Sanitation District No. 1
January 30, 2012

# Consent Decree
# Quarterly Report No. 17
(October 1, 2011 through December 31, 2011)

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SD1
Managing Northern Kentucky's
Wastewater and Storm Water

January 30, 2012

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

Chief, Water Program Enforcement Branch
Water Management Division
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, 2011 through December 31, 2011. This report also contains an outlook for the upcoming calendar quarter period of January 1, 2011 through March 31, 2011.

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

I am confident in the integrity of the enclosed document, and I am certain that its content not only satisfies regulatory requirements, but also helps further the mission and vision of SD1 by demonstrating aggressive, proactive, achievable measures underway in Northern Kentucky to protect water resources and enhance the quality of life.

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

Best regards,

Mark W. Wurschmidt, P.E., BCEE
Deputy Executive Director, Director of Engineering

MWW/pc
Enclosures

Sanitation District No. 1
January 30, 2012

# Consent Decree
# Quarterly Report No. 17
(October 1, 2011 through December 31, 2011)

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SD1
Managing Northern Kentucky's Wastewater and Storm Water

## CERTIFICATION

Consent Decree Quarterly Report No. 17
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.

Mark W. Wurschmidt

Mark W. Wurschmidt, P.E., BCEE
Deputy Executive Director, Director of Engineering

1/30/12
Date

COMMONWEALTH OF KENTUCKY

COUNTY OF Kenton )ss.

The foregoing instrument was acknowledged before me this 30 day of January, 2012 by Mark W. Wurschmidt, P.E., BCEE, Deputy Executive Director, Director of Engineering of Sanitation District. No. 1.

Ina Marie Bowns

NOTARY PUBLIC

Kenton County, Kentucky

My commission expires: 7/6/2014

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# CONSENT DECREE
# QUARTERLY REPORT NO. 17

January 30, 2012

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

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## FIGURES

# LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| Cabinet | Kentucky Energy and Environment Cabinet |
| CSO | Combined Sewer Overflow |
| EPA | U.S. Environmental Protection Agency |
| 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, 2011 through December 31, 2011. This report also contains an outlook for the upcoming calendar quarter period of January 1, 2012 through March 31, 2012.

## 1.3 Consent Decree Compliance Schedule

A comprehensive compliance schedule for meeting the requirements of the Consent Decree can be found in Appendix A. Additionally, 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 subsequent quarter can be found in Appendix B. SD1 has also incorporated the status of the projects proposed in the first five years of the revised Draft Integrated Watershed Plan, which was submitted on March 31, 2011, into Appendix B.

# SECTION 2. OVERFLOW DATA

This section of the Quarterly Report presents SD1's estimates of overflow activity in the collection systems. While SD1 has a long history of comprehensive data collection and inspection programs, we have been working over the last several years to realign and optimize our existing programs, originally implemented to meet pre-Consent Decree needs, to fit into the framework of the quarterly reports. This realignment continues to

be improved and optimized as part of SD1's wet-weather management activities, and future reports will continue to incorporate expanded overflow metrics based on more quantitative measures as they become available.

Over the last quarter, SD1 has made further progress with developing standardized reports in its computerized maintenance management system, Lucity (previously known as GBA Master Series or gbaMS), to help support the specific reporting needs for these quarterly reports and to better utilize the collected data to track system performance. SD1 is continuing to fine-tune and optimize its tracking and reporting capabilities to increase efficiency in its work. SD1 has been using Lucity since 1999 and has added several modules and applications in response to evolving needs over the years. As there are now new uses for this tool after entering into the Consent Decree, SD1 is undergoing adjustments to both the data input and output processes for Lucity to generate more precise data for use in these quarterly reports. SD1 continues to move forward with structuring its reporting procedures, and enhancing and improving data input and output quality assurance and quality control processes.

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 service lateral or main line, and can be determined to be either SD1's responsibility or the building owner's responsibility.

Quantitative Estimates

SD1 uses three general methods for developing quantitative estimates of overflow activity:

- Field inspections during or shortly after wet-weather events to identify activations. This inspection program has been in place since 2005 and is expanded as warranted for ongoing reporting and sewer overflow response cleanup. SD1's wet weather crew continues to perform routine inspections before, during and after rain events at prioritized recurring, inactive and suspected SSO locations to understand and verify overflow activity and the need for sewer overflow response cleanup. This is part of SD1's ongoing effort to characterize and verify overflows throughout the collection systems and ensure they are categorized accurately and cleaned up after rain events. Proper characterization of overflows ensures that the hydraulic model that SD1 utilizes maintains and improves upon its accuracy and will help identify the most appropriate and effective solutions to be included in SD1's Watershed Plans.

- Simple hydraulic estimating using 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 exception to this calculation methodology is at the Lakeview Pump Station, which has a metered bypass pipe. This method has been used historically for reporting purposes, and its results are included in this Quarterly Report.

- Estimates developed from SD1's system-wide collection system models. 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 and validation of the 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. In addition to the use of the models for planning future capital improvements, the models are also being used to provide information about the current performance of SD1's system. Based on the results of the model calibration and verification, SD1 has developed a highly calibrated hydraulic model that provides an accurate representation of the sewer system. This tool allows SD1 to have confidence in the results of the overflow volumes from the sewer system and to provide estimates of the overflow locations within the system for quarterly reporting purposes. In addition, the model is updated on a quarterly and annual basis to incorporate the latest data gathered from ongoing targeted flow monitoring, sewer inspections, completed projects and SSO inspections and characterization. This process ensures that the model is kept up-to-date and accurately reflects the current state of the collection system. This approach is consistent with SD1's commitment to provide the best available information on overflow activity within these reports.

For this submittal, SD1 has collected rainfall data from a series of 21 rain gauges located across the system and simulated the rainfall that occurred between October 1, 2011 and December 31, 2011 within the hydraulic models. 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 model. As noted in earlier quarterly reports and the Sewer Overflow Response Plan, SD1 is actively realigning and optimizing their field activities and this process includes continually performing field inspections to verify the model results against actual field conditions through monitoring and observation. Over time, these field verifications will continue to improve the model as appropriate to better reflect any discrepancies found with observed conditions. It is an ongoing and continual process to refine the modeling tools in order to provide the most accurate information possible about overflow locations, including future model updates to incorporate system improvements.

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 will constantly vary over time, with or without system improvements, due to natural variations in rainfall patterns and the associated groundwater 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 quarter, in order to understand the relative impact of 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 rain gauge maintained by the National Weather Service (CVG).

**Table 2.1 Summary of Storm Events**
**(October 1, 2011 through December 31, 2011)**

| Month | Approximate # of Storm Events[1] | Rainfall (in) |
|---|---|---|
| October | 5 | 4.01 |
| November | 8 | 8.32 |
| December | 10 | 6.52 |
| **Total** | **23** | **18.85** |

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

As the data in Table 2.1 indicates, SD1's service area experienced significant amounts of rainfall over the past reporting period, with a total of approximately18.9 inches recorded at the Cincinnati-Northern Kentucky International Airport rain gauge. Historically, the average fourth quarter rainfall volume from 1951 through 2005 is

approximately 9.2 inches. The recorded 2011 fourth quarter rainfall volume of 18.9 inches is almost 10 inches more than what would be expected during a typical October through December period. For further comparison, the typical year used for system characterization (1970) includes approximately 8.1 inches of rainfall during the fourth quarter. This volume is less than 50% of the rainfall that fell during the fourth quarter of 2011. This excessive rainfall, coupled with increasing groundwater conditions, led to higher than average overflow volume during this reporting period.

The remainder of this section reports overflows that occurred throughout SD1's service area during the period of October 1, 2011 through December 31, 2011. A cumulative accounting of SD1's overflow activity from January 2008 through the current reporting period and an annual comparison of the 2008 through 2011 overflow activity can be found in Appendix C.

## 2.1 SSOs Due to Wet Weather Capacity Issues

As previously described, this category includes recurring and inactive overflows from SD1's sanitary sewer system 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 the 153 recurring wet weather SSO locations for the current reporting period can be found in Appendix D. Updates to the locations of SD1's recurring SSOs are reported on an annual basis to include any revisions based upon the field inspection and hydraulic modeling programs. Appendix E of SD1's April 2011 Quarterly Report, titled "Recurring Wet Weather SSO Locations Revision Transactions," included revisions to the recurring SSO list. Therefore, any revisions to the SSO list documented after April 2011 will be published in the April 2012 Quarterly Report.

Recurring Pump Station Overflows

In addition to the 153 recurring wet weather SSOs, there are also 14 pump stations identified in the Consent Decree that have historically documented recurring wet weather capacity issues. Table 2.2 lists each of the 14 pump stations identified in Exhibit E of the Consent Decree and demonstrates their wet weather SSO occurrences during the current reporting period.

Four of the 14 pump stations listed in the Consent Decree discharged a total of 22 times due to lack of capacity during the current reporting period, with an estimated overflow volume of 9.88 million gallons.

As previously mentioned, SD1 uses Manning's Gravity Flow and Pipe Calculation to estimate discharge volume from pump stations. The only exception to this calculation methodology is at the Lakeview Pump Station, which has a metered bypass pipe.

**Table 2.2 Discharges from Consent Decree Pump Stations Due to Lack of Capacity during Wet Weather**
**(October 1, 2011 through December 31, 2011)**

| Name of Pump Station | Number of Wet-Weather Related Discharge Occurrences | Total Estimated Volume (gallons) |
|---|---|---|
| Allen-Fork | 0 | 0 |
| Crestview | 2 | 29,900 |
| Kentucky Aire | 9 | 424,700 |
| Lakeview | 8 | 9,370,000 |
| South Hampton | 3 | 56,500 |
| Union | 0 | 0 |
| Alex-Licking | Overflows Eliminated | |
| Harrison Harbor | | |
| Highland Acres | | |
| Riley Road | | |
| Ripple Creek | | |
| South Park | | |
| Sunset | | |
| Taylorsport | | |
| **TOTAL** | **22** | **9,881,100** |

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, there were four pump stations with documented recurring wet weather capacity issues that discharged with a total of 16 occurrences and a total estimated volume of 1.734 million gallons. Table 2.3 provides detailed information for these occurrences. As SD1 moves forward with the watershed planning efforts required under the Consent Decree, priorities will be established based on severity and known wet weather issues will be addressed.

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**Table 2.3 Discharges from Pump Stations Not Listed in the Consent Decree Due to Lack of Capacity during Wet Weather**
**(October 1, 2011 through December 31, 2011)**

| Name of Pump Station | Number of Wet-Weather Related Discharge Occurrences | Total Estimated Volume (gallons) |
|---|---|---|
| Gamon Calmet | 2 | 46,200 |
| Highland Heights | 12 | 1,673,600 |
| Keavy | 1 | 5,600 |
| Mafred PS | 1 | 8,500 |
| **TOTAL** | **16** | **1,733,900** |

Inactive Wet Weather SSOs

During the current reporting period, there were seven inactive overflows observed with an estimated overflow volume of 158,900 gallons. Table 2.4 provides detailed information for these occurrences. These structures have been added to SD1's wet weather overflow inspection program and are monitored to verify overflow activity and provide a sewer overflow response cleanup, if needed. These locations are also being evaluated to be added to SD1's recurring SSO list. As previously mentioned, updates to the locations of SD1's recurring SSOs are reported on an annual basis to include any revisions based upon the field inspection and hydraulic modeling programs. Appendix E of SD1's April 2011 Quarterly Report, titled "Recurring Wet Weather SSO Locations Revision Transactions," included revisions to the recurring SSO list. Therefore, any revisions to the SSO list documented after April 2011 will be published in the April 2012 Quarterly Report.

**Table 2.4 Inactive Discharges Due to Lack of Capacity During Wet Weather**
**(October 1, 2011 through December 31, 2011)**

| Structure ID# | Number of Wet-Weather Related Discharge Occurrences | Total Estimated Volume (gallons) |
|---|---|---|
| 2370003 Bullitsville PS | 2 | 26,600 |
| 2380957 Gunpowder PS | 4 | 127,400 |
| 2210PS2 Enzweiller PS | 1 | 4,900 |
| **TOTAL** | **7** | **158,900** |

## 2.2 SSOs Due to Operational Issues

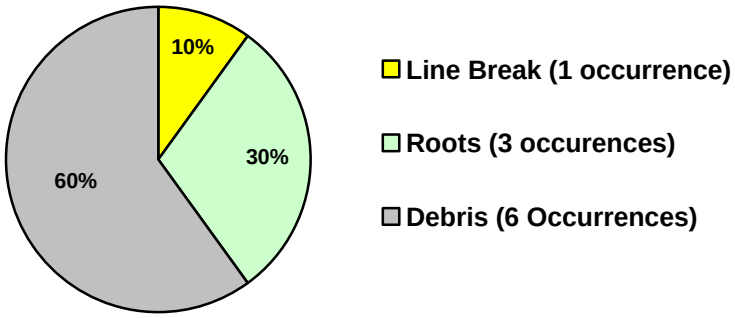
As previously mentioned, this category of overflows includes discharges from SD1's sanitary sewer system that are not a result of wet weather capacity issues. Many of these are one-time, dry-weather occurrences caused by temporary system issues that are investigated and corrected as soon as practicable.

During the current reporting period, there were a total of 11 SSOs due to operational issues throughout SD1's service area with a total estimated overflow volume of 37,700 gallons.

Of the 11 overflows reported in this category, 10 were due to blockages and one was caused by an equipment malfunction.

The 10 SSOs caused by blockages can be broken down into 3 secondary causes, as demonstrated in Figure 2.1.

**Figure 2.1 Causes for Blockages in Pipes Resulting in SSOs**
**(October 1. 2011 through December 31, 2011)**




These SSOs were immediately acted upon and the problems repaired. The sewers where blockages occurred were put into the cleaning program to be inspected and cleaned as-needed in the next six months as part of the Continuous Sewer Assessment Program, 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 SSOs) exist that warrant the need for a larger-scale inspection or rehabilitation/ repair project.

## 2.3 Wet Weather CSOs

Included in Appendix E are the modeled activation and volume statistics for SD1's 94 CSOs. This data was generated from the hydraulic modeling program previously described in Section 2.1.

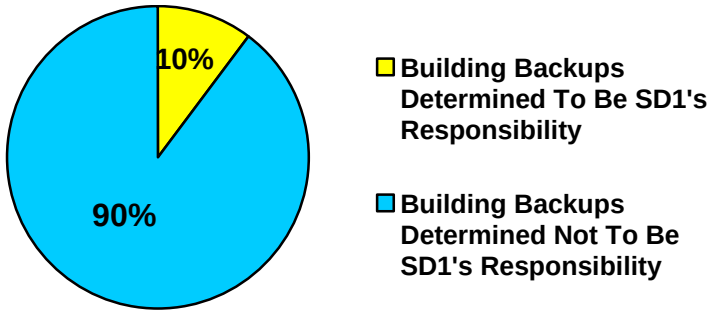
## 2.4 Dry Weather CSOs

During the current reporting period, there were no dry weather discharges from the combined sewer system.

## 2.5 Building Backups

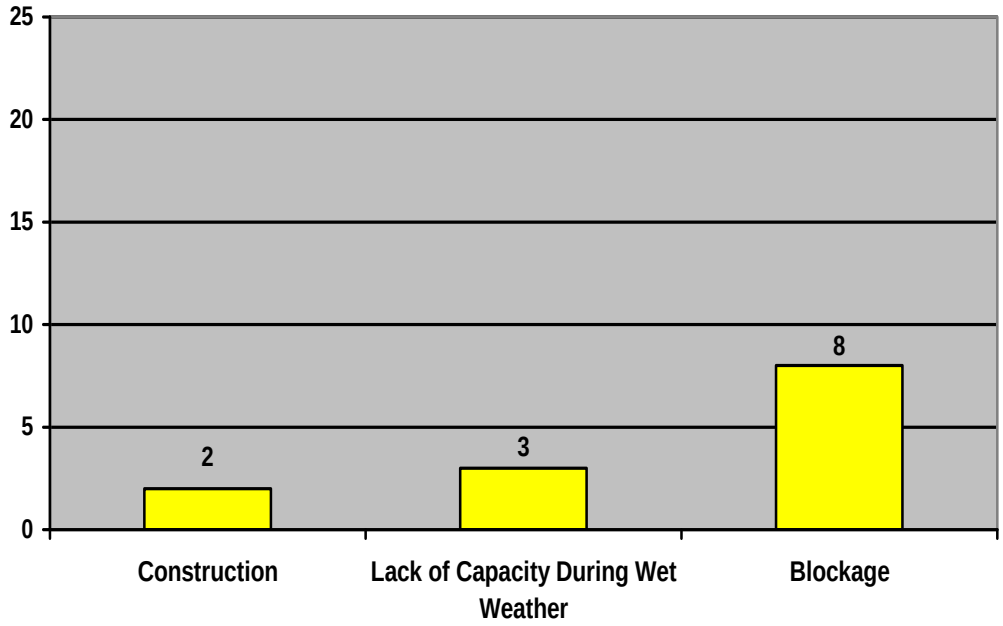
During the current reporting period, there were approximately 127 building backups throughout SD1's service area. Of these 127**,** approximately 13 were determined to be SD1's responsibility and 114 were determined not to be the responsibility of SD1, as shown in Figure 2.2. The backups determined not to be the responsibility of SD1 were due to causes such as breaks and blockages in private service laterals.

**Figure 2.2 Building Backups: Public vs. Private**
**(October 1, 2011 through December 31, 2011)**




Causes for the 13 building backups determined to be SD1's responsibility are detailed in Figure 2.3 below.

**Figure 2.3 Causes of SD1-Responsible Building Backups**
**(October 1, 2011 through December 31, 2011)**



Of the eight building backups caused by blockages, two were caused by grease and six were caused by roots. The sewers where these blockages occurred were put into the cleaning program to be inspected and cleaned as-needed in the next six months as part of the Continuous Sewer Assessment Program, 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 (such as past overflows or proximity to recurring SSOs) exist that warrant the need for a larger-scale inspection or rehabilitation/ 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 2010 and 2011 data are included for detailed comparison, while 2008 and 2009 data are included for historical reference. A summary comparison of SD1's 2008 through 2011 overflow data 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 vary over time, with or without system improvements, due to natural variations in rainfall patterns and the associated groundwater 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 Airport. 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. Daily precipitation statistics in Figures 3.1 and 3.2 are derived from daily rainfall totals measured by the rain gauge at the Cincinnati Airport.

**Table 3.1 Rain Events and Total Rainfall by Quarter (2008 through 2011)**

| | 2008 | | | 2009 | | | 2010 | | | 2011 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Qtr. | # of Storm Events | Rainfall (in) | Avg. Storm | # of Storm Events | Rainfall (in) | Avg. Storm | # of Storm Events | Rainfall (in) | Avg. Storm | # of Storm Events | Rainfall (in) | Avg. Storm |
| 1st | 42 | 17.21 | 0.51 | 34 | 7.09 | 0.21 | 33 | 7.82 | 0.24 | 33 | 11.92 | 0.36 |
| 2nd | 30 | 14.28 | 0.48 | 41 | 14.79 | 0.36 | 35 | 14.53 | 0.42 | 43 | 29.12 | 0.68 |
| 3rd | 22 | 6.39 | 0.29 | 38 | 11.96 | 0.31 | 18 | 4.13 | 0.23 | 31 | 13.37 | 0.43 |
| 4th | 24 | 7.78 | 0.32 | 28 | 9.27 | 0.33 | 26 | 10.19 | 0.39 | 23 | 18.85 | 0.82 |
| Total | **118** | **45.66** | **0.42** | **141** | **43.11** | **0.31** | **112** | **36.67** | **0.33** | **130** | **73.26** | **0.56** |

**Table 3.2 Rain Events and Total Rainfall Change from 2010 to 2011**

| | Change from 2010 to 2011 | |
|---|---|---|
| **Qtr.** | **# of Storm Events** | **Rainfall (in)** |
| **1st** | 0 | 4.1 |
| **2nd** | 8 | 14.59 |
| **3rd** | 13 | 9.24 |
| **4th** | -3 | 8.66 |
| **Total** | **18** | **36.59** |

*(This space intentionally left blank.)*

**Figure 3.1 Daily Precipitation (2008 through 2011)**

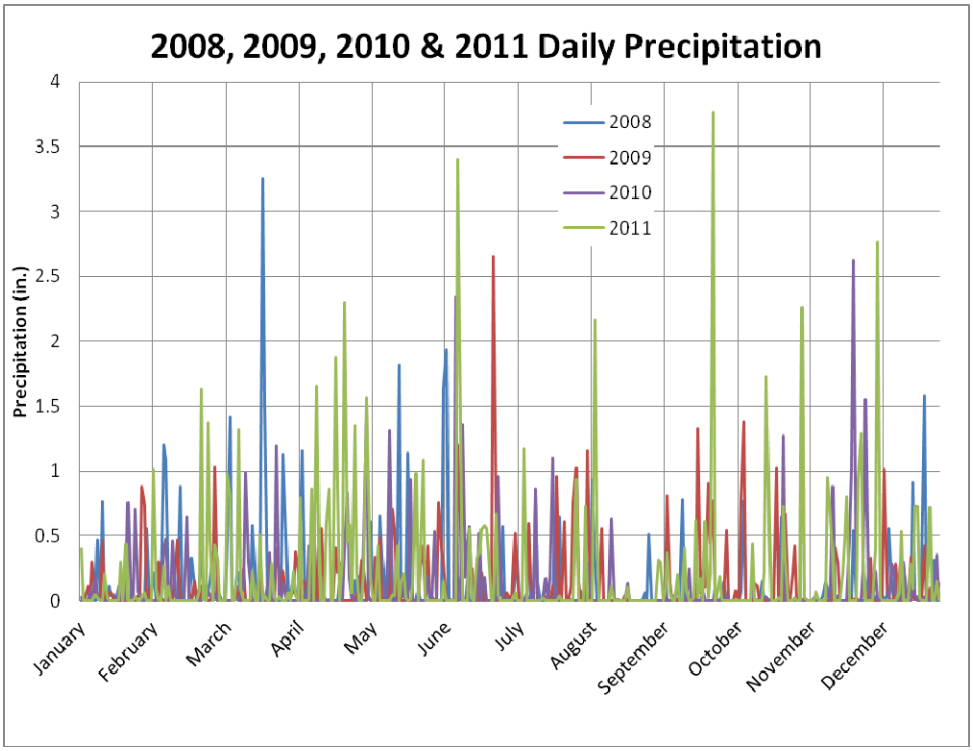
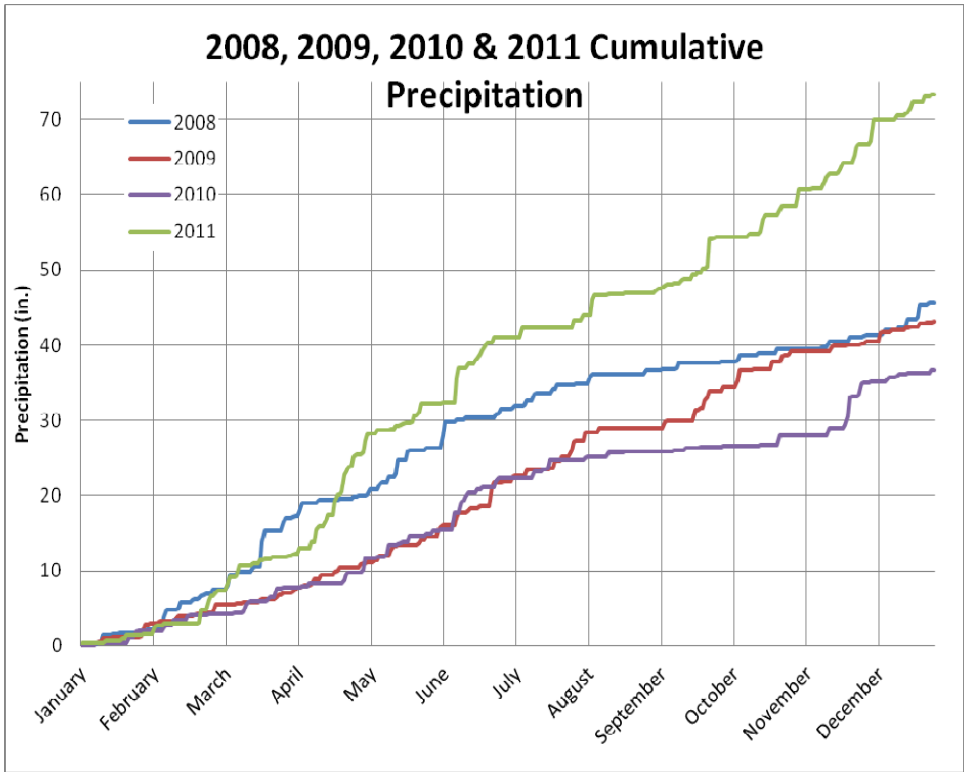



**Figure 3.2 Cumulative Precipitation (2009 through 2011)**



A review of the rainfall data shows that 2011 was an incredibly wet year in comparison to 2010, 2009 and 2008. The total rainfall of 73.3 inches is the highest ever recorded. It is 15.7 inches more than the previous record of 57.6 inches set in 1990. The second quarter of 2011 had a particularly high rainfall total of almost 30 inches. The data in Table 3.1 shows that every quarter of 2011 experienced a higher rainfall amount than in 2010. In addition, the storms were larger on average in 2011 as the average storm amount increased in every quarter over 2010. A review of quarterly rainfall totals since 2008 shows that only the first quarter of 2008 experienced more rainfall than 2011. While rainfall totals for 2008-2010 were closer to typical yearly rainfall amounts, 2011 was approximately 80% above what would be expected. 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.

River Water Intrusion

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, CSO outfall flood gates 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 could not flow out into the river due to the elevated river levels. SD1 is currently working on eliminating river water intrusion through a program to install duckbill-style check valves on outfalls to reduce the river water intrusion up to river level 47 feet.

Table 3.3 shows the number of days each quarter that the river stage exceeded 41 feet in 2009, 2010 and 2011. Overall, the river stage was greater than 41 feet 74 days in 2011, as summarized below.

*(This space intentionally left blank.)*

**Figure 3.3 Daily River Stage (2008 through 2011)**

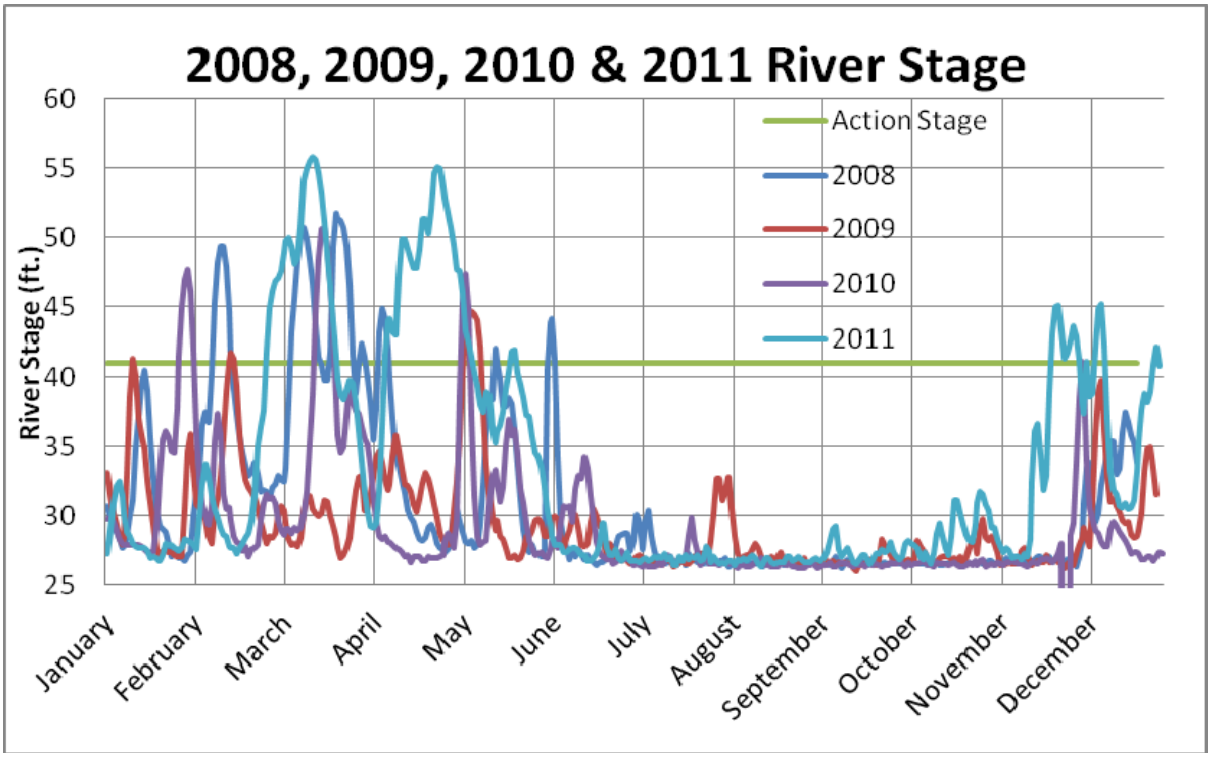



**Table 3.3 Number of Days Ohio River Stage Level above 41 Feet (2008 through 2011)**

| Quarter | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|
| **1** | 28 | 4 | 13 | 25 |
| **2** | 9 | 6 | 3 | 33 |
| **3** | 0 | 0 | 0 | 0 |
| **4** | 0 | 0 | 1 | 16 |
| **Total** | **37** | **10** | **17** | **74** |

In 2011, the Ohio River stage level of 41 ft was exceeded more days than all of 2008-2010 combined, causing large CSO overflow volumes due to flood protection system operation and increased groundwater conditions. As previously mentioned, historic rainfall amounts occurred in 2011, which contributed to the large number of high river level occurrences. While river water levels in 2009 and 2010 were more typical of average conditions, and 2008 exceeded typical conditions, 2011 far exceeded average river level conditions. On average, the Ohio River is at or above 41 feet 26 days of the year. Of those, less than three typically occur in the fourth quarter of the year. Consequently, CSO overflow volume was significantly higher in 2011 than in any of the previous years, including 2008 (approximately 4,600 million gallons in 2011 versus approximately 2,900 million gallons in 2008). A further discussion and 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

Tables 3.4 and 3.5 provide a summary of the number of activations and corresponding volume of recurring wet weather SSOs occurring in 2008, 2009, 2010 and 2011 including recurring wet weather overflows at pump stations.

**Table 3.4 Recurring Wet Weather SSOs by Quarter (2008 through 2011)**

| | 2008 | | 2009 | | 2010 | | 2011 | |
|---|---|---|---|---|---|---|---|---|
| **Qtr.** | Activations | Volume (MG) | Activations | Volume (MG) | Activations | Volume (MG) | Activations | Volume (MG) |
| **1st** | 285 | 103 | 152 | 26 | 128 | 30 | 402 | 89 |
| **2nd** | 211 | 39 | 175 | 24 | 351 | 55 | 1,031 | 216 |
| **3rd** | 24 | 2 | 147 | 20 | 123 | 14 | 239 | 22 |
| **4th** | 56 | 14 | 177 | 35 | 134 | 41 | 403 | 112 |
| **Total** | **576** | **158** | **651** | **105** | **736** | **140** | **2,075** | **439** |

**Table 3.5 Recurring Wet Weather SSOs Change from 2010 to 2011**

| | Change from 2010 to 2011 | |
|---|---|---|
| **Qtr.** | **Activations** | **Volume (MG)** |
| **1st** | 274 | 59 |
| **2nd** | 680 | 161 |
| **3rd** | 116 | 8 |
| **4th** | 269 | 71 |
| **Total** | **1339** | **299** |

The recurring wet weather SSO number of activations and volume were significantly higher in 2011 than in 2010, 2009 or 2008. As was noted earlier, 2011 saw a record rainfall amount which was significantly higher than in 2008-2010. In addition, Ohio River stage levels were significantly higher in 2011 than in 2008-2010. These factors, plus elevated groundwater conditions, led to an SSO overflow volume in 2011 that exceeded the SSO overflow volume of 2008-2010 combined.

The SSO activations and volume for the second quarter were significantly higher in 2011 than in 2010. As was noted earlier, for 2011, the second quarter experienced significantly more rainfall than 2010. In addition, high river level occurrences were significantly higher in the second quarter which led to increased SSO overflow volume.

A similar trend can be seen in the first and fourth quarters of 2011 compared with 2010. The third quarter of 2011 more closely matches 2010 SSO overflow volume. This is due in part to the fact that there were no high river occurrences during the third quarter of 2011 or 2010. While the third quarter of 2011 had higher rainfall than 2010, there were also more storm events, which helped to lessen the impact.

Based on SD1's current watershed planning efforts, a substantial reduction to the volume of wet weather SSOs will occur across several basins once the Western Regional system related improvement projects are complete. These projects, including the water reclamation facility and tunnel are currently in-progress and are scheduled to be complete in 2013.

SD1 is also focusing on smaller, higher priority wet weather SSO projects that address public health concerns in localized neighborhood areas. Although the SSO volume reductions for these projects are not projected to be as significant as the ongoing Western Regional program, the reduction in the number of wet weather SSOs through implementation of these projects is critical to improving both public health and water quality in Northern Kentucky. These projects are being implemented as part of the 5-Year Improvement Program outlined in the revised Draft Integrated Watershed Plan, which was submitted on March 31, 2011. The progress and expected benefits of these projects and other Watershed Plan related projects are included in Appendix B.

### *3.2.2* 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 2010, a total of 11 inactive overflows were identified with an estimated overflow volume of 64,000 gallons. During 2011, SD1's wet weather investigations identified a total of 36 inactive overflows with an estimated overflow volume of 1.24 million gallons.

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 the activity of the structures being investigated. Unlike other overflow categories, inactive overflows are generally under investigation as suspected or predicted hydraulic model overflow points in the collection system that must be confirmed.

The wet weather investigation crew meets on a quarterly basis to compare the overflow field inspection data against the modeled results to understand any differences, improvements that may be needed to the hydraulic model, additional flow monitoring that may be required, the need for sewer inspection work in the area around overflows, and the need for sewer overflow response cleanup. This is part of SD1's ongoing effort to characterize and verify overflows throughout the collection system, ensure overflows are categorized accurately and cleaned up after rain events, and ensure that the model is updated quarterly with the latest field and flow monitoring information so that it is accurately predicting and reporting what is occurring in the collection system. Proper

characterization of overflows ensures that the hydraulic model that SD1 utilizes is kept up-to-date and improves upon its accuracy to aid in identifying the most appropriate and effective solutions for eliminating recurring SSOs.

## 3.3 Review 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 in 2008 through 2011.

**Table 3.6 SSOs Due to Operational Issues (2008 through 2011)**

| Year | Total Number of Occurrences | Total Volume (Million Gallons) |
|---|---|---|
| 2008 | 143 | 5 |
| 2009 | 108 | 31 |
| 2010 | 63 | 3 |
| 2011 | 66 | 8 |
| **Change from 2010-2011** | **3** | **5** |

SD1 uses a benchmark taken from American Water Works Association's 2007 Annual Survey Data & Analyses Report for determining how its annual SSOs due to operational issues compare to the rest of the wastewater utility industry. The industry benchmark is less than 8.75 overflows per 100 miles of collection system piping. SD1 has 1,700 miles of collection system piping which equates to a benchmark of 148 SSOs due to operational issues annually. As shown in Table 3.5, SD1 has consistently been below the industry benchmark and had 82 fewer SSOs due to operational issues in 2011 as compared to the industry benchmark.

This reduction can be attributed to regularly scheduled operation and maintenance (O&M) activities as implemented through SD1's formal CSAP that has been in place since January 2008. Implementation of the CSAP has enabled SD1 to more effectively and proactively prioritize and implement system inspection, cleaning, and rehabilitation/replacement needs in order to reduce overflows due to operational issues. The work completed by both internal and external crews during 2008 through 2011 has helped to maintain proper operation of the collection system is summarized in Table 3.7.

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**Table 3.7 O&M Activities (2008 through 2011)**

| O&M Activity | 2008 | 2009 | 2010 | 2011 | Total |
|---|---|---|---|---|---|
| Manholes Inspected | 5,985 | 4,688 | 1,285 | 1,852 | **13,810** |
| Manholes Repaired | 485 | 332 | 315 | 288 | **1,420** |
| Manholes Replaced | 55 | 59 | 83 | 30 | **227** |
| New Manholes Installed[1] | 26 | 53 | 37 | 48 | **164** |
| Sewer Lines Cleaned - Feet | 706,441 | 530,303 | 657,709 | 375,303 | **2,269,756** |
| Sewer Lines Inspected (Initial Inspection and Follow-up) - Total Feet | 1,414,803 | 1,411,818 | 1,076,042 | 977,575 | **4,880,238** |
| Sewer Lines Rehabilitated (CIPP) – Feet[2] | 953 | 2,251 | 29,528 | 84,417 | **117,149** |
| Sewer Lines Repaired – Feet[1] | 2,609 | 2,864 | 2,606 | 4,356 | **12,435** |
| Sewer Lines Replaced – Feet[1] | 15,833 | 14,794 | 23,220 | 6,664 | **60,511** |
| Misc. Sewer Line Repairs - Count | 45 | 40 | 8 | 9 | **102** |

[1]Does not include manholes installed or lines repaired or replaced as part CIP projects and new development.

[2]In January 2010, SD1 entered into CIPP lining contract, which accounts for the increases in lineal footage in FYs 2010 and 2011.

## 3.4 Review of Wet Weather CSOs

Tables 3.8 and 3.9 provide a summary of the number of activations and corresponding volume of CSOs occurring from 2008 through 2011.

**Table 3.8 Recurring Wet Weather CSOs by Quarter (2008 through 2011)**

| | 2008 | | 2009 | | 2010 | | 2011 | |
|---|---|---|---|---|---|---|---|---|
| **Qtr.** | Activations | Volume (MG) | Activations | Volume (MG) | Activations | Volume (MG) | Activations | Volume (MG) |
| **1st** | 943 | 1,798 | 607 | 266 | 456 | 426 | 600 | 1,097 |
| **2nd** | 899 | 685 | 1,244 | 436 | 971 | 435 | 1,538 | 2,029 |
| **3rd** | 542 | 119 | 828 | 397 | 461 | 279 | 795 | 319 |
| **4th** | 504 | 267 | 610 | 403 | 444 | 435 | 705 | 1,152 |
| **Total** | **2,888** | **2,869** | **3,289** | **1,502** | **2,332** | **1,575** | **3,638** | **4,597** |

**Table 3.9 Recurring Wet Weather CSOs Changes from 2010 to 2011**

| | Changes from 2010 to 2011 | |
|---|---|---|
| **Qtr.** | Activations | Volume (MG) |
| **1st** | 144 | 671 |
| **2nd** | 567 | 1,594 |
| **3rd** | 334 | 40 |
| **4th** | 261 | 717 |
| **Total** | **1,306** | **3,022** |

The number of CSO activations and volume was significantly higher in 2011 than in 2010 due to the record rainfall amount of 73.3 inches in 2011, and a significantly higher number of high river level occurrences (74 versus 26 average). In addition, due to increased rainfall, higher groundwater conditions also impacted CSO volume in 2011. While 2010 had shown a shift downward in the number of CSO activations compared with essentially equal CSO volume to 2009, activations increased dramatically in 2011. This is due to not only increased number of storm events in 2011, but also larger storms in general. The average storm in 2011 was 0.56 inches, as compared to 0.33 inches in 2010, and 0.31 inches in 2009. As mentioned earlier, high river level conditions occurred during 74 days during 2011 as opposed to 17 days in 2010.

Despite record rainfall amounts and high river level conditions in 2011, efforts continue to be made to reduce CSO activations in a similar fashion as was seen from 2009 to 2010. These efforts are discussed below in further detail:

- Nine Minimum Control Efforts
- Green Project Implementation

Nine Minimum Control Efforts

As part of its continued compliance with the Nine Minimum Controls for CSOs, SD1 has incorporated many small scale improvements in the combined sewer system. These improvements have resulted in small reductions in local activations at a number of CSO locations.

*Nine Minimum Control #4: Maximization of Flow to POTW for Treatment*

Approximately 3,414 linear feet of interceptor was cleaned as part of the targeted sewer cleaning program (TSCP) during 2011. This cleaning program helps to lower the number of CSO activations by ensuring that the full interceptor capacity is available for wet weather conveyance.

In addition, capacity improvement projects at the Dry Creek Wastewater Treatment Plant began in 2011. It is anticipated that these projects will provide the following benefits:

- Increase in plant screening and grit removal capacity from 75 million gallons per day to 160 million gallons per day. This improvement will remove the current screenings capacity limitation and is consistent with the Watershed Plans long-term strategy to increase the wet weather capacity of the Dry Creek Waste Water Treatment Plant to 160 million gallons per day.
- Equalized flow splits between plant final clarifiers to allow for more consistent operation and accommodate future increases in flow.
- Odor control for solids storage and dewatering.
- Reduce typical year CSO volume by 34 million gallons.

Green Projects Implementation

As part of its watershed planning efforts, SD1 has also initiated several green projects within the combined sewer system with the goals of reducing CSO volume and improving water quality.

*St. Elizabeth's Detention Basin Retrofit and Terraced Reforestation, Covington*

The St. Elizabeth project was complete during 2009 and involved the modification of an existing dry detention basin located on property owned by St. Elizabeth Medical Center. The project was designed to capture, infiltrate, and control storm water entering SD1's combined sewer system, and reduce CSO volume.

In May 2010, SD1 began a terraced reforestation project along I-71/75 that is directly upstream of the St. Elizabeth site. This project involves the construction of a series of vegetated, terraced berms within the right-of-way in the City of Covington. It too was designed to capture, infiltrate and control storm water entering SD1's combined sewer system, and reduce CSO volume. Substantial completion of the project was accomplished in 2011.

*12th Street Green Improvements, Covington*

SD1 worked closely with the City of Covington and the Kentucky Transportation Cabinet during the 12$^{th}$ Street corridor expansion project to incorporate green infrastructure into the plans with the goal of reducing the volume of storm water runoff entering the combined sewer system. The project involved the installation of four bioretention planter boxes and a biofiltration swale and was completed in 2011.

*Kentucky Transportation Cabinet Basin Retrofit, Covington*

Storm water runoff from a drainage area of approximately 110 acres drains to an existing detention basin (owned by the Kentucky Transportation Cabinet) located along Interstate 71/75 in the City of Covington, which ultimately discharges storm water into SD1's combined sewer system. In 2011, the basin outlet structure was reconstructed and the height of the embankment was increased. These improvements will allow for it to function as an extended detention basin and significantly reduce storm water discharge flow rates.

*Church Street CSO Reduction, Taylor Mill and Covington*
The Church Street CSO Reduction project was under design in 2011 and involves the rehabilitation and replacement of existing combined sewers, construction of approximately 2,000 linear feet of separate storm sewer pipe, the removal of private source storm water connections and a green infrastructure component, such as a wetland, will be constructed to receive the separated storm water runoff from private property. Through this combination of gray and green infrastructure, the project will improve and restore natural habitats and reduce CSO volume. Construction is anticipated to begin in 2012.

## 3.5 Review of Dry Weather CSOs

Table 3.10 provides a summary of the number of activations and corresponding volume of dry weather CSOs that occurred during 2008 through 2011.

**Table 3.10 Dry Weather CSOs (2008 through 2011)**

| Year | Total Number of Occurrences | Total Volume (Million Gallons) |
|---|---|---|
| 2008 | 15 | 9 |
| 2009 | 8 | .104 |
| 2010 | 5 | .264 |
| 2011 | 2 | 1.79 |
| **Change from 2010-2011** | **-3** | **1.526** |

The number of dry weather CSO activations was lower in 2011 in comparison to 2010 and overall shows a downward trend when compared to 2008. The total volume lost was greater in 2011 than in 2010. The 2011 event was due to equipment malfunction and mechanical failure which caused the Patton Street Pump Station to flood. The downward trend in total number of activations can be attributed to the following reasons, which are discussed below in further detail:

- Routine CSO investigations
- Routine O&M Activities

Routine CSO Investigations
SD1's CSO investigation crew inspects each CSO outfall and its associated diversions once per week as well as after every rainfall event. During the weekly routine inspections and after rainfall events, the CSO investigation crew visually looks for debris and blockages that may trigger a dry weather overflow or would affect the ability of the diversion to maximize the flow entering the interceptor during rainfall.

Routine 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.

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 annually inspects each catch basin at least once and is continuing to gather data in order to develop a prioritized schedule for more frequent inspections and cleaning depending on the catch basin location. In addition, SD1 has constructed four grit pits along the Ohio River and Licking River interceptors to remove grit and other solids from the sewers. These grit pits continue to operate well to trap and remove debris from the interceptors and maximize flow to the treatment plant.

These activities, which are summarized in Table 3.11, ensure that the combined sewer system will perform as effectively as possible to maximize treatment of combined sewage and reduce the magnitude, frequency and duration of CSOs.

**Table 3.11 Combined Sewer System O&M Activities (2008 through 2011)**

| O&M Activity | 2008 | 2009 | 2010 | 2011 | Total |
|---|---|---|---|---|---|
| Catch Basins Cleaned | 1211 | 888 | 786 | 1,392 | **4,277** |
| Catch Basin Cleaning (Yards of Debris Removed) | N/A | 427 | 469 | 525 | **1,421** |
| Catch Basins Inspected[1] | 2057 | 3328 | 4075 | 4,125 | **13,585** |
| New Catch Basin Installation | 0 | 5 | 2 | 2 | **9** |
| Catch Basins Replaced | 159 | 224 | 140 | 90 | **613** |
| Catch Basins Repaired | 128 | 65 | 78 | 211 | **482** |
| Grit Pit Cleaning (Yards of Debris Removed) | 358 | 439 | 355 | 365 | **1,517** |

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

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## 3.6 Review of Building Backups

Table 3.12 provides a summary of the building backups reported during 2008 through 2011.

**Table 3.12 Building Backups: Public vs. Private (2008 through 2011)**

| Responsible Party | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|
| Private Owner | 402 | 482 | 644 | 513 |
| SD1 | 39 | 36 | 36 | 146 |
| **Total** | **441** | **518** | **680** | **659** |

The total number of building backups in 2011 remained higher than those reported in 2008 and 2009, which can be attributed to the historic rainfall totals in 2011. The significant increase in the number of building backups determined to be SD1's responsibility is due to the increase in the number of building backups caused by a lack of sewer capacity during wet weather.

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# APPENDIX A:

## *Consent Decree Schedule*

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## Consent Decree Compliance Schedule

| | CONSENT DECREE ACTIVITY | PERCENT COMPLETE | DUE DATE | DATE OF COMPLETION |
|---|---|---|---|---|
| | **ASSESSED STIPULATED PENALTY** | | | |
| ✓ | $14,000 for 9 DWOs, between 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 2014** | | | |
| ✓ | 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 | 0% | 12/31/12 | |
| | CMOM Annual Report 7 | 0% | 12/31/13 | |
| | CMOM Annual Report 8 | 0% | 12/31/14 | |
| **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)** | | 56% | 12/31/2015 | |
| **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 | 0% | 11/10/12 | |
| | SORP Annual Review 5 | 0% | 11/10/13 | |
| | SORP Annual Review 6 | 0% | 11/10/14 | |
| | **INITIAL WATERSHED PROJECTS** | | | |
| | Complete Initial Watershed Projects (51 Total) | 86% | 12/31/14 | |
| **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 | 0% | 06/07/12 | |
| | Initial Watershed Projects Annual Report 6 | 0% | 06/07/13 | |
| | Initial Watershed Projects Annual Report 7 | 0% | 06/07/14 | |
| | **NMC PROGRAM REQUIREMENTS – 2007 through 2014** | | | |
| ✓ | 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 | 0% | 09/04/12 | |
| | NMC Annual Compliance Report 5 | 0% | 09/04/13 | |
| | NMC Annual Compliance Report 6 | 0% | 09/04/14 | |

## 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 2014** | | | |
| ✓ | 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 | 0% | 05/14/12 | |
| | PSOEP Annual Report 5 | 0% | 05/14/13 | |
| | PSOEP Annual Report 6 | 0% | 05/14/14 | |
| | **REPORTING – 2007 through 2014** | | | |
| **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 | 0% | 04/30/12 | |
| | Submit Quarterly Report 19 | 0% | 07/30/12 | |
| | Submit Quarterly Report 20 | 0% | 10/30/12 | |
| | Submit Quarterly Report 21 | 0% | 01/30/13 | |
| | Submit Quarterly Report 22 | 0% | 04/30/13 | |
| | Submit Quarterly Report 23 | 0% | 07/30/13 | |
| | Submit Quarterly Report 24 | 0% | 10/30/13 | |
| | Submit Quarterly Report 25 | 0% | 01/30/14 | |
| | Submit Quarterly Report 26 | 0% | 04/30/14 | |
| | Submit Quarterly Report 27 | 0% | 07/30/14 | |
| | Submit Quarterly Report 28 | 0% | 10/30/14 | |

## 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 | 82% | 04/18/12 | |
| | *Boone County* | 80% | 04/18/12 | |
| | *Campbell County* | 85% | 04/18/12 | |
| | *Kenton County* | 80% | 04/18/12 | |
| | Licking River Watershed Watch | 95% | 04/18/12 | |
| ✓ | Split Rock | 100% | 04/18/12 | 12/18/08 |
| ✓ | Education Programs | 100% | 04/18/12 | 08/04/11 |
| | State Environmental Project Completion Report | 0% | 06/17/12 | |
| | **SUPPLEMENTAL PROJECTS** | | | |
| | Supplemental Environmental Projects | 95% | 04/18/12 | |
| | SEP Completion Reports | 0% | 06/17/12 | |
| | **WATERSHED PLANS** | | | |
| **Framework for Developing Watershed Plans** | | | | |
| ✓ | Obtain Public Input on Framework for Watershed Plans | 100% | 04/09/08 | 04/09/09 |
| ✓ | 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 |
| **Second Round Watershed Plans** | | | | |
| | Obtain Public Input on Second Round of Watershed Plans | 0% | Summer 2014[2] | |
| | Submit Second Round of Watershed Plans | 0% | Summer 2014[2] | |
| **Third Round Watershed Plans** | | | | |
| | Obtain Public Input on Third Round of Watershed Plans | 0% | Summer 2019[2] | |
| | Submit Third Round of Watershed Plans | 0% | Summer 2019[2] | |
| | **Consent Decree Compliance** | | | |
| | Complete all Consent Decree Compliance Measures | 26% | 12/31/25 | |

*[1] Projects 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.*

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# APPENDIX B:

## *Watershed Improvement Projects*

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# Grease Control Program: Phased Implementation Tasks

| Cateogry | Task | Status/Activity |
|---|---|---|
| **Grease Control Phase 1 Tasks / Completed January 2008 - January 2009** | | |
| Conduct Self Assessment | SD1 will acquire a list of FSEs within the service area that are permitted by the Kentucky Health Department. This will aid in determining the magnitude of FSEs that have the potential to discharge FOG to the SSS. This information will also help establish mailing addresses and points of contact for the FSEs. | Complete |
| | Field crew personnel currently determine when collection system problems are caused by FOG during a trouble call. This process will be evaluated to determine if the causes of trouble calls are being classified accurately. | Complete |
| | Field crew personnel enter trouble call evaluations into GBA. The process of entering information into GBA will be evaluated to ensure data is accurate, accessible and manageable. | Complete |
| | SD1 currently uses a geographical information mapping system called Arc Viewer. One of the primary functions of Arc Viewer is to show the locations of sanitary sewer lines in the service area. This system will be evaluated to find possible mapping capabilities for areas with FOG problems within the collection system. | Complete |
| Review Rules and Regulation / Enforcement Response Plan | A review of the SD1's Rules and Regulations and ERP is being conducted. This review will identify any deficiencies in the legal authority to control the discharge of grease into the SSS. It will also identify deficiencies in the enforcement program. If found, the deficiencies will indicate revisions to be made in Phase 2 of this program. | Complete |
| Design Criteria | SD1 will review the effectiveness of other publicly owned treatment works (POTWs) Rules and Regulations and ERPs (i.e. Cincinnati MSD, Louisville MSD, and Knoxville Utilities Board). This will provide insight into what is working for utilities in the surrounding area. | Complete |
| | SD1will seek the development of design criteria for grease reduction device standards by the Kentucky Division of Plumbing, Kentucky Health Department and Kentucky Environmental and Public Protection Cabinet. | Complete |

# Grease Control Program: Phased Implementation Tasks

| Cateogry | Task | Status/Activity |
|---|---|---|
| **Grease Control Phase 1 Tasks (Continued) / Completed January 2008 - January 2009** | | |
| FSE Education | Over the last year, SD1has created and distributed BMP posters to be displayed in permitted FSEs and will continue to distribute such posters. The FSEs are required to display these posters in areas where there is potential for FOG to be discharged to the SSS. | Complete |
| | SD1will create and send out BMP brochures to all FSEs. The brochure will focus on the harmful effects of FOG in sewer lines and proper grease handling techniques used to minimize the release of FOG into the collection system. These brochures can also be distributed during site visits. | Complete |
| | SD1will begin researching a compliance assistance workshop for FSEs. An evaluation of other FOG workshops will be conducted to determine content and effectiveness. This workshop will provide FSEs with a comprehensive overview of the Grease Control Program. The workshop will be initiated when all specifics of the program have been established. | Complete |
| FSE Education | SD1has met with members of the Kentucky Restaurant Association (KRA) and the Northern Kentucky Restaurant Association (NKRA) to open channels of communication with key stakeholders. SD1will continue to work to educate these key stakeholders. Their participation and cooperation is valuable. We will encourage the KRA and NKRA to include grease control program information in their newsletters. | Complete |
| Public Education | Over the last year, SD1has created and distributed door hangers to inform customers when there has been a blockage or obstruction due to FOG in their area. These informational pieces focus on the harmful effects of FOG in sewer lines and proper grease handling techniques used to minimize the release of FOG into the collection system. SD1will continue to distribute door hangers and letters to customers in areas impacted by FOG related overflows. | Complete |
| | SD1will create and send out additional bill inserts to all customers within the service area. The bill stuffers will spotlight the harmful effects of FOG in sewer lines and proper grease handling techniques used to minimize the release of FOG into the collection system. | Complete |
| | SD1will research the “Trap the Grease Program.” This program involves supplying residences with a container for grease rather than pouring it down the drain. | Complete |

# Grease Control Program: Phased Implementation Tasks

| Cateogry | Task | Status/Activity |
|---|---|---|
| **Grease Control Phase 2 Tasks / Completed January 2009 - January 2010** | | |
| Conduct Self Assessment | GBA will be modified and field crew personnel will be trained to ensure data is entered accurately and that the data is accessible and manageable. | Complete |
| | SD1will create a list of collection system areas experiencing problems with FOG in the sanitary sewers. This list will be created using the information established in GBA in Phase 1. | Complete |
| | SD1will create a list of FSEs that may be contributing to FOG problem areas. This list will be created using information provided from the Kentucky Health Department in Phase 1. | Complete |
| Revise Rules and Regulation / Enforcement Response Plan | If necessary, SD1will begin drafting revisions to the District's Rules and Regulations and ERP to ensure proper legal authority and enforcement. | Complete |
| Design Criteria | SD1will continue to coordinate with the Kentucky Division of Plumbing, Kentucky Health Department and Kentucky Environmental and Public Protection Cabinet on the development of design criteria for grease reduction device standards. | Complete |
| FSE Education | SD1will continue developing the compliance assistance workshop for FSEs and will maintain the distribution of the BMP posters to permitted FSEs. | Complete |
| | | Complete |
| | SD1will distribute letters and other informational pieces to residential customers in areas impacted by FOG related overflows. These pieces will be evaluated and updated as needed on a regular basis. | Complete |
| Develop Inspection Protocol | SD1will begin developing an inspection protocol for plumbing plans, installation and final inspection. This will ensure the proper installation of appropriate grease control devices. | Complete |
| | Inspection frequency and inspection report forms will be developed to determine if the FSE is in compliance with the Grease Control Program. | Complete |
| Modify Food Service Discharge Permit | SD1 will revise the Food Service Discharge Permit to ensure the permit coincides with changes made to the Rules and Regulations and Emergency Response Plan. The permit will address grease control device management, operation and maintenance standards, onsite record keeping requirements, cleaning frequency, cleaning standards, additives and ultimate disposal. | Complete |
| | SD1 will evaluate and revise, if necessary, the Restraunt/Food Service Grease Questionnaire to ensure the proper information is supplied about grease handling procedures. | Complete |

# Grease Control Program: Phased Implementation Tasks

| Cateogry | Task | Status/Activity |
|---|---|---|
| **Grease Control Phase 3 Tasks / To be completed January 2010 - January 2011** | | |
| Revise Domestic Holding Tank Waste Hauler Manifest | SD1 will evaluate and revise, if necessary, the Domestic Holding Tank Waste Hauler Manifest to better monitor the method and disposal of grease. | Complete |
| Evaluate Staffing and Equipment Requirements | SD1 will evaluate staffing levels and employ additional personnel, if necessary, to ensure requirements of the FOG program are being met. | Complete |
| FSE Education | SD1 will continue developing the compliance assistance workshop for FSEs. | Complete |
| | SD1 will maintain the distribution of the BMP poster to permitted FSEs. | On-going - distributed during FSE inspections. Brochures and pamphlets are also distributed during monthly FSE compliance assistance workshops. |
| Approval for Rules and Regulations / Enforcement Response Plan | SD1 will read publicly the modifications to the Rules and Regulations on two separate occassions at SD1's board meetings. A public comment period will begin with the first reading. SD1 will then submit revisions to SD1's Board of Directors for approval, then to the Cabinet for approval. | Complete |
| Public Education | SD1 will expand the grease control section of its website. The expansion will contain additional information for th public, FSEs and sludge haulers. Documents and forms will be made available for viewing and printing. | Complete |
| | SD1 will distribute letters and other informational pieces to residential customers in areas impacted by FOG related overflows. These pieces will be evaluated and updated as needed on a regular basis. | On-going task - distributed to residents in areas that experience overflows or in areas where inspection data reveal a grease problem. |
| **Cateogry** | **Task** | **Status/Activity** |
| **Grease Control Phase 4 Tasks / To be completed January 2011 - January 2012** | | |
| Public Readings of Rules and Regulations/Enforcement Response Plan | SD1 will publicly read the modifications on two separate occasions at SD1 board meetings. The revisions will be published when Phase 4 is complete. | Complete |
| Evaluate Staffing and Equipment Needs | The Industrial Monitoring Department will be responsible for all the activities associated with the Grease Control Program, and will be provided with necessary equipment. If the workload becomes too great for the current staff, SD1 will employ and additional Industrial Monitoring Specialist to ensure requirements of the program are being met. | Complete |

# Grease Control Program: Phased Implementation Tasks

| | | |
|---|---|---|
| Performance Indicators | GBA will be used to determine the number of trouble calls due to grease, number of lines being PM's and the number of SSOs due to FOG. | Complete |
| | Linko FOG will be used to track permits, inspections, violations and correspondence on all permitted FSEs. | Complete |
| Permitting | All previously permitted FSEs will undergo a re-evaluation using the modifications to the Grease Control Program conducted in the previous phases. | Complete |
| | Any FSEs in new grease problem areas will be evaluated using the modifications in the previous phases. | On-going - any FSEs in new grease problem areas will be evaluated using the modifications in the previous phase. |
| | All new FSEs will be evaluated using the modifications from the previous phases. | On-going - any new FSEs in will be evaluated using the modifications in the previous phase. |
| FSE/Public Education | SD1 will require all permitted FSEs to attend a compliance assitance workshop and will maintain the distribution of the BMP posters to permitted FSEs. | On-going - compliance workshop meetings are held on a monthly basis. FOG brochures and pamphlets are also distributed during monthly FSE compliance assistance workshops. BMP posters are provided during inspections. During October - November 2011, 126 FSEs attended the workshop (December data not available at this time). |
| | SD1 will distribute letters and other informational pieces to residential customers in areas impacted by FOG related overflows. These pieces will be evaluated and updated as needed on a regular basis. | On-going task - approximately 6,792 pieces of literature have been sent since February 2009, of which 376 were mailed October - December 2011. Letters will continue to go out to any residence that experiences a backup due to FOG or where an overflow has occurred due to a blockage of FOG. |

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# Pump Station Backup Power Plan

| CIP Title | Basin | Original Proposed Solution | Updated Proposed Solution | Scheduled Completion Date | Actual Completion Date | Status Description As of October 2011 |
|---|---|---|---|---|---|---|
| **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 Engine | 2010 | 2010 | Complete |
| ***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 Engine | Study - 2008 | 2008 | Complete |
| | | | | 2012 - 2015 | 2010 | Complete |
| Wedgewood Dr | Central | PS Elimination Study | PS Elimination | Study - 2008 | 2008 | Complete |
| | | | | 2012 - 2015 | | On-hold |
| Willow Bend No. 2 | West | PS Elimination Study | PS Elimination | Study - 2008 | 2008 | Complete |
| | | | | 2012 - 2015 | n/a | Initial Project Analysis |
| Army Reserve | East | PS Elimination Study | Initial analysis indicated that this station can be eliminated by means of gravity sewer. Cost-effectiveness of solution to be further analyzed before final determination is made. | Study - 2008 | 2008 | Complete |
| | | | | 2012 - 2015 | n/a | Initial Project Analysis |
| Eagles Landing | West | PS Elimination Study | Initial analysis indicated that this station can be eliminated by means of gravity sewer. Cost-effectiveness of solution to be further analyzed before final determination is made. | Study - 2008 | 2008 | Complete |
| | | | | 2012 - 2015 | n/a | Initial Project Analysis |
| Evergreen | Central | PS Elimination Study | Initial analysis indicated that this station can be eliminated by means of gravity sewer. Cost-effectiveness of solution to be further analyzed before final determination is made. | Study - 2008 | 2008 | Complete |
| | | | | 2012 - 2015 | n/a | Initial Project Analysis |
| 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 Engine | Study - 2008 | 2008 | Complete |
| | | | | 2012 | n/a | Project In-Progress |
| Ridgefield | North | PS Elimination Study | PS Elimination | Study - 2008 | 2008 | Complete |
| | | | | 2012 - 2015 | n/a | Initial Project Analysis |

## Pump Station Backup Power Plan

| CIP Title | Basin | Original Proposed Solution | Updated Proposed Solution | Scheduled Completion Date | Actual Completion Date | Status Description As of October 2011 |
|---|---|---|---|---|---|---|
| ***Category 2 Projects (continued)*** | | | | | | |
| War Admiral | West | PS Elimination Study | PS Elimination | Study - 2008<br>2012 - 2015 | 2008<br>2011 | Complete<br>Complete |
| Blackstone | West | PS Elimination Study | These stations will be eliminated after the Western Regional collection system is operational. | Study - 2008<br>2012 - 2015 | 2008<br>n/a | Complete |
| Dublin Green No. 1 | West | PS Elimination Study | | Study - 2008<br>2012 - 2015 | 2008<br>n/a | Complete |
| Fowler Creek | West | PS Elimination | | 2013 | 2011 | Complete |
| Gammon Calmet | West | PS Elimination | | 2013 | n/a | |
| Gunpowder | West | PS Elimination | | 2013 | n/a | |
| Union | West | PS Elimination | | 2013 | n/a | |
| **CIP Title** | **Basin** | **Original Proposed Solution** | **Updated Proposed Solution** | **Scheduled Completion Date** | **Actual Completion Date** | **Status Description As of October 2011** |
| ***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 | Permanent Generator | Property owner issues; still evaluating solutions | 2014 | n/a | Evaluating Solutions |
| Kees | East | Permanent Generator | Back up dry pump system with diesel engine | 2011 | 2011 | Complete |
| Overlook | East | Permanent Generator | Property owner issues; permanent generator no feasible. Evaluating alternate backup power solution. The generator initially procured for this location will be moved to Newport Steel Pump Station. | 2014 | n/a | Evaluating Solutions |
| Riverview Farms | North | Permanent Generator | Property owner issues; permanent generator no feasible. Evaluating alternate backup power solution. The generator initially procured for this location will be moved to Enzweiller Pump Station. | 2014 | n/a | Evaluating Solutions |
| Stillwater | East | Permanent Generator | Property owner issues; permanent generator no feasible. Evaluating alternate backup power solution. The generator initially procured for this location will be moved to Cedar Pump Station. | 2014 | n/a | Evaluating Solutions |

## Pump Station Backup Power Plan

| CIP Title | Basin | Original Proposed Solution | Updated Proposed Solution | Scheduled Completion Date | Actual Completion Date | Status Description As of October 2011 |
|---|---|---|---|---|---|---|
| ***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 Engine | 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 Engine | 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 Engine | 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 Engine | 2009-2014 | 2010 | Complete |
| Shadow Lake | East | Permanent Generator | Backup Dry Prime Pump with a Diesel Engine | 2009-2014 | 2009 | Complete |
| Wolf Rd | Central | Permanent Generator | Backup Dry Prime Pump with a Diesel Engine | 2009-2014 | 2009 | Complete |
| Air Park West | North | Permanent Generator | Backup Dry Prime Pump with a Diesel Engine | 2009-2014 | 2011 | Complete |
| Arbortech | North | Permanent Generator | Backup Dry Prime Pump with a Diesel Engine | 2012 | n/a | Initial Project Analysis |
| Arborwood | North | Permanent Generator | Property owner issues; permanent generator not feasible. Evaluating alternate backup power solution. | 2009-2014 | n/a | Evaluating Solutions |
| Brandtly Ridge | Central | Permanent Generator | Backup Dry Prime Pump with a Diesel Engine | 2012 | n/a | Project In-Progress |
| Brentwood | North | Permanent Generator | Property owner issues; permanent generator not feasible. Evaluating alternate backup power solution. | 2009-2014 | n/a | Evaluating Solutions |
| Brushup Lane | West | Permanent Generator | PS Elimination | 2012 | | Project In-Progress |
| Carlisle Ave | East | Permanent Generator | n/a | 2009-2014 | n/a | Evaluating Solutions |
| Cinnamon Ridge | West | Permanent Generator | Backup Dry Prime Pump with a Diesel Engine | 2012 | n/a | Project In-Progress |
| Cold Spring Crossing | East | Permanent Generator | n/a | 2009-2014 | n/a | Evaluating Solutions |
| Cold Spring Plaza | East | Permanent Generator | Backup Dry Prime Pump with a Diesel Engine | 2012 | n/a | Project In-Progress |
| Darma Ct | East | Permanent Generator | Electrical hook up for portable generator | 2012 | n/a | Project In-Progress |
| Deer Creek No. 1 | North | Permanent Generator | Backup Dry Prime Pump with a Diesel Engine | 2009-2014 | 2011 | Complete |
| Deer Creek No. 2 | North | Permanent Generator | Backup Dry Prime Pump with a Diesel Engine | 2009-2014 | 2011 | Complete |
| Eighth Street | Central | Connect to Grid Power | n/a | 2009-2014 | n/a | Initial Project Analysis |
| Gerrard Ave | East | Permanent Generator | Portable Generator | 2009-2014 | 2011 | Complete |
| Golf Course | Central | Permanent Generator | n/a | 2009-2014 | n/a | Initial Project Analysis |
| Hampton Ridge | West | Permanent Generator | Property owner issues; permanent generator not feasible. Evaluating alternate backup power solution. | 2009-2014 | n/a | Evaluating Solutions |
| Harrison Harbor | East | Permanent Generator | Portable Generator | 2009-2014 | 2011 | Complete |

## Pump Station Backup Power Plan

| CIP Title | Basin | Original Proposed Solution | Updated Proposed Solution | Scheduled Completion Date | Actual Completion Date | Status Description As of October 2011 |
|---|---|---|---|---|---|---|
| ***Category 4 Projects (continued)*** | | | | | | |
| Harvest Hill | Central | Permanent Generator | PS Elimination Study | 2009-2014 | n/a | Under analysis to be eliminated by means of gravity sewer. |
| ICH | Central | Permanent Generator | Electrical hook up for portable generator | 2011 | 2011 | Complete |
| IDI | North | Permanent Generator | n/a | 2009-2014 | n/a | Initial Project Analysis |
| Independence Station Rd | Central | Permanent Generator | Backup Dry Prime Pump with a Diesel Engine | 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 | Property owner issues; permanent generator not feasible. Evaluating alternate backup power solution. | 2009-2014 | n/a | Evaluating Solutions |
| Litton | North | Permanent Generator | n/a | 2009-2014 | n/a | Initial Project Analysis |
| Ohio Ave | East | Permanent Generator | Portable Generator | 2009-2014 | 2011 | Complete |
| Orchard Estates | West | Permanent Generator | n/a | 2009-2014 | n/a | Evaluating Solutions |
| Parkside No. 2 | East | Permanent Generator | n/a | 2009-2014 | n/a | Initial Project Analysis |
| Patton Street | Central | Dual Utility Power Feed | n/a | 2009-2014 | n/a | Initial Project Analysis |
| Ria Vista | North | Permanent Generator | Electrical hook up for portable generator | 2011 | 2011 | Complete |
| Silver Grove | East | Permanent Generator | n/a | 2009-2014 | n/a | Initial Project Analysis |
| St Annes | East | Permanent Generator | n/a | 2009-2014 | n/a | Evaluating Solutions |
| Sycamore | West | Permanent Generator | Property owner issues; permanent generator not feasible. Evaluating alternate backup power solution. | 2009-2014 | n/a | Evaluating Solutions |
| Taylor Mill Rd | Central | Permanent Generator | Electrical hook up for portable generator | 2011 | 2011 | Complete |
| Wilder | East | Permanent Generator | n/a | 2009-2014 | n/a | Evaluating Solutions |
| Wyndemere | North | Permanent Generator | Portable Generator | 2009-2014 | n/a | Evaluating Solutions |
| Youell Rd | West | Permanent Generator | Backup Dry Prime Pump with a Diesel Engine | 2012 | n/a | Initial Project Analysis |

## Pump Station Backup Power Plan

| CIP Title | Basin | Original Proposed Solution | Updated Proposed Solution | Scheduled Completion Date | Actual Completion Date | Status Description As of October 2011 |
|---|---|---|---|---|---|---|
| ***Category 5 Projects (6 total projects)*** | | | | | | |
| Keavy | Central | Permanent Generator | Backup Dry Prime Pump with a Diesel Engine | 2010-2015 | 2010 | Complete |
| Meadow Lane | Central | Permanent Generator | Backup Dry Prime Pump with a Diesel Engine | 2010-2015 | 2009 | Complete |
| Cardinal Cove | North | Permanent Generator | n/a | 2010-2015 | n/a | Initial Project Analysis |
| Crestview | East | PS Elimination Study | n/a | 2010-2015 | n/a | Evaluating Solutions |
| Ripple Creek | East | PS Elimination Study | PS Elimination | 2010-2015 | 2010 | Complete |
| Winters Lane No. 2 | East | Permanent Generator | n/a | 2010-2015 | n/a | Initial Project Analysis |
| **CIP Title** | **Basin** | **Original Proposed Solution** | **Updated Proposed Solution** | **Scheduled Completion Date** | **Actual Completion Date** | **Status Description As of October 2011** |
| ***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 Engine | 2012-2015 | 2009 | Complete |
| Ridgeway | Central | Permanent Generator | Backup Dry Prime Pump with a Diesel Engine | 2012-2015 | 2009 | Complete |
| Richwood | West | Permanent Generator | Backup Dry Prime Pump with a Diesel Engine | 2012 | n/a | Project In-Progress |
| Twin Lakes | Central | Permanent Generator | n/a | 2012-2015 | n/a | Initial Project Analysis |

| Progress Summary | Number |
|---|---|
| 2007 Complete Projects | 4 |
| 2008 Complete Projects | 8 |
| 2009 Complete Projects | 24 |
| 2010 Complete Projects | 10 |
| 2011 Complete Projects | 16 |
| **Total Complete** | **62** |
| 2012 Active Projects | 8 |
| **Total Project Activity** | **70** |

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# Pump Station Overflow Elimination Plan

| CIP Title | Basin | Scheduled Completion Date | Actual Completion Date | Past Activity for 04/01/2011 to 06/30/2011 | Planned Activity for 07/01/2011 to 09/30/2011 |
|---|---|---|---|---|---|
| **Pump Station Overflow Elimination Projects** | | | | | |
| Alex-Licking | East | 12/31/2010 | 2008 | Complete | |
| Harrison Harbor | East | 12/31/2010 | *See PS Oveflow Elimination Annual Report May 11, 2009 | Complete | |
| Highland Acres | West | 12/31/2010 | 2010 | Complete | |
| Riley Road No.1 | East | 12/31/2010 | 2009 | Complete | |
| Ripple Creek | Central | 12/31/2010 | 2010 | Complete | |
| South Park | North | 12/31/2010 | 2010 | Complete | |
| Sunset | Central | 12/31/2010 | 2010 | Complete | |
| Taylorsport | North | 12/31/2010 | 2004 | Complete | |
| Allen Fork | North | 12/31/2014 | n/a | Initial Design | Initial Design |
| Crestview | East | 12/13/2014 | n/a | Phase 1 - Sewer and lateral rehab design is complete. Construction is underway. | |
| Kentucky Aire | West | 12/31/2013 | n/a | Final Design | Final Design |
| Lakeview | Central | Requested Delay - Awaiting Approval (see Watershed Plans) | | | |
| South Hampton | West | 3/31/2013 | n/a | Construction has started. Overflow will be eliminated when Western Regional improvements are complete and in service in 2013. | |
| Union | West | 3/31/2013 | n/a | Construction is complete. Overflow will be eliminated when Western Regional improvements are complete and in service in 2013. | |



Updated: January 30, 2012

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# Initial Watershed Projects

| CIP Title | Basin | Scheduled Completion Date | Actual Completion Date | | |
|---|---|---|---|---|---|
| **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, 2012

# Initial Watershed Projects

| CIP Title | Basin | Scheduled Completion Date | Actual Completion Date | Past Activity for 04/01/2011 to 6/30/2011 | Planned Activity for 07/01/2011 to 09/30/2011 |
|---|---|---|---|---|---|
| **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 | n/a | Construction | Construction |
| Western Regional Water Reclamation Facility | West | 2013 | n/a | Construction | Construction |
| Western Regional - Frogtown Interceptor Sewer (from Sunnybrook Dr. to Frogtown Rd.) | West | 2014 | n/a | Construction | Construction |
| Western Regional - Narrows Road Diversion PS | West | 2013 | n/a | Construction | Construction |
| Western Regional - Richwood Sewer and Force Main | West | Requested Removal as Initial Action Project - Awaiting Approval (see Watershed Plans) | | | |
| Western Regional - South Fork Gunpowder Interceptor Sewer and Rosetta Sewer | West | 2013 | n/a | Construction | Construction |
| Western Regional - Turkeyfoot Industrial Road Force Main | West | 2013 | n/a | Force main Construction was split into 4 phases. Phases 1, 2 & 3 are complete. Phase 4 is under construction. | |

**Watershed Improvement Program (2007 through 2014)**

| CIP Title | Basin | Project Description | Scheduled Completion Date | Actual Completion Date | Past Activity for 10/1/2011 to 12/31/2011 | Planned Activity for 1/1/2012 to 3/31/2011 | Target Project Benefit |
|---|---|---|---|---|---|---|---|
| **Basin Projects (Schedules listed in this section are subject to change based on the approval of SD1's Watershed Plans.)** | | | | | | | |
| Decentralized Control Projects | 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 | Beyond 2014 | n/a | Initial Design | Initial Design | Improve water quality of local streams |
| 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 | 2014 | n/a | Final Design | Construction | Reduce SSOs at Lakeview PS and increase PS reliability |
| Church Street (gray, green, and watershed controls) Phase 1 | Central | Disconnection of downspouts from approximately 130 homes, the separation of street load on six streets, new biofiltration basin and installation of approximately 1,300 linear feet of new 72-inch sewer | 2013 | n/a | Final Design | Final Design | Reduce CSO frequency and volume into Banklick Creek and improve structural integrity of sewer infrastructure. |
| Vernon Lane – Public & Private Source I/I Removal | Central | Combinbination of private I/I removal, sewer rehabilitation, manhole lining, and stormwater BMPs in area comprising approximatley 270 homes | Beyond 2014 | n/a | Final Design | Final Design | Eliminate Vernon Ln. SSO and improve water quality |
| Banklick Regional Wetlands | Central | Constructed wetland that treats flow diverted from Banklick Creek to reduce bacteria concentrations. | 2011 | 2011 | Finish Construction | Post-Construction Monitoring | Improve water quality of Banklick Creek |
| 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 | Beyond 2014 | n/a | Initial Design | Initial Design | Reduce I/I and SSOs in Lakeview PS service area |
| 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 | Beyond 2014 | n/a | Initial Design | Initial Design | Reduce I/I and SSOs in Licking River Siphon area |
| 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 | 2011 | 2011 | Finish Construction | Post-Construction Monitoring | Reduce CSO and SSO in Taylor Creek area and address basement flooding |
| 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 | 2014 | n/a | Final Design | Final Design | Zero overflows from Silver Grove CSO in the typical year and SSO reduction in the Highland Heights PS and Silver Grove PS service areas. |
| Demonstration of Green Technologies – Taylor Creek Retention | East | Construction of retention basin along Waterworks Road in Newport, KY to reduce storm water quantity and downstream flooding | 2011 | 2011 | Finish Construction | Complete | Reduce stormwater quantity; flood control |
| Riviera Sewer Replacement | East | Replacement of approximately 4,100 LF of deteriorated 24-inch pipe in the Taylor Creek area | 2012 | n/a | n/a | n/a | Reduce CSOs into Taylor Creek and address structural issues |
| 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 | Beyond 2014 | n/a | Initial Design | Initial Design | Reduce I/I and SSOs in Taylor Creek area |
| 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 | Beyond 2014 | n/a | Final Design | Final Design | Eliminate SSOs in Lakside Park |
| 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 | 2011 | 2011 | Post-Construction Monitoring | Post-Construction Monitoring | Reduce SSOs and illicit discharges in Lakeside Park |
| Avon Drive Sanitary Sewer Improvements | North | Replacement of 570 LF of 12-inch sewer with 24-inch pipe and installation of new storm sewer | 2010 | n/a | Post-Construction Monitoring | Post-Construction Monitoring | Reduce SSOs in Lakeside Park |
| Willow Run Dynamic Control Facility | North | Construction of a dynamic weir facility at the Willow Run overflow diversion to provide in-line storage | 2014 | n/a | Initial Design | Initial Design | CSO reduction using in-line storage |
| Willow Run Direct Entry Point Bar Racks | North | Installed bar racks on 10 direct entry points where open storm channels discharge into sewer system | 2009 | 2010 | Post-Construction Monitoring | Post-Construction Monitoring | Reduce debris entry into system, maintain capacity and reduce blockages |
| 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 | 2012 | n/a | Finish Construction | Post-Construction Monitoring | CSO reduction, informs future green infrastructure design |
| Dry Creek WWTP Headworks Imrpovements | North | Construction of a new 110 MGD headworks facility at the Dry Creek WWTP | 2013 | n/a | Construction | Construction | Increase reliability and wet weather treatment cpacity at Dry Creek WWTP |



Updated: January 30, 2012

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# *Project Fact Sheets Created Specifically for Public Communication Efforts*

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# ASH STREET PUMP STATION *and* FORCE MAIN

## PROJECT DESCRIPTION

Sanitation District No. 1 (SD1) is designing the Ash Street Pump Station and associated force main, which will be key components of the Eastern Regional Sanitary Sewer System. The Ash Street Pump Station will be located at the intersection of First Street and Ash Street in Silver Grove. The project is critical to SD1's capital improvement plan and is required by their Federal Court Order to reduce sewer overflows.

Currently, a 10-inch diameter sewer line conveys wastewater from local cities to the Silver Grove Pump Station, located at the intersection of Mary Ingles Highway & State Route 1998. However, during heavy rainfall, flow into the sewer quickly exceeds its conveyance capacity. The excess flow is discharged into a drainage ditch through a combined sewer overflow (CSO). This overflow discharges a combination of wastewater and storm water an average of 29 times per year with an annual overflow volume of about 2.4 million gallons (MG). The CSO discharge is located near a mobile home community and the surrounding area is subject to frequent backwater from the Ohio River. It experiences poor drainage even in low river conditions. When the river is elevated, ground and river water enter the Silver Grove Pump Station through low lying manholes and leaky sewers, resulting in sewer overflows near the Silver Grove Pump Station that discharge approximately 23.2 MG a year.

The new 7 to 9 million gallon per day (MGD) Ash Street Pump Station will redirect the flow to the state-of-the-art Eastern Regional Water Reclamation Facility (ERWRF) in Campbell County. The total, projected overflow volume reduced by this project is 38.4 MG. This project also includes:

- >> Installation of approximately 27,000 linear feet (LF) of 20-inch diameter force main to convey wet weather flows from Ash Street to the ERWRF.
- >> Redirecting the existing Silver Grove Force Main to the Ash Street Pump Station.
- >> Installation of a new gravity sewer immediately upstream of the Silver Grove Pump Station to convey the remaining flow and to eliminate the intrusion of river water.
- >> Abandonment of the 10-inch diameter gravity sewer that currently conveys flow from downtown Silver Grove to the Silver Grove Pump Station.
- >> New services for the customers that are currently served directly by the 10-inch diameter gravity sewer to be abandoned. These customers shall receive sewer service through the installation of approximately 19 individual grinder pumps and 6,000 LF of low pressure sewer.

## PROJECT TIMELINE

Construction is expected to start in Winter 2011 and be completed by Summer 2013.

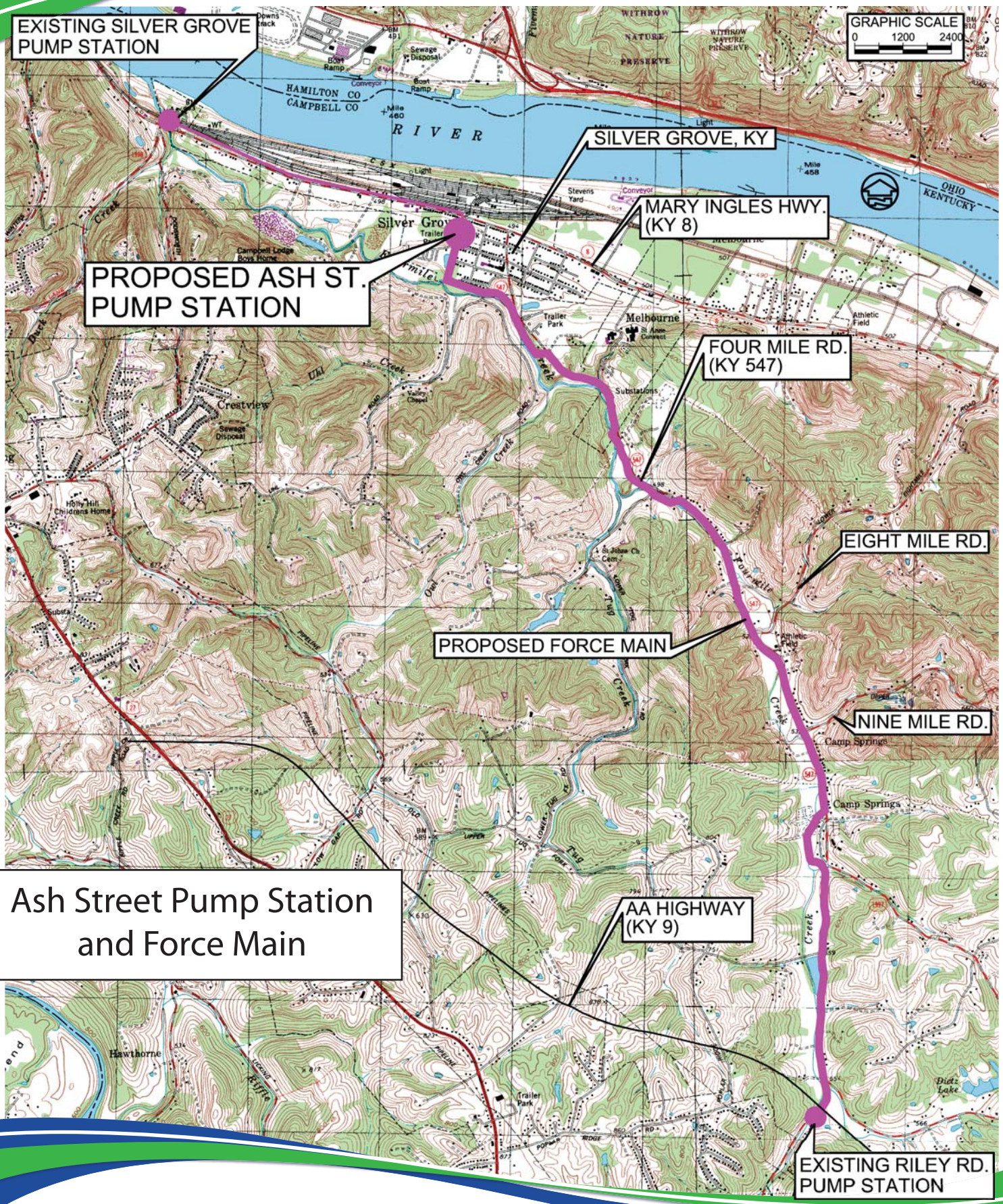
## CONTACT INFORMATION

- >> Kyle Boyle, SD1 Project Engineer | 859-547-1644 | kboyle@sd1.org
- >> Joe Henry, GRW, Inc. | 859-223-3999 | jhenry@grwinc.com
- >> SD1 Customer Care Team | 859-578-7452 | info@sd1.org

for more information please visit **www.SD1.org**

*for* PROJECT MAP, *see back page*

# PROJECT MAP




Ash Street Pump Station and Force Main

# CHURCH STREET CSO REDUCTION

## PROJECT DESCRIPTION

Near Church Street in Taylor Mill, there is a combined sewer overflow (CSO) that spills approximately 56 million gallons of a wastewater and storm water mixture into Banklick Creek every year. This overflow volume, along with other pollutant sources, contribute to poor water quality in Banklick Creek and make it unsafe for recreation after rain events. More than 150 acres of land drain to this overflow location, which spans the cities of Taylor Mill and Covington and consists of primarily residential areas.

Through SD1's innovative watershed-based approach to water quality improvements, a combination of green infrastructure storm water management techniques and new sewers will be constructed in this area to reduce the wastewater and storm water entering Banklick Creek, treat storm water flowing to the stream to increase its water quality, improve and restore natural habitats in an underutilized natural drainage area and provide educational opportunities that highlight the water quality improvements needed in our region.

The Church Street CSO Reduction Project involves the construction of an innovative storm water management biofiltration basin to capture and treat the storm water runoff from the area, rehabilitation and replacement of existing

combined sewers, construction of approximately 2,000 linear feet of separate storm sewer system and removal of storm water connections like down spouts from private property.

## PROJECT BENEFITS

>> Environmental: This project will provide an improvement in both water quantity and quality in Banklick Creek. Based on typical year rainfall, the annual volume of the Church Street CSO will be reduced by a projected 52 million gallons once all phases of the project are completed. By separating and treating the storm water runoff, the water quality of Banklick Creek will also be improved.

>> Economic: The biofiltration basin is an innovative green infrastructure approach that will provide greater water quality, public health and community benefits than a more costly gray alternative. The total cost of this project is $11.9 million and total estimated CSO volume reduction is 52 million gallons. There is an overall cost savings of approximately $4.5 million compared to a traditional gray infrastructure storage tank solution.

>> Social: Currently, the proposed location for the biofiltration basin is an underutilized, unmaintained area subject to overflows and flooding. This space will now be fully utilized and redeveloped. The reduction in CSO volume and improvement in storm water quality will serve to protect public health in the nearby area. In addition, SD1 will be working closely with the City of Taylor Mill, City of Covington and other local officials to evaluate opportunities to incorporate walking paths and other amenities around the biofiltration basin to improve the public recreational value of the open space area and potentially allow connectivity to other nearby public park areas.

## PROJECT TIMELINE

Construction of Phase I is scheduled to begin Summer 2012 and be completed by Summer 2014, when Phase II is projected to begin.

## CONTACT INFORMATION


>> Jim Turner | 859-547-7461 | jturner@sd1.org

>> SD1 Customer Care Team | 859-578-7452 | info@sd1.org


for more information please visit

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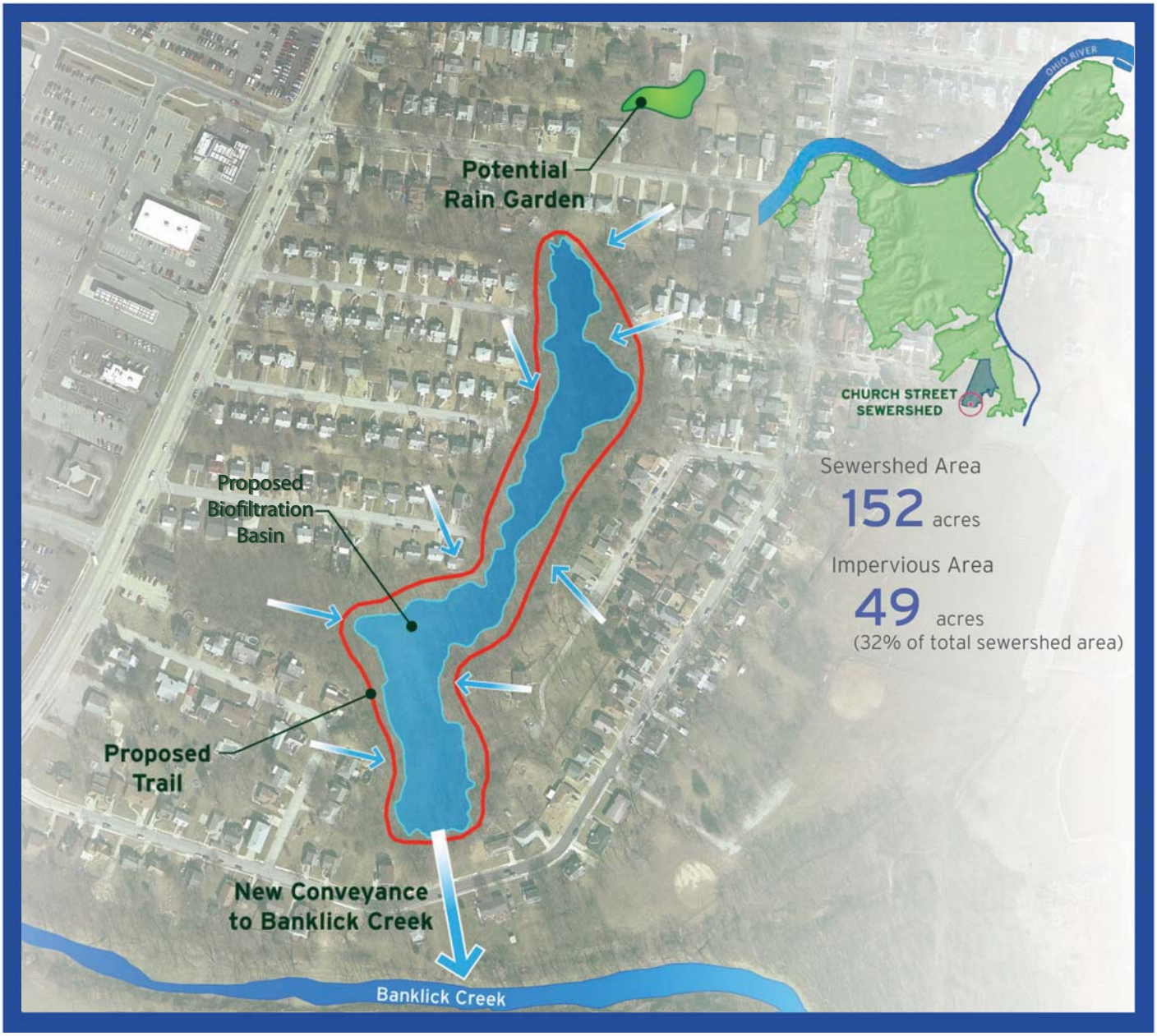
*for* PROJECT MAP, *see back page*

# PROJECT MAP




SD1 currently anticipates the construction of a storm water biofiltration basin. SD1 will be working closely with the City of Taylor Mill, City of Covington and other local officials to evaluate opportunities to incorporate walking paths and other amenities around the biofiltration basin to improve the public recreational value of the open space area and potentially allow connectivity to other nearby public park areas. Native wetland plants and amended soils will provide a valuable, natural filter for storm water before it flows directly into Banklick Creek.

# DRY CREEK WASTEWATER TREATMENT AND ODOR CONTROL IMPROVEMENT PROJECT

## PROJECT DESCRIPTION

In an effort to provide better and more efficient sanitary sewer service to our customers, SD1 is making a series of improvements to our Dry Creek Wastewater Treatment Plant.

Currently at Dry Creek, sanitary flows from both the Bromley Pump Station and the Lakeview Pump Station enter the plant through one Headworks facility, the site of the preliminary stage in wastewater treatment. Heavy precipitation can greatly increase the amount of flow being pumped through the Lakeview and Bromley Pump Stations, overwhelming the existing Headworks facility and resulting in a decrease in treatment effectiveness, backups and combined sewer overflows (CSOs). As a part of the Dry Creek improvement project, a second Headworks facility will be built to accept flow strictly from the Lakeview Pump Station, increasing Dry Creek's treatment capacity and alleviating stress on the existing Headworks facility. When more waste is able to be pumped from the pump stations to the treatment plant, fewer CSOs occur and less sanitary waste pollutes the environment.

The new Headworks will feature cutting edge technology, allowing for more efficient and effective preliminary wastewater treatment. Advanced screening equipment will allow for removal of finer particles from the wastewater, decreasing wear and tear on the pipes and pumps, and automated flow-monitoring controls will streamline the preliminary treatment stage and decrease the risk of flooding.

In addition, the new Headworks will employ the innovative odor control features used at our Eastern Regional and Western Regional Water Reclamation Facilities. This highly effective odor control measure utilizes a mulch pit into which gases from the incoming wastewater are pumped. The mulch filters the foul gases, trapping and eliminating odor. The Solids Handling area will also receive an odor-control upgrade. A two-stage chemical scrubber will be installed to capture and treat the odors emitting from the dewatered sludge solids.

Aside from the new Headworks, several other improvements for Dry Creek are included in the project. To streamline the dumping process for grease and septage haulers, each hauler will be given a key fob that will grant access to the dumping area and control all necessary equipment while tracking how often each hauler is dumping. Also, the vactor dumping area will be doubled in size. Both enhancements will increase productivity and dumping capacity and decrease dumping time.

Dry Creek will also be adding environmental technology to conserve energy and control storm water runoff. A large, domed skylight will be constructed in the new Headworks facility to increase natural light in the building, and a bioretention basin will be added to capture storm water runoff from the plant and filter it before it enters the neighboring creek. This basin will be an aesthetic asset to Dry Creek's natural landscape and remove pollutants from the many impervious surfaces at the plant.

## PROJECT TIMELINE

The Dry Creek Wastewater Treatment and Odor Control Improvement Project is scheduled to be completed in the year 2013.

## CONTACT INFORMATION


>> Joe Baxter, Dry Creek Wastewater Treatment Plant Manager | 859-547-1111 | jbaxter@sd1.org

>> John Clark, Director of Treatment Plant and Pump Station Operations | 859-547-1108 | jclark@sd1.org

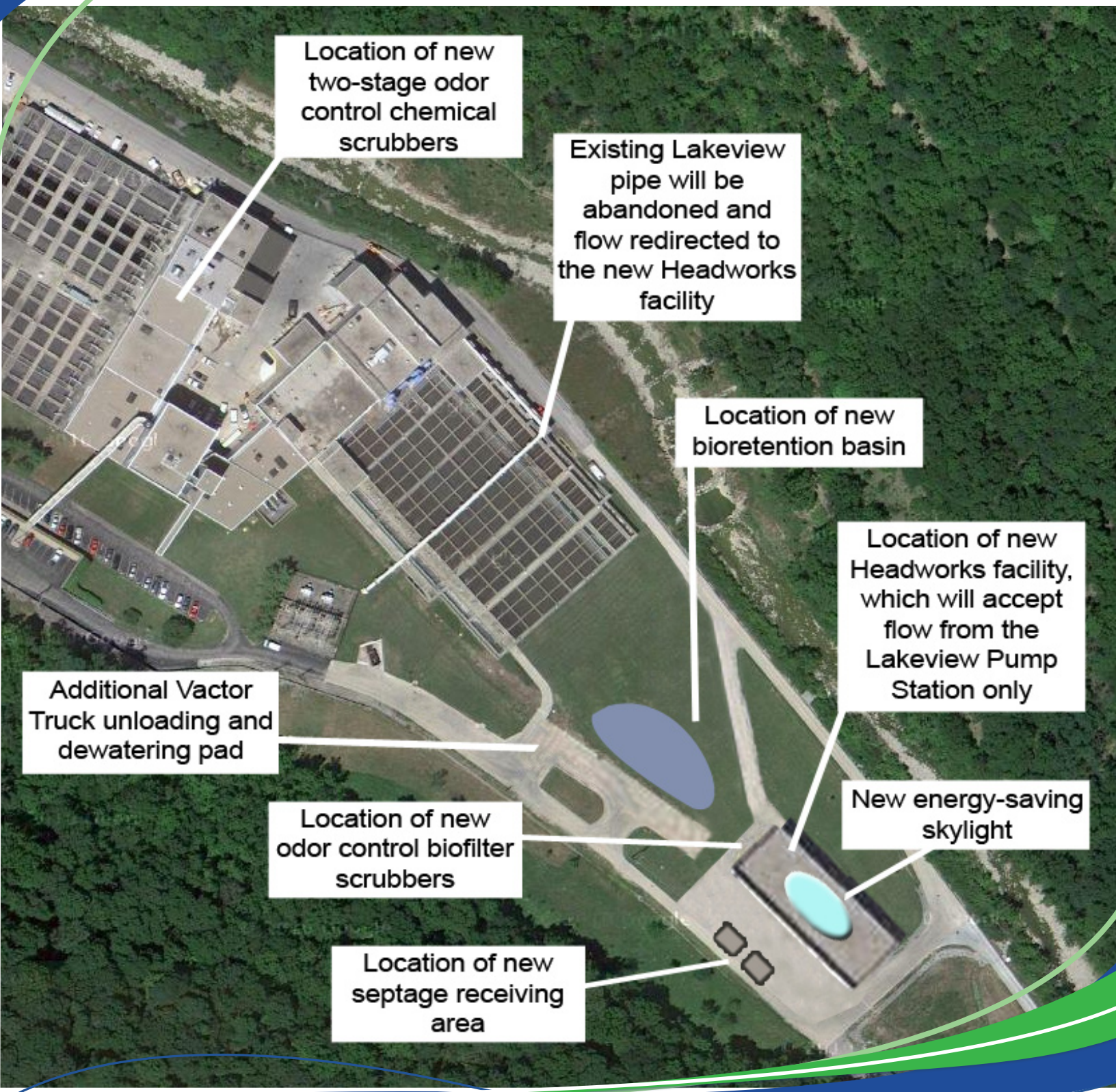
>> SD1 Customer Care Team | 859-578-6776 | info@sd1.org


for more information please visit

**www.SD1.org**

*for* PROJECT MAP, *see back page*

## PROJECT MAP


Location of new two-stage odor control chemical scrubbers
Existing Lakeview pipe will be abandoned and flow redirected to the new Headworks facility
Location of new bioretention basin
Location of new Headworks facility, which will accept flow from the Lakeview Pump Station only
Additional Vactor Truck unloading and dewatering pad
New energy-saving skylight
Location of new odor control biofilter scrubbers
Location of new septage receiving area

# FROGTOWN INTERCEPTOR SEWER

## PROJECT DESCRIPTION

Sanitation District No. 1 (SD1) is constructing the next portion of the Western Regional Sanitary Sewer System along Gunpowder Creek from Sunnybrook Drive to Frogtown Road. The project includes installation of approximately 10,900 feet of 42-inch interceptor sewer and related manholes. The majority of the sewer will be installed by open cut, trench construction. However, there will be one bore and jack under Mount Zion Road.

The project is an important project in SD1's capital improvement plan and is required by their Federal Court Order to reduce Sanitary Sewer Overflows (SSOs). This sewer will replace the existing sewer along this alignment and will ultimately eliminate two pump stations in the area, the South Hampton Pump Station and Hemstead Pump Station. It will also convey flows from the upstream sewers to the downstream South Gunpowder Interceptor. SD1 was able to obtain a low interest loan to fund the project through Kentucky Infrastructure Authority (KIA).

## PROJECT TIMELINE

Construction is expected to start Winter 2010 and be completed by Spring 2012.

for more information please visit

**www.SD1.org**

## TEMPORARY INCONVENIENCES

- Most of the construction is along Gunpowder Creek. However, construction vehicles will need to access the project area.
- Access to homes will be maintained throughout the project. Some noise, dirt, vibration, and disturbance will occur as the project proceeds.
- Expect travel delays in and around the construction area and plan travel time accordingly.

## SAFETY

- The contractor is required to follow all OSHA safety requirements. However, if you become aware of a public safety hazard, please report it to 911 immediately.
- Children can be curious about construction. Please keep them away from machinery, trenches, and pits to avoid accidents.
- If you see a potentially unsafe condition or safety fencing that needs repair, please contact SD1 immediately.
- Follow the speed limit and be aware that in construction zones, the speed limits are often lower than normal.

## RESTORATION

Restoration of landscaping and grassy areas disturbed by construction will begin after construction is complete in that area. Every effort will be made to restore property to its original condition.

## CONTACT INFORMATION

- Bob Wilson, SD1 Project Manager | (859) 578-7469 | rwilson@sd1.org
- Tom Schaffer, Project Engineer, HDR Engineering, Inc. | (859) 223-3755 | tom.schaffer@hdrinc.com
- SD1 Customer Care Team | (859) 578-7452 | info@sd1.org

# NARROWS ROAD DIVERSION PUMP STATION

## PROJECT DESCRIPTION

Sanitation District No. 1 (SD1) is constructing a Diversion Pump Station (DPS) which is a key component of the Western Regional Sanitary Sewer System improvements. The DPS will be located on Narrows Road where it crosses Bullock Pen Creek in Erlanger. The project is a critical project in SD1's capital improvement plan required by their Federal Court Order to reduce Sanitary Sewer Overflows (SSOs).

Two existing major gravity sewer interceptors converge at the DPS site and currently flow to the Lakeview Pump Station and ultimately the Dry Creek Wastewater Treatment Plant. The new 17 million gallon per day peak capacity DPS will redirect the flow from these two interceptors to the Western Regional Water Reclamation Facility in Boone County. This improvement project will reduce flow to the Lakeview Pump Station resulting in a reduction of SSOs at the Lakeview Pump Station. The following photo show a rendering of the front of the proposed pump station building.

The project also includes construction of a new aerial sewer line crossing of Bullock Pen Creek near the pump station, to replace an old aerial crossing in the same location. Improvements to the Bullock Pen Creek channel are also part of the project, including stream flow velocity control and bank erosion control elements near the pump station.

SD1 has received a low-interest loan through the Kentucky Infrastructure Authority (KIA) to fund this project.

## PROJECT TIMELINE

Construction of the DPS is expected to start in January 2011 and be completed by Summer 2012.

## TEMPORARY INCONVENIENCES

The construction site is located near the dead-end of Narrows Road. However, construction traffic on Narrows Road and Brightleaf Boulevard may create some noise and disturbance as the project proceeds.

## SAFETY

- The construction contractor is required to follow all OSHA safety requirements.
- Children can be curious about construction. Please keep them away from machinery, trenches, or pits to avoid accidents.
- If you see a potentially unsafe condition or safety fencing that needs repair, please contact SD1 immediately.

## CONTACT INFORMATION

- Kyle Boyle, Project Engineer | (859) 547-1644 | kboyle@sd1.org
- John LaRue, Project Engineer, HDR Engineering, Inc. | (859) 223-3755 | john.larue@hdrinc.com
- SD1 Customer Care Team | (859) 578-7452 | info@sd1.org

for more information please visit
**www.SD1.org**

*for* PROJECT MAP, *see back page*

# SOUTH FORK GUNPOWDER INTERCEPTOR *and* ROSETTA SEWER

## PROJECT DESCRIPTION

Sanitation District No. 1 (SD1) is constructing a portion of the Western Regional Sanitary Sewer System along Gunpowder Creek starting at the Fowler Creek Pump Station near Woodcreek Subdivision to Sunnybrook Drive and along Utter Back Creek from Haines Road to Rosetta Drive. The project includes installation of approximately 17,000 feet of 42-inch to 66-inch and approximately 3,700 feet of 30-inch to 36-inch interceptor sewer and related manholes. The majority of the sewer will be installed by open cut, trench construction. However, there will be two tunnels; one 150 feet long and one 1,170 feet long.

The project is a critical project in SD1's capital improvement plan required by their Federal Court Order to reduce Sanitary Sewer Overflows (SSOs). This sewer will replace the existing sewer along this alignment and will ultimately eliminate both the Fowler Creek Pump Station and the Rosetta Pump Station. It will also convey flows from the upsteam sewers including Sunnybrook Sewer to the downstream Gunpowder Interceptor. SD1 was able to obtain a low interest loan to fund the project through Kentucky Infrastructure Authority (KIA).

## PROJECT TIMELINE

Construction is expected to start Fall 2010 and be completed by Spring 2012.

for more information please visit **www.SD1.org**

## TEMPORARY INCONVENIENCES

- Most of the construction is along Gunpowder Creek. However, construction traffic will need to access the project area.
- Access to homes will be maintained throughout the project. Some noise, dirt, vibration, and disturbance will occur as the project proceeds.
- Expect travel delays in and around the construction, so plan travel time accordingly to avoid stress and frustration.

## SAFETY

- The contractor is required to follow all OSHA safety requirements. However, if you become aware of a public safety hazard, please report it to 911 immediately.
- Children can be curious about construction. Please keep them away from machinery, trenches or pits to avoid accidents.
- If you see a potentially unsafe condition or safety fencing that needs repair, please contact SD1 immediately.
- Follow the speed limit and be aware that in construction zones, the speed limits are often lower than normal.

## RESTORATION

Restoration of landscaping and grassy areas disturbed by construction will begin after construction is complete in that area. Every effort will be made to restore property to its original condition.

## CONTACT INFORMATION

- Bob Wilson, Project Manager | (859) 578-7469 | rwilson@sd1.org
- Tom Schaffer, Project Engineer, HDR Engineering, Inc. | (859) 223-3755 | tom.schaffer@hdrinc.com
- SD1 Customer Care Team | (859) 578-7452 | info@sd1.org

*for* PROJECT MAP, *see back page*

# Western Regional Tunnel Conveyance System Fact Sheet

## .....Project Description.....

This gravity sewer project will route flow to the new 20 million gallon per day Western Regional Water Reclamation Facility. The project consists of 32,610 ft. of 8.5 ft. diameter pipe to be installed by tunneling methods as well as 2,990 ft. of open cut sewer installation and a 700 ft. pipe bridge over Willoughby Creek. The completion of this project is a requirement of the SD1 Consent Decree and is the single largest capital project in SD1 history. When completed, the projects will reduce modeled sanitary sewer overflow volumes by 60 million gallons annually and allow for the removal of at least ten pump stations.

## .....Project Benefits.....

- 14 million gallons wet weather storage.
- Relief to existing interceptor sewers with added system capacity for future growth.
- Energy saving design that flows by gravity, eliminating the need for a pump station.
- Operational simplicity, minimal maintenance and limited operations involvement.

## .....Project Facts.....

- Tunnel Design and Construction Management Team: HDR Quest, Hatch Mott MacDonald, CH2MHill and Thelen Associates, Inc.
- Contractor: McNally Kiewit WRCT JV
- Construction cost: $110,000,000
- Start date: June 2009
- Anticipated average daily flow at start-up: 10 million gallons per day
- The tunnel will be constructed up to 300 feet below ground.
- Tunnel excavation is predominantly through Kope Formation Shale with layers of stronger limestone.

## .....Tunnel Boring Machine Facts.....

- The Tunnel Boring Machine (TBM) was originally manufactured in 1969 by Robbins Company and was first used in 1970.
- The TBM has successfully completed twelve projects in Canada and the USA (including Frankfort, KY and Cleveland, OH).
- The TBM was scheduled to excavate 500 feet per week.
- As the TBM advanced, rings of rolled steel section and timber boards were erected to support the ground.
- The TBM cutterhead was 145 inches in diameter, had twenty seven, 12-inch diameter disc cutters and eight muck buckets.
- The TBM cutterhead rotated clockwise at a maximum 6.45 times per minute and was driven by four 100HP electric motors.
- The TBM was propelled forward using two 10-inch diameter jacks with 65" stroke with maximum thrust of 550,000 pounds.
- The TBM was kept on alignment using a laser which is connected to a computer.
- The TBM was approximately 200 ft. in length and the body of the TBM weighed 65 tons.

# APPENDIX C:

## *Cumulative and Annual Overflow Data*

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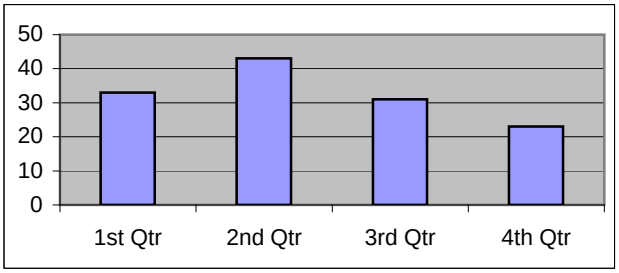
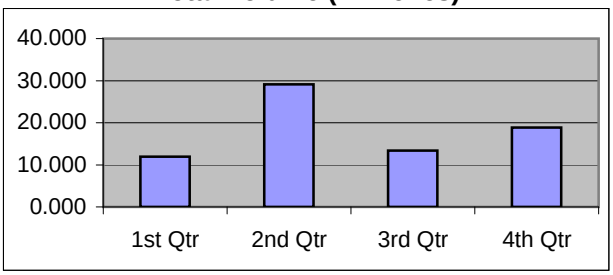
**Cumulative Overflow Data**
**January 1, 2011 through December 31, 2011**

## Rainfall

### Total Occurrences

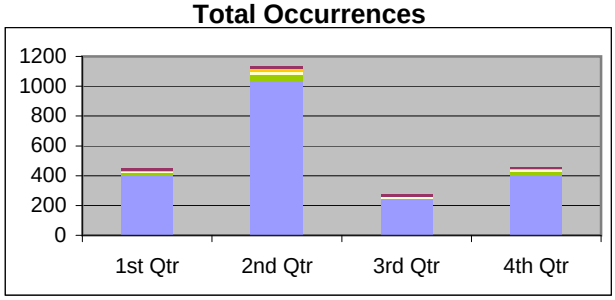



### Total Volume (In Inches)

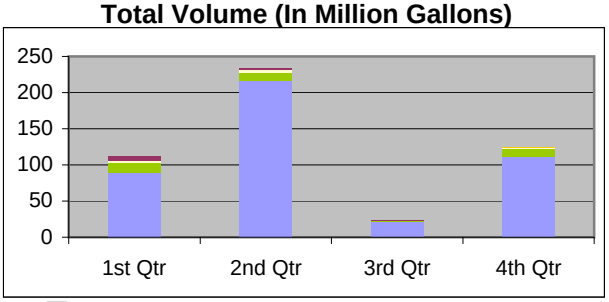



## SSOs - Due to Wet Weather (WW) and Operational Issues

### Total Occurrences



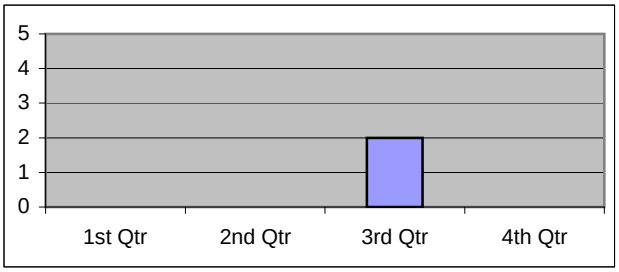

### Total Volume (In Million Gallons)



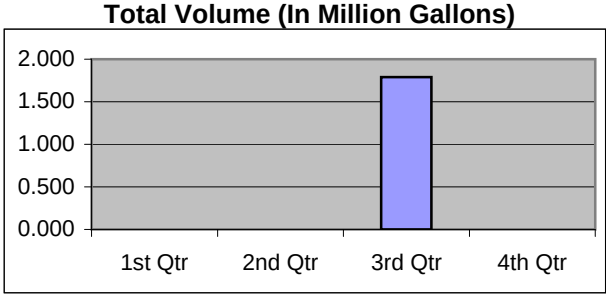

Recurring WW SSOs
Recurring WW CD Pump Station Overflows
Recurring WW Other Pump Station Overflows
Inactive WW Overflows
SSOs Due to Operational Issues

## Dry Weather CSOs

### Total Occurrences

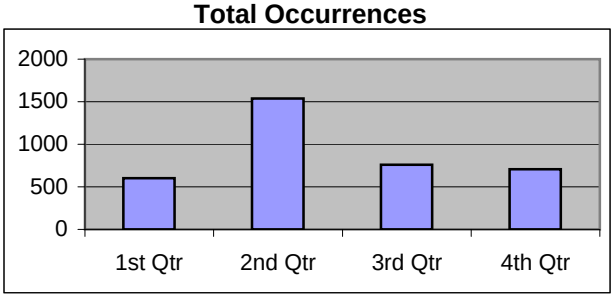



### Total Volume (In Million Gallons)

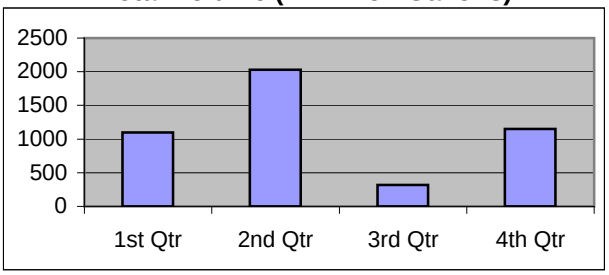



## Wet Weather CSOs

### Total Occurrences

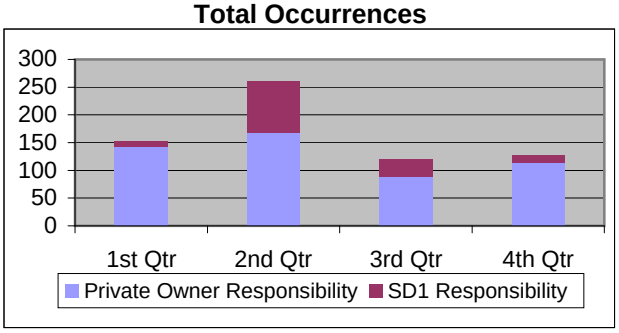



### Total Volume (In Million Gallons)




## Building Backups

### Total Occurrences




| 2011 Overflow Summary | | | |
|---|---|---|---|
| | **Occurrences** | **Volume** | |
| **Rainfall** | 130 | 73.260 | inches |
| **Recurring WW SSOs** | 2221 | 483.809 | MG |
| **Inactive WW SSOs** | 36 | 1.239 | MG |
| **Operational SSOs** | 66 | 8.030 | MG |
| **Dry Weather CSOs** | 2 | 1.790 | MG |
| **Wet Weather CSOs** | 3602 | 4596.340 | MG |
| | | | |
| **Building Backups (Private)** | | 513 | |
| **Building Backups (SD1)** | | 146 | |

Updated: January 30, 2012

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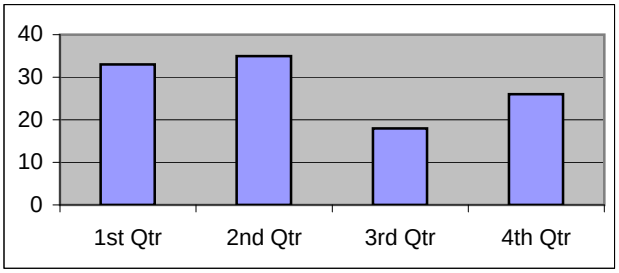
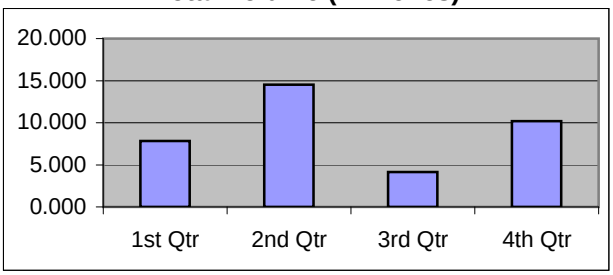
**Cumulative Overflow Data**
**January 1, 2010 through December 31, 2010**

## Rainfall

### Total Occurrences

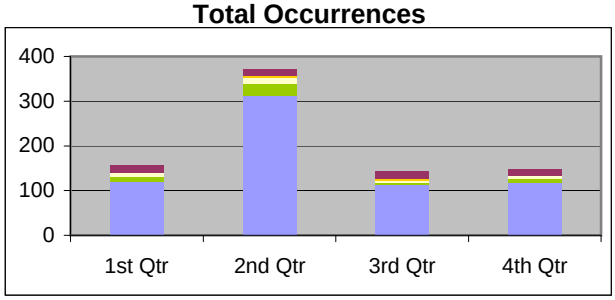



### Total Volume (In Inches)

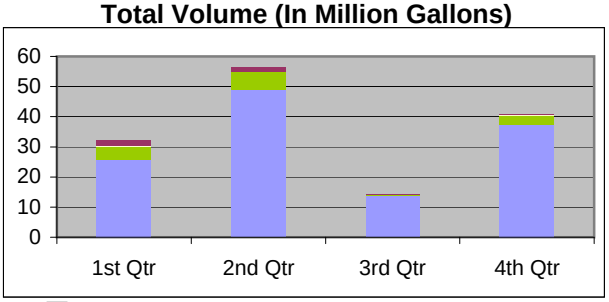



## SSOs - Due to Wet Weather (WW) and Operational Issues

### Total Occurrences



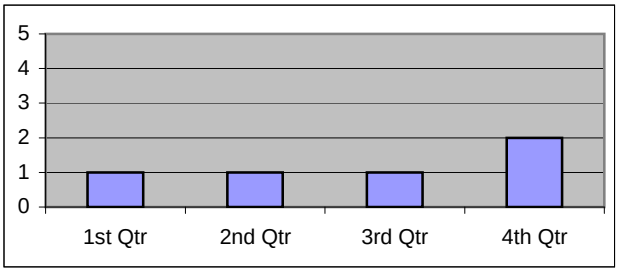

### Total Volume (In Million Gallons)



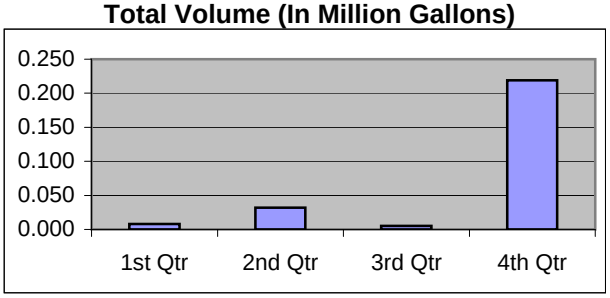

Recurring WW SSOs
Recurring WW CD Pump Station Overflows
Recurring WW Other Pump Station Overflows
Inactive WW Overflows
SSOs Due to Operational Issues

## Dry Weather CSOs

### Total Occurrences

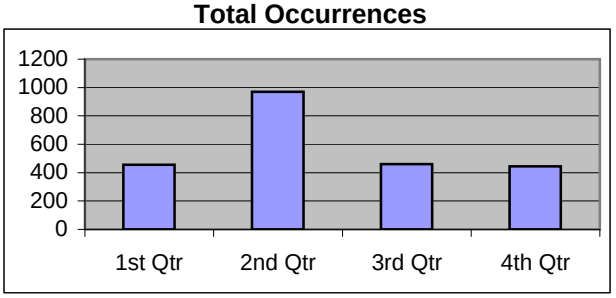



### Total Volume (In Million Gallons)

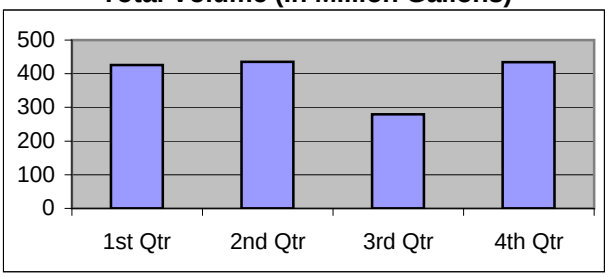



## Wet Weather CSOs

### Total Occurrences

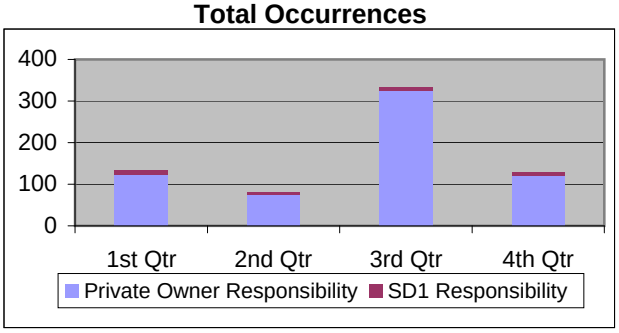



### Total Volume (In Million Gallons)




## Building Backups

### Total Occurrences




| 2010 Overflow Summary | | | |
|---|---|---|---|
| | **Occurrences** | **Volume** | |
| **Rainfall** | 112 | 36.670 | inches |
| **Recurring WW SSOs** | 748 | 140.280 | MG |
| **Inactive WW SSOs** | 11 | 0.064 | MG |
| **Operational SSOs** | 63 | 3.486 | MG |
| **Dry Weather CSOs** | 5 | 0.264 | MG |
| **Wet Weather CSOs** | 2332 | 1575.500 | MG |
| | | | |
| **Building Backups (Private)** | | 644 | |
| **Building Backups (SD1)** | | 36 | |

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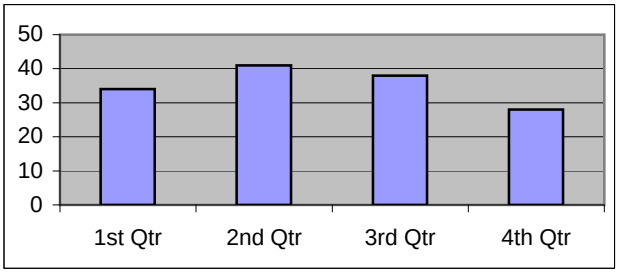
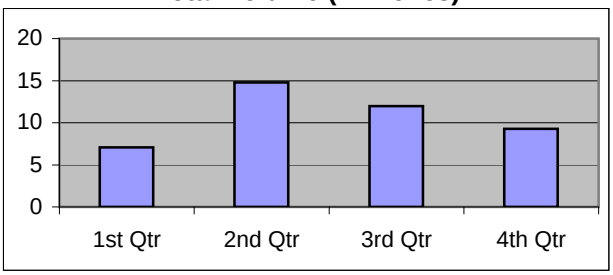
**Cumulative Overflow Data**
**January 1, 2009 through December 31, 2009**

## Rainfall

### Total Occurrences

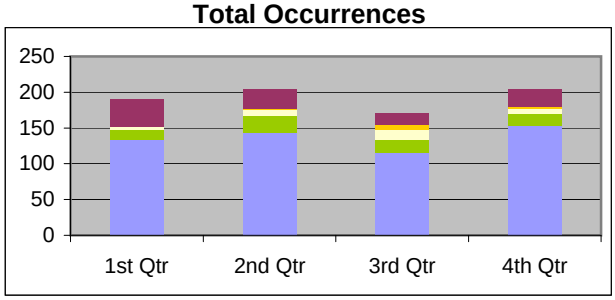



### Total Volume (In Inches)

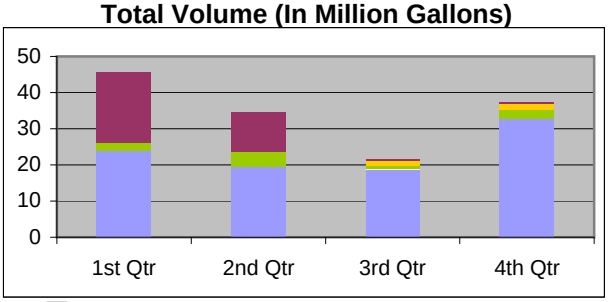



## SSOs - Due to Wet Weather (WW) and Operational Issues

### Total Occurrences



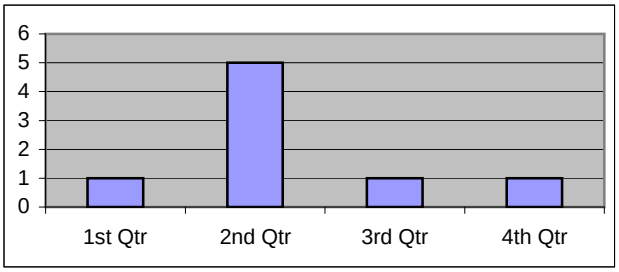

### Total Volume (In Million Gallons)



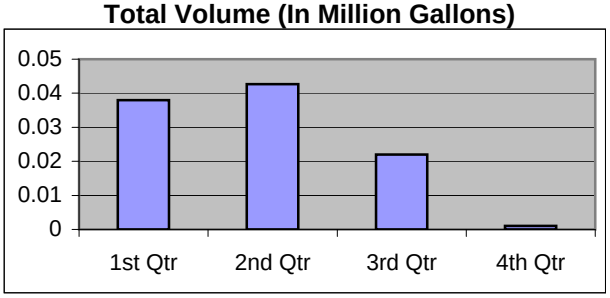

Recurring WW SSOs
Recurring WW CD Pump Station Overflows
Recurring WW Other Pump Station Overflows
Inactive WW Overflows
SSOs Due to Operational Issues

## Dry Weather CSOs

### Total Occurrences

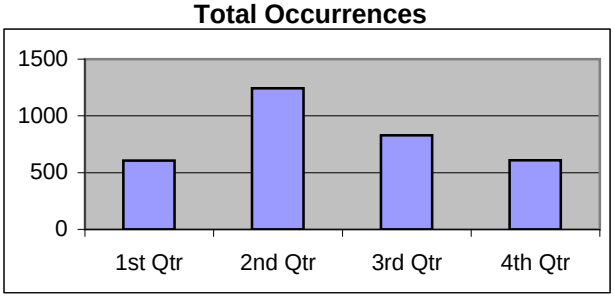



### Total Volume (In Million Gallons)

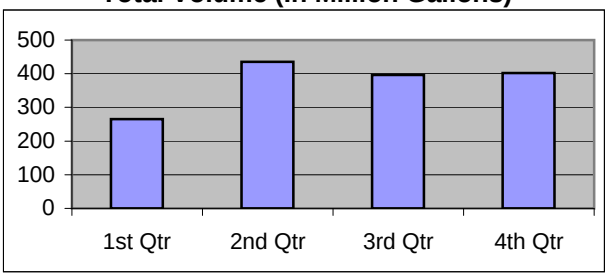



## Wet Weather CSOs

### Total Occurrences

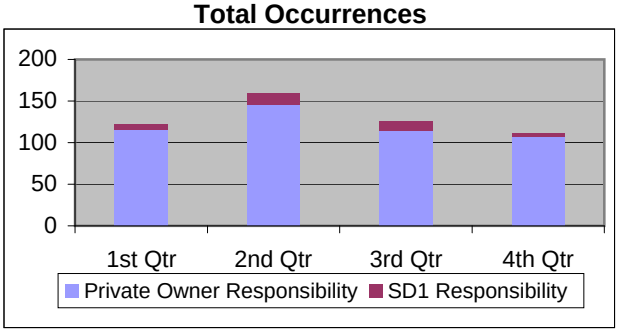



### Total Volume (In Million Gallons)




## Building Backups

### Total Occurrences




| 2009 Overflow Summary | | | |
|---|---|---|---|
| | **Occurrences** | **Volume** | |
| **Rainfall** | 141 | 43.11 | inches |
| **Recurring WW SSOs** | 651 | 105 | MG |
| **Inactive WW SSOs** | 13 | 3 | MG |
| **Operational SSOs** | 108 | 31 | MG |
| **Dry Weather CSOs** | 8 | 0.104 | MG |
| **Wet Weather CSOs** | 3289 | 1,502 | MG |
| | | | |
| **Building Backups (Private)** | | 482 | |
| **Building Backups (SD1)** | | 36 | |

Updated January 29, 2010

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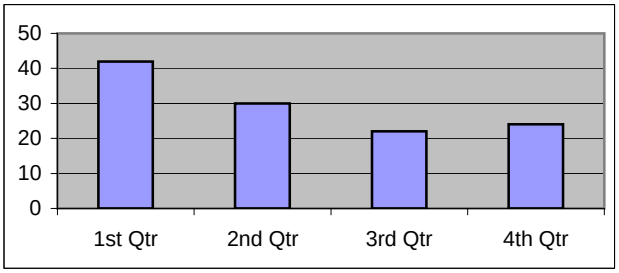
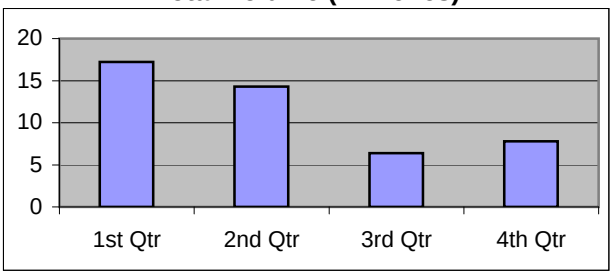
**Cumulative Overflow Data**
**January 1, 2008 through December 31, 2008**

## Rainfall

### Total Occurrences

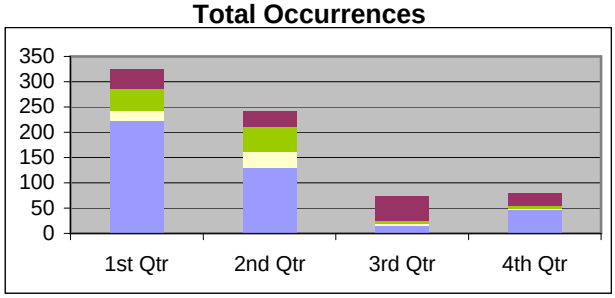



### Total Volume (In Inches)

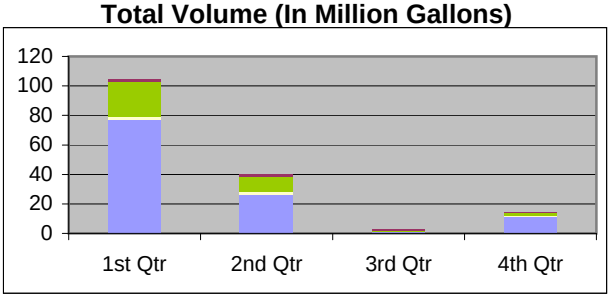



## SSOs - Due to Wet Weather (WW) and Operational Issues

### Total Occurrences



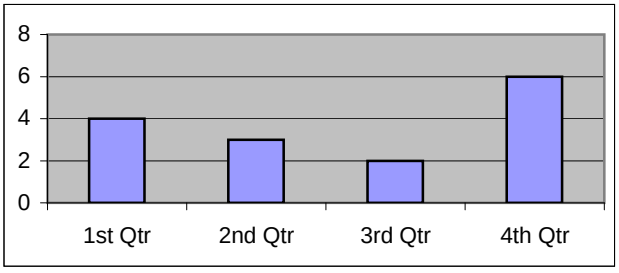

### Total Volume (In Million Gallons)



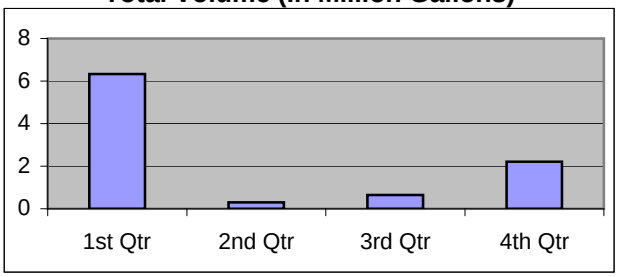

Recurring WW CD Pump Station Overflows
Recurring WW Other Pump Station Overflows
SSOs Due to Operational Issues
Recurring WW SSOs

## Dry Weather CSOs

### Total Occurrences

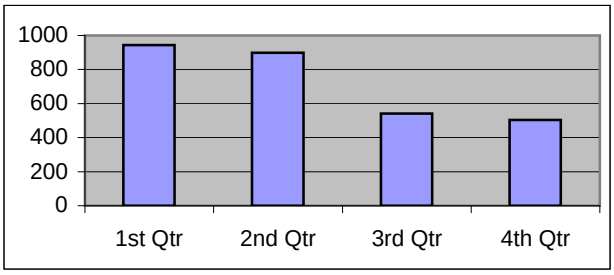



### Total Volume (In Million Gallons)

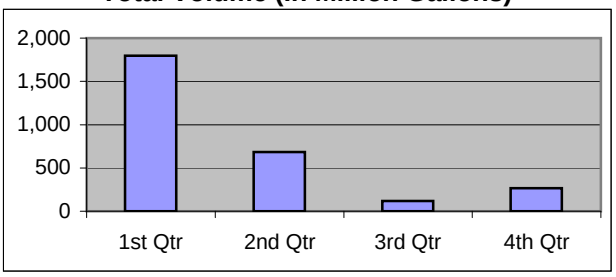



## Wet Weather CSOs

### Total Occurrences

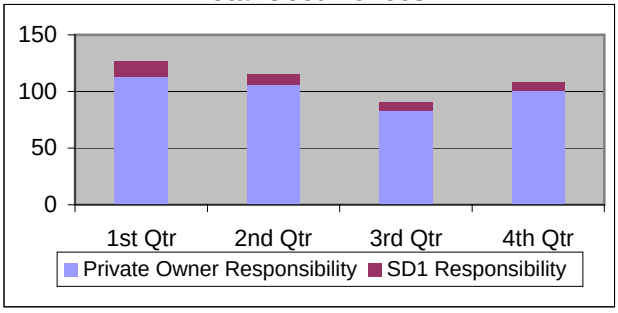



### Total Volume (In Million Gallons)




## Building Backups

### Total Occurrences




## 2008 Overflow Summary

| | Occurrences | Volume | |
|---|---|---|---|
| **Rainfall** | 118 | 45.66 | inches |
| **Recurring WW SSOs** | 576 | 158 | MG |
| **Inactive WW SSOs** | N/A | N/A | |
| **Operational SSOs** | 143 | 5 | MG |
| **Dry Weather CSOs** | 15 | 9 | MG |
| **Wet Weather CSOs** | 2888 | 2,869 | MG |
| | | | |
| **Building Backups (Private)** | | 402 | |
| **Building Backups (SD1)** | | 39 | |

Updated January 29, 2010

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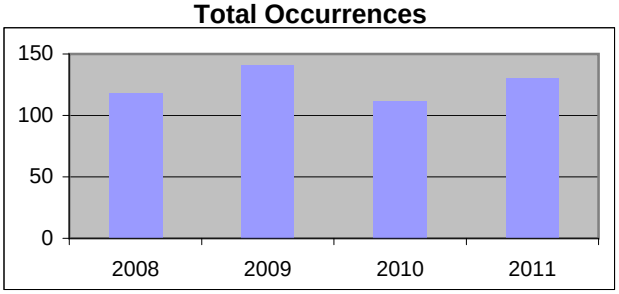
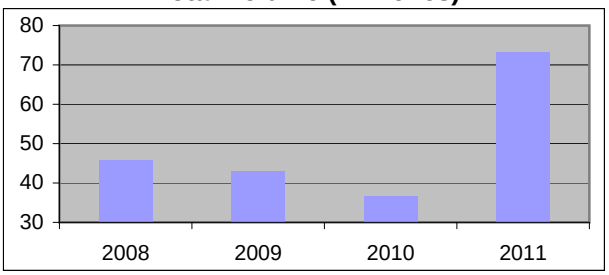
# Annual Cumulative Overflow Data
# 2008 through 2011

## Rainfall

### Total Occurrences

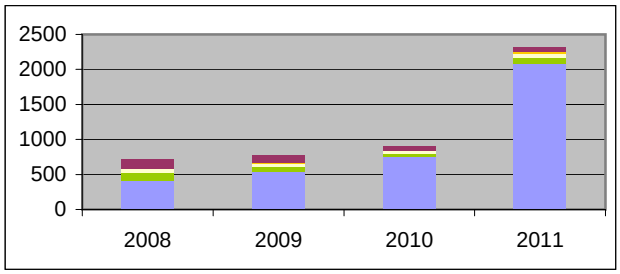



### Total Volume (In Inches)

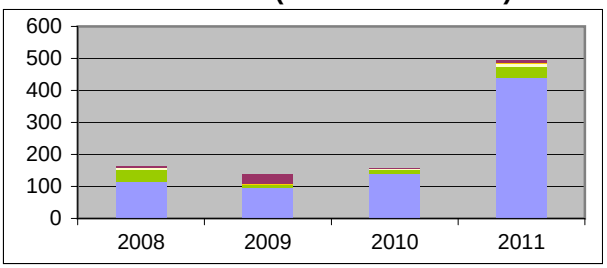



## SSOs - Due to Wet Weather (WW) and Operational Issues

### Total Occurrences



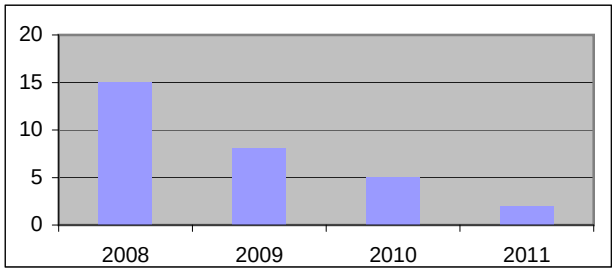

### Total Volume (In Million Gallons)



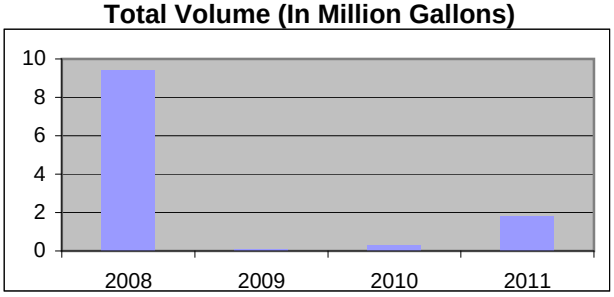

Recurring WW SSOs
Recurring WW CD Pump Station Overflows
Recurring WW Other Pump Station Overflows
Inactive WW Overflows
SSOs Due to Operational Issues

## Dry Weather CSOs

### Total Occurrences

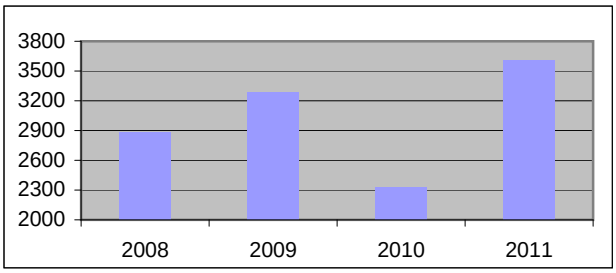



### Total Volume (In Million Gallons)

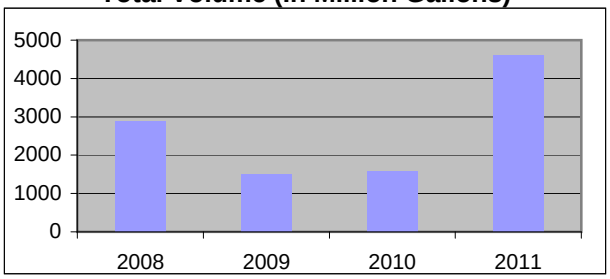



## Wet Weather CSOs

### Total Occurrences

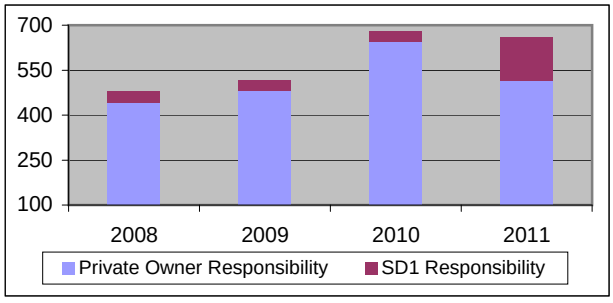



### Total Volume (In Million Gallons)




## Building Backups

### Total Occurrences




| Change from 2010 to 2011 | | | |
|---|---|---|---|
| | Occurrences | Volume | |
| Rainfall | 18 | 36.59 | inches |
| Recurring WW SSOs | 1386 | 333.11 | MG |
| Inactive WW SSOs | 25 | 1.18 | MG |
| Operational SSOs | 3 | 4.54 | MG |
| Dry Weather CSOs | -3 | 1.53 | MG |
| Wet Weather CSOs | 1270 | 3020.84 | MG |
| | | | |
| Building Backups (Private) | | -131 | |
| Building Backups (SD1) | | 110 | |

Updated: January 30, 2012

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# 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 | 0020005 | Silver Grove | Campbell | 13 | 3.11 |
| 2 | 0020006 | Silver Grove | Campbell | 13 | 0.44 |
| 3 | 0020007 | Silver Grove | Campbell | 9 | 0.09 |
| 4 | 0020008 | Unicorp Campbell County | Campbell | 7 | 0.15 |
| 5 | 0020012 | Unicorp Campbell County | Campbell | 0 | 0.00 |
| 6 | 0020031 | Unicorp Campbell County | Campbell | 0 | 0.00 |
| 7 | 0020032 | Unicorp Campbell County | Campbell | 0 | 0.00 |
| 8 | 0040003 | Fort Thomas | Campbell | 1 | 0.00 |
| 9 | 0050022 | Fort Thomas | Campbell | 1 | 0.09 |
| 10 | 0060001 | Unicorp Campbell County | Campbell | 1 | 0.22 |
| 11 | 0060002 | Unicorp Campbell County | Campbell | 1 | 0.01 |
| 12 | 0060004 | Unicorp Campbell County | Campbell | 1 | 0.06 |
| 13 | 0070044 | Highland Heights | Campbell | 0 | 0.00 |
| 14 | 0100002 | Highland Heights | Campbell | 4 | 0.28 |
| 15 | 0100003 | Highland Heights | Campbell | 1 | 0.02 |
| 16 | 0110002 | Fort Thomas | Campbell | 1 | 0.00 |
| 17 | 0110010 | Highland Heights | Campbell | 5 | 0.28 |
| 18 | 0120019 | Highland Heights | Campbell | NA | NA |
| 19 | 0150009 | Wilder | Campbell | 7 | 1.35 |
| 20 | 0150024 | Southgate | Campbell | 0 | 0.00 |
| 21 | 0150058 | Wilder | Campbell | 9 | 1.03 |
| 22 | 0150063 | Wilder | Campbell | 0 | 0.00 |
| 23 | 0150064 | Wilder | Campbell | 0 | 0.00 |
| 24 | 0150065 | Wilder | Campbell | 0 | 0.00 |
| 25 | 0150085 | Fort Thomas | Campbell | 0 | 0.00 |
| 26 | 0150086 | Fort Thomas | Campbell | 5 | 0.92 |
| 27 | 0150087 | Fort Thomas | Campbell | 1 | 0.02 |
| 28 | 0150356 | Southgate | Campbell | 0 | 0.00 |
| 29 | 0200003 | Fort Thomas | Campbell | 0 | 0.00 |
| 30 | 0220035 | Southgate | Campbell | 0 | 0.00 |
| 31 | 0220044 | Fort Thomas | Campbell | 1 | 0.03 |
| 32 | 0220056 | Fort Thomas | Campbell | 0 | 0.00 |
| 33 | 0220058 | Fort Thomas | Campbell | 0 | 0.00 |
| 34 | 0220086 | Southgate | Campbell | 0 | 0.00 |
| 35 | 0230011 | Fort Thomas | Campbell | 0 | 0.00 |
| 36 | 0230016 | Fort Thomas | Campbell | 0 | 0.00 |
| 37 | 0250002 | Fort Thomas | Campbell | 0 | 0.00 |
| 38 | 0260001 | Fort Thomas | Campbell | 0 | 0.00 |
| 39 | 0270026 | Fort Thomas | Campbell | 0 | 0.00 |
| 40 | 0270062 | Fort Thomas | Campbell | 0 | 0.00 |
| 41 | 0270103 | Fort Thomas | Campbell | 1 | 0.01 |
| 42 | 0280001 | Fort Thomas | Campbell | 0 | 0.00 |
| 43 | 0280073 | Fort Thomas | Campbell | 0 | 0.00 |

| Recurring Wet Weather SSOs | | | | | |
|---|---|---|---|---|---|
| **No.** | **MHID** | **City** | **County** | **Model Predicted Overflow Activations** | **Model Predicted Overflow Volume (MG)** |
| 44 | 0300035 | Fort Thomas | Campbell | 1 | 0.00 |
| 45 | 0330005 | Fort Thomas | Campbell | 0 | 0.00 |
| 46 | 0360004 | Dayton | Campbell | 0 | 0.00 |
| 47 | 0380005 | Fort Thomas | Campbell | 0 | 0.00 |
| 48 | 0390007 | Fort Thomas | Campbell | 0 | 0.00 |
| 49 | 0400002 | Fort Thomas | Campbell | 3 | 0.13 |
| 50 | 0400017 | Fort Thomas | Campbell | 0 | 0.00 |
| 51 | 0410010 | Fort Thomas | Campbell | 2 | 0.07 |
| 52 | 0410019 | Fort Thomas | Campbell | 2 | 0.05 |
| 53 | 0410036 | Fort Thomas | Campbell | 0 | 0.00 |
| 54 | 0430011 | Newport | Campbell | NA | NA |
| 55 | 0440074 | Fort Thomas | Campbell | 0 | 0.00 |
| 56 | 0530083 | Newport | Campbell | 1 | 0.01 |
| 57 | 0540064 | Bellevue | Campbell | NA | NA |
| 58 | 0860001 | Wilder | Campbell | 29 | 35.15 |
| 59 | 0860003 | Wilder | Campbell | 0 | 0.00 |
| 60 | 0860016 | Wilder | Campbell | 0 | 0.00 |
| 61 | 1010002 | Fort Thomas | Campbell | 0 | 0.00 |
| 62 | 1010025 | Fort Thomas | Campbell | 0 | 0.00 |
| 63 | 1010027 | Fort Thomas | Campbell | 0 | 0.00 |
| 64 | 1040060 | Independence | Kenton | 1 | 0.01 |
| 65 | 1090069 | Edgewood | Kenton | 0 | 0.00 |
| 66 | 1110025 | Erlanger | Kenton | 1 | 0.00 |
| 67 | 1110051 | Erlanger | Kenton | 3 | 0.28 |
| 68 | 1110067 | Erlanger | Kenton | 4 | 0.67 |
| 69 | 1110161 | Erlanger | Kenton | 2 | 0.09 |
| 70 | 1110164 | Erlanger | Kenton | 3 | 0.06 |
| 71 | 1110174 | Elsmere | Kenton | 1 | 0.01 |
| 72 | 1110275 | Elsmere | Kenton | 0 | 0.00 |
| 73 | 1110294 | Erlanger | Kenton | 2 | 0.02 |
| 74 | 1190012 | Erlanger | Kenton | 4 | 0.61 |
| 75 | 1220016 | Erlanger | Kenton | 2 | 0.00 |
| 76 | 1220029 | Erlanger | Kenton | 4 | 0.07 |
| 77 | 1220054 | Erlanger | Kenton | 4 | 0.41 |
| 78 | 1240008 | Erlanger | Kenton | 9 | 0.47 |
| 79 | 1240012 | Erlanger | Kenton | 0 | 0.00 |
| 80 | 1550053 | Fort Mitchell | Kenton | 0 | 0.00 |
| 81 | 1560016 | Fort Mitchell | Kenton | 0 | 0.00 |
| 82 | 1560019 | Fort Mitchell | Kenton | 0 | 0.00 |
| 83 | 1560074 | Fort Mitchell | Kenton | 0 | 0.00 |
| 84 | 1560092 | Fort Mitchell | Kenton | 0 | 0.00 |
| 85 | 1570025 | Fort Mitchell | Kenton | 0 | 0.00 |
| 86 | 1600029 | Lakeside Park | Kenton | 1 | 0.05 |
| 87 | 1600050 | Lakeside Park | Kenton | 2 | 0.12 |
| 88 | 1610102 | Fort Mitchell | Kenton | 0 | 0.00 |
| 89 | 1690043 | Fort Wright | Kenton | 1 | 0.00 |
| 90 | 1690072 | Fort Wright | Kenton | 0 | 0.00 |
| 91 | 1700008 | Covington | Kenton | 0 | 0.00 |
| 92 | 1700025 | Park Hills | Kenton | 0 | 0.00 |
| 93 | 1730103 | Fort Mitchell | Kenton | 1 | 0.04 |

| Recurring Wet Weather SSOs | | | | | |
|---|---|---|---|---|---|
| **No.** | **MHID** | **City** | **County** | **Model Predicted Overflow Activations** | **Model Predicted Overflow Volume (MG)** |
| 94 | 1750076 | Independence | Kenton | NA | NA |
| 95 | 1760047 | Edgewood | Kenton | 7 | 0.53 |
| 96 | 1760048 | Edgewood | Kenton | 2 | 0.29 |
| 97 | 1790003 | Crescent Springs | Kenton | 0 | 0.00 |
| 98 | 1830020 | Unicorp Boone County | Boone | 0 | 0.00 |
| 99 | 1830067 | Unicorp Boone County | Boone | 0 | 0.00 |
| 100 | 1850140 | Covington | Kenton | 2 | 0.09 |
| 101 | 1850141 | Covington | Kenton | 7 | 1.07 |
| 102 | 1860108 | Taylor Mill | Kenton | 0 | 0.00 |
| 103 | 1870013 | Covington | Kenton | 0 | 0.00 |
| 104 | 1870014 | Covington | Kenton | 0 | 0.00 |
| 105 | 1920086 | Cold Spring | Campbell | 0 | 0.00 |
| 106 | 1920097 | Cold Spring | Campbell | 0 | 0.00 |
| 107 | 1940006 | Fort Wright | Kenton | 5 | 0.48 |
| 108 | 1950014 | Fort Wright | Kenton | 12 | 8.67 |
| 109 | 1950232 | Fort Wright | Kenton | 0 | 0.00 |
| 110 | 1960002 | Fort Wright | Kenton | 5 | 0.74 |
| 111 | 1990018 | Covington | Kenton | 0 | 0.00 |
| 112 | 1990028 | Covington | Kenton | 3 | 0.88 |
| 113 | 1990032 | Unicorp Kenton County | Kenton | 10 | 11.64 |
| 114 | 2040040 | Edgewood | Kenton | 3 | 1.97 |
| 115 | 2070019 | Elsmere | Kenton | 4 | 0.51 |
| 116 | 2090008 | Elsmere | Kenton | 10 | 1.08 |
| 117 | 2100002 | Elsmere | Kenton | 1 | 0.04 |
| 118 | 2100007 | Elsmere | Kenton | 0 | 0.00 |
| 119 | 2100036 | Elsmere | Kenton | 2 | 0.03 |
| 120 | 2100037 | Elsmere | Kenton | 0 | 0.00 |
| 121 | 2100057 | Elsmere | Kenton | 1 | 0.02 |
| 122 | 2100106 | Elsmere | Kenton | 3 | 0.46 |
| 123 | 2100126 | Elsmere | Kenton | NA | NA |
| 124 | 2100128 | Elsmere | Kenton | 0 | 0.00 |
| 125 | 2100129 | Elsmere | Kenton | 12 | 4.11 |
| 126 | 2110001 | Elsmere | Kenton | 5 | 0.49 |
| 127 | 2110002 | Elsmere | Kenton | 3 | 0.26 |
| 128 | 2110006 | Elsmere | Kenton | 0 | 0.00 |
| 129 | 2120001 | Elsmere | Kenton | 2 | 0.01 |
| 130 | 2120041 | Elsmere | Kenton | 0 | 0.00 |
| 131 | 2130022 | Villa Hills | Kenton | 3 | 0.22 |
| 132 | 2130027 | Erlanger | Kenton | 3 | 4.41 |
| 133 | 2130286 | Erlanger | Kenton | 3 | 0.07 |
| 134 | 2150050 | Crestview Hills | Kenton | 0 | 0.00 |
| 135 | 2160004 | Fort Mitchell | Kenton | 0 | 0.00 |
| 136 | 2160005 | Fort Mitchell | Kenton | 0 | 0.00 |
| 137 | 2170006 | Crestview Hills | Kenton | 2 | 0.04 |
| 138 | 2170008 | Crestview Hills | Kenton | 0 | 0.00 |
| 139 | 2170013 | Lakeside Park | Kenton | 0 | 0.00 |
| 140 | 2170097 | Crestview Hills | Kenton | 2 | 0.01 |
| 141 | 2280010 | Unicorp Kenton County | Kenton | 0 | 0.00 |
| 142 | 2280011 | Unicorp Kenton County | Kenton | 11 | 0.63 |
| 143 | 2280016 | Independence | Kenton | 7 | 0.60 |

| Recurring Wet Weather SSOs | | | | | |
|---|---|---|---|---|---|
| **No.** | **MHID** | **City** | **County** | **Model Predicted Overflow Activations** | **Model Predicted Overflow Volume (MG)** |
| 144 | 2290001 | Crescent Springs | Kenton | 1 | 0.02 |
| 145 | 2300016 | Erlanger | Kenton | 0 | 0.00 |
| 146 | 2300019 | Erlanger | Kenton | 2 | 0.60 |
| 147 | 2300121 | Independence | Kenton | 44 | 7.84 |
| 148 | 2300123 | Unicorp Kenton County | Kenton | 25 | 6.15 |
| 149 | 2300523 | Erlanger | Kenton | 14 | 5.05 |
| 150 | 2301219 | Erlanger | Kenton | 12 | 5.43 |
| 151 | 2301274 | Erlanger | Kenton | 0 | 0.00 |
| 152 | 2360024 | Unicorp Boone County | Boone | 2 | 0.36 |
| 153 | 2410387 | Unicorp Boone County | Boone | 8 | 0.78 |
| | | | **TOTAL** | **403** | **112.05** |

**Threshold for model activation is 0.01 MGD and 0.001 MG**
**NA: Not Modeled**

# 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 | 7 | 0.59 |
| 2 | 0030031 | KY0021466 - Outfall 10 | 0 | 0.00 |
| 3 | 0200069 | KY0021466 - Outfall 11 | 12 | 0.29 |
| 4 | 0330100 | KY0021466 - Outfall 12 | 0 | 0.00 |
| 5 | 0340050 | KY0021466 - Outfall 14 | 4 | 0.05 |
| 6 | 0340051 | KY0021466 - Outfall 13 | 7 | 0.08 |
| 7 | 0360079 | To Be Permitted | 11 | 1.61 |
| 8 | 0540009 | To Be Permitted | 14 | 0.27 |
| 9 | 0540044 | To Be Permitted | 8 | 0.10 |
| 10 | 0550134 | To Be Permitted | 3 | 0.04 |
| 11 | 0570089 | KY0021466 - Outfall 16 | 6 | 8.67 |
| 12 | 0570090 | KY0021466 - Outfall 17 | 1 | 0.01 |
| 13 | 0600094 | KY0021466 - Outfall 18 | 9 | 0.31 |
| 14 | 0600096 | To Be Permitted | 2 | 0.03 |
| 15 | 0600097 | KY0021466 - Outfall 19 | 10 | 1.01 |
| 16 | 0600104 | To Be Permitted | 0 | 0.00 |
| 17 | 0610071 | KY0021466 - Outfall 21 | 16 | 46.25 |
| 18 | 0610072 | KY0021466 - Outfall 20 | 4 | 0.04 |
| 19 | 0620075 | KY0021466 - Outfall 23 | 18 | 4.06 |
| 20 | 0620077 | KY0021466 - Outfall 22 | 6 | 0.06 |
| 21 | 0630061 | KY0021466 - Outfall 83 | 7 | 0.37 |
| 22 | 0640090 | KY0021466 - Outfall 24 | 19 | 173.45 |
| 23 | 0650054 | To Be Permitted | 0 | 0.00 |
| 24 | 0650090 | KY0021466 - Outfall 26 | 13 | 2.59 |
| 25 | 0650098 | To Be Permitted | 12 | 9.57 |
| 26 | 0650100 | KY0021466 - Outfall 25 | 2 | 0.03 |
| 27 | 0660085 | To Be Permitted | 0 | 0.00 |
| 28 | 0690059 | To Be Permitted | 0 | 0.00 |
| 29 | 0690067 | To Be Permitted | 0 | 0.00 |
| 30 | 0730129 | To Be Permitted | 16 | 0.66 |
| 31 | 0770096 | KY0021466 - Outfall 28 | 8 | 0.52 |
| 32 | 0790084 | KY0021466 - Outfall 31 | 21 | 9.78 |
| 33 | 0790086 | KY0021466 - Outfall 29 | 27 | 69.18 |
| 34 | 0840111 | To Be Permitted | 0 | 0.00 |
| 35 | 0840112 | To Be Permitted | 18 | 2.25 |
| 36 | 0840116 | KY0021466 - Outfall 27 | 18 | 2.17 |
| 37 | 0870078 | KY0021466 - Outfall 33 | 1 | 0.15 |
| 38 | 0870079 | KY0021466 - Outfall 34 | 18 | 16.98 |
| 39 | 0880081 | KY0021466 - Outfall 36 | 16 | 12.69 |
| 40 | 0880082 | KY0021466 - Outfall 35 | 1 | 0.00 |
| 41 | 0890081 | To Be Permitted | 0 | 0.00 |
| 42 | 0910065 | KY0021466 - Outfall 38 | 18 | 132.27 |
| 43 | 0910066 | To Be Permitted | 0 | 0.00 |
| 44 | 0910068 | KY0021466 - Outfall 37 | 17 | 32.13 |
| 45 | 0910084 | To Be Permitted | 1 | 0.01 |
| 46 | 0930102 | KY0021466 - Outfall 43 | 0 | 0.00 |
| 47 | 0930103 | KY0021466 - Outfall 42 | 0 | 0.00 |
| 48 | 0930104 | KY0021466 - Outfall 40 | 0 | 0.00 |
| 49 | 0930105 | KY0021466 - Outfall 41 | 17 | 12.29 |
| 50 | 0930106 | KY0021466 - Outfall 39 | 0 | 0.00 |

| Wet Weather CSOs | | | | |
|---|---|---|---|---|
| No. | CSO ID | KPDES Permit # | Model Predicted Activations | Model Predicted Overflow Volume (MG) |
| 51 | 0960063 | KY0021466 - Outfall 45 | 6 | 6.49 |
| 52 | 0960064 | KY0021466 - Outfall 44 | 0 | 0.00 |
| 53 | 0980073 | KY0021466 - Outfall 46 | 2 | 0.01 |
| 54 | 0980080 | KY0021466 - Outfall 47 | 0 | 0.00 |
| 55 | 0980081 | KY0021466 - Outfall 48 | 19 | 28.25 |
| 56 | 1310100 | To Be Permitted | NA | NA |
| 57 | 1320112 | To Be Permitted | 0 | 0.00 |
| 58 | 1350155 | KY0021466 - Outfall 49 | 0 | 0.00 |
| 59 | 1380132 | To Be Permitted | 2 | 0.03 |
| 60 | 1380146 | To Be Permitted | 0 | 0.00 |
| 61 | 1420141 | KY0021466 - Outfall 50 | 9 | 0.10 |
| 62 | 1420142 | KY0021466 - Outfall 51 | 19 | 63.14 |
| 63 | 1420144 | KY0021466 - Outfall 52 | 0 | 0.00 |
| 64 | 1420145 | KY0021466 - Outfall 53 | 0 | 0.00 |
| 65 | 1420146 | KY0021466 - Outfall 54 | 0 | 0.00 |
| 66 | 1420147 | KY0021466 - Outfall 55 | 1 | 0.02 |
| 67 | 1440204 | KY0021466 - Outfall 59 | 0 | 0.00 |
| 68 | 1440206 | KY0021466 - Outfall 61 | 13 | 1.44 |
| 69 | 1440207 | To Be Permitted | 0 | 0.00 |
| 70 | 1440209 | KY0021466 - Outfall 56 | 21 | 44.21 |
| 71 | 1440508 | KY0021466 - Outfall 60 | 1 | 0.01 |
| 72 | 1470089 | KY0021466 - Outfall 62 | 1 | 0.00 |
| 73 | 1470093 | KY0021466 - Outfall 63 | 17 | 34.59 |
| 74 | 1480185 | To Be Permitted | 14 | 0.70 |
| 75 | 1480187 | KY0021466 - Outfall 30 | 18 | 326.95 |
| 76 | 1490132 | KY0021466 - Outfall 65 | 6 | 0.17 |
| 77 | 1490172 | KY0021466 - Outfall 64 | 0 | 0.00 |
| 78 | 1500131 | KY0021466 - Outfall 66 | 13 | 5.20 |
| 79 | 1510133 | To Be Permitted | 0 | 0.00 |
| 80 | 1710114 | KY0021466 - Outfall 69 | 6 | 0.09 |
| 81 | 1710116 | KY0021466 - Outfall 68 | 17 | 15.03 |
| 82 | 1710119 | KY0021466 - Outfall 70 | 16 | 9.30 |
| 83 | 1710121 | KY0021466 - Outfall 71 | 12 | 6.41 |
| 84 | 1710124 | KY0021466 - Outfall 72 | 12 | 8.33 |
| 85 | 1720109 | KY0021466 - Outfall 73 | 17 | 17.32 |
| 86 | 1730259 | KY0021466 - Outfall 75 | 16 | 2.19 |
| 87 | 1730262 | To Be Permitted | 0 | 0.00 |
| 88 | 1730263 | KY0021466 - Outfall 74 | 16 | 1.76 |
| 89 | 1840130 | To Be Permitted | 6 | 0.09 |
| 90 | 1850158 | KY0021466 - Outfall 76 | 21 | 37.59 |
| 91 | 1870193 | KY0021466 - Outfall 78 | 7 | 0.51 |
| 92 | 1870194 | KY0021466 - Outfall 79 | 1 | 0.01 |
| 93 | 1880090 | KY0021466 - Outfall 81 | 6 | 1.45 |
| 94 | 1880091 | KY0021466 - Outfall 80 | 2 | 0.04 |
| | | **TOTAL** | **705** | **1151.98** |

**Threshold for model activation is 0.01 MGD and 0.001 MG**