



Louisville and Jefferson County Metropolitan Sewer District
700 West Liberty Street
Louisville Kentucky 40203-1911
502-540-6000
www.msdlouky.org

August 17, 2012 (Revised September 20, 2012)

Chief, Environmental Enforcement Section
Environmental and Natural Resources Division
U.S. Department of Justice
Post Office Box 7611
Washington DC 20044-7611

Jeff Cummins, Acting Director
Division of Enforcement
Department of Environmental Protection
300 Fair Oaks Lane
Frankfort, KY 40601

Chief, Water Programs Enforcement Branch
Water Management Program
US EPA Region 4
Atlanta Federal Center
61 Forsyth Street SW
Atlanta, GA 30303

Subject: Central Relief Drain CSO In-line Storage, Green Infrastructure, and Distributed Storage
New Project
DOJ Case No. 90-5-1-1-08254

Attention: Chiefs and Director:

MSD is providing advanced notification of a proposed new project be added to the IOAP with the name Central Relief Drain (CRD) CSO In-line Storage, Green Infrastructure, and Distributed Storage project. This new project is the result of an overall adaptive management review of the approved 2009 IOAP that will be documented in the proposed 2012 IOAP Modification to be formally submitted in 2013. No action is requested at this time.

New Project Description

The new project involves the use of in-line storage, green infrastructure, flow diversion and localized storage to control overflows within the Central Relief Drain to eight overflows in a typical year and a completion date of December 31, 2018.

As part of an internal modeling review and re-calibration, MSD initiated a detailed review of the combined sewer system hydraulic model. Upon completion of this review, MSD determined that the CSOs associated with the CRD should be removed from the 13th Street and Rowan Street Storage Basin solution and controlled through in-line storage, green infrastructure and distributed storage. Additional information regarding the separation of these projects can be found in the 13th and Rowan modification letter.

These modifications are part of an overall adaptive management review of the approved 2009 IOAP. Additional sewer system monitoring, hydraulic modeling recalibration and enhancements to the physical representation of the sewer system resulted in a redistribution of the flow in individual sewer lines, thus



Beneficial Use of Louisville's Biosolids
www.louisvillegreen.com

affecting project approach and sizing in some cases. Each proposed change will be justified in detail through minor modification letters. Detailed benefits, costs and program implementation refinements to the overflow abatement program will be documented in proposed 2012 IOAP Modification to be submitted in 2013. No action is requested at this time.

Technical Justification

Since the last IOAP submittal, additional flow monitors have been installed in the system and on the overflow structures. In addition, detailed topographic surveys were conducted at many of the CSO structures. The combined sewer system model was updated with the new survey data and re-calibrated based on the data from the additional flow monitors. The flows in the re-calibrated model differed from the original model and required changes to some of the IOAP projects.

Based on the results of the re-calibration, a new benefit cost analysis was performed on the CRD solutions, and a level of control analysis was conducted on the selected solution. The benefit cost analysis and the level of control analysis showed that diverting the flow at CSO 200 and raising the weirs at CSOs 028, 029, 034, 178, 181, 195, 197, 200, and 202 to create in-line storage would limit the number of overflows to eight per year while providing the best benefit/cost ratio. Therefore, MSD proposes to remove the CSOs associated with the Central Relief Drain from the 13th Street and Rowan Street Storage Basin solution and create a new project called 'Central Relief Drain CSO In-line Storage, Green infrastructure, and Distributed Storage'.

A total of 21 CSOs discharge into the Central Relief Drain (CRD). Of these, only 9 CSOs discharge during the typical year, and most of the others have very small average annual overflow volumes (AAOV). The CRD is a very deep pipe, and including the CRD into the 13th and Rowan Storage Basin project made the new interceptor sewer and the storage basin deeper than would otherwise be required, thereby increasing the overall project cost. Monitoring equipment is currently being installed on the CRD CSOs to verify the behavior of this system, as the overflows are heavily hydraulically interconnected with one another.

During model recalibration MSD decided to investigate alternative approaches to handling the CRD CSOs. MSD determined that CSO200 could be most cost effectively controlled by diverting the overflow to the Sneads Branch system, which is currently controlled through in-line storage. For the remaining CRD CSOs a localized approach that addressed only the CRD CSOs is more cost-effective than keeping them included in the 13th and Rowan Storage Basin project.

MSD will use a highly interactive adaptive management approach to controlling CSOs in the CRD. The first round of projects will include expanding the use of in-line storage, either through fixed weirs, bending weirs or active real time control (RTC) elements. Given the interconnectivity of the CRD system, MSD must ensure that new in-line storage in one location does not activate or negatively impact another CSO. In-line storage projects will start as early as 2013, with implementation of projects on individual CSOs expected to be completed over the time frame of 2015 through 2018. These in-line storage projects will be designed to achieve an AAOV frequency of eight overflows in a typical rainfall year.

In parallel with the in-line storage projects, MSD will implement a focused approach to construct stormwater control in this area through green infrastructure and distributed storage. Given the small volumes of AAOV associated with several of these CSOs, MSD will couple green infrastructure projects with the aforementioned inline storage. The focused approach to green infrastructure projects will begin in 2013, and continue through 2018. Recurring flooding issues in this area at several viaducts near the University of Louisville's main campus will also be considered through these projects. AAOV reductions achieved by this approach will factor into "right-sizing" additional off-line storage systems if required.

If the combination of in-line storage and green infrastructure cannot be demonstrated to meet at least eight overflows per year in the typical year, a "right-sized" suite of gray infrastructure projects will be implemented. This storage may be one or two centralized underground tanks or a system of off-line pipes connected to the system to provide distributed storage where needed. If off-line storage is required, an updated level of control analysis will be performed to ensure that the right-sized storage facilities are sized in accordance with the benefit/cost approach used in the 2009 IOAP. If off-line storage facilities are required, they will be complete and in-service not later than December 31, 2020, which was the original approved date for control of these CSOs.

The in-line storage portion of the project will have a completion date of December 31, 2018, which is before the completion date of the original 13th Street and Rowan Street solution to which these CSOs were originally attached. MSD also intends to potentially use green infrastructure and off-line storage if future flow monitoring and re-calibration efforts indicate the need for additional controls.

For your reference, a copy of the original project fact sheet and map from the 2009 IOAP are in Attachment A. New project fact sheets and maps have been provided in Attachment B. Additional documentation on the costs and level of control analysis will be included in the 2012 IOAP Modification.

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.

If you have questions or need additional information, please contact Ms. Angela Akridge, Project WIN Program Manager, or myself at (502) 540-6000.

Sincerely,


W. Brian Bingham
Regulatory Services Director

cc: Greg Heitzman Paula Purifoy
Attachment



Louisville and Jefferson County Metropolitan Sewer District
700 West Liberty Street
Louisville Kentucky 40203-1911
502-540-6000
www.msdlouky.org

August 17, 2012 (Revised September 20, 2012)

Chief, Environmental Enforcement Section
Environmental and Natural Resources Division
U.S. Department of Justice
Post Office Box 7611
Washington DC 20044-7611

Jeff Cummins, Acting Director
Division of Enforcement
Department of Environmental Protection
300 Fair Oaks Lane
Frankfort, KY 40601

Chief, Water Programs Enforcement Branch
Water Management Program
US EPA Region 4
Atlanta Federal Center
61 Forsyth Street SW
Atlanta, GA 30303

Subject: Central Relief Drain CSO In-line Storage, Green Infrastructure, and Distributed Storage
New Project
DOJ Case No. 90-5-1-1-08254

Attention Chiefs and Director:

MSD is providing advanced notification of a proposed new project be added to the IOAP with the name Central Relief Drain (CRD) CSO In-line Storage, Green Infrastructure, and Distributed Storage project. This new project is the result of an overall adaptive management review of the approved 2009 IOAP that will be documented in the proposed 2012 IOAP Modification to be formally submitted in 2013. No action is requested at this time.

New Project Description

The new project involves the use of in-line storage, green infrastructure, flow diversion and localized storage to control overflows within the Central Relief Drain to ~~eight~~^{zero} overflows in a typical year and a completion date of December 31, 2018.

As part of an internal modeling review and re-calibration, MSD initiated a detailed review of the combined sewer system hydraulic model. Upon completion of this review, MSD determined that the CSOs associated with the CRD should be removed from the 13th Street and Rowan Street Storage Basin solution and controlled through in-line storage, green infrastructure and distributed storage. Additional information regarding the separation of these projects can be found in the 13th and Rowan modification letter.

These modifications are part of an overall adaptive management review of the approved 2009 IOAP. Additional sewer system monitoring, hydraulic modeling recalibration and enhancements to the physical representation of the sewer system resulted in a redistribution of the flow in individual sewer lines, thus



Beneficial Use of Louisville's Biosolids
www.louisvillegreen.com

affecting project approach and sizing in some cases. Each proposed change will be justified in detail through minor modification letters. Detailed benefits, costs and program implementation refinements to the overflow abatement program will be documented in proposed 2012 IOAP Modification to be submitted in 2013. No action is requested at this time.

Technical Justification

Since the last IOAP submittal, additional flow monitors have been installed in the system and on the overflow structures. In addition, detailed topographic surveys were conducted at many of the CSO structures. The combined sewer system model was updated with the new survey data and re-calibrated based on the data from the additional flow monitors. The flows in the re-calibrated model differed from the original model and required changes to some of the IOAP projects.

Based on the results of the re-calibration, a new benefit cost analysis was performed on the CRD solutions, and a level of control analysis was conducted on the selected solution. The benefit cost analysis and the level of control analysis showed that diverting the flow at CSO 200 and raising the weirs at CSOs 028, 029, 034, 178, 181, 195, 197, 200, and 202 to create in-line storage would limit the number of overflows to eight per year while providing the best benefit/cost ratio. Therefore, MSD proposes to remove the CSOs associated with the Central Relief Drain from the 13th Street and Rowan Street Storage Basin solution and create a new project called 'Central Relief Drain CSO In-line Storage, Green infrastructure, and Distributed Storage'.

A total of 21 CSOs discharge into the Central Relief Drain (CRD). Of these, only 9 CSOs discharge during the typical year, and most of the others have very small average annual overflow volumes (AAOV). The CRD is a very deep pipe, and including the CRD into the 13th and Rowan Storage Basin project made the new interceptor sewer and the storage basin deeper than would otherwise be required, thereby increasing the overall project cost. Monitoring equipment is currently being installed on the CRD CSOs to verify the behavior of this system, as the overflows are heavily hydraulically interconnected with one another.

During model recalibration MSD decided to investigate alternative approaches to handling the CRD CSOs. MSD determined that CSO200 could be most cost effectively controlled by diverting the overflow to the Sneads Branch system, which is currently controlled through in-line storage. For the remaining CRD CSOs a localized approach that addressed only the CRD CSOs is more cost-effective than keeping them included in the 13th and Rowan Storage Basin project.

MSD will use a highly interactive adaptive management approach to controlling CSOs in the CRD. The first round of projects will include expanding the use of in-line storage, either through fixed weirs, bending weirs or active real time control (RTC) elements. Given the interconnectivity of the CRD system, MSD must ensure that new in-line storage in one location does not activate or negatively impact another CSO. In-line storage projects will start as early as 2013, with implementation of projects on individual CSOs expected to be completed over the time frame of 2015 through 2018. These in-line storage projects will be designed to achieve an AAOV frequency of ~~eight~~zero overflows in a typical rainfall year.

In parallel with the in-line storage projects, MSD will implement a focused approach to construct stormwater control in this area through green infrastructure and distributed storage. Given the small volumes of AAOV associated with several of these CSOs, MSD will couple green infrastructure projects with the aforementioned inline storage. The focused approach to green infrastructure projects will begin in 2013, and continue through 2018. Recurring flooding issues in this area at several viaducts near the University of Louisville's main campus will also be considered through these projects. AAOV reductions achieved by this approach will factor into "right-sizing" additional off-line storage systems if required.

If the combination of in-line storage and green infrastructure cannot be demonstrated to meet at least ~~eight~~zero overflows per year in the typical year, a "right-sized" suite of ~~gray~~green infrastructure projects will be implemented. This storage may be one or two centralized underground tanks or a system of off-line pipes connected to the system to provide distributed storage where needed. If off-line storage is required, an updated level of control analysis will be performed to ensure that the right-sized storage facilities are sized in accordance with the benefit/cost approach used in the 2009 IOAP. If off-line storage facilities are ~~are~~ required, they will be complete and in-service not later than December 31, 2020, which was the original approved date for control of these CSOs.

The in-line storage portion of the project will have a completion date of December 31, 2018, which is before the completion date of the original 13th Street and Rowan Street solution to which these CSOs were originally attached. MSD also intends to potentially use green infrastructure and off-line storage if future flow monitoring and re-calibration efforts indicate the need for additional controls.

For your reference, a copy of the original project fact sheet and map from the 2009 IOAP are in Attachment A. New project fact sheets and maps have been provided in Attachment B. Additional documentation on the costs and level of control analysis will be included in the 2012 IOAP Modification.

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.

If you have questions or need additional information, please contact Ms. Angela Akridge, Project WIN Program Manager, or myself at (502) 540-6000.

Sincerely,

W. Brian Bingham
Regulatory Services Director

cc: Greg Heitzman Paula Purifoy
Attachment

MSD

Metropolitan Sewer District

ATTACHMENT A

New Project

No Attachment A

MSD

Metropolitan Sewer District

ATTACHMENT B

Project Name: Central Relief Drain CSO In-line Storage, Green Infrastructure & Distributed Storage

Project Type: Diversion, Inline Storage and Green Infrastructure

Rec Stream: Ohio River

Project Description: Weir raises on existing CSO structures to reduce overflows to 8 per typical year. CSO 200 is diverted to the east into the Sneads Branch Relief. Additional Green Infrastructure is accounted for in cost to reduce runoff to offset potential flooding concerns at viaducts. Bending weirs may also be used in lieu of traditional static weirs.

Design Assumption: Assumes weir raises will be acceptable. Additional evaluating of potential flooding at weir raise level will need to be evaluated based on the configuration of each CSO structure. Green Infrastructure or bending weirs may be used to mitigate potential increase of flooding risks.

Capital Cost: \$2,184,000

Capital Benefit/Cost: 543.96

Present Worth Benefit Cost: 581.21

CSO	CSO Name	Existing May 2012 ¹		Baseline May 2012 ²	
		Avg. Annual Overflow Volume	Avg. Annual Frequency	Avg. Annual Overflow Volume	Avg. Annual Frequency
CSO178	CRD 9th & YORK "B"	18.58	48	18.58	48
CSO181	CRD 2nd & BROADWAY NO 2	15.70	61	15.70	61
CSO193	CRD S 6th & KENTUCKY	0.02	4	0.02	4

1. Existing May 2012 conditions reflect existing system operating conditions as of that date.

2. Baseline May 2012 assumes all SSDP projects are complete and critical combined sewer facilities (e.g. Morris Forman WQTC Southwestern Pump Station, Starkey Pump Station) are operating at optimal, sustainable levels.

Integrated Overflow Abatement Plan
Vol. 2 - Final CSO Long Term Control Plan

Ohio River

Central Relief Drain CSO Service Area

Preliminary - For Budget Development Only

- Active CSO
- Eliminated CSO
- PS Proposed Pump Station Solution
- PS Pump Stations
- Proposed Pipe Solution
- Combined Sewer Pipe
- Force Main
- Collector < 12"
- Interceptor ≥ 12"
- Drainage Mains
- Proposed Storage Solution
- Streams
- Floodway
- CRD CSO Service Area
- Jefferson County Boundary

General representation of overflow abatement solutions are for preliminary planning purposes. Alignments and locations may be altered during design.

1 inch = 1,000 feet

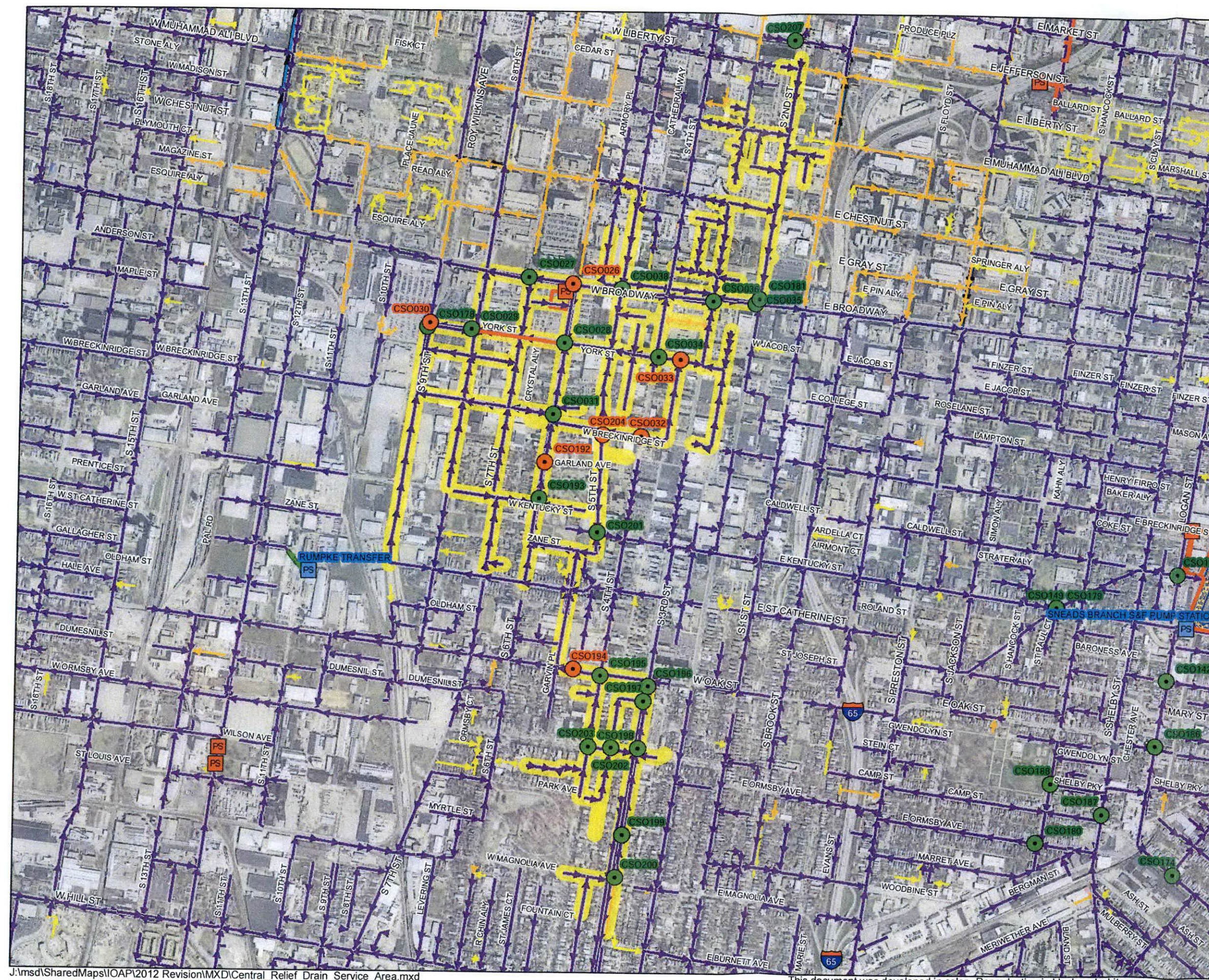


Aerial Date:
2009

Map Revision:
April 9, 2012



Copyright © 2012 LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT (MSD), LOUISVILLE WATER COMPANY, LOUISVILLE METRO GOVERNMENT, and JEFFERSON COUNTY PROPERTY VALUATION ADMINISTRATOR (PVA). All Rights Reserved.



J:\msd\SharedMaps\IOAP\2012 Revision\MXD\Central_Relief_Drain_Service_Area.mxd

This document was developed in color. Reproduction in black and white may not represent the data as intended. Scalable when printed on 11"x17" paper.