEP) – 2007 through 2018			
✓	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	100%	05/14/16	05/14/16
✓	PSOEP Annual Report 9	100%	05/14/17	05/12/17
✓	PSOEP Annual Report 10	100%	05/14/18	05/14/18
	PSOEP Annual Report 11	0%	05/14/19	
	QUARTERLY REPORTING – 2007 through 2018			
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	100%	04/30/16	04/30/16
✓	Submit Quarterly Report 35	100%	07/30/16	07/29/16
✓	Submit Quarterly Report 36	100%	10/30/16	10/30/16
✓	Submit Quarterly Report 37	100%	01/30/17	01/30/17
✓	Submit Quarterly Report 38	100%	04/30/17	04/30/17
✓	Submit Quarterly Report 39	100%	07/30/17	07/30/17
✓	Submit Quarterly Report 40	100%	10/30/17	10/30/17
✓	Submit Quarterly Report 41	100%	01/30/18	01/30/18
✓	Submit Quarterly Report 42	100%	04/30/18	04/30/18
✓	Submit Quarterly Report 43	100%	07/30/18	07/30/18
✓	Submit Quarterly Report 44	100%	10/30/18	10/30/18
	Submit Quarterly Report 45	0%	01/30/19	

	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 COMMUNITY COUNCIL			
✓	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
	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	64%	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 and the execution of the Amended Consent Decree.*

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APPENDIX B:

Watershed Improvement Projects

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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 07/01/2018 to 09/30/2018	Planned Activity for 10/01/2018 to 12/31/2018
(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 2019	n/a	Flow Monitoring, Modeling, and Initial Design	Flow Monitoring, Modeling, and 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 2019	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 2019	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	
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	
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	
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 2019	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 07/01/2018 to 09/30/2018	Planned Activity for 10/01/2018 to 12/31/2018
(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	
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)	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	
				2018	Ph 2 - 2018	Ph 2 - Finish Construction	Ph 2 - Post-Construction Monitoing
Vernon Lane – Public & Private Source I/I Removal	Central	Combination of private I/I removal, sewer rehabilitation in area comprising approximatley 270 homes	Eliminate Vernon Ln. SSO and improve water quality	2014	Ph 1 - 2014	Ph 1 - Complete	
				2017	Ph 2 - 2017	Ph 2 - Complete	Post-Construction Monitoring
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.	2018	n/a	In-Progress	In-Progress
Riviera Sewer Replacement	East	Replacement of approximately 2,000 LF of deteriorated 24-inch pipe in the Taylor Creek area	Reduce CSOs into Taylor Creek and address structural issues	Beyond 2019	n/a	Initial Design	Initial Design
		Replacement of approximately 350 LF of deterioriated 24-inch pipe. Upsize to 54-inch pipe.	Replace collapsed ineterceptor and provide additional capacity.	2018	2018	Complete	Complete
		Emergency repair of approximately 1,300 LF of collapsed 24-inch pipe. Upsize to 54-inch pipe.		2016	2016	Complete	Complete
Lakeside Park – Public Sewer Rehab and Private Source Removal	North	Combinbination of private I/I removal, sewer rehabilitation/replacment and manhole lining, and stormwater BMPs where feasible in Lakeside Park	Eliminate SSOs in Lakside Park	2014	Ph 1 & 2 - 2014	Ph 1 & 2- Complete	
				2017	2018	Ph 3 - Finish Construction	Ph 3 - Complete
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 2019	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 07/01/2018 to 09/30/2018	Planned Activity for 10/01/2018 to 12/31/2018
(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 I/I 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	

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: October 30, 2018

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.		

Updated: October 30, 2018

Additional CSO and SSO Reduction Projects

Project Title	Basin	Project Description	Target Project Benefit	Scheduled Completion Date	Actual Completion Date	Activity for 2018
CSO Reduction						
Aqua on the Levee	East	In partnership with a developer to construct a 48" separate storm outfall through the Ohio River levee in Newport. Project will provide storm water offloading opportunity for 5 acres, and extended opportunity for 19 acres of additional offloading along Saratoga St. Maximum extent of offloading opportunity with new storm outfall will be 38 acres, including Washington St.	Reduce CSO volumes at Saratoga St and Washington St CSOs approximately 4 MG in typical year with proximal separation. Extended separation will provide approximately 7.5 MG reduction in typical year. The maximum extent separation will provide more than 17 MG of CSO reduction during the typical year.	2017	2018	Complete Post-Construction Monitoring
Bromley Pump Station Capacity Increase and Mechanical & Eletrical Upgrade	North	Improve the wet well to maximize capacity and the start/stop controls for each of the pumps.	Reduce typical year CSO volume by approximately 30 MG in the typical year at multiple locations along the Ohio river and Licking River.	2022	n/a	Initial Design
Catch Basin Retrofits C480-11	Central & North	Strategically disconnect catch basins in the CSS that are tied into the collection lines, main interceptors, or the regulating diversion MHs. Reconnect the catch basins to the wet-weather CSO outfall line, effectively removing the inflows from the CSS mainlines. Retrofit all reconnected CBs with solids and floatable controls.	Partial removal of street inflows in various areas of the combined system: Kenner St (Ludlow) = 2 CBs Adams St + Eastern Ave (Covington) = 3 CBs Garrard St + Riverside Dr (Covington) = 4 CBs Greenup St + Riverside Dr (Covington) = 2 CBs Pike St + Rohmann Ave (Covington) = 4 CBs Virginia Ave + 45th St (Covington) = 2 CBs Warren St (Covington) = 3 CBs	2011	2011	Complete
Covington Detention Basins	North	In partnership with the City of Covington, construct detention basins in the low lying areas of the Peasleburg neighborhood to mitigate flooding from peak storm events.	The detention basins will provide approximately 2.5 to 3.5 MG of typical year CSO reduction in the Willow Run system.	2015	2015	Complete
Eighth St. Combined Sewer Separation (Covington)	North	Construct 2,300 LF of separate storm sewer along the 8th St. corridor, in Covington, to offload approximately 11.8 ac of public streets and private property.	Reduce SD1's sixth largest CSO at 8th St.(CSO 1420142 - KY0021466 Outfall 51) from approximately 92.8 MG to 87.4 MG in the typical year.	2022	n/a	Initial Design
Hazen Street, Ludlow Separation	North	In partnership with the City of Ludlow, replace and reconfigure CSS catch basins to improve drainage.	Consolidates CSS catch basins on Hazen St and at the entrance of River's Breeze Condominiums. Extends the initial scope of disconnection in Ludlow, beyond what was identified in Figure 8.2a of the Watershed Plans. Full disconnection will be possible with a new 42" separate storm pipe on West St.	2013	2013	Complete
Injection Wells Pilot	North, Central, East	Disconnect catch basins in portions of the CSS in Ludlow, Covington, and Bellevue for deep well injection into the alluvium, in three pilot areas.	Reduce activations and volumes at the Adella St CSO (Ludlow), E 6th St CSO (Covington), and Patchen St CSO (Bellevue)	Beyond 2019	n/a	Aquifer characterization by USGS & Permitting
Jacob Price Ph1	Central	Stormwater offloading from approximately 7.5 acres of Covington Housing development	Reduce CSO approximately 5.5 MG in the typical year at Robbins St and 11th St CSOs.	2014	2014	Complete
Jacob Price Ph2	Central	Additional stormwater offlaoding of 9 acres adjacent to Jacob Price Ph 1 redevelopment.	Reduce CSO by approximately 5 MG in the typical year at the 8th St, 9th St, and 10th CSOs. The 9th St and 10th St CSOs are predicted to have no typical year activity following the completion of the project.	2019	n/a	Construction

Additional CSO and SSO Reduction Projects

Project Title	Basin	Project Description	Target Project Benefit	Scheduled Completion Date	Actual Completion Date	Activity for 2018
CSO Reduction						
Park Hills Separation	North	In partnership with the City of Park Hills, replace and locally separate CSS catch basins to improve drainage. Streets improved: Alhambra Ct, Exter Dr, Coram St, Harriet St, Irishrose Ln, Old State Rd, South Arlington Rd, Jackson St.	Removes catch basins from the local CSS and redirects to a drainage ditch. The ditch drains to Willow Run CSS, further downstream. This localized separation provides opportunity to completely remove the identified street flows from the Willow Run CSS with the replacement of the Brent Spence Bridge.	2015	2015	Complete
Rivercenter Separation	North	In partnership with the City of Covington, reconfigure existing catch basins in the intersection of Rivercenter Blvd, Johnson St, and 2nd St. Approximately 7 catch basins to be disconnected from CSS and reconnected to the Main St. CSO outfall.	The disconnection of 2.5 acres of street flow provides approximately 1.1 MG reduction of typical year CSO at Russell St and Main St outfalls. Extends opportunity to disconnect additional 20 acres of private property, with the redevelopment of the IRS building.	2018	2018	Construction
State Route KY9 Realignment	Central	In partnership with KY Transportation Cabinet, offload stormwater from the existing CSS on approximately 2.5 miles of newly realigned state route KY9, along the Licking River in Newport. KYTC's proposed 36" separate storm pipe will be upsized by SD1 to 60" to accommodate additional offloading in the future. Utilizes two existing CSO outfalls and requires the construction of one new separate storm outfall through the levee.	Reduces CSO volumes in the short term at 4th St, 9th St, 10th St, and 12 St CSOs by approximately 10 MG. Maximum extent of potential separation in Newport is approximately 167 acres with the new separate storm outfall, which will provide approximately 63 MG of CSO reduction. Project also rehabilitates all intersecting sanitary assets and eliminates discovered illicit connections to the CSO outfalls.	Southern Phase 2016	Southern Phase 2016	Southern Phase Complete
				Northern Phase 2020	n/a	Northern Phase Construction
Victory Ave Storm Sewer Improvement	Central	Construct a new 15" separate storm sewer to alleviate flooding of private property in south Covington.	Allows disconnection of four existing CSS catch basins that collect approximately 0.3 acres of street runoff. Reduces combined flows tributary to the Banklick PS and offloads to the Banklick Creek.	2016	2016	Construction
Water's Edge	East	Construct a new 36" separate storm sewer and disconnect existing CSS catch basins on Taylor Ave in Bellevue. Integrate BMPs for WQ. Four phases of offloading.	Reduce CSO volumes at Taylor Ave CSO and other local CSOs by approximately 6.1 MG in the typical year with Ph 1 and 15.68 MG with Ph 4. Improves flooding issues on Taylor and Eden Avenues.	2017	2018	Complete Post-Construction Monitoring
SSO Reduction						
Burlington Sewer Reroute	West	Near the Burlington Pump Station, construct 100 linear feet of 18" gravity sewer to reroute flows from the Allen Fork Pump Station to the Burlington Pump Station.	New sewer will remove approximately 70 homes from flowing to the Allen Fork PS and pipe them directly to the Burlington PS, improving wet-weather capacity at Allen Fork PS and making pumping operations more efficient.	2017	2018	Complete Post-Construction Monitoring
Bullitsville Pump Station Intermediate Improvements	West	Install 150,000 gallons of EQ storage and structural modifications to existing pump station to allow the operation of three new pumps.	Increase firm pumping capacity to 3.0 MGD. Reduce typical year SSO by 0.11 MG at Recurring SSO 2370003.	2023	n/a	Initial Design
Elsmere Corridor	Central	In the City of Elsmere, upsize approximately 6,600 feet of existing gravity main from Covered Bridge Rd to Raintree Ct, and approximately 1,900 feet of existing gravity main west of Central Row Rd and north towards Edwards Rd.	Upsizing the sewers will eliminate approximately 3.41 MG of wet either SSO in the typical year.	2020	n/a	Final Design Construction
Lakeview Pipe Upgrades	Central	Approximately 85,000 feet of conveyance upgrades in the Lakeview sewershed, as described in Watershed Plans Section 3.3.1.d.	Addresses remaining SSOs in the Lakeview sewershed after the redirection of portions of the sewershed to Western Regional Water Reclamation Facility, Lakeview Pump Station upgrades, I/I removal, and storage.	2020	n/a	Initial Design

Additional CSO and SSO Reduction Projects

Project Title	Basin	Project Description	Target Project Benefit	Scheduled Completion Date	Actual Completion Date	Activity for 2018
SSO Reduction						
Richwood Forcemain Reroute	West	Remove Richwood PS from the Dry Creek/Lakeview PS sewershed and reroute to Western Regional Water Reclamation Facility with a new 20" force main.	Reduces SSO volume 1.58 MG in the typical year at Recurring SSOs 2300123 and 2300121.	2018	2018	Complete Post-Construction Monitoring
US 27 & AA Highway Sewer Improvements	East	Relocate, redirect, and improve capacity of Cold Spring Crossing PS, and redirect flows from the Wolpert PS away from outfall sewer along Industrial Road and the Silver Grove PS to Eastern Regional Water Reclamation Facility.	Reduce activation and volume of Recurring SSOs along industrial Road and in the vicinity of the Silver Grove PS. Reduces typical year SSO by 0.11 MG.	2022-2024	n/a	Initial Design

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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
			PS Elimination	2013	2013	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	2008	Complete
				2012 - 2015	2010	
Riley Road No. 1	East	PS Elimination	n/a	2009	2009	Complete
Riley Road No. 2						
Riverwatch PS	North	PS Elimination Study	PS Elimination	Study - 2008	2008	Complete
				2012 - 2015	2008	Complete
South Park Industrial	North	PS Elimination Study	Backup Dry Prime Pump with a Diesel	Study - 2008	2008	Complete
				2012 - 2015	2010	Complete
Wedgewood Dr	Central	PS Elimination Study	Electrical hook up for portable generator	Study - 2008	2008	Complete
				2015	2015	Complete
Willow Bend No. 2	West	PS Elimination Study	PS Elimination	Study - 2008	2008	Complete
				2013	2013	Complete
Army Reserve	East	PS Elimination Study	Electrical hook up for portable generator	Study - 2008	2008	Complete
				2013-2014	2014	Complete
Eagles Landing	West	PS Elimination Study	Electrical hook up for portable generator	Study - 2008	2008	Complete
				2013-2014	2014	Complete
Evergreen	Central	PS Elimination Study	Electrical hook up for portable generator	Study - 2008	2008	Complete
				2014	2014	Complete
Lamphill	East	PS Elimination Study	Electrical hook up for portable generator	Study - 2008	2008	Complete
				2011	2011	Complete
Mill House Crossing	Central	PS Elimination Study	Backup Dry Prime Pump with a Diesel	Study - 2008	2008	Complete
				2012	2012	Complete
Ridgefield	North	PS Elimination Study	Backup Dry Prime Pump with a Diesel	Study - 2008	2008	Complete
				2014	2014	Complete
War Admiral	West	PS Elimination Study	PS Elimination	Study - 2008	2008	Complete
				2012 - 2015	2011	Complete
Blackstone	West	PS Elimination Study	Electrical hook up for portable generator	Study - 2008	2008	Complete
				2015	2015	Complete
Dublin Green No. 1	West	PS Elimination Study	PS Elimination	Study - 2008	2008	Complete
				2015	2012	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

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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	Permanent Generator	2009	2009	Complete
			PS Elimination	2011	2011	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	Permanent Generator	2008	2007	Complete
			PS Elimination	2014	2014	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	Permanent Generator	2008	2007	Complete
			PS Elimination	2012	2012	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 07/01/2018 to 09/30/2018	Planned Activity for 10/01/2018 to 12/31/2018
Pump Station Overflow Elimination Projects					
Alex-Licking	East	12/31/2010	2008	Complete	Complete
Allen Fork	North	12/31/2015	2014	Complete	Additional Improvements to Burlington PS and Forcemain in Intital Design
Ash Street	East	5/01/2021[1]	n/a	In-Progress	In-Progress
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[2]	n/a	In-Progress	In-Progress

[1] *Force majeure request for timeline of the Ash St. PS granted in letter dated April 11, 2018 from Cabinet and USEPA, due to ongoing legal challenges delaying easement acquisitions. Anticipated completion date has been provided, but may require further adjustment due to ongoing litigation.*

[2] *Revised deadline approved by Cabinet in a letter dated May 13, 2013.*

Updated: October 30, 2018

APPENDIX C:

Annual and Cumulative Overflow Data

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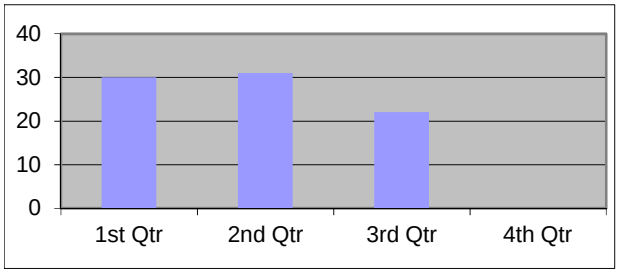
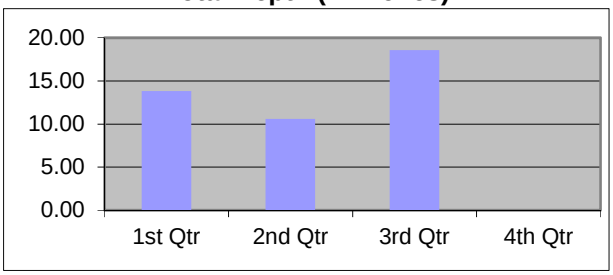
Cumulative Overflow Data
January 1, 2018 through September 30, 2018

Rainfall at CVG

Total Occurrences

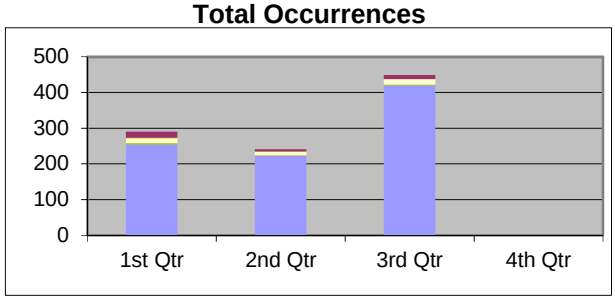


Total Depth (In Inches)

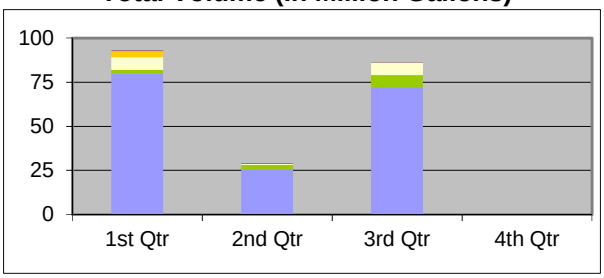


SSOs - Due to Wet Weather (WW) and Operational Issues

Total Occurrences



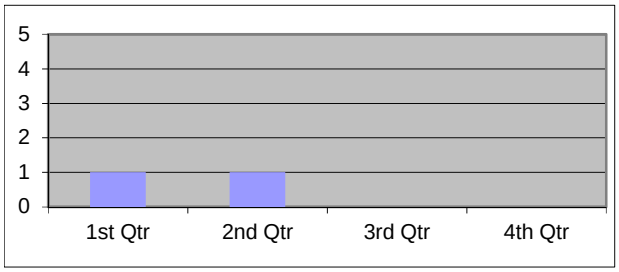
Total Volume (In Million Gallons)



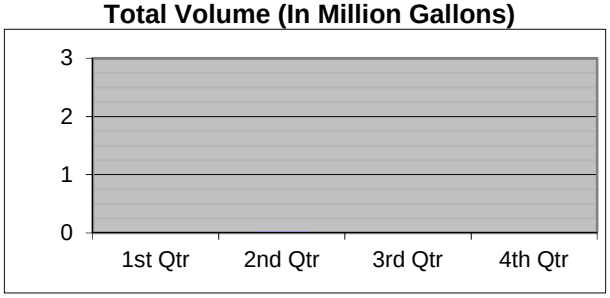
- Recurring WW SSOs
- Recurring WW CD Pump Station Overflows
- Recurring WW Non-CD Pump Station Overflows
- Inactive WW Overflows
- SSOs Due to Operational Issues

Dry Weather CSOs

Total Occurrences

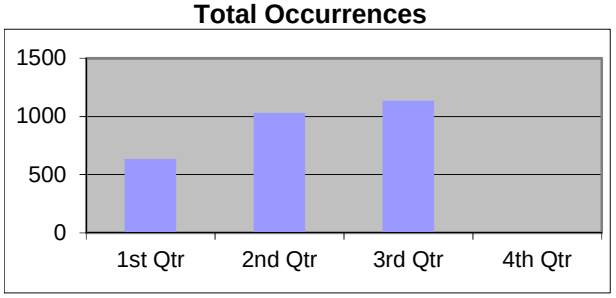


Total Volume (In Million Gallons)

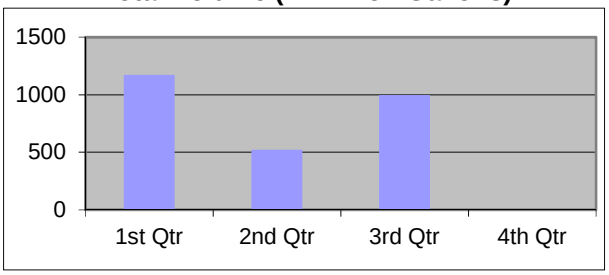


Wet Weather CSOs

Total Occurrences

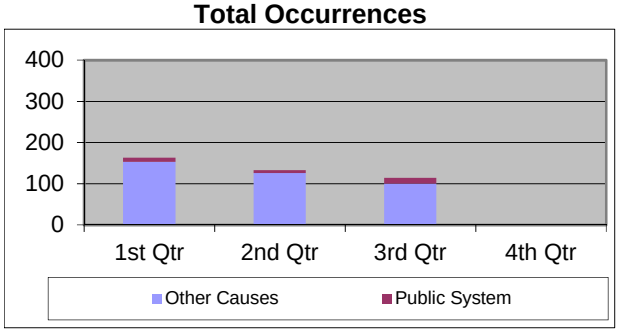


Total Volume (In Million Gallons)



Building Backups

Total Occurrences



2018 Overflow Summary			
	Occurrences	**Volume**	
Rainfall	83	42.970	inches
Recurring WW SSOs	941	203.721	MG
Inactive WW SSOs	3	3.441	MG
Operational SSOs	36	0.757	MG
Dry Weather CSOs	2	0.029	MG
Wet Weather CSOs	2795	2688.053	MG
Building Backups (Other Causes)		379	
Building Backups (Public System)		31	

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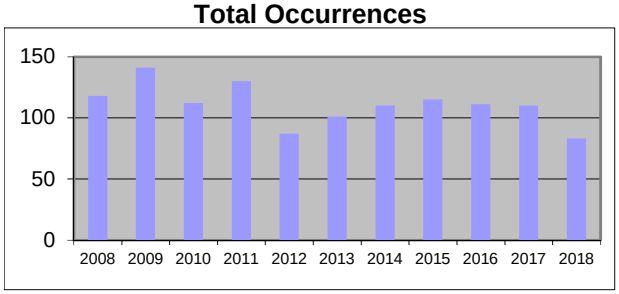
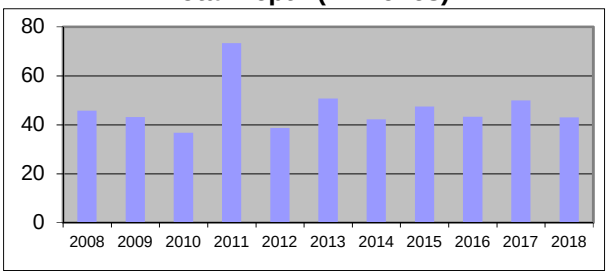
Annual Cumulative Overflow Data
2008 through Q3-2018

Rainfall at CVG

Total Occurrences

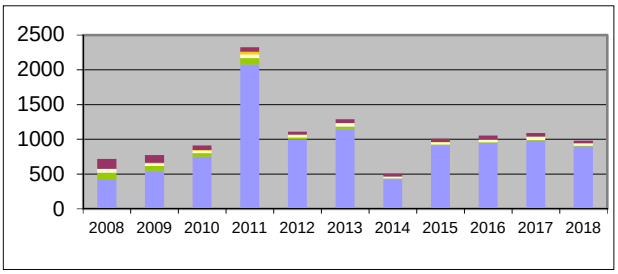


Total Depth (In Inches)

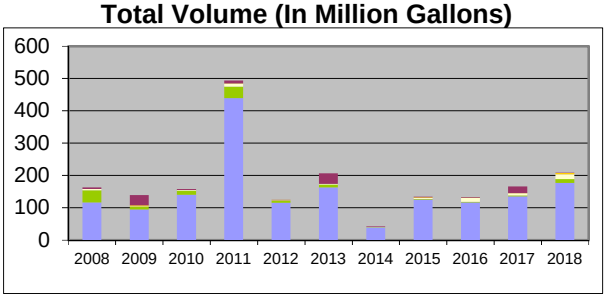


SSOs - Due to Wet Weather (WW) and Operational Issues

Total Occurrences



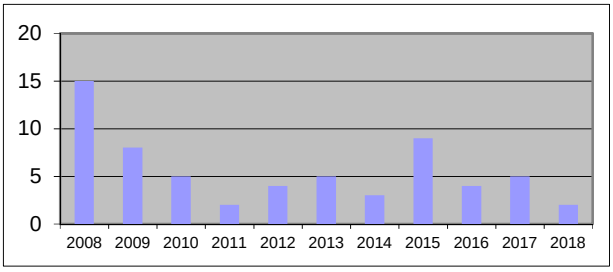
Total Volume (In Million Gallons)



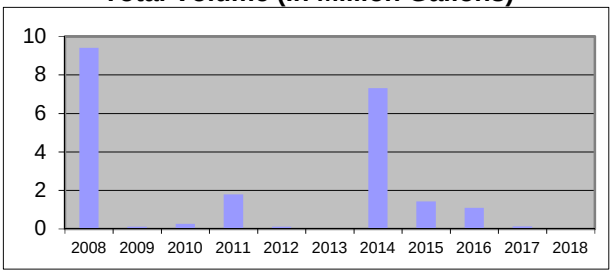
Recurring WW SSOs
Recurring WW CD Pump Station Overflows
Recurring WW Other Pump Station Overflows
Inactive WW Overflows
SSOs Due to Operational Issues

Dry Weather CSOs

Total Occurrences

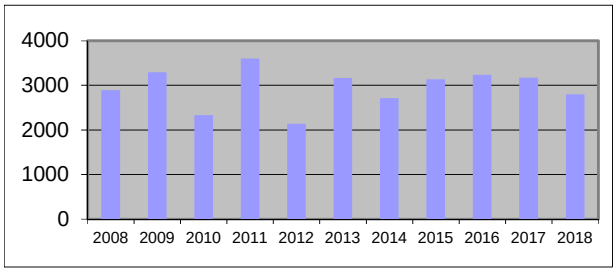


Total Volume (In Million Gallons)

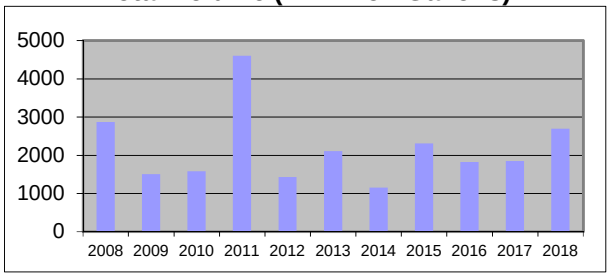


Wet Weather CSOs

Total Occurrences

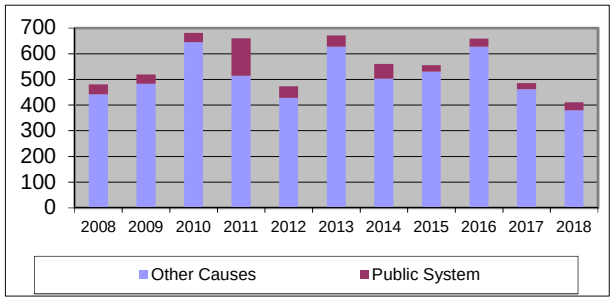


Total Volume (In Million Gallons)



Building Backups

Total Occurrences



Change from 2017 to Q3-2018			
	Occurrences	**Volume**	
Rainfall	-27	-6.91	inches
Recurring WW SSOs	-95	51.041	MG
Inactive WW SSOs	2	3.437	MG
Operational SSOs	-19	-20.694	MG
Dry Weather CSOs	-3	-0.091	MG
Wet Weather CSOs	-373	844.72	MG
Building Backups (Other Causes)	-82		
Building Backups (Public System)	7		

Updated: Updated 30, 2018

APPENDIX D:

Recurring Wet Weather SSOs

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Recurring Wet Weather SSOs					
No.	**MHID**	**City**	**County**	**Model Predicted Overflow Activations**	**Model Predicted Overflow Volume (MG)**
1	0020006	Silver Grove	Campbell	7	4.409
2	0020007	Silver Grove	Campbell	8	0.288
3	0020008	Unicorp Campbell County	Campbell	7	0.212
4	0020030	Silver Grove	Campbell	1	0.007
5	0020032	Unicorp Campbell County	Campbell	5	1.087
6	0020050	Unicorp Campbell County	Campbell	3	0.009
7	0040003	Fort Thomas	Campbell	5	0.474
8	0050022	Fort Thomas	Campbell	5	0.251
9	0060001	Unicorp Campbell County	Campbell	4	0.300
10	0060002	Unicorp Campbell County	Campbell	4	0.353
11	0060004	Unicorp Campbell County	Campbell	3	0.642
12	0070044	Highland Heights	Campbell	2	0.207
13	0110002	Fort Thomas	Campbell	3	0.067
14	0110010	Highland Heights	Campbell	5	1.800
15	0120019	Highland Heights	Campbell	1	0.011
16	0150003	Wilder	Campbell	0	0.000
17	0150005	Wilder	Campbell	0	0.000
18	0150009	Wilder	Campbell	5	3.032
19	0150063	Wilder	Campbell	3	-0.010
20	0150065	Wilder	Campbell	2	0.971
21	0150086	Fort Thomas	Campbell	4	0.749
22	0150356	Southgate	Campbell	0	0.000
23	0150399	Wilder	Campbell	5	3.494
24	0200003	Fort Thomas	Campbell	0	0.000
25	0220056	Fort Thomas	Campbell	4	0.069
26	0220058	Fort Thomas	Campbell	3	0.041
27	0220086	Southgate	Campbell	3	0.115
28	0230011	Fort Thomas	Campbell	1	0.001
29	0230016	Fort Thomas	Campbell	3	0.045
30	0260002	Fort Thomas	Campbell	1	0.004
31	0270020	Fort Thomas	Campbell	0	0.000
32	0270026	Fort Thomas	Campbell	6	0.085
33	0270062	Fort Thomas	Campbell	0	0.000
34	0270103	Fort Thomas	Campbell	0	0.000
35	0280001	Fort Thomas	Campbell	4	0.055
36	0330005	Fort Thomas	Campbell	1	0.006
37	0360004	Dayton	Campbell	2	0.006
38	0380005	Fort Thomas	Campbell	10	0.230
39	0390007	Fort Thomas	Campbell	5	0.080
40	0400002	Fort Thomas	Campbell	12	1.219
41	0400017	Fort Thomas	Campbell	2	0.015
42	0400034	Fort Thomas	Campbell	4	0.100
43	0410010	Fort Thomas	Campbell	10	0.197
44	0410019	Fort Thomas	Campbell	10	0.381
45	0410036	Fort Thomas	Campbell	0	0.000
46	0430006	Newport	Campbell	10	0.207
47	0440074	Fort Thomas	Campbell	3	0.040
48	0490035	Newport	Campbell	2	0.006
49	0490039	Newport	Campbell	2	0.021
50	0490137	Newport	Campbell	4	0.046
51	0500047	Newport	Campbell	8	0.601
52	0530083	Newport	Campbell	9	0.799

Recurring Wet Weather SSOs					
No.	**MHID**	**City**	**County**	**Model Predicted Overflow Activations**	**Model Predicted Overflow Volume (MG)**
53	0860001	Wilder	Campbell	26	23.658
54	0860003	Wilder	Campbell	0	0.000
55	0860016	Wilder	Campbell	0	0.000
56	1010002	Fort Thomas	Campbell	9	0.161
57	1010027	Fort Thomas	Campbell	5	0.103
58	1090069	Edgewood	Kenton	2	0.056
59	1110067	Erlanger	Kenton	4	0.453
60	1110161	Erlanger	Kenton	2	0.114
61	1110174	Elsmere	Kenton	2	0.049
62	1110226	Elsmere	Kenton	0	0.000
63	1210018	Erlanger	Kenton	0	0.000
64	1220016	Erlanger	Kenton	7	0.173
65	1220054	Erlanger	Kenton	5	0.969
66	1230019	Erlanger	Kenton	1	0.005
67	1240008	Erlanger	Kenton	6	0.326
68	1240012	Erlanger	Kenton	2	0.091
69	1330022	Park Hills	Kenton	0	0.000
70	1550036	Fort Mitchell	Kenton	0	0.000
71	1550053	Fort Mitchell	Kenton	5	0.040
72	1560016	Fort Mitchell	Kenton	2	0.075
73	1560074	Fort Mitchell	Kenton	0	0.000
74	1560092	Fort Mitchell	Kenton	5	0.340
75	1560121	Fort Mitchell	Kenton	1	0.028
76	1590006	Lakeside Park	Kenton	1	0.037
77	1610054	Fort Mitchell	Kenton	1	0.007
78	1690043	Fort Wright	Kenton	3	0.147
79	1690072	Fort Wright	Kenton	2	0.024
80	1700008	Covington	Kenton	2	0.052
81	1700025	Park Hills	Kenton	2	0.049
82	1730086	Unicorp Kenton County	Kenton	2	1.952
83	1730100	Crescent Springs	Kenton	1	0.018
84	1730103	Fort Mitchell	Kenton	0	0.000
85	1760047	Edgewood	Kenton	3	0.857
86	1760048	Edgewood	Kenton	2	0.801
87	1830020	Unicorp Boone County	Boone	0	0.000
88	1830067	Unicorp Boone County	Boone	1	0.005
89	1850140	Covington	Kenton	8	2.145
90	1850141	Covington	Kenton	12	1.682
91	1860108	Taylor Mill	Kenton	8	1.442
92	1870013	Covington	Kenton	0	0.000
93	1870014	Covington	Kenton	0	0.000
94	1920097	Cold Spring	Campbell	3	0.135
95	1920163	Cold Spring	Campbell	0	0.000
96	1930008	Southgate	Campbell	6	0.177
97	1940006	Fort Wright	Kenton	2	0.856
98	1940038	Fort Wright	Kenton	3	0.041
99	1940039	Fort Wright	Kenton	4	0.255
100	1940044	Fort Wright	Kenton	3	0.196
101	1950010	Fort Wright	Kenton	2	2.766
102	1950015	Fort Wright	Kenton	2	0.097
103	1950027	Fort Wright	Kenton	2	0.331
104	1950036	Fort Wright	Kenton	2	4.072

Recurring Wet Weather SSOs					
No.	**MHID**	**City**	**County**	**Model Predicted Overflow Activations**	**Model Predicted Overflow Volume (MG)**
105	1950092	Fort Wright	Kenton	2	0.012
106	1960002	Fort Wright	Kenton	2	0.158
107	2020035	Covington	Kenton	2	0.321
108	2020203	Covington	Kenton	2	0.052
109	2090008	Elsmere	Kenton	5	0.662
110	2100002	Elsmere	Kenton	2	0.453
111	2100036	Elsmere	Kenton	2	0.024
112	2100037	Elsmere	Kenton	1	0.002
113	2100057	Elsmere	Kenton	4	0.120
114	2100081	Elsmere	Kenton	2	0.050
115	2100106	Elsmere	Kenton	5	0.553
116	2100156	Elsmere	Kenton	2	0.006
117	2110002	Elsmere	Kenton	7	0.465
118	2120001	Elsmere	Kenton	6	0.198
119	2120041	Elsmere	Kenton	3	0.073
120	2130027	Erlanger	Kenton	1	0.282
121	2160006	Fort Mitchell	Kenton	1	0.004
122	2170097	Crestview Hills	Kenton	2	0.020
123	2280010	Unicorp Kenton County	Kenton	0	0.000
124	2280011	Unicorp Kenton County	Kenton	0	0.000
125	2280023	Unicorp Kenton County	Kenton	0	0.000
126	2290001	Crescent Springs	Kenton	0	0.000
127	2300011	Erlanger	Kenton	2	0.245
128	2300121	Independence	Kenton	1	0.500
129	2300123	Unicorp Kenton County	Kenton	1	0.197
130	2301274	Erlanger	Kenton	0	0.000
131	2370003	Unicorp Boone County	Boone	2	0.273
132	2400001	Unicorp Boone County	Boone	0	0.000
			TOTAL	419	72.173

Threshold for model activation is 0.01 MGD and 0.001 MG

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APPENDIX E:

Wet-Weather CSOs

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Wet Weather CSOs				
No.	CSO ID	KPDES Permit #	Model Predicted Activations	Model Predicted Overflow Volume (MG)
1	0010220	To Be Permitted	9	2.018
2	0030031	KY0021466 - Outfall 10	5	0.160
3	0200069	KY0021466 - Outfall 11	16	1.009
4	0330100	KY0021466 - Outfall 12	1	0.010
5	0340050	KY0021466 - Outfall 14	11	0.688
6	0340051	KY0021466 - Outfall 13	9	0.290
7	0360079	To Be Permitted	7	3.100
8	0540157	To Be Permitted	17	0.891
9	0540156	To Be Permitted	17	1.022
10	0540158	To Be Permitted	6	0.273
11	0550134	To Be Permitted	8	0.136
12	0570089	KY0021466 - Outfall 16	8	34.713
13	0570090	KY0021466 - Outfall 17	8	6.260
14	0600094	KY0021466 - Outfall 18	14	0.929
15	0600096	To Be Permitted	12	0.412
16	0600097	KY0021466 - Outfall 19	12	4.448
17	0600104	To Be Permitted	6	0.137
18	0610071	KY0021466 - Outfall 21	13	15.323
19	0610072	KY0021466 - Outfall 20	11	0.962
20	0620075	KY0021466 - Outfall 23	20	6.669
21	0620077	KY0021466 - Outfall 22	10	0.309
22	0630054	To Be Permitted	1	0.011
23	0630061	KY0021466 - Outfall 83	14	3.325
24	0640090	KY0021466 - Outfall 24	21	89.080
25	0650054	To Be Permitted	5	0.030
26	0650090	KY0021466 - Outfall 26	10	9.048
27	0650098	To Be Permitted	9	7.842
28	0650100	KY0021466 - Outfall 25	12	0.368
29	0660085	To Be Permitted	18	0.791
30	0690059	To Be Permitted	3	0.058
31	0690067	To Be Permitted	12	0.163
32	0730129	To Be Permitted	23	2.161
33	0770096	KY0021466 - Outfall 28	8	0.293
34	0790084	KY0021466 - Outfall 31	69	22.459
35	0790086	KY0021466 - Outfall 29	26	53.201
36	0840111	To Be Permitted	5	0.955
37	0840112	To Be Permitted	21	2.290
38	0840116	KY0021466 - Outfall 27	23	6.263
39	0870078	KY0021466 - Outfall 33	10	1.637
40	0870079	KY0021466 - Outfall 34	22	17.371
41	0880081	KY0021466 - Outfall 36	23	24.793
42	0880082	KY0021466 - Outfall 35	12	1.578
43	0890081	To Be Permitted	0	0.000
44	0910065	KY0021466 - Outfall 38	23	93.236
45	0910066	To Be Permitted	0	0.000
46	0910068	KY0021466 - Outfall 37	17	37.930

Wet Weather CSOs				
No.	CSO ID	KPDES Permit #	Model Predicted Activations	Model Predicted Overflow Volume (MG)
47	0910084	To Be Permitted	12	0.605
48	0930102	KY0021466 - Outfall 43	0	0.000
49	0930103	KY0021466 - Outfall 42	5	0.085
50	0930104	KY0021466 - Outfall 40	4	0.232
51	0930105	KY0021466 - Outfall 41	24	17.827
52	0930106	KY0021466 - Outfall 39	0	0.000
53	0960063	KY0021466 - Outfall 45	14	1.364
54	0960064	KY0021466 - Outfall 44	4	0.060
55	0980073	KY0021466 - Outfall 46	16	0.231
56	0980080	KY0021466 - Outfall 47	7	0.127
57	0980081	KY0021466 - Outfall 48	24	34.361
58	1320112	To Be Permitted	0	0.000
59	1350155	KY0021466 - Outfall 49	5	0.414
60	1380132	To Be Permitted	5	0.397
61	1380146	To Be Permitted	3	0.053
62	1420141	KY0021466 - Outfall 50	20	0.709
63	1420142	KY0021466 - Outfall 51	26	41.018
64	1420144	KY0021466 - Outfall 52	7	0.094
65	1420145	KY0021466 - Outfall 53	6	0.108
66	1420146	KY0021466 - Outfall 54	0	0.000
67	1420147	KY0021466 - Outfall 55	1	0.035
68	1440204	KY0021466 - Outfall 59	14	0.270
69	1440206	KY0021466 - Outfall 61	22	2.022
70	1440207	To Be Permitted	18	0.157
71	1440209	KY0021466 - Outfall 56	28	57.180
72	1440508	KY0021466 - Outfall 60	20	0.908
73	1470089	KY0021466 - Outfall 62	5	0.463
74	1470093	KY0021466 - Outfall 63	21	34.618
75	1480185	To Be Permitted	16	2.267
76	1480187	KY0021466 - Outfall 30	21	276.725
77	1490132	KY0021466 - Outfall 65	5	2.519
78	1490172	KY0021466 - Outfall 64	0	0.000
79	1500131	KY0021466 - Outfall 66	17	6.611
80	1510244	To Be Permitted	7	0.207
81	1710114	KY0021466 - Outfall 69	7	0.315
82	1710116	KY0021466 - Outfall 68	21	7.678
83	1710119	KY0021466 - Outfall 70	8	3.039
84	1710121	KY0021466 - Outfall 71	6	1.618
85	1710124	KY0021466 - Outfall 72	6	2.468
86	1720109	KY0021466 - Outfall 73	9	8.788
87	1730259	KY0021466 - Outfall 75	6	1.683
88	1730262	To Be Permitted	0	0.000
89	1730263	KY0021466 - Outfall 74	7	1.393
90	1840130	To Be Permitted	20	2.046
91	1850158	KY0021466 - Outfall 76	7	21.916
92	1870193	KY0021466 - Outfall 78	20	1.226

Wet Weather CSOs				
No.	CSO ID	KPDES Permit #	Model Predicted Activations	Model Predicted Overflow Volume (MG)
93	1870194	KY0021466 - Outfall 79	12	0.469
94	1880090	KY0021466 - Outfall 81	10	3.948
95	1880091	KY0021466 - Outfall 80	10	3.602
		TOTAL	1133	996.499

Threshold for model activation is 0.01 MGD and 0.001 MG