

# Kansas City's Overflow Control Program

## ANNUAL REPORT

*Reporting Period: January 1, 2014 through December 31, 2014*

March 31, 2015

To:

**Chief**

*Environmental Enforcement Section, Environment and Natural Resources Division*

U.S. Department of Justice

Post Office Box 7611

Washington, D.C. 20044-7611

Reference Case No. 90-5-1-1-0643811

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Please find enclosed the fourth annual report related to the City of Kansas City, Missouri's Overflow Control Program. This report covers the period from January 1, 2014 to December 31, 2014. Pursuant to the Consent Decree, this report has a required submittal date no later than March 31, 2015.

Additionally, and as required by the Consent Decree, any report, plan, or other submission that the City is required to submit, including reports, plans or other submissions as required by its current National Pollution Discharge Elimination System (NPDES) Permits, shall be signed and certified by an official or authorized agent of the City.

By signing below, I certify under penalty of law that the document and all attachments have been prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted, and that 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.

Thank you for your participation and cooperation in this important program. If you have any questions, please contact me at (816) 513-0203 or [Terry.Leeds@kcmo.org](mailto:Terry.Leeds@kcmo.org).

Sincerely,

A handwritten signature in blue ink, appearing to read "Terry Leeds".

Terry Leeds

Director, Kansas City Water Services

cc: Troy Schulte, City Manager, City of Kansas City, Missouri  
Matthew J. Gigliotti, Assistant City Attorney, City of Kansas City, Missouri

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## I. ANNUAL REPORT PURPOSE AND SCOPE

On September 27, 2010, The United States District Court for the Western District of Missouri entered a consent decree in the case U.S. vs. The City of Kansas City, Missouri. The Consent Decree was amended by the parties and approved by the court on January 9, 2015. This Annual Report is submitted in accordance with Section IX.B of the Consent Decree. The report reflects the status of program implementation that has occurred between January 1, 2014 and December 31, 2014.

In accordance with the Consent Decree's Section IX.A, this Annual Report also includes Kansas City's Semi-Annual Report on the progress of implementing control measures defined in Appendix A of the Consent Decree, as well as all other related activities.

## II. KANSAS CITY'S OVERFLOW CONTROL PROGRAM

Individual elements of the City's Overflow Control Plan (OCP) became part of an enforceable document with the entry of a Consent Decree in United States District Court. The Consent Decree is a culmination of nearly a decade of negotiation between the City, USEPA and MDNR related to reducing overflows. The Consent Decree includes requirements for capital construction, management, operations and maintenance of the City's sewer systems.

Kansas City's OCP was developed to reduce overflows from the combined sewer systems and prevent overflows from the separate sewer systems. The City and its regulatory partners have agreed to meet those objectives over a 25-year period from 2010 through 2035. The OCP involves a planned list of improvements that are structured to eliminate, or capture for treatment, approximately 88 percent of total wet weather flow in the combined sewer system and sanitary sewer overflows during a five-year 24-hour rainfall event.

The occurrence of combined sewer overflows is not uncommon in combined sewer systems and is authorized pursuant to the terms of two (Westside WWTP and Blue River WWTP) of the City's National Pollutant Discharge Elimination System (NPDES) permits. NPDES permits are issued by MDNR to Kansas City and implemented by the Water Services Department at each treatment facility. Consent Decree components include:

- Capital projects targeted at reducing overflows through Combined Sewer Overflow (CSO) Control Measures and Separate Sewer Overflow (SSO) Control Measures;
- Nine Minimum Controls (NMCs) Plan targeted at operationally reducing and addressing combined sewer overflows through a series of minimum control efforts;
- Capacity, Management, Operation and Maintenance (CMOM) Plan targeted at reducing separate sewer overflows by adequately operating and maintaining the sewer system;
- Post Construction Monitoring Plan targeted at long-term monitoring and assessment of overflow reduction;
- Supplemental Environmental Project (SEP) Plan targeted at reducing septic system use in the sewered area; and
- Implementation of disinfection technology at wastewater treatment plants.

### III. KANSAS CITY'S SEWER SYSTEM OVERVIEW

More than 150 years ago Kansas City began building the basic sewer infrastructure that would allow the city to grow and prosper. Some of that infrastructure is still in use today.

Kansas City's overall sanitary sewer system comprises both combined and separate sewer systems totaling approximately 318 square miles. The combined sewer system consists of 58 square miles, primarily located in the oldest areas of the City. During moderate to heavy rainfall events, the system will reach capacity, overflow, and discharge a mixture of wastewater and rainwater directly to receiving streams and rivers. By implementing control measures in accordance with Kansas City's Consent Decree the occurrence of overflows will be reduced over time.

The remaining 260 square miles of Kansas City's sanitary sewer system are a separate system. A separate sanitary sewer system collects and conveys only wastewater. However, rainwater can enter the system through leaky sewer pipe joints, broken sewer pipes, manholes, and unpermitted direct connections causing the system to overload during rainfall events. When this system exceeds its capacity, it too overflows a mixture of wastewater and rainwater. Kansas City does have one constructed sanitary sewer overflow (SSO) which is being eliminated as part of the Overflow Control Program.

### IV. REPORTING PERIOD ACTIVITY

The following specific milestones, as laid forth in Consent Decree Appendices A and D, were met during the reporting period from January 1, 2014 through December 31, 2014. Work also continued on several other projects that began in previous reporting periods, including the continuation of inflow/infiltration reduction activities in areas north and south of the Missouri River. To-date, all Consent Decree schedule milestone dates have been met.

Annual activities associated with Appendices B, C, and E that began during the reporting period are discussed in their respective sections of this report.

#### 1. Appendix A – Performance Measures

##### **Brush Creek Basin**

- Neighborhood Sewer Rehabilitation
  - Consent Decree Required Start Date – 2017
  - Actual Start Date – 2014

##### **Middle Blue River Basin**

- Sewer Consolidation Outfall 063
  - Consent Decree Required Start Date – 2016
  - Actual Start Date – 2014

- Sewer Separation: Outfall 067
  - Consent Decree Required Start Date – 2016
  - Actual Start Date – 2014
- Sewer Separation: Outfall 099
  - Consent Decree Required Start Date – 2016
  - Actual Start Date – 2014

**Northeast Industrial District**

- Sewer Separation: Diversion Structure 006
  - Consent Decree Required Start Date – 2016
  - Actual Start Date – 2014
- Green Infrastructure Pilot Project
  - Conceptual Proposal Required Submittal Date – December 31, 2014
  - Actual Submittal Date – December 31, 2014
- Gooseneck Creek Arch Sewer Gates and Pump Station Improvements
  - Consent Decree Required Start Date – 2018
  - Actual Start Date – 2014

**Turkey Creek/Central Industrial District**

- In-line Gates at Santa Fe Pump Station (Storm Drainage Improvements)
  - Consent Decree Required Start Date – 2016
  - Actual Start Date – 2014
- Green Infrastructure Pilot Project
  - Conceptual Proposal Required Submittal Date – December 31, 2014
  - Actual Submittal Date – December 31, 2014

**2. Appendix D – Post Construction Monitoring Program**

- Implement Flow Monitoring Program for the outfalls listed below. The Consent Decree required implementation date of 2014 was achieved with an actual implementation date of March 2014.
  - Outfall BR063 (2 flow meters)
  - Outfall BR066
  - Outfall BR067
  - Outfall BR031
  - Outfall BR076

- Outfall W003
- Outfall W002

## V. DATA MANAGEMENT AND PROJECT CONTROLS

Managing the large amount of data generated by the OCP program is a primary focus of Kansas City Water Services. In 2014, Water Services continued to maintain and update the Project Management Information System (MIS) Database to capture data pertaining to work activities, schedules, and budgets for all OCP projects. The MIS is currently being used to create and update project status reports, provide program financial summary information, and develop trends and forecast projections regarding project costs and schedule information.

In 2014, Water Services began developing more robust schedule management practices to allow staff members to identify project schedule status more accurately and foresee potential schedule issues that will allow proactive steps to mitigate via recovery plans.

A major effort during the reporting period was the commencement of sewer system characterizations, manhole inspections, sewer cleaning, and CCTV work in eight basins throughout the City. In 2014, field survey crews were mobilized to perform the work, and the initial data sets started being delivered in the third quarter of 2014 for the quality control process. At the end of the reporting period, none of the field data had been finalized. Water Services purchased a new server to house the data generated by the Control Program. In early 2015, the new server will be installed to store the collected data.

## VI. PUBLIC OUTREACH

A summary of public outreach activities for the City's OCP program that were completed between January 1 and December 31, 2014 is provided below. Additional information regarding these activities is in the discussion of NMC 7 which begins on page 31 in this report.

- Made 30 presentations to more than 1,500 citizens and stakeholders about OCP.
- Mailed more than 125 letters in the spring of 2014 to neighborhood leaders requesting the opportunity for Water Services to present to their organizations an update on the progress of OCP.
- Conducted seven public meetings for four OCP projects, which are discussed in more detail later in this report.
- Presented topics related to OCP at seven conferences and workshops.
- Developed four articles for publication and had fifteen news stories published in local media outlets about OCP.
- Published OCP-related information on the Kansas City Water Services website.

## VII. IMPLEMENTATION OF OVERFLOW CONTROL MEASURES

### a. Post-Construction Monitoring Program

Post-construction monitoring activities completed in 2014, as defined in Appendix D of the Consent Decree, are outlined later in this report beginning on page 67.

### b. Green Infrastructure

#### i. ADDITIONAL GREEN INFRASTRUCTURE PILOT

Conceptual planning began in 2014 for an additional green infrastructure pilot project in Kansas City's 3rd Council District. Water Services issued an RFQ/P for preliminary design of green infrastructure in August 2014. In December 2014, a design professional was selected and contract negotiations are currently underway. The design professional is expected to receive a Notice to Proceed for this project in early 2015.

#### ii. CONSENT DECREE GREEN INFRASTRUCTURE PROJECTS

Water Services also completed conceptual proposals for two additional green infrastructure pilot projects prescribed by the Consent Decree located in the Northeast Industrial District and the Turkey Creek/Central Industrial District. A conceptual proposal for both of these projects was submitted to USEPA on December 31, 2014 for approval. More information about these two projects is provided on pages 11 and 13 of this report.

#### iii. MIDDLE BLUE RIVER BASIN GREEN SOLUTIONS PILOT PROJECT

Water Services continues to administer a three-year maintenance service contract in the pilot project area, which runs through November 2015.

### c. Compliance with Permits

The City strives to maintain compliance at all times with its current permits as they relate to the capacity of the WWTPs, capacity, management, operation and maintenance of the collection system and the stormwater system.

#### i. MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) PERMIT

Part IV.B of the Missouri State Operating Permit MO-0130516 requires the City of Kansas City, Missouri to provide written notice of compliance or non-compliance with the schedule for permit implementation. The City submits yearly reports, with the most recent report covering the period of May 1, 2013 through April 30, 2014. The report documents the status of implementing the components of the stormwater management programs that are established as permit conditions and addresses the progress of required programs. As detailed in the latest report, the



City is in compliance with the schedule for all interim milestones and final deadlines as identified in the permit schedule (Permit Part IV.A). The latest report is included in *Attachment B* of this report.

From June 2-5, 2014, an audit of the MS4 program was conducted at the request of the Water, Wetlands and Pesticides Division, Water Enforcement Branch of USEPA. The audit was conducted under the authority of Section 308 of the Clean Water Act, as amended. It was conducted in accordance with EPA Region VII Standard Operating Procedures (SOPs) for Compliance Inspections (ENSV SOP No. 2332). The narrative report and the attachments included in *Attachment B* presents the results of the audit.

**ii. DISCHARGE PERMITS**

A collection of all Discharge Reports submitted to MDNR during 2014 is included in *Attachment A* of this report. The Wastewater Treatment and Wastewater Line Maintenance Divisions of the City's Water Services Department submitted these reports. These reports are a part of the Missouri State Operating Permits MO-0024911, MO-0024929, MO-0024961, MO-0048305, MO-0049531, and MO-0048313.

**iii. MONTHLY OPERATING REPORTS**

The City's Monthly Operating Reports, submitted as part of the City's current NPDES permits, are included in *Attachment B* of this report.

## VIII. COMBINED SEWER OVERFLOW CONTROL MEASURES – APPENDIX A

Combined sewer systems (CSS) make up approximately 58 square miles running from the Missouri/Kansas state line on the west, 85th Street on the south, the Blue River on the east, and the Missouri River on the north. The area served by the CSS is subdivided into six principal basins: Brush Creek, Lower Blue River, Middle Blue River, Northeast Industrial District, Town Fork Creek, and Turkey Creek/Central Industrial District.

Field investigation activities for two neighborhood sewer rehabilitation projects are being completed through a Water Services OCP Program Management contract and citywide sewer cleaning and closed circuit television (CCTV) inspection contract. The work consists of sewer system characterization and manhole inspections, sewer cleaning, and CCTV inspection of sanitary sewers in the Brush Creek and Town Fork Creek combined sewer system basins. Field investigation activities are also being completed in the separate sewer system basins.

The City's Overflow Control Program is being implemented over a 25-year period in three phases, each with a predominant control strategy. The early years of the program include repairs to the existing sewer systems and pilot projects focused on developing green infrastructure solutions. The middle years of the program will focus on maximizing the capacity within the existing system and analyzing the results of source volume reductions and pilot projects. The later years of the program will address necessary improvements to the City's wastewater treatment plants and construction of structural storage solutions (currently proposed as deep storage tunnels).

### a. Brush Creek Basin

#### i. NEIGHBORHOOD SEWER REHABILITATION

Neighborhood sewer rehabilitation work in the Brush Creek Basin has been split into two projects due to the size of the basin. These projects are being implemented to improve the reliability and performance of the combined sewer collection system and reduce basement backups. These projects involve field investigations to identify and quantify sewer system defects and the preparation of construction contract documents to rehabilitate sewer pipes 12-inch and smaller within the collection system.

During the reporting period, scoping documents for design professional services were initiated. The RFQ/P was advertised in December 2014; the design professionals are expected to be selected in early 2015.

### b. Middle Blue River Basin

#### i. DISTRIBUTED STORAGE OUTFALL 069 (TARGET GREEN EAST MARLBOROUGH)

The design professional for this project is designing green infrastructure solutions to reduce combined sewer overflows at Outfall 069. The project includes distributed storage utilizing green infrastructure along the Paseo Boulevard, Rachel Morado Drive, and 74<sup>th</sup> Street, and in Arleta Park. The project also involves

a limited amount of sewer separation and modifications to the existing diversion structure.

Several public outreach events occurred for this project in 2014, some in combination with the Target Green West Marlborough project. On May 7, 2014, a project open house was held to provide residents with an update on project planning efforts. Another update was provided on June 24, 2014 to the neighborhood association located in the project area. Attendees viewed updates of the proposed improvements based on feedback previously received, and additional input was received. Project team members provided another brief project update to the neighborhood association on November 18, 2014. On November 20 and November 22, 2014, project team members conducted door-to-door outreach along 74<sup>th</sup> Street, which will have multiple improvements that could potentially impact the residents. In 2015, additional outreach activities are planned prior to the start of construction.

Design professional services were approximately 70 percent complete at the end of December 2014. The project is expected to advertise in the spring of 2015. Construction of the project is required to be completed by December 31, 2017.

**ii. DISTRIBUTED STORAGE OUTFALL 059 (TARGET GREEN WEST MARLBOROUGH)**

The design professional for this project is designing green infrastructure solutions to reduce combined sewer overflows at Outfall 059 and evaluating whether improved flood protection could be achieved as a part of the project. During the reporting period, Water Services moved forward with property acquisition of properties needed for project implementation. At the site of a former dry cleaner, a partial Phase 2 environmental site assessment was performed to search for site contamination concerns, none of which were found.

Several outreach events occurred for this project in 2014, some in combination with the Target Green East Marlborough project. In addition to the open house and neighborhood association updates, targeted meetings occurred with businesses along Troost Avenue and residents in a focus area that will have multiple green infrastructure improvements. At each meeting, attendees learned about the project and the proposed improvements. The attendees were encouraged to provide input into some elements of the green infrastructure improvements being planned. In 2015, additional outreach activities are planned prior to the start of construction.

Design professional services were approximately 60 percent complete at the end of December 2014. The project is expected to advertise in the spring of 2015. Construction of the project is required to be completed by December 31, 2017.

**iii. NEIGHBORHOOD SEWER REHABILITATION**

Neighborhood sewer rehabilitation work in the Middle Blue River Basin is being implemented to improve the reliability and performance of the combined sewer

collection system and reduce basement backups. This project involves field investigations to identify and quantify sewer system defects and the preparation of two sets of construction contract documents to rehabilitate sewer pipes 12-inch and smaller within the collection system.

During the reporting period, field investigations were completed, including collection system characterization, manhole inspections, smoke testing, sewer pipe CCTV inspections, and data analysis. Design professional services were completed for Area 1 (covering the area tributary to Outfalls 059 and 069), and the project was bid on July 1, 2014. In October 2014, the construction contractor received a Notice to Proceed; construction work was approximately 15 percent complete through the end of December 2014.

On November 20, 2014, a public meeting was held with residents in the Area 1 project boundaries. Meeting attendees learned about the project construction details, including the contractor's planned construction schedule and contact information. They learned what they should expect from construction activities, including potential service disruptions.

Design professional services for Area 2 were approximately 90 percent complete at the end of December 2014. Project Area 2 is expected to advertise in early 2015. The construction of neighborhood sewer rehabilitation work in the entire Middle Blue River Basin has a required completion date of December 31, 2017.

#### **iv. SEWER CONSOLIDATION OUTFALL 063**

This sewer consolidation project involves consolidation piping, disconnection of inlets from the combined sewer system, and elimination of 15 of 18 diversion structures located in the project area. The purpose of the project is to eliminate typical year overflows at Outfall 063 and reduce the number of overflows at outfall 064 to no more than two in a typical year.

In October 2014, the design professional received a Notice to Proceed. Preliminary design is underway, and final design is expected to be complete September 2015. Construction is expected to begin in February 2016 and be completed by September 2017, ahead of the December 31, 2017 Consent Decree deadline.

#### **v. SEWER SEPARATION: OUTFALL 067**

This sewer separation project involves the separation of approximately 270 acres of the combined sewer system and elimination of typical year overflows at outfall 067.

In December 2014, the design professional received a Notice to Proceed. Construction is expected to begin in February 2017 and be completed by August 2019, ahead of the December 31, 2019 Consent Decree deadline.

**vi. SEWER SEPARATION: OUTFALL 099**

During the reporting period, scoping documents for design professional services were initiated for the Sewer Separation Project at Outfall 099. The RFQ/P is expected to advertise in early 2015.

**c. Northeast Industrial District Basin**

**i. SEWER SEPARATION: DIVERSION STRUCTURE 006**

The project involves the separation of approximately 260 acres of the combined sewer system, construction of approximately 13,000 linear feet of sanitary sewer pipe, and elimination of the diversion structure 006 in the Northeast Industrial District Basin. Water Services developed an RFQ/P for design professional services in early 2014 and advertised in March 2014. The design professional was issued a Notice to Proceed in October 2014. Design professional services were approximately 10 percent complete at the end of December 2014. This project has a required Consent Decree completion date of December 31, 2017.

**ii. GREEN INFRASTRUCTURE PILOT PROJECT**

Water Services developed a conceptual proposal for a green infrastructure pilot project for the Northeast Industrial District. The proposal identified potential locations for green infrastructure technologies to reduce combined sewer overflows. The proposal also outlined a plan for public/ private partnerships to implement green infrastructure within the basin. The proposal was submitted to USEPA on December 31, 2014 for review and approval. This project has a required Consent Decree completion date of December 31, 2020.

**iii. GOOSENECK CREEK ARCH SEWER GATES AND PUMP STATION IMPROVEMENTS**

In December 2014, a pre-proposal memorandum was prepared to develop the project concepts for the Gooseneck Creek Arch Sewer Gates and Pump Station Improvements. The RFQ/P documents, including a conceptual design and scope of work for the project are expected to advertise in early 2015.

As part of the Consent Decree amendment approved in early 2015, this project was moved up in the implementation schedule from an initial completion date of 12/31/21 to 12/31/18.

**d. Town Fork Creek Basin**

**i. NEIGHBORHOOD SEWER REHABILITATION**

The Neighborhood Sewer Rehabilitation Project in the Town Fork Creek Basin is being implemented to improve the reliability and performance of the sewer collection system and reduce basement backups. This project will involve field

investigations to identify and quantify sewer system defects and the preparation of construction contract documents to rehabilitate sewer pipes 12-inch and smaller.

Water Services' OCP Program Management Team performed system characterization and manhole inspections in the Town Fork Creek Basin. The data will be provided to the design professionals for their use during design of sewer rehabilitation improvements.

The project includes inspection of manholes and 12-inch and smaller sewer pipes, review of the CCTV inspection data, design of sewer system rehabilitation improvements, and preparation of construction contract documents for recommended system rehabilitation improvements.

In July 2014, a Notice to Proceed was issued to the design professional. Design professional services were approximately 10 percent complete as of December 31, 2014. Construction is expected to begin in September 2016 and will be completed by August 2018, ahead of the December 31, 2018 Consent Decree deadline.

## e. Turkey Creek/Central Industrial District Basins

### i. TURKEY CREEK PUMP STATION REHABILITATION

This construction project involves upgrades at the existing pump station including removal of existing pumps, installation of new pumping units, replacement of new pump control/discharge valves, and installation of new transformers and disconnects for pumps. The project also includes a variety of electrical, instrumentation and control equipment modifications and structural and architectural modifications.

In February 2014, a Notice to Proceed was issued to the construction contractor. Approximately 30 percent of the construction work was completed by the end of December 2014. This project has a required Consent Decree completion date of December 31, 2016.

### ii. IN-LINE GATES AT SANTA FE PUMP STATION (STORM DRAINAGE IMPROVEMENTS)

This project involves modification or replacement of existing sluice gates at the Santa Fe Pump Station to facilitate the storage of wet weather flows in the existing upstream collection sewer system and to reduce the number of CSOs from Outfall 003 to the Missouri River.

The project includes assessment and modeling of combined sewer system improvements to determine the maximum potential storage without adverse impacts. It also includes the preparation of construction contract documents for modification or replacement of the in-line gates, including the addition of real-time SCADA control capabilities and establishment of gate operational criteria.

This contract was selected to be a Small Local Business Enterprise-Water Services Department Engineering Professional Service Program (SLBE-WSDEPS) project. The design professional was issued a Notice to Proceed (NTP) in October 2014. Design professional services for this project were approximately 25 percent complete at the end of December 2014.

**iii. GREEN INFRASTRUCTURE PILOT PROJECT**

Water Services developed a conceptual proposal for green infrastructure pilot projects for the Turkey Creek/Central Industrial District basin. The proposal identified potential locations for green infrastructure technologies to reduce combined sewer overflows. The proposal also outlined a plan for public/ private partnerships to implement green infrastructure within the basin. The proposal was submitted to USEPA on December 31, 2014 for review and approval. This project has a required Consent Decree completion date of December 31, 2020.

## IX. SEPARATE SEWER OVERFLOW CONTROL MEASURES – APPENDIX A

Kansas City’s Separate Sanitary Sewer (SSS) system comprises nine drainage basins covering 260 square miles of the City. The four SSS basins north of the Missouri River are the Northern and Northwestern watersheds and the Line Creek/Rock Creek and Birmingham/Shoal Creek basins. The five SSS system basins south of the Missouri River are the Blue River North, Round Grove, Blue River Central, Blue River South and Little Blue River basins.

Much of the early projects and program strategy in the separate sanitary sewer basins involve reducing the amount of inflow and infiltration (I/I) entering the SSS to reduce overflows from the system. This reduction in I/I is achieved by reducing or eliminating points of direct rainwater inflow into the system and/or reducing rainwater infiltration through collection system defects. A combination of wet weather storage and treatment will be utilized to address system needs as outlined in the City’s Overflow Control Plan.

As was mentioned previously, field investigation activities were performed for I/I projects in the Blue River Central, Blue River North, Blue River South, and Line Creek/Rock Creek SSS basins in 2014.

### a. Private Inflow and Infiltration Reduction Program

In 2014, Water Services continued the development of a private I/I reduction program to be implemented in conjunction with public sewer I/I reduction projects. The focus of the program is to disconnect private I/I sources only when cost-effective to do so. To help establish a private I/I reduction program that reflects the needs and desires of Kansas City ratepayers, Water Services worked with the City Mayor’s office to form a Community Advisory Group. The 12-member Community Advisory Group made up of stakeholders and residents participated in five meetings in 2014. Recommendations for the program will be presented to City Council in early 2015 along with a request for approval of a revised sewer use ordinance to support the implementation of this new program.

### b. North of the Missouri River Separate Sewer System

#### i. LINE CREEK/ROCK CREEK I/I REDUCTION AREA 1 PROJECT

Two I/I reduction projects are underway in the Line Creek/Rock Creek basins, further defined as Area 1 and Area 2. The design contract for Area 1 project involves inspection of manholes and public sanitary sewers, reviewing of CCTV inspection data, system characterization data and manhole inspection data, performing smoke testing and field investigations, developing rehabilitation recommendations, and preparing construction contract documents. The purpose of the project is to reduce I/I flows and improve the reliability and performance of the separate sanitary sewer system. Water Services’ OCP Program Management Team performed system characterization and manhole inspections in the Line Creek/Rock Creek basins. The data was provided to the design professionals for use during performance of I/I reduction design.



In October 2014, a Notice to Proceed was given to the design professional. Design for this project was approximately 10 percent complete through the end of December 2014.

The targeted amount of I/I reduction in the Line Creek/Rock Creek basins is 35 percent. This I/I reduction project is part of Water Services' efforts to reduce the amount of I/I in the City's separate sanitary sewer system north of the Missouri River. This work is required to be completed by December 31, 2023.

**ii. LINE CREEK/ROCK CREEK I/I REDUCTION AREA 2 PROJECT**

Design professional services for the Line Creek/Rock Creek I/I Reduction Area 2 Project are similar to what is underway in Area 1.

In June 2014, a design professional was selected for this project; in the summer of 2015, a Notice to Proceed is expected for Area 2. This work is required to be completed by December 31, 2023.

**c. South of the Missouri River Separate Sewer System**

**i. BLUE RIVER SOUTH I/I REDUCTION AREA 1 AND AREA 2 PROJECT**

Design professional services for the first I/I reduction project in the Blue River South Basin project was approximately 90 percent complete through the end of December 2014. Construction contract documents for the project are expected to be complete in early 2015.

The targeted amount of I/I reduction in the Blue River South Basin (including all five sub-basins) is 45 percent. This I/I reduction project is part of Water Services' efforts to reduce the amount of I/I flow in the City's separate sanitary sewer system south of the Missouri River. This work is required to be complete by December 31, 2021.

**ii. ADDITIONAL BLUE RIVER SOUTH I/I REDUCTION PROJECTS**

Three additional I/I reduction projects are underway in the Blue River South Basin, further defined as Area 3, Area 4 and Area 5. Project scope elements are similar to what is underway in other I/I project basins.

In June 2014, design professional consultants were selected and contract negotiations are currently underway. A Notice to Proceed for all three projects is expected in early 2015.

These I/I reduction projects are part of Water Services' efforts to reduce the amount of I/I flow in the City's separate sanitary sewer system south of the Missouri River. This work is required to be completed by December 31, 2021.

**iii. BLUE RIVER CENTRAL I/I REDUCTION AREA 1 AND AREA 2 PROJECT**

In April 2014, design professional services for an I/I reduction project in Area 1 and Area 2 in the Blue River Central Basin were advertised. The project involves similar design professional services similar to what is underway for the Blue River South I/I Reduction Projects.

Project scope elements for design professional services include project management, analysis of CCTV inspection data, collection system characterization data and manhole inspection data, smoke testing, and dyed water testing, developing rehabilitation recommendations, and preparing construction contract documents.

In June 2014, the design professional was selected and a Notice to Proceed is expected in early 2015. The targeted amount of I/I reduction in the entire Blue River Central Basin is 30 percent. This I/I reduction project is part of Water Services' efforts to reduce the amount of I/I flow in the City's separate sanitary sewer system south of the Missouri River. Under the Consent Decree Modification filed in November 2014, this work was moved up in the implementation schedule from an initial completion date of 12/31/21 to 12/31/18.

**iv. BLUE RIVER NORTH I/I REDUCTION PROJECT**

The Blue River North I/I Reduction Project involves similar design professional services as what will be conducted for the Blue River South I/I Reduction Projects.

Project scope elements for design professional services include review of CCTV, flow metering, collection system characterization and manhole inspection data, smoke testing, field investigations, development of rehabilitation recommendations, and preparation of the construction contract documents.

In June 2014, a design professional was selected, and a Notice to Proceed is expected in early 2015.

The targeted amount of I/I reduction in the entire Blue River North basin is 30 percent. This I/I reduction project is part of Water Services' efforts to reduce the amount of I/I flow in the City's separate sanitary sewer system south of the Missouri River. Under the Consent Decree Modification filed in November 2014, this work was moved up in the implementation schedule from an initial completion date of 12/31/21 to 12/31/18.

**v. 87TH STREET PUMP STATION REHABILITATION**

The project includes rehabilitation of the existing 87th Street Pump Station, including the replacement of duty pumping units, to improve the station's reliability of existing pumping capacity.

Design professional services includes services for preliminary and detailed design, development of construction contract documents, bidding assistance, construction phase office and field support, resident project representative services, and control system configuration and programming.

Design professional services for this project were approximately 90 percent complete through the end of December 2014. The development of construction contract documents is scheduled to be completed in early 2015. Construction is expected to be completed by the Consent Decree deadline of December 2017.

Beginning in late 2012 and through 2014, the United States and the City negotiated an amendment to the Consent Decree which was designed to defer construction and operation of Phase I wet weather pumping capabilities and storage facilities. The parties agreed that the City would accelerate four other projects in the meantime. The United States and the City agreed that deferring construction and operation of Phase I wet weather pump capabilities and storage facilities was reasonable and prudent in light of the expected reduction in flows from Johnson County Wastewater. The modified Decree was lodged with the court on November 11, 2014 and after a public comment period, the court entered the decree on January 9, 2015.

## **X. SCHEDULED ACTIVITY FOR THE NEXT REPORTING PERIOD**

From January 1, 2015 to June 30, 2015, the activities listed below are expected to occur. However, this list should not be construed as an explanation of all activities that will be occurring in the first half of 2015. Certain Consent Decree and OCP activities (e.g., NMC, CMOM, public participation; project planning; data management) will continue for the duration of the Consent Decree, but are not specifically discussed in this section.

- Request for Qualifications/Proposals for the following OCP projects will be developed and advertised for selection of a design professional:
  - Neighborhood Sewer Rehabilitation: Northeast Industrial District basin
  - In-Line Storage: OK Creek Gates – Turkey Creek/Central Industrial District basins
  - Additional green infrastructure pilot projects
  - Sewer Separation: Outfall 099
  - Relief Sewer: Diversion Structure 068
- Construction contract documents will advertise for selection of a construction contractor for the following OCP projects:
  - Distributed Storage at Outfall 059
  - Distributed Storage at Outfall 069
  - Neighborhood Sewer Rehabilitation: Middle Blue River Basin (Area 2)
  - Blue River South I/I Reduction Area 1 and Area 2 Project
  - 87<sup>th</sup> Street Pump Station Rehabilitation Project

- Water Services will issue a Notice-to-Proceed to design professional consultants for the following OCP projects that are currently being advertised or are undergoing contract negotiations:
  - Neighborhood Sewer Rehabilitation: Brush Creek
  - Gooseneck Creek Arch Sewer Gates and Pump Station Improvements – Northeast Industrial District basin
  - I/I reduction projects south of the Missouri River in the Blue River South (Areas 3, 4, and 5), Blue River Central (Areas 1 and 2), and Blue River North basins
- Work will continue on the following existing projects:
  - Blue River South I/I Reduction Area 1 and Area 2 Project
  - Construction of improvements for the Middle Blue River Basin Neighborhood Sewer Rehabilitation Project (Area 1)
  - Distributed Storage at Outfall 059 Project
  - Distributed Storage at Outfall 069 Project
  - 87<sup>th</sup> Street Pump Station Rehabilitation Project
  - Line Creek/Rock Creek I/I reduction Area 1 Project
  - Construction of Turkey Creek Pump Station Modifications
  - Long-term flow monitoring
- Start the development of green infrastructure pilot projects in the Northeast Industrial District and the Turkey Creek/CID Basins upon receipt of approval from USEPA for the conceptual proposal submitted by the City on 12/31/14.
- Start the development of a construction management web-based document management tool.

## XI. NINE MINIMUM CONTROLS – APPENDIX B

This section focuses on documenting Nine Minimum Controls (NMC) program accomplishments in 2014. Table 1 identifies each of the NMC and summarizes significant measure accomplishments for 2014. Accomplishments for control measure are explained in further detail in the applicable NMC section.

Table 1: 2014 NMC Accomplishments

NMC	Description	Accomplishment
1	Proper Operation and Regular Maintenance Program	<ul style="list-style-type: none"> <li>✓ Conducted routine maintenance procedures</li> <li>✓ Conducted routine inspection schedules</li> <li>✓ Carried out the emergency response protocol</li> <li>✓ Inspected flow regulating structures</li> <li>✓ Conducted CCTV inspections</li> <li>✓ Cleaned CSS interceptor and collection lines</li> </ul>
2	Maximization of Storage in the Collection System	<ul style="list-style-type: none"> <li>✓ Source control technologies</li> <li>✓ Optimized sewer system</li> <li>✓ Performed inflow reduction and storage</li> </ul>
3	Review and modification of pretreatment requirements	<ul style="list-style-type: none"> <li>✓ Inventory non-domestic CSS discharges</li> <li>✓ Assessed non-domestic CSO discharge impacts</li> </ul>
4	Maximization of Flow to the POTW for Treatment	<ul style="list-style-type: none"> <li>✓ Updated wet weather operating guidelines</li> </ul>
5	Elimination of CSOs during Dry Weather	<ul style="list-style-type: none"> <li>✓ Inspected to identify dry weather overflows</li> <li>✓ Corrected primary causes of dry weather overflows</li> <li>✓ Performed dry weather overflow reporting procedures</li> <li>✓ Performed routine preventive cleaning of system</li> </ul>
6	Control of Solids and Floatable Material in CSOs	<ul style="list-style-type: none"> <li>✓ Repaired and cleaned catch basins</li> <li>✓ Conducted street sweeping</li> <li>✓ Performed construction site erosion control</li> </ul>
7	Pollution Prevention Programs to Reduce Contaminants in CSOs	<ul style="list-style-type: none"> <li>✓ Conducted street sweeping</li> <li>✓ Carried out Oil and Grease Management Program</li> <li>✓ Conducted Solid Waste and Recycling activities</li> <li>✓ Conducted Household Hazardous Waste Program</li> <li>✓ Leaf and Brush Collection and Recycling</li> <li>✓ Conducted Public Education and Outreach Programs</li> </ul>
8	Public Notification	<ul style="list-style-type: none"> <li>✓ Provided CSO notification</li> <li>✓ Conducted warning sign inspections</li> </ul>
9	Monitoring to Characterize CSO Impacts and the Efficacy of CSO Controls	<ul style="list-style-type: none"> <li>✓ Identified and mapped CSO structures and outfalls</li> <li>✓ Monitored water quality</li> </ul>

## a. NMC 1- Proper Operation and Regular Maintenance Program

### i. ORGANIZATION

Kansas City operates and maintains its wastewater systems through its Water Services Department. The Wastewater Line Maintenance Division and the Wastewater Treatment Division are primarily responsible for the O&M of the City's CSS. The Stormwater Maintenance Division is responsible for street cleaning activities in the CSS area.

The Wastewater Treatment Division is responsible for the O&M of the two WWTPs within the CSS area (Blue River and Westside).

Several Line Maintenance sections are responsible for the O&M of the City's CSS including the:

- Sewer Investigation Section;
- Sewer Cleaning Section; and
- Sewer Repair Section.

### ii. RESOURCES

Water Services maintains adequate personnel and capital resources to maintain O&M activities throughout the CSS. In fiscal year 2014, the operating expenses for sewer operations were as follows:

- Wastewater Treatment and Pumping: \$21,852,034
- Sewer Maintenance: \$20,686,435
- Administration and General: \$18,709,733
- Industrial and Household Hazardous Waste: \$1,277,181

### iii. LIST OF CRITICAL FACILITIES

Water Services maintains a list of critical CSS facilities, including diversion structures, flow splitters, and outfalls. Diversion structures divert excess wet weather flow to receiving streams. Often, several diversion structures direct excess wet weather flow to the same outfall. Flow splitters are structures that divide flows within the CSS but do not direct flow to receiving waters (one or more flow regulating structures are downstream of the structure, upstream of the receiving waters). *Attachment C* contains a list of critical facilities. Inspection intervals vary from three to 30 days depending on the history of required cleaning. If inspections reveal the interval is not adequate, it is adjusted accordingly.

CSS outfalls are points where combined flow discharges to a receiving stream. *Attachment C* lists the identification number, location, map number, and receiving

stream of the CSOs. CSOs were eliminated from the system if they did not have an inspection interval.

**iv. CSO SEWER MAINTENANCE MANUAL**

The Line Maintenance Division adheres to guidelines set forth in the CSO Operations and Maintenance Manual, found in hard copy form at Water Services offices. The manual provides guidelines to personnel for the proper operation and maintenance of the CSS. Guidelines include:

- Routine inspection schedules;
- Emergency response protocol;
- Dry weather overflow reporting procedures; and
- Training and safety practices.

**v. LOG OF MAINTENANCE ACTIVITIES**

Water Services currently uses the Hansen computerized maintenance management system to log maintenance activities. The system tracks maintenance activities with work orders. Water Services initiates work orders from sources including customer complaints, 3-1-1 Action Center calls, and investigation activities. Work orders are prioritized using a system that categorizes each work order into one of three levels based on the critical nature of the defect. Work orders are closed out upon completion of the work. Work orders track parameters, including:

- Date initiated;
- Initiating party;
- Date completed;
- Line segment;
- General supervisor;
- All costs, including materials;
- Labor hours, including overtime; and
- Permitting.

*Table 2* shows a summary of the maintenance activities performed in the combined sewer system during the reporting period.

Table 2: 2014 CSS Maintenance Activities

Activity	Quantity
Sewer- Main Stoppages Opened	130 work orders
Sewer- Main Repairs	337 work orders
Sewer- Manhole Repair/Resurfacing	286 work orders
Sewer- Water in the Basement	1,517 work orders
Sewer CCTV	92 miles
Sewer Cleaning	183 miles

**vi. CLOSED CIRCUIT TELEVISION INSPECTION**

The Wastewater Line Maintenance Division maintains a CCTV inspection program. The division utilizes both internal and subcontracted equipment. In 2014, approximately 92 miles of CSS were televised, which exceeds the Consent Decree requirements of 26 miles annually. Documentation for mileage cleaned is stored in Hansen and verified using WinCan software.

**vii. SEWER CLEANING**

Water Services maintains a fleet of sewer cleaning equipment including:

- Jet trucks;
- Jet-Vac trucks;
- Rodding machines;
- Easement machines; and
- Bucket machines.

Local contractors may be used for specialized cleaning services on large diameter sewers through contractual agreements. In 2014, approximately 183 miles of CSS were cleaned, which exceeds the Consent Decree requirements of 106 miles annually. This mileage is documented in Hansen.

**viii. OVERFLOW AND BYPASS RESPONSE**

The Line Maintenance Division has a documented protocol to guide actions following a dry weather overflow in both the combined and separate sanitary sewer systems. When a triggering overflow is recognized, Water Services responds quickly to control the release of wastewater and perform appropriate cleanup tasks. This activity is documented by Wastewater Line Maintenance supervisors and reported to MDNR in accordance with our plan and permits. Copies of overflows reported to MDNR are included in *Attachment A*. In 2014, a total of 63 dry weather overflows were reported, 21 of which were in the combined sewer system.



**ix. EMERGENCY CONTACT**

The City maintains a 3-1-1 Action Center for reporting collection system problems. The Action Center can also be reached by dialing 3-1-1 in Kansas City, Missouri or by dialing (816) 513-1313 from cell phones. The Action Center is staffed from 7 a.m. to 7 p.m. weekdays. Emergencies can be reported outside of these hours via 3-1-1, which connects to dispatch after hours. In 2014, approximately 2,901 3-1-1 calls related to collection system problems were received.

Installation of signs has occurred at each of the system's 89 combined sewer outfalls. Each sign identifies the outfall by number and lists the emergency contact number. The signs solicit public reports of dry weather overflows. The emergency contact number directs the caller to the City's 3-1-1 Action Center. More information about the signs can be found in NMC 8 later in this document.

**b. NMC 2- Maximization of Storage in the Collection System**

Measures described in this section consist of those that have been implemented without the need for a complex analysis of their system impacts to maximize storage in the existing collection system.

**i. COLLECTION SYSTEM INSPECTIONS**

All CSO diversion structures and flow splitters are inspected and cleaned regularly to identify overflows, remove debris and blockages, assess the operational status of the structure, and make needed repairs. Inspection crews can readily view detailed structure information such as inspection log forms, inventory sheets, schematics, profiles, and sectional views. Inspections of all diversion structures occur in intervals ranging from three to 30 days. Tracking of CSS diversion structure inspection logs occurs in Hansen.

**ii. DIVERSION STRUCTURE MODIFICATION**

Modification of diversion structures may be necessary after inspections or maintenance activities. Tracking of the modifications occurs in Hansen. Outfall structure 070 was eliminated following field investigations of a reported of weather overflow event.

**iii. REDUCE AND/OR ELIMINATE INFLOWS AND ENCOURAGE LOCALIZED UPSTREAM DETENTION**

Kansas City has been actively identifying City-funded projects that have the opportunity to produce multiple benefits by integrating green solutions that reduce and/or eliminate inflows or provide localized detention. Obstacles, opportunities, and project development process recommendations will be identified upon completion of these projects so that future projects can provide greater environmental benefits.

The Water Services' Green Solutions Maintenance Crew, led by the department's senior landscape architect, provides routine services such as trimming, mulching, and weeding of the green infrastructure improvements. These staff members continually oversee and maintain the green infrastructure improvements that are within the purview of Water Services.

1. Water Services Capital Projects

Water Services has many green infrastructure projects under construction and currently in design through the stormwater and wastewater divisions, intended to reduce inflows or provide solutions for localized flooding.

In 2014, construction began on the seven projects listed in *Table 3* below. In addition, green infrastructure improvements are being evaluated for inclusion as part of other stormwater and wastewater projects currently in design, including OCP green infrastructure projects.

As OCP continues, additional projects will be implemented that will aid in reducing and/or eliminating inflows. These projects may include private inflow source reduction, such as the disconnection of downspouts, sump pumps, and other sources of stormwater inflow from private property.

*Table 3: Water Services Green Infrastructure Projects Under Construction (2014)*

Property/Project Name	Description/Type
Marlborough 81 <sup>st</sup> Street and Chestnut	Rain Garden
N. Topping Avenue and 61 <sup>st</sup> Street (front yard)	Bioswale
N. Compton Road and Munger Avenue (front yard)	Bioswale
Swope Campus Parking Lot and Sustainable Stormwater Improvements	Pervious Pavements, Rain Gardens, Bioretention
Stillwell Detention (Universal Avenue and Stillwell)	Detention Basins with Native Plants
82 <sup>nd</sup> Street and Oldham Road	Detention Basin with Native Plants
29 <sup>th</sup> Street and Norton Avenue	Rain Garden and Bioswales with Native Plants

2. Other Citywide Green Infrastructure Efforts

Outside of Water Services, implementation of green infrastructure projects occurs in three primary ways: 1) through City capital project

enhancements; 2) required private installations; and 3) voluntary private installations.

**iv. UPGRADE/ADJUST PUMP OPERATIONS AT INTERCEPTOR LIFT STATIONS**

Six pump stations are within the boundaries of Kansas City's CSS. Four pump stations (Turkey Creek, Santa Fe, Northeast Industrial District (NEID), and Blue River) function as influent pump stations for the Blue River and Westside WWTPs. These pump stations are operated according to the Wet Weather Operating Plans defined in NMC 4. Flows that reach these pump stations exceed pumping capacity during wet weather. It is not possible to adjust the pump operations to store water in the upstream systems without affecting backwater conditions that would result in upstream overflows and basement back-ups. The OCP includes provisions for additional system storage and some sewer separation upstream of these stations to reduce overflow frequency.

Two very small pump stations in the CSS (12th and 15th Street stations) are operated to maximize storage in the upstream system during wet weather.

Pump operations at the interceptor lift stations will be upgraded or adjusted, as practical, and in accordance with the OCP and Consent Decree.

**v. REMOVAL OF OBSTRUCTIONS TO FLOW**

Obstructions to flow continue to be prohibited by the City's Sewer Use Ordinance. Cleaning of existing interceptors to maintain available conveyance and storage capacity is a normal procedure performed by the City's Line Maintenance Division. The division utilizes its crews and contract cleaning crews on an as-needed basis to remove and prevent accumulation of debris and sediment that restrict the flow. This information is tracked in Hansen.

**c. NMC 3- Review and Modification of Pretreatment Requirements**

The Wastewater Treatment Division regulates non-domestic discharges. The division is responsible for implementing and enforcing Chapter 60, Article IV of the Kansas City Code of Ordinances and several citywide programs, including:

- Federal Pretreatment Program;
- Surcharge Program for high strength wastewaters;
- Oil and Grease Management Program; and
- Annual review of pretreatment requirements.

These activities incorporate the following control measures.

- Inventory non-domestic CSS discharges - Identification of significant industrial users (SIUs).

- Assess non-domestic CSO discharges - Implementation of the surcharge program to evaluate the impact of non-domestic wastewater.
- Evaluate feasible modifications - Periodic review of pretreatment requirements as necessary. No pretreatment requirements were modified in 2014.

**i. FEDERAL PRETREATMENT PROGRAM**

The Wastewater Treatment Division’s administration of the Federal Pretreatment Program is subject to regular review by both the MDNR and the U.S. EPA Region VII. An annual report of the City’s Pretreatment Program activities is filed with the MDNR in March of each year. The 2013 Industrial Pretreatment Program Annual Report was submitted to the MDNR on March 27, 2014 and can be found in *Attachment B*.

The report includes the following information:

- Companies in significant non-compliance
- Inter-jurisdictional agreement status
- Permit activity
- Annual enforcement log
- Notices of violations.

The Wastewater Treatment Division identifies the regulated discharge flow volume, potential pollutants of concern, drainage basins, and the pump station(s) serving each SIU. According to the 2013 Industrial Pretreatment Program Annual Report, there are 69 SIUs permitted under the program. Annual inspections of each SIU occur, and they are monitored periodically for conformance with its wastewater discharge permit conditions.

**ii. SURCHARGE PROGRAM**

The Surcharge Program applies a surcharge for biological oxygen demand (BOD), total suspended solids (TSS), or fat, oil and grease (FOG) concentrations above that in “normal sewage” as defined in Chapter 60 of the City’s Code of Ordinances. Food handling operations such as restaurants are most affected by this ordinance. The surcharge program makes SIUs aware of the effects their discharge has on the sewer system and is an incentive to reduce their waste discharge through modifications or improved housekeeping procedures.

**iii. OIL AND GREASE MANAGEMENT PROGRAM**

The Oil and Grease Management Program objective is to encourage non-domestic sources to limit discharge of fats, oils and grease (FOG). The primary non-domestic sources of FOG discharges are restaurants. The Oil and Grease Management Program encompasses training, outreach, inspections, and enforcement.

The Health Department requires food establishments to either have a trained food service operations manager on site at all times or certify 80 percent of their staff through the food handler course. A portion of both the operations manager and the food handler training focuses on BMPs for FOG management. Twice a month, courses are held (one north of the Missouri River and one at the Kansas City, Missouri Health Department). Certification is valid for five years for operations managers. Food handlers' classes are held weekly at the Health Department and can also be completed online at <http://kcmo.gov/health/food-handler-and-manager-training/online-food-handler-training/>.

During 2014, the Health Department trained 589 operations managers and 7,721 food handlers through both online and in person training.

The City's Health Department and Water Services' Wastewater Treatment Division completes inspections of grease traps at food handling facilities. There were more than 6,000 facility inspections completed in 2014. At the time of inspection, facility personnel are informed about ordinance requirements regarding FOG discharges; if requirements are not met, there is a potential for enforcement actions. The inspector reviews cleaning records and performs a sink test to determine if the lines are clogged with FOG. During the inspection, if a FOG issue is discovered, the inspector will suggest one of the following enforcement options:

- Shorter cleaning cycles
- Replacement of grease traps with grease interceptors
- Temporary shut-down of food facilities until the grease trap issues are resolved.

**iv. REVIEW OF PRETREATMENT REQUIREMENTS**

Every year, the Wastewater Treatment Division reviews the pretreatment program to determine whether changes are warranted. Economic and environmental impacts are taken into account when evaluating potential changes. These include an assessment of the non-domestic discharges to the CSS and the impact of non-domestic discharges on CSOs. In 2014 no changes to the pretreatment program were warranted.

**d. NMC 4- Maximization of Flow to the POTW for Treatment**

**i. WASTEWATER TREATMENT PLANT (WWTP) PERFORMANCE AND FLOW CAPACITIES**

Previously, capacity studies were performed for both the Blue River WWTP and Westside WWTP. The Blue River Wastewater Treatment Plant Capacity Study dated March 2, 2006, and the Westside Wastewater Treatment Plant Capacity Study dated April 6, 2006 summarized the findings from the capacity studies. Plant stress tests were also performed on both plants. Two technical memorandums titled Blue River Wastewater Treatment Plant Stress Test Report

dated August 2008 and Westside Wastewater Treatment Plant Stress Test Report dated December 2007 summarized the findings of the stress tests. These studies compared flows processed during wet weather and dry periods to determine the relationship between performance and flow.

The treatment capacity of the Blue River Wastewater Treatment Plant and the Westside Wastewater Treatment Plant are fully utilized, and no simple modifications were made in 2014. Water Services plans to increase wet weather capacity in the future as part of the Overflow Control Program.

## ii. **WET WEATHER OPERATING GUIDELINES FOR WWTPs**

### 1. Blue River WWTP

The Wet Weather Operating Guidelines for the Blue River WWTP summarize the operating procedures at the facility during wet weather events. The guidelines specify that the Blue River WWTP processes combined (primary plus secondary) treat wastewater only to the maximum capacity of the secondary treatment plant. The operating guidelines indicate that the secondary treatment plant has a design capacity of 105 MGD and a total capacity of 140 MGD. The primary treatment capacity of 220 MGD is not achieved due to capacity limitation of secondary treatment.

Field stress testing results indicate the maximum wet weather plant capacity is limited by secondary treatment capacity of 156 MGD. The theoretical capacity of the entire plant assumes all equipment is on-line and operating as designed.

In August 2014, the Wet Weather Operating Guidelines were updated for the Blue River WWTP to reflect a change in operating practices.

### 2. Westside WWTP

The Wet Weather Operating Guidelines summarize the procedure for operations at the facility during wet weather events. The operating guidelines provide the following recommended wet weather pump station conveyance rates:

- Turkey Creek PS-11.4 MGD
- Santa Fe PS-4.5 MGD
- Line Creek PS-8 MGD.

Water Services is initiating operating guideline revisions to increase the pumping rate of these stations during wet weather to fully utilize the plant treatment capacity. The current plant operating procedure is to treat a greater volume of wet weather flow than recommended in the Wet Weather Operating Guidelines.

The current design capacity of the Westside WWTP is 40 MGD. Stress testing has confirmed that 40 MGD is the peak capacity this WWTP can process without affecting process performance.

#### e. NMC 5- Elimination of CSOs during Dry Weather

The Line Maintenance Division actively works to eliminate dry weather overflows. The measures taken include:

- Routine preventative cleaning of system
- Inspection to identify dry weather overflows
- Correction of primary causes of dry weather overflows
- Notification to MDNR when a dry weather overflow occurs.

##### i. **FLOW REGULATING STRUCTURE INSPECTION**

The CSS contains flow regulating structures that include diversion structures and flow splitters. Routinely, these structures are inspected to verify proper functioning. Diversion structures direct excess wet weather flows to receiving waters. The inspection interval varies for each structure and is based on historical records of performance and the sensitivity of the area surrounding the structure. *Attachment C* of this report lists inspection intervals for each diversion structure in the system. Flow splitters are structures that divide flows within the CSS but do not direct flow to receiving waters. *Attachment C* of this report lists the inspection intervals for flow splitters in the CSS.

##### ii. **DRY WEATHER OVERFLOW CORRECTIVE ACTION**

Water Services implements dry weather overflow (DWO) corrective actions to address operational problems believed to be the cause of the overflows. The corrective actions include:

- Interceptor cleaning
- Sewer repair.

The Line Maintenance Division's sewer cleaning program relies on jet vacuum cleaning units to remove materials that may restrict flow leading to blockages and DWOs at upstream locations. The Line Maintenance Division's sewer repair program is responsible for repairing localized sewer defects linked to the occurrence of DWOs. These steps are taken immediately (as is practical) upon notification that a DWO has occurred.

A DWO at Outfall 070 was reported in 2014. This diversion structure was eliminated by upsizing the downstream sewer line from 12-inch to 33-inch.

iii. **DRY WEATHER OVERFLOW NOTIFICATION**

The Line Maintenance Division notifies MDNR within 24 hours of discovery of a DWO. Within five days of the original notification, follow-up written reports are made. In all occurrences, the area around the overflow is cleaned and inspected for any debris or contaminants. In the case of DWOs caused by vandalism, the standard manhole covers are replaced with bolt-down covers to deter future vandalism. In 2014, 21 dry weather overflows in the CSS and three dry weather overflows from CSOs were reported to MDNR.

The Wastewater Treatment Division notifies MDNR of DWOs that occur at either pump stations or treatment plants within 24 hours of discovery. Within five days of the occurrence, a follow-up written report is submitted to MDNR.

In 2014, a dry weather overflow event occurred on August 6, 2014 at the Birmingham Wastewater Treatment Plant. In addition, a single two-day overflow event occurred from June 13 through June 14, 2014 at the Blue River Wastewater Treatment Plant. Dry weather overflows were also reported at the Turkey Creek Wastewater Treatment Plant on March 29, April 2, April 17, and April 23, 2014. *Attachment A* includes copies of these reports submitted in 2014.

f. **NMC 6- Control of Solids and Floatable Material in CSOs**

i. **PREVENTING EXTRANEOUS SOLIDS AND FLOATABLES FROM ENTERING THE CSS**

Water Services and other City departments employ various measures that minimize extraneous solids and floatables from entering the CSS, including:

- **Street Sweeping** – Water Services sweeps streets on a routine schedule to reduce trash, silt and other debris on the streets. During 2014, Water Services swept a total of 15,632 lane miles throughout both the combined and separate sewer system areas. The schedule for street sweeping runs from May 1st through April 30th each year; by the end of that time, street sweeping will have been conducted three times on all streets with curbs within the CSS area. The street sweeping activities exceeded the Consent Decree requirement of sweeping all streets with curbs within the CSS area twice annually.
- **Repair and Clean Catch Basins** – To maintain the proper function of stormwater inlets, the Stormwater Line Maintenance Division performs catch basin cleaning and repairs through its Catch Basin Replacement Program. This information is stored and tracked in Hansen. In 2014, 19,334 catch basins were cleaned, and 505 were repaired or replaced.
- **Construction Site Erosion Control** – Soil erosion from construction activity can increase the quantity of turbidity, nutrients, metals and sediment in the sewer system and receiving waters. Sedimentation problems can potentially reduce the hydraulic capacity of sewer lines, leading to overflows. The implementation and enforcement of erosion control regulations can be an extremely effective method of reducing these



constituents in the CSS. In 2014, the Stormwater Utility Division inspected 37 City-contracted construction sites that were one acre or larger in size for compliance with stormwater erosion control regulations.

Construction work is required to conform to the following City engineering and construction standards for all public or private work.

- Section 2100 – Grading and Site Preparation, May 2008
- Section 5100 – Site Work and Erosion and Sediment Control, August 2003
- Section 5600 – Storm Drainage Systems and Facilities, February 2006
- Manual of Best Management Practices for Stormwater Quality, March 2008

#### g. NMC 7- Pollution Prevention Programs to Reduce Contaminants in CSOs

Kansas City has a long-standing record of implementing pollution prevention measures throughout the City and providing pollution prevention options to residents. The City continues to implement the following measures to help reduce pollution entering the combined sewers and, in turn, the rivers and streams.

- Street sweeping (See NMC 6)
- Oil and Grease Management Program (See NMC 3)
- Solid Waste and Recycling
- Household Hazardous Waste Program
- Leaf and Brush Collection and Recycling
- Public Education and Outreach Programs

#### i. **SOLID WASTE AND RECYCLING**

Kansas City offers curbside pickup of solid waste, recycling, and bulky items to give residents a convenient way to dispose of unwanted waste and ultimately reduce illegal dumping. The City also manages three drop-off recycling centers used by businesses and residents of multi-family dwellings who may not have curbside recycling options available. In addition to these programs, the City also provides services for cleanup of illegal dump sites, a drop-off facility for waste tires, and reduced cost dumpsters for neighborhood cleanups. The total amount of solid waste collected through City programs in 2014 is listed in *Table 4*.

Table 4: 2014 Amount of Solid Waste Collected

Waste	Quantity
Solid Waste	82,183 Tons
Recycling – Curbside	19,257 Tons
Recycling – Recycling Centers	617 Tons
Bulky Items	6,407 Tons
Leaf and Brush	7,760
Waste Tires	19,605
Household Hazardous Waste	620
Illegal Dumping Cleaned	960 Sites
Illegal Dumping Collected	2,754 Tons

**ii. HOUSEHOLD HAZARDOUS WASTE PROGRAM**

The household hazardous waste (HHW) program is hosted by Water Services and consists of two subprograms: an HHW drop-off facility and HHW mobile collection events. In 2014, the program served 31 communities, including Kansas City, from four counties in the region. The program continues its success in collecting, recovering and recycling hazardous materials and producing reusable chemicals for the public.

The HHW facility serves as a core location for providing a cooperative regional collection system on the Missouri side of the metropolitan area. The facility accepts residential hazardous wastes including pesticides, herbicides, and fertilizers. Operational hours for the Swap Shop are Tuesdays through Saturdays 9:00 am to 4:00 pm and Thursdays and Fridays 9:00 am to 6:00 pm. Drop off of HHW from participating communities occurs on Saturdays 9:00 am to 4:00 pm.

The permanent facility is open to the public on Thursdays, Fridays and Saturdays year-round, with the exception of City observed holidays. Mobile events throughout the City and the region provide convenient opportunities for proper disposal. These mobile events typically occur on Saturdays from April 1 through October 31 and can be held in any city or county participating in the regional HHW program. The program provides a viable alternative to improper disposal in landfills, storm sewers, or sanitary sewer facilities. More than 3,200 vehicles were served at the mobile events in 2014.

In 2014, the program collected a total of 1,241,221 pounds of HHW, including 627,014 pounds coming from Kansas City residents.

**iii. LEAF AND BRUSH COLLECTION AND RECYCLING**

The leaf and brush recycling program allows residents to drop off or place these items curbside for free pickup by the City. The leaf and brush are then composted or mulched by a local company and made available to residents for free or for a

small fee. Removal of excess leaf and brush from residences curtails illegal dumping of these items down storm drains and into local creeks, streams, and rivers. The leaf and brush program is a collaborative effort between Water Services and the Kansas City's Public Works Department. Water Services is responsible for the collection of curbside leaf and brush, and the Public Works Department runs the drop-off facilities. Water Services collects leaf and brush from residents three times a year, once in the spring and twice in the fall, on regularly-scheduled trash pickup days. In 2014, 7,760 tons of leaf and brush were collected and recycled.

#### **iv. PUBLIC EDUCATION AND OUTREACH PROGRAMS**

In addition to the pollution prevention measures implemented, Water Services provides additional outreach and education to encourage residents and business owners to minimize or eliminate contaminants from entering the sewer system. Descriptions of active outreach and education initiatives, including those that are part of the Overflow Control Program, follow.

##### **1. Presentations, Conferences, and Tours**

From January 1 through December 31, 2014, 32 presentations were made to more than 1,500 citizens and stakeholders about OCP. The presentations included groups such as professional associations, metropolitan planning and non-governmental organizations, and neighborhood groups.

In March 2014, approximately 140 letters were mailed to neighborhood leaders offering a presentation by Water Services on the progress of the City's Overflow Control Program. For groups that responded, a detailed presentation was given that provided them with an overview of the Overflow Control Program and more specific information about watershed or basin improvements, when appropriate.

The following is a listing of the organizations and presentations given between January and December 2014:

- EWRI/ASCE Local Chapter Luncheon – January 8, 2014
- Maple Park Gardens Neighborhood Association – January 14, 2014
- Green Infrastructure and Water Management in Growing Metropolitan Area's Conference – January 15, 2014
- Southtown Council – January 16, 2014
- Wyandotte County, Kansas' "Managing Stormwater in Urban Development" Workshop – February 12, 2014
- KC Water Services' Capital Improvement Program Roll-out – February 18, 2014

- EPA Green Infrastructure Webinar Series – March 4, 2014
- APWA Local Chapter Sustainability Committee – March 4, 2014
- State of Kansas City’s Green Infrastructure Workshop – March 7, 2014
- Friends of Lakeside Nature Center Membership Meeting – March 10, 2014
- Big Muddy Speaker Series – March 11, 2014
- Marlborough Community Coalition Meeting – March 26, 2014
- Silver-Haired City Council – April 7, 2014
- Citadel Homeowners Association – April 12, 2014
- Community Engagement University – April 15, 2014
- Beacon Hill Neighborhood Association – April 19, 2014
- Run for KC: City Council Candidate Preparation Workshop – April 26, 2014
- Downtown Neighborhood Association – April 30, 2014
- Leawood, Kansas’ Stormwater Management Committee – April 30, 2014
- Eastern Jackson County Planning Commission Training Session – May 6, 2014
- Hallmark Health and Safety Team – May 7, 2014
- Citizens Association – May 13, 2014
- APWA Mid-America Conference – May 22, 21014
- AWWA Utility Benchmarking Workshop – June 8, 2014
- Kansas State University Teachers’ Tour – June 10, 2014
- Volker Neighborhood Association – June 12, 2014
- Nebraska Forest Services Tour – June 24, 2014
- Highland Gardens Neighborhood Association – June 26, 2014
- Kansas City Government Contracting and Procurement Workshop – August 14, 2014
- One Water Leadership Conference – September 17, 2014
- MORE<sup>2</sup> Meeting – November 20, 2014

2. Public Meetings

Table 5 below displays information about the public meetings held in 2014. Additional details about the meetings can be found with each project update.

Table 5: Public Meeting Information (2014)

Date	Project	Meeting Purpose	No. of Attendees
May 7, 2014	Target Green Marlborough Area Project (Distributed Storage 059 and 069 Projects)	Project information meeting – input requested	25
May 28, 2014	Target Green West Marlborough Project (Distributed Storage 059)	Project information meeting for businesses – input requested	5
May 29, 2014	Target Green West Marlborough Project (Distributed Storage 059)	Project information meeting for targeted neighbors – input requested	4
June 24, 2014	Target Green Marlborough Area Project (Distributed Storage 059 and 069 Projects)	Project information meeting – input requested	55
November 13, 2014	Line Creek/Rock Creek I/I Reduction Area 1 Project	Project information meeting	12
November 20, 2014	Middle Blue River Neighborhood Sewer Rehabilitation	Project information meeting	20
December 16, 2014	Sewer Separation Project: Diversion Structure 006	Project information meeting	20

3. Other Outreach

During the reporting period, Water Services continued to add project information on its website, including Overflow Control Program projects. The website ([www.kcwaterservices.org/overflow-control-program](http://www.kcwaterservices.org/overflow-control-program)) provides general information about the Overflow Control Program and contains project fact sheets for active and completed OCP projects. The fact sheets provide citizens information about a particular project, including what they should expect, why the project is being completed, and who they should contact with questions.

v. **NEWSLETTERS**

Water Services produces both internal and external newsletters for disseminating information to employees and customers respectively. The internal newsletter, titled “News on Tap,” is distributed monthly to employees electronically and in

hard copy. Water Services included 14 articles relating to OCP projects and initiatives in the employee newsletter in 2014.

The external newsletter, known as “What’s On Tap,” is sent to customers quarterly with their water bills. Water Services included five articles relating to OCP projects and initiatives in the external newsletter in 2014.

**vi. KC GREEN TEAM**

In 2008, four KC Green Teams were created under Administrative Regulation 5-5 Green Solutions and Sustainability: Education and Outreach, Green Infrastructure, Regulation and Policy, and Resource Management. To effectively execute the missions of each team, City staff members from various city departments volunteer their time.

**1. Education and Outreach Team**

The mission of the Education and Outreach Team (EOT) is to organize a variety of events and activities to educate City staff and residents about green solutions and sustainability within City operations and the City as a whole. For 2014, the EOT continued the KC Green Neighborhood Recognition Program, which allows neighborhoods proactive in sustainability to receive recognition for their green initiatives.

Neighborhoods can apply for the program and are scored based on their efforts in six categories: Natural Environment, Waste and Recycling, Transportation, Energy, Food and Urban Agriculture, and Water and Stormwater Management. Practices in the Water and Stormwater Management category include rain barrel use, planting and maintaining rain gardens, utilizing pervious pavement, and routing downspouts to green space. Depending on the number of homes implementing sustainable practices and the amount of collaborative special neighborhood projects, the neighborhoods are given a rating of Platinum, Gold, Silver, or Not Eligible. Three neighborhoods applied in 2014, and two of those received a “Silver” designation.

For Earth Day, April 22, 2014, the EOT hosted a series of neighborhood clean-up events throughout the City. Branded the KC Trash Bash, the events resulted in nearly 19 tons of trash removed from neighborhood streets and 275 tires collected. Water Services hosted a Trash Bash site outside their headquarters in partnership with the Swope Parkway/Elmwood Neighborhood Association. The site received media attention from two news stations both for the beautification of the neighborhood and the connection between trash and local water quality.

The OET also implemented a “Hard to Recycle Item” pilot event on November 22, 2014. The event allowed residents to get rid of items that cannot be recycled curbside through the City’s recycling program.

Residents were able to dispose of items such as batteries, glass, plastic bags, electronics, construction debris, mattresses, bicycles, furniture, and old appliances. The pilot event was a success with 475 residents participating; additional events are expected for 2015.

## 2. Green Infrastructure Team

Under new leadership, the Green Infrastructure Team (GI Team) resumed activity in late summer 2014 after an extended period of inactivity. The mission of this team is to facilitate green infrastructure work citywide by sharing design and construction resources with city staff, reviewing performance and maintenance of existing projects, and looking for opportunities for policy updates where barriers exist to green infrastructure implementation.

It was determined at the first meeting that the GI Team would begin by working on the following four primary task areas:

- Citywide green infrastructure inventory and map development;
- Design and construction resources for staff;
- Combined easement documents for post-construction best management practice easements on private property; and
- Street tree planting program.

Two meetings occurred in 2014 and a plan for meetings in 2015 has been established with the addition of small task groups. The four tasks mentioned above are expected to be complete by the end of 2015, and new tasks identified for the next calendar year.

## vii. **KC TO THE SEA**

Since 2010, Water Services has worked to educate local 4th through 6th-grade students through the KC to the Sea curriculum. The five-day interactive curriculum teaches students how precipitation moves through a watershed, how stormwater becomes polluted, and how BMPs implemented on public and private property could improve water quality and reduce the quantity of stormwater. During 2014, 2,074 students from 27 schools throughout Kansas City participated in the program.

## viii. **REGIONAL WATER QUALITY EDUCATION PROGRAM (RWQEP)**

In 2014, Water Services is one of the 24 local governmental organizations that contribute funding and staff time to a Regional Water Quality Education Program (RWQEP) sponsored by Mid-America Regional Council. The RWQEP allows metro

area cities to pool resources and provides a regional approach to raising public awareness about water quality issues affecting Kansas City for the benefit of both MS4 and combined sewer cities. The program accomplishes this through a bi-annual community survey, yearly media campaign, printed materials, and a grant program that funds projects designed to improve public understanding of the negative impact of stormwater runoff.

The successful media campaign, “If It’s On The Ground – It’s In Our Water,” continued in 2014. The main media campaign in 2014 focused on pet waste and litter prevention.

On October 30, 2014 RWQEP hosted 122 participants from across the Kansas City metropolitan area at a Stormwater Symposium. The purpose of the event was to review what has been done in the past for stormwater management throughout the region and discuss the future of stormwater management practices. A highlight of the symposium was a regulatory agency panel with members of the EPA, MDNR and the Kansas Department of Health and Environment (KDHE) who shared their insight with local governments.

#### **ix. PARTNERSHIPS IN PUBLIC OUTREACH**

##### **1. Blue River Watershed Association (BRWA)**

Water Services continued to work with Blue River Watershed Association (BRWA), a nonprofit, grassroots community organization that engages Kansas Citians in protecting and restoring the area watersheds. The organization focuses its efforts on community education, environmental stewardship, and strategic partnerships.

Water Services provides staff to support the BRWA’s T.R.U.E. (Teaching Rivers in an Urban Environment) Blue Program, which trains and equips area teachers, students, and community members to establish school-based “stream teams” to monitor water quality in local streams. In 2014, Water Services staff continued to volunteer their time to mentor small groups of students as they collected water quality data in local streams.

Water Services also partnered with BRWA to host an event called “Revolving Green Around the Blue,” which consisted of a litter pickup and invasive species removal near Watts Mill Park on Indian Creek. After the completed stewardship activities, the participants took a 5-mile bike ride along the Blue River trails to Alex George Lake. The purpose of the event was to familiarize people with the Blue River trails and the stewardship opportunities available in their community to help protect the rivers and creeks. A total of 32 bicycle riders participated in the event.



## 2. Project Blue River Rescue

Project Blue River Rescue is an outreach event hosted by the Friends of Lakeside Nature Center, operated by the City's Parks and Recreation Department. The event is sponsored by MDNR and supported by many governmental entities and businesses. The City's Parks and Recreation, Public Works, and Water Services Departments continue to provide facilities, equipment, expertise and assistance with program coordination.

On March 27, 2014, approximately 1,200 volunteers participated in this event. Nearly 90 tons of trash and approximately 1,000 used tires were collected and disposed. In addition to trash removal, groups removed invasive honeysuckle from a three-acre site and planted native trees and shrubs along the Blue River. The project provided economic, educational, and environmental benefits to the City by removing debris, refurbishing the floodplain and river banks, and safeguarding habitats along the river.

## h. NMC 8- Public Notification

### i. **COMBINED SEWER OVERFLOW PUBLIC NOTIFICATION PLAN**

The City recognizes the need to notify the public of CSOs. The purpose of the City's notification plan is to inform and educate the public of potential overflows in the urban waterways during and following storm events. The goals of the public notification program are to:

- Notify citizens when overflows are likely to occur;
- Educate the public about the potential health impacts associated with overflows in waterways;
- Educate the public about the potential danger and health impacts of high waters in waterways during heavy rainstorms; and
- Enable citizens to take appropriate steps to protect themselves and their families from such hazards.

Water Services utilizes these methods to inform the public of the potential for CSOs:

- **Telephone Hotline** – Overflows are to be reported to the City's Action Center at 3-1-1 or (816) 513-1313.
- **Signs** – Two types of warning signs have been installed to notify citizens of the hazards of CSOs. The first type, a Pedestrian Warning Sign (PWS), has been posted at public access points to streams. It notifies citizens that the streams receive CSOs and to avoid contact with the water during and 72 hours after rainfall. For more information, citizens are encouraged to call the OCP information line that is staffed by Water Services employees.

The process of replacing and relocating PWS signs, identified in a 2013 inspection, began in late 2014 and is expected to be completed in the spring of 2015. After completion of sign replacement and relocation, there will be a total 107 PWS locations.

A second type of warning sign has been posted at all outfall locations. The sign warns citizens to avoid contact with water and displays the phone number listed above for reporting of dry weather overflows. The signs are printed in English and Spanish and are readable from a distance of approximately 20 feet. The Line Maintenance Division is responsible for inspecting and maintaining the signs. Signs are inspected during overflow events and through routine inspections. A comprehensive CSS-wide outfall sign inspection began in late 2013 and was completed in the winter of 2014. A total of seven outfall signs were found to be damaged and 10 were missing. Sign replacement will begin in the spring of 2015.

- **Media Advisories** – When a sewer overflow occurs during the recreation season, Water Services Communications distributes a media advisory to local media outlets. In 2014, 20 advisories were distributed.
- **Website** – In addition to providing notification directly to media outlets, the media advisories are also posted on the KC Water Services website at [www.kcwaterservices.org/sewer-overflows-2/](http://www.kcwaterservices.org/sewer-overflows-2/)
- **Water Bill Insert** – Water Services publishes a quarterly customer newsletter (“What’s On Tap”) that informs the public about the activities underway at Water Services. Periodically, information on OCP projects is included in the newsletter.

## i. NMC 9- Monitoring to Characterize CSO Impacts and the Efficacy of CSO Controls

The City completed a thorough characterization of the CSS as part of the development of the OCP. The following sections summarize what has been completed to aid the City in assessing the effectiveness of the NMC and the control measures described in the OCP.

### i. MAPPING CSS DRAINAGE AREA DIVERSION STRUCTURES AND OUTFALLS

Water Services has completed mapping of the CSS drainage areas and has located and inspected all diversion structures and outfalls. The CSS drainage areas were verified during the development of the OCP. In 2014, mapping was updated to remove the eliminated Outfall 070.

Figure 1<sup>1</sup> was updated in 2014 and shows the locations of diversion structures, flow splitters, and outfalls.

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<sup>1</sup> Originally included in the October 2008 report entitled “Capacity, Management, Operations and Maintenance Plan (CMOM) and Nine Minimum Controls”.

## ii. RECEIVING WATER BODIES AND DESIGNATED USES

Kansas City's combined sewers overflow to numerous receiving streams. Primary receiving streams include the Kansas River, the Missouri River, the Blue River, and Brush Creek. Brush Creek is tributary to the Blue River, which is tributary to the Missouri River. The Missouri River at the Broadway Bridge in Kansas City drains a total of 484,100 square miles. That area includes 59,756 square miles tributary to the Kansas River at De Soto, Kan. (approximately 30 miles upstream of the confluence of the Missouri River and Kansas River). All of Kansas City's CSS basins are eventually tributary to the Missouri River. They represent only 0.01 percent of the total Missouri River tributary area at Kansas City. The Downtown Airport, the Central Industrial District, and the Northeast Industrial District are each directly tributary to the Missouri River. The Turkey Creek basin is the only Kansas City CSS basin tributary to the Kansas River. The remaining CSS basins in Kansas City (Gooseneck Creek; Lower Blue River; Brush Creek; Town Fork Creek; and the Middle Blue River) are tributary to the Blue River.

Figure 2<sup>2</sup> shows streams that receive overflows from Kansas City's CSS, and indicates the current recreational water quality standard designated by the State of Missouri (or by the State of Kansas, for the Kansas River). This figure defines (in blue) the CSS area directly tributary to the Missouri River (including those areas tributary via the Kansas River). It also shows all areas tributary to the Blue River. The map distinguishes between those tributary areas upstream of Kansas City's CSOs (e.g., upstream of the points marked with red stars), and areas directly tributary to those stream reaches that receive CSOs. Within the Blue River basin, areas directly tributary to those stream reaches that receive CSOs include both CSS (shown in yellow) and SSS (shown in green).

Of the total area tributary to the Blue River, 74 percent is located upstream of those reaches of the Blue River, and its tributaries are impacted by overflows from Kansas City's CSS. Kansas City's CSS serves 10 percent of the total area tributary to the Blue River. The remaining 16 percent of the Blue River tributary area is served by separate storm and sanitary sewer systems in Kansas City.

## iii. DEVELOPMENT OF OVERFLOW OCCURRENCE ESTIMATES

The current performance of the CSS was estimated using computer models developed as part of the OCP. Water Services calibrated the models to sewer flow meter and rainfall data. The estimated overflow volume from Kansas City's CSS in a typical year is just over six billion gallons.

Overflow frequency varies significantly, both within the individual basins and across the City. The estimated average overflow frequency at the 88 outfalls south of the Missouri River is more than 20 times in a typical year. A complete summary of the overflow frequency, volume, and duration for each outfall is found in the supporting documentation included in Kansas City's OCP. As Water Services

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<sup>2</sup> Originally included in the October 2008 report entitled "Capacity, Management, Operations, and Maintenance Plan (CMOM) and Nine Minimum Controls".

implements control projects, estimates of overflow volume and frequency will be compared with these baseline values.

**iv. DEVELOPMENT OF A LONG-TERM MONITORING PLAN FOR THE OVERFLOW CONTROL PROGRAM**

The City is implementing a Water Quality Monitoring Program (WQMP)<sup>3</sup> that was developed to address the requirements of Section II, Water Quality Monitoring Plan, of the Post-Construction Monitoring Program Performance Criteria, included as Appendix D of the Consent Decree. The WQMP is being implemented citywide and addresses water quality in both the CSS and SSS areas. Summary results from the WQMP for 2014 begin on page 69.

Given the dynamic nature of the assessment of water quality standards and evolution of regulations, the data collected will be periodically evaluated during the course of the program for usefulness in serving Water Services' needs. Based on such evaluations, Water Services will propose a modification of the WQMP to the regulatory agencies and will make any modifications accepted by them. Modifications may include the addition, elimination or relocation of monitoring stations; the addition or elimination of pollutant parameters; modification of data collection techniques; and modification of data evaluation methods.

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<sup>3</sup> Dated December 28, 2010

Figure 1: Diversion Structure, Flow Splitter, and Outfall Locations

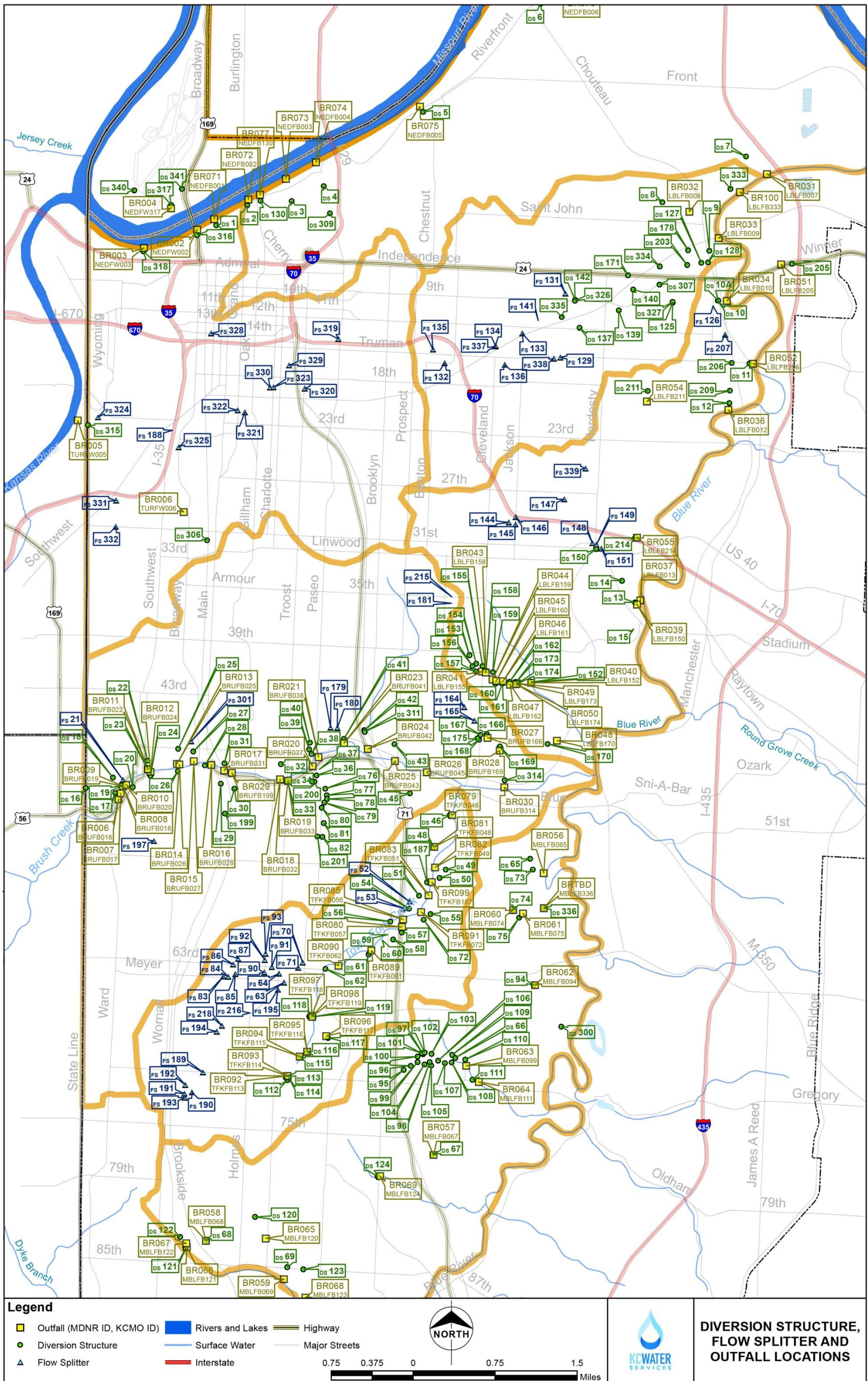
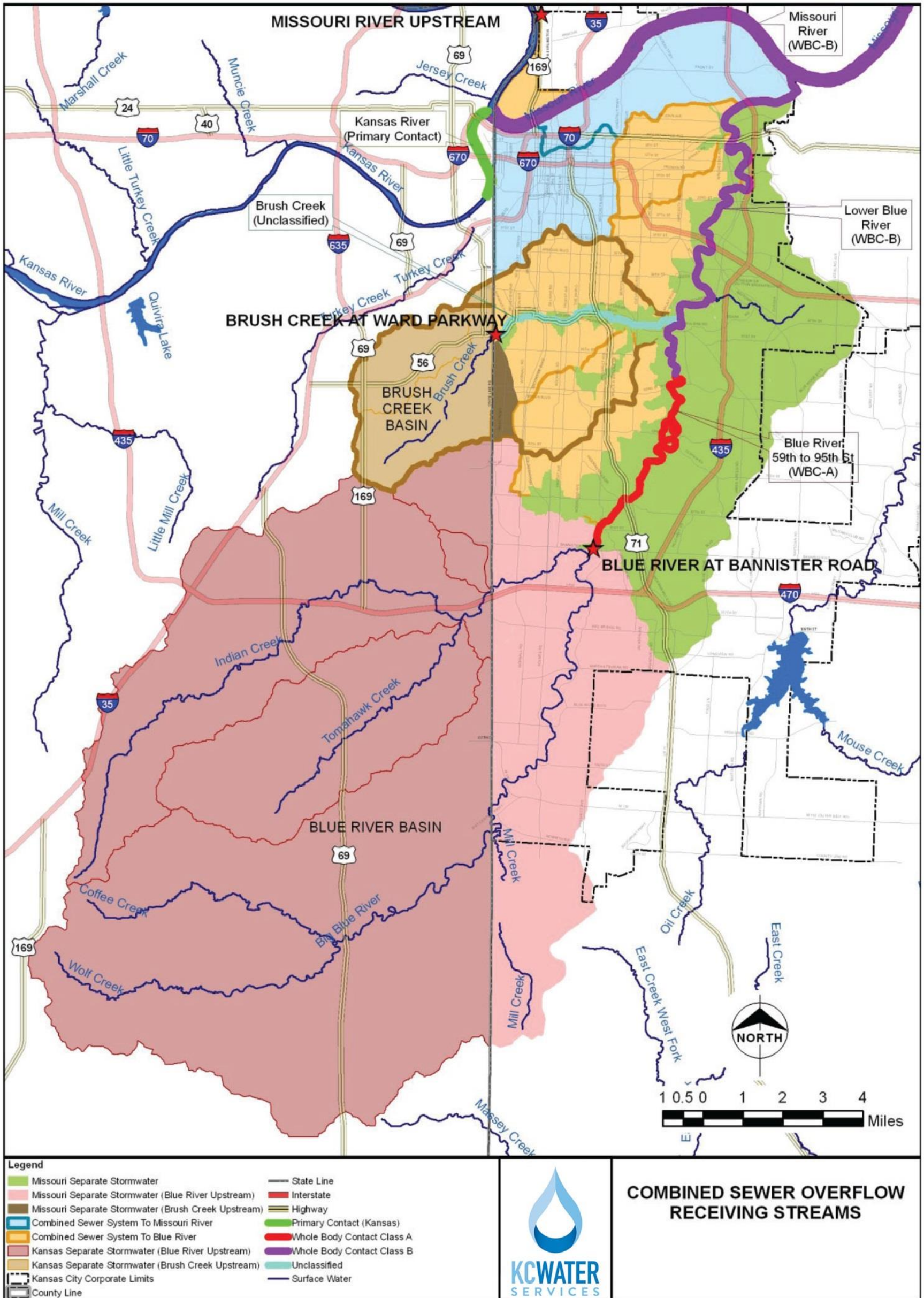


Figure 2: Combined Sewer Overflow Receiving Streams



## XII. CAPACITY, MANAGEMENT, OPERATION AND MAINTENANCE PLAN PERFORMANCE CRITERIA – APPENDIX C

The following information is a summary of activities conducted in the reporting period to demonstrate compliance with the Capacity, Management, Operation and Maintenance (CMOM) program. The program is aimed at improving the ability of the utility to manage its system and ultimately reduce the occurrence of sewer overflows and maintain compliance.

### a. Collection System Management

#### i. ORGANIZATIONAL STRUCTURE

Water Services' organizational structure delineates job responsibilities, outlines opportunities for advancement, ensures effective employee to supervisor ratios, and guarantees adequate staff is in place to accomplish the mission and vision of the department. This structure is used during the annual budget process to determine staffing needs and allocate operational expenses appropriately. Water Services maintains job descriptions and organizational charts and effectively communicates job responsibilities to staff, and acquires and maintains the level of skills and abilities necessary to support the business needs of the organization.

Water Services' organizational structure chart outlines functional groups and classifications. It is used as a planning tool when evaluating staffing needs. In addition, the organizational chart visually presents the hierarchy and reporting structures, as well as career opportunities.

Hiring for all vacant positions is handled through the Department's Human Resources Division; positions are posted internally citywide to provide advancement opportunities for existing staff members. Water Services fills vacancies once the appropriate level of talent is found.

The organizational structure is evaluated during the annual budget process and through frequent communication between Human Resources personnel and the operating divisions of Water Services. In addition, members of the management team evaluate staffing needs throughout the year to address operational challenges that may not have been taken into consideration while developing the budget. The performance of all Water Services employees is evaluated using a formal performance review process. The Water Services' Director and the Human Resources Manager are responsible for ensuring that Water Services' organizational structure and staffing meets department needs.

#### ii. COMMUNICATIONS AND CUSTOMER SERVICE

In 2014, Water Services communications staff continued to meet the unique needs of the many audiences the department serves. These audiences encompass:

- approximately 850 employees;
- 170,000 retail customers;

- 27 wholesale wastewater customers;
- local and national media outlets;
- neighborhood and civic groups;
- the Mayor, City Council, City Manager, and City Departments; and
- State and Federal elected officials and governmental entities.

The communications staff members produce a quarterly newsletter titled “What’s on Tap” which is distributed in the water bills. Staff members also regularly update the KC Water Services website ([www.kcwaterservices.org](http://www.kcwaterservices.org)), which allows for real-time updates to the site when needed. Currently, the website supplies basic information on the Overflow Control Program and informs citizens of upcoming OCP projects.

### iii. INQUIRIES, REQUESTS AND COMPLAINTS

The City tracks all customer service requests. The primary point of contact for members of the public with complaints is Kansas City’s 3-1-1 Action Center. Calls to the Action Center are logged into a computer database that documents a description of the problem, location, caller identification, and contact data. An electronic ticket is then generated for routing to the appropriate City department. Complaints related to sanitary sewer or stormwater issues are routed to the Wastewater Line Maintenance staff by both phone and email. Each complaint is scanned by a supervisor and assigned to an investigator to determine the nature of the problem. In 2014, Action Center opened 2,949 cases for sewer related issues.

If the Wastewater Line Maintenance Inspector finds that the problem is with a facility for which Water Services is responsible, a work order is initiated. Once the work has been completed, the customer service ticket is closed out. In situations where Water Services repair activities require the involvement of other City departments, the appropriate departments are called in, and the associated costs are charged back to the Line Maintenance Division for work completed on their behalf.

Occasionally, a member of the public will call Water Services directly. If the call is related to an ongoing customer service ticket, the operator accesses the customer service database, looks up the matter, and routes the call to the appropriate Wastewater Line Maintenance Supervisor.

### iv. LEGAL AUTHORITY

The legal authority of Water Services rests in the City Charter of Kansas City, Missouri (KCMO), which sets forth each of the City departments and defines their responsibilities. Chapter 60 of the City Municipal Code defines the specific authority and responsibilities of Water Services regarding the sewer system.



Specifically, Chapter 60 of the Municipal Code provides the Department authority to do the following:

- Charge fees to all users of the sewer system, whether or not they reside within the City limits;
- Set rates for different classifications of sewer system users;
- Enter into agreements with communities outside the City limits for wastewater services;
- Measure and/or calculate the volumes of wastewater received from customers outside of the City limits;
- Solicit bids, select contractors and construct public sanitary and combined sewers; Set standards for the use of private septic tanks or cesspools, including the cleaning of the tanks and the disposal of collected materials;
- Maintain the approved pretreatment program pursuant to 40 C.F.R. Part 403 and the Current NPDES Permits;
- Prohibit the discharge of flammable or other hazardous materials into the sewer system;
- Regulate the release of oil and grease into the sewer system by setting acceptable discharge concentrations and setting surcharge rates for higher concentrations of discharged oil and grease;
- Require the pretreatment of waste from industrial or commercial users in order to protect the POTW;
- Require industrial or commercial users to report on their releases into the sewer system;
- Inspect the facilities of industrial or commercial users to determine the types and quantities of materials being released into the sewer system; and
- Implement the City's approved pretreatment program against any industrial or commercial users who violate the terms of the ordinance or permits issued.

In addition, Section 60-346 of the City's sewer user ordinance gives the City the authority to regulate the connection of private sewers to the public system by entering into contracts, assessing fees, requiring adherence to the City's Standard Specifications, and requiring bonds. The City has the authority to deny a building permit or sewer connection permit if it is determined the receiving sewers have inadequate capacity. The City has established Standard Specifications for the design and construction of new or upgraded sanitary and combined sewers.

Coordination between the Departments of Public Works and Water Services is required to regulate the connection of private sewers to the public system in accordance with Section 60-346 mentioned previously.

An established Enforcement Program provides the City the support needed to interpret, adapt, and enforce Water Services Rules and Regulations as needed, which helps control causes of SSOs. Such causes may include I/I, corrosion and blockage due to industrial waste and FOG. The Enforcement Program also provides the City the resources necessary to manage and implement the requirements set forth in the OCP, which will ultimately minimize overflows in the City's service area.

**v. ACQUISITION CONSIDERATIONS**

As part of the City's Acquisition Considerations Program, the design and construction of infrastructure acquired into the sewer system complies with the City's technical specifications and construction standards. This program applies to prospective infrastructure from both new construction and privately-owned systems being considered for a transfer of ownership to the City. The City has established a formal, written policy and guidelines for assuming ownership of preexisting infrastructure and ensures performance of proper recordkeeping and documentation.

The program includes proactive measures to prevent the occurrence of I/I by inspecting new infrastructure to determine if it is properly designed, constructed, and installed, and by inspecting private sewers connecting to the public system to ensure they are water tight.

This program is largely implemented and enforced through standard evaluation and inspection procedures. Located on the City's website, the City's standards (Design Criteria and Construction Specifications) are a source of information for contractors and developers. City inspectors monitor new construction activities for compliance with City standards and specifications. Prior to accepting new infrastructure, City inspectors witness post-construction performance tests to assess the integrity of the infrastructure. The City's in-house inspectors are dedicated full time to monitoring construction activities of infrastructure to be dedicated to the City. This team of inspectors is within the City Planning and Development Department. Water Services works with City Planning and Development to ensure better coordination procedures.

The Land Development Permits staff (located in the City Planning and Development Department) is responsible for issuing private development project permits for construction of public infrastructure, including storm and sanitary sewer improvements. The group, working under City ordinance, issues permits to those individuals and companies who have obtained the necessary insurance, bonds and construction plan approvals. The group also maintains the public infrastructure records. The City provides unique file numbers to all public infrastructure construction plans, permits, and other pertinent records that are scanned and permanently stored.

The Plans Management staff reviews and approves detailed plans required for permits. Upon submittal, the plans are reviewed for complete information and are

then forwarded to the appropriate City departments for technical review and approval. The City issues permits once they receive all required approvals.

Such acquisitions are extremely rare and most likely will require custom procedures. Generally the City follows the following procedure:

- City assigns a project manager to oversee potential acquisition activities.
- Owner of the infrastructure obtains and delivers to the City historical information on the infrastructure including proof of ownership, design guidelines, design calculations, as-built plans, specifications, rights-of-way, and any other information of interest.
- Owner obtains/performs a condition assessment (to be witnessed by the City).
- Owner tests the performance (to be witnessed by the City).
- City may determine whether the infrastructure will meet the desired conveyance need.
- City may require the owner to make improvements if needed, before assuming ownership.

**vi. INFORMATION MANAGEMENT SYSTEM**

The City maintains an Information Management System (IMS) that provides tools for tracking collection systems' performance, costs, and work orders and measures the effectiveness and efficiency of O&M activities.

In addition, the City continues to enhance its computer-based tools to manage and track collection system data. They have updated its SOPs to ensure accurate documentation of pertinent collection system data and staff members' competent use of the IMS tools. The City continues to improve IMS training as the City deploys mobile data units for data entry and research.

Collectively, IMS tools give staff members a well-defined, detailed understanding of how the collection system performs by monitoring and analyzing their performance measures. The IMS tools help categorize and prioritize problems throughout the system so that staff members can make well-informed decisions regarding the allocation of resources and implement maintenance and rehabilitation activities that can minimize overflows.

Water Services continues to expand the IMS and share data among divisions in several locations around the City. For the wastewater treatment and collection system, the primary data systems used is Infor's Hansen work/service order modules, asset management, and work crew assignment. It additionally includes the City's geographic information system (GIS) mapping with attribute tables, WinCan CCTV data management system, plus other software supporting applications to help manage the large quantity of data processed on a daily basis. The following is a list of the relevant systems maintained and used during the 2014 reporting period:

- **GIS – ESRI ArcGIS:** Discussed in more detail below.
- **WinCan CCTV data management system:** Used to organize and store CCTV investigation information. WinCan stores digital video, still images and text data in a database format. The Division utilizes WinCan V8.24 with PAPC coding.
- **Infor-Hansen System - CMMS:** Water Services is currently using Hansen 8.3 release 1404.
- **Hansen (formerly Ventyx) Banner Customer Information System:** Used for Water, Wastewater, and Stormwater utility billing. Banner (Hansen Customer Suite) is used to manage and bill approximately 170,000 customer accounts.
- **SCADA:** Used by the Water and Wastewater Treatment Divisions for data acquisition and signaling alarms.
- **Inventory Data Management – Interface Systems – Storeroom:** Used to manage supplies, track the quantity, cost, and physical location of spare equipment, parts, and material.
- **Mobile SR Tablet:** In-house developed web-based application to allow assignment of Hansen 8 service orders to be completed in the field in real-time with access to GIS, CIS, and Hansen 8 data via a secure connection. Tablets allow staff to close Hansen 8 service orders in the field and update Hansen/Banner within five (5) minutes, including the GIS were allowable.

Water Services' Information Technology (IT) Division manages the PC network and applications specific to Water Services that includes the integration of various application programs to facilitate user and work needs at each location. The IMS interfaces are constantly being enhanced to improve efficiencies by automation based on work/problem code for work assignment and updates to the supporting system. Monitor tools have been added to review performance measures and provide real-time presorting to all of the Water Services divisions.

On an annual basis, the systems are evaluated to assess upgrade or replacement needs. In addition, an assessment is conducted to evaluate if an existing module can replace an older standalone system or process.

Water Services IT continues to work with each division to support the use of IMS in addition to providing training as requested with the core Water Services systems as new functionality becomes available, or an enhancement is made. A combination of Water Services IT staff and vendor provided maintenance provide oversight and support for Water Services IMS tools.

#### 1. GIS Software

During the reporting period, Water Services continues to use the ESRI ArcGIS 10 suite of products. Within ArcGIS, ArcInfo is used for maintaining spatial data. In Water Services, there are a moderate number of users of ArcInfo (split between water distribution, sewer collection, and stormwater collection) that create and maintain GIS

data. A small number of people are using ArcView to view the GIS and perform some analysis. The remaining people that use the GIS are using ArcReader, a free product used for viewing and plotting GIS data. This product has no editing capabilities and has limited analysis tools, but it meets the needs of some GIS end users.

Field crews can access GIS data via a secure connection from their mobile units based on user credentials. On a monthly basis, the GIS group refreshes the accessible GIS data.

The GIS contains asset type, material, size, install date, pipe elevation, and address information although not all fields are complete. These data fields also exist in Hansen. While the GIS contains a comprehensive list of assets, it does not contain the level of asset data that Hansen contains, because Hansen is considered a source database for assets. It is unnecessary to replicate all data in both locations. This is especially true because the two systems are integrated. If staff members want to spatially analyze data that only exists in Hansen, the data can be loaded temporarily into the GIS or join tables through open database connectivity. In addition, Hansen 8 has built-in integration into ESRI GIS that allows work/service orders to be created via GIS (through the Hansen 8 application).

## **vii. GIS MAPPING**

The purpose of Water Services' GIS Mapping Program is to ensure that an accurate and comprehensive inventory is maintained of the collection and transmission systems, to assemble and present the information in a manner conducive for use, and to ensure that it is easily accessible by Water Services personnel that depend on the data. The City's online mapping system shows Water Services GIS data accessible to employees on the citywide network. For security reasons, the data discussed above is not available to the public.

Water Services' mapping software identifies several collection system components and attributes, including:

- Gravity sewer/force mains:
  - Property lines/parcels
  - Pipe attributes
  - Manholes and other access points
  - Diversion structures/flow splitters and outfalls
  - Ownership of infrastructure
  - Sewer easements
  - Stormwater inlets
  - Septic tanks

- Impervious surfaces
- Aerial photography
- Wastewater facilities (including pump stations, flood pump stations, and wastewater treatment plants)
- Green infrastructure
- Proposed new construction services
- Planimetric features (including contours, roads, surface water and land use)

Water Services continually includes comprehensive, accurate data to include in the mapping system. Updates to existing infrastructure are submitted by both internal crews and external consultants when routine field inspections or work in special project areas reveal changes or additions to system mapping data. The updates include new sewer extensions and sewer additions installed by contractors or identified by crews. In 2014, Water Services continued to develop green infrastructure layer for inclusion in the GIS.

Digital maps generated from ArcGIS are available to field crews both in the office and via hard copies in the field. Field crews and CCTV crews record changes and inaccuracies by submitting hard copy revisions to Water Services' GIS staff. This data is transferred into the GIS as it is submitted, and monthly files are maintained by a GIS technician.

There are several employees throughout Water Services that utilize system mapping tools and provide updates to inventory data. In addition to internal staff, Water Services obtains planimetric data and aerial photography from partnering GIS organizations. All applicable staff members receive training from IT personnel on ArcGIS and ArcReader. The method of training for these applications ranges from formal classroom instruction to informal reference sheets. Personnel who utilize system mapping tools also attend relevant workshops and other GIS events.

GIS administrators and users throughout Water Services evaluate the GIS Mapping Program on a continuous basis through monthly team meetings and frequent communication.

#### **viii. SANITARY SEWER OVERFLOW REPORTING AND NOTIFICATION**

The City maintains an SSO reporting and notification program that ensures that discharges from the City's sewer system are documented, stored in a data management system, and properly reported to appropriate regulatory authorities. Water Services notifies the public, where appropriate, including persons with the potential to come in contact with the sewage. This SSO reporting program includes listing of all Building/Private Property Backups discovered by or reported to the City that have occurred. This tabular listing also includes the date of the building/private backup incident, location, source of notification (e.g., property owner, field crew), general cause(s) of the backup, and actions taken or suggested by the City to halt, mitigate, and prevent future incidents. The City shall follow its

Current NPDES Permits for verbal and written notification to the NPDES permitting authority that an SSO has occurred.

Adherence to and compliance with the SSO Reporting and Notification Program plays a vital role in minimizing SSOs, supporting the City's community values, and minimizing the City's compliance and legal risks. Properly tracking and reporting SSOs provides Water Services staff with a better understanding of release point trends and root causes throughout the collection systems and enables decision makers to prioritize resources to cost effectively minimize SSOs. Continuous tracking of overflow occurrences leads to proactive prevention of SSO events.

The primary point of contact for members of the public with complaints is Kansas City's 3-1-1 Action Center. The 3-1-1 Center is the principal method in which SSO overflows are reported to Water Services. Water Services initiates a work order if a problem with a Water Services facility is identified upon receipt and investigation of a 3-1-1 service call. A total of 1,517 calls related to SSOs were routed to the Line Maintenance Division during 2014. The breakdown of SSO call types includes:

- Water in basement dry weather (W) – 1,269
- Water in basement wet weather (WR) – 230
- Water in the Basement – Line Cleaning Backups (WL) – 18

In the event of a backup that resulted in the owner/tenant of the property calling 3-1-1 or after hours calling Water Services Central Dispatch, the City's Building and Private Property Response Plan comes into effect. At the onset of the call, the consumer is asked a series of questions to determine the appropriate cleaning response. If the problem cannot be determined on the call, a Wastewater Maintenance Crew is dispatched to verify the condition of the City's sewer main and to clean that section to ensure it is functioning properly. If, as a result of the call, it is agreed upon that City involvement is necessary, a Hansen service request will be initiated. Either a Code 2 (Urgent) or a Code 3 (Emergency) prioritization will be given. In the case of a Code 2 event, a maintenance crew will respond as soon it is available. In the event of a Code 3 event, a maintenance crew will be dispatched on an emergency basis and will respond as soon as possible. There is a certain amount of interpretation associated with the decision to label an event a Code 2 or a Code 3. As a general rule of thumb, if there is water coming into the house from an outside source, the event would be categorized as a Code 3. If water is slowly draining, then it would most likely be a Code 2. If water comes up in the basement after using the facilities in the residence, it would most likely be a Code 2 event. If it is determined that the backup occurred due to issues on private property, a "Property Owners Responsibility letter" is given to the property owner with instructions and next steps to resolve the issue.

"Dry weather" backup complaints are documented as a "W" in the problem field on the Hansen caller log. Wastewater Maintenance Crews will respond based on the Code 2 or Code 3 priority. "Wet weather" backup complaints will be

documented as a “WR” in the problem field on the Hansen caller log. Wastewater Maintenance Crews will respond to all wet weather backup complaints as a Code 3 priority. Crews will respond to inspect the city manholes for surcharge conditions. If a stoppage is found within the system, the crews will open it. If the sewer system is surcharging, a door hanger will be given to the property owner to inform them of the surcharge. The City will recommend that the owner contact a private plumbing company to install a backflow preventer at the property owner’s expense.

Historically, SSO responses have been designed to occur quickly, control the release of wastewater, and perform appropriate cleanup tasks; crews are dispatched 24 hours a day to investigate complaints. Water Services continually evaluates the SSO Reporting and Notification Program. This review process helps Water Services determine how the program goals are being accomplished and whether the program is being implemented in the most efficient manner. “Dry weather” backup complaints are documented as a “W” in the problem field on the Hansen caller log. Wastewater Maintenance Crews will respond based on the Code 2 or Code 3 priority. “Wet weather” backup complaints will be documented as a “WR” in the problem field on the Hansen caller log. Wastewater Maintenance Crews will respond to all wet weather backup complaints as a Code 3 priority. Crews will respond to inspect the city manholes for surcharge conditions. If crews find a stoppage within the system, the crews will open it. If the sewer system is surcharging, a door hanger will be given to the property owner to inform them of the surcharge. The City will recommend that the owner contact a private plumbing company to install a backflow preventer at the property owner’s expense.

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**ix. PERMIT AUTHORITY NOTIFICATION**

The Line Maintenance Division notifies the MDNR when a DWO occurs within 24 hours of discovery. Water Services completes follow-up written reports within five days of the original notification. In all occurrences, the area around the overflow is cleaned and inspected for any debris or contaminants. In the case of DWOs caused by vandalism, the standard manhole covers are replaced with bolt-down covers to deter future vandalism.

The Wastewater Treatment Division notifies MDNR when dry weather overflows occur at either pump stations or WWTPs within 24 hours of discovery. Water Services submits a follow-up written report to MDNR within five days of the occurrence. There were 63 dry weather overflows reported to MDNR in 2014



compared with 76 in 2013. See *Attachment A* for copies of all dry weather overflow reports submitted in 2014.

## b. Collection Systems Operation

### i. BUDGETING

The budgeting process provides adequate fiscal resources to the operating divisions to carry out their responsibilities. The Department's Division managers identify recommended staffing and funding levels, which are then adjusted based on City priorities.

Proper funding, budgeting, and planning are necessary for the Line Maintenance and Wastewater Treatment divisions to provide sufficient capital, labor, and equipment to complete CMOM activities as needed to ensure the minimization of overflows.

Budgets are created by division managers on an annual basis. The budget process covers project costs and revenue sources for five years. The managers submit their budget requests to accounting. Accounting reviews the requests, compiles the budget and submits it to the Director of Water Services for review and approval. The Director then presents it to the City Manager who, in turn, presents it to the Mayor and City Council for review and approval. Ultimately, the City Council approves the budget, which takes effect at the beginning of each fiscal year.

### ii. ENGINEERING

The purpose of Engineering within Water Services is multi-faceted, as it encompasses several functional business units:

- Utility Planning
- Energy Management
- Stormwater Management
- Systems Engineering – for water distribution and wastewater collection systems.
- Facilities Plant Engineering – for Water and Wastewater Supply, treatment and pumping facilities.
- OCP
- Waterways

The business units are the coordinating entities behind many collection system activities such as new construction, construction inspections, rehabilitation and replacement, and capacity assessment and assurance. The engineering business units confirm that new facilities are constructed according to standard

construction specifications and do not contribute to future I/I problems. The engineering business unit also provides inspection and oversight of rehabilitative work to ensure proper execution.

The various engineering business units have unique areas of collection system responsibility as follows:

- Planning is responsible for GIS mapping.
- Energy Management is responsible for negotiating utility contracts for pump station and treatment plant operations.
- Stormwater Management is responsible for the design of stormwater projects.
- Systems Engineering is responsible for the design of gravity sewer system improvements and general collection system planning.
- Facilities Plant Engineering is responsible for the design of all above ground structures including pump stations and wastewater treatment plants.
- OCP is responsible for development and implementation of the City's Overflow Control Program.
- Waterways is responsible for stormwater management projects that are funded jointly by other government agencies such as the Corps of Engineers.

Engineering is responsible for design review, approval and inspection of new sanitary sewers and pump stations installed by private developers. This work is also closely inspected to ensure it meets the City's construction standards and technical specifications. The City takes ownership of these assets once construction is complete.

Water Services performs all engineering activities under the supervision and direction of registered professional engineers. Staff members in the Engineering Department receive continuing education and training through industry seminars and workshops, as well as classes required to maintain PE licensure.

In addition, the City commonly uses engineering consulting firms and outside contractors to perform planning, design, and construction activities.

### **iii. WATER QUALITY MONITORING**

Water Services has developed an integrated monitoring program intended to meet all water quality related objectives in a cost-effective manner as part of the Overflow Control Plan post-construction monitoring requirements set forth in Appendix D.

The Water Quality Monitoring Plan is divided into five sections:

- Objectives and Rationale

- Water Quality Monitoring Plan
- Field Methods and Procedures
- Quality Control
- Resource Assessment

Water Services conducts sampling and analysis efforts for the Water Quality Monitoring Program in accordance with Water Services' OCP Quality Assurance Project Plan, Water Services Laboratory's Quality Assurance Manual, and Health and Safety Plan.

More information on the Water Quality Monitoring Program can be found in the Consent Decree Appendix D: Post Construction Monitoring Program Performance Criteria in this report.

#### **iv. PRETREATMENT PROGRAM**

The City continues to implement its approved pretreatment program pursuant to 40 C.F.R. Part 403 and the current NPDES permits. Information on the pretreatment program may be found in NMC 3. Submittals to MDNR associated with the pretreatment program can be found in *Attachment B*.

#### **v. PUMP STATION OPERATIONS**

The purpose of the Pump Station Operations Program is to ensure reliable operations of Water Services' wastewater pump stations and flood pump stations.

In 2014, the Tiffany Lakes, Tiffany Greens, Green Hills, Quail Run, and Second Creek Pump Stations came off-line. Water Services replaced all five pump stations removed from service with the new Second Creek Pump Station which was substantially complete in June 2014. One new pump station is expected to come on-line in early 2015.

The department ensures reliable operations by:

- Conducting routine inspections
- Troubleshooting when situations arise
- Performing preventive maintenance
- Retaining appropriate records of pump station performance
- Remotely monitoring pump station operations through the use of remote dialers and a SCADA system

This program is executed in conjunction with the Pump Station Maintenance Program (see below). Routine inspections typically generate work orders for the maintenance crew and pump station operators are responsible for performing light maintenance work as needed.

Monitoring the reliability of pump stations through routine inspections, troubleshooting, and remote supervision decreases the chance of pump station failure that could potentially cause an overflow. Proper pump station operation also maximizes storage and ensures adequate capacity throughout the collection system, which may consequently prevent an overflow from occurring.

Wastewater Treatment Division operators visit each wastewater pump station (WWPS), flood pump station, and headworks pump station at WWTP sites on a regular basis. The visits occur at varying frequencies ranging from daily to three times per week for larger stations, to once per week for small stations. Visit frequency is based on a number of factors including manpower availability, facility size, complexity, criticality, reliability, and past maintenance history. Maintenance staff performs tasks needed to keep WWPS equipment in serviceable condition, perform preventive and emergency maintenance, plus other tasks needed to maintain the overall wastewater treatment system.

The pump stations include remote monitoring using telephone dialers and SCADA. In 2014, Water Services continued to implement a SCADA system program for the wastewater system. Water Services records pump station inspections in a log book, and inspection forms and data are archived. There is pump station inspection data on record for all stations.

At some of the larger stations, more extensive data is collected and filled out on worksheets, which are kept on clipboards at the site so that operators can easily scan the data for trends during their inspections.

Water Services has assigned operations crews and maintenance crews to pump station O&M activities. Seven operators are assigned to perform pump station rounds and station monitoring. Maintenance has two supervisors and 12 associates assigned full time to mechanical investigation and repair activities at the stations. Maintenance also has crews available for electrical, instrument and controls, and HVAC repairs as needed.

The majority of training for pump station operators occurs through on-the-job experience. However, Water Services provides considerable training through an in-house program in which staff is eligible to obtain continuing education credits required for certification.

**vi. PUMP STATION MAINTENANCE**

The purpose of the Pump Station Maintenance Program is to perform the necessary predictive, preventive, and corrective maintenance required to sustain the reliability of wastewater and flood pump stations and ensure that all pump stations throughout the service area are operating efficiently. This program is executed in conjunction with the Pump Station Operations Program to complete work orders generated from routine inspections, trouble calls, and preventive maintenance schedules.

Maintaining the reliability of pump stations helps to decrease the chance of pump station failure that could potentially cause an overflow. Performing predictive and

preventive maintenance helps to correct problems before they become an emergency situation and pump station reliability increases.

Crews perform regular maintenance at each of the pump stations. All pump station maintenance is performed based on planned weekly maintenance schedules or when an emergency occurs. Typical tasks include verifying normal operation of pumps and equipment, checking for sewage leaks, servicing equipment for proper overall operation, and other corrective and preventive maintenance. Each location has a log book and staff record work orders in the Hansen system.

Maintenance supervisors produce a weekly maintenance schedule and select specific projects based on crew availability, parts availability and the urgency of a particular repair. Staff members update plans during a weekly meeting between the pump station maintenance planners, operators, and maintenance supervisors to facilitate coordination. As a result, 90 percent of all work performed consists of scheduled maintenance. This process has been used since 2010. Control of backlog has also improved since this process was initiated.

Hansen administration, procurement, and coordination consume the majority of the plant superintendent's time. Daily meetings with maintenance supervisors are conducted to communicate and coordinate the activities that need to be performed. Daily Maintenance Activity reports are emailed to plant personnel as warranted.

This program is evaluated consistently through daily team meetings and regular tracking of work orders. Tracking work orders in Hansen enables staff to identify patterns that may require further evaluation. All flood pump stations are inspected by the department quarterly, and the Army Corps of Engineers conducts annual audits.

#### **vii. PUMP STATION EMERGENCIES**

Water Services has emergency response procedures that crews follow for pump station emergencies. Water Services monitors the basic operations status via the SCADA alarm reporting system and telephone dial-out system, each used as appropriate to the pump station location and equipment type. The SCADA system is monitored 24 hours a day, seven days a week by a certified plant operator (CPO) at the Blue River WWTP. The alarms received by the CPO indicate the type of equipment problem and permit the CPO to tailor responses. The CPO has guidelines that specify whom to call and when to call them based on the time of day, weather conditions and nature of the issue. Water Services also receives notification of trouble in the collection system from the public. External constituencies can hear an audible alarm or see a flashing red light at one of the pump stations and call Water Services' 24-hour response line to report trouble.

Water Services provides emergency response. The CPO has the authority to call in additional resources as needed, including either staff with electrical and mechanical expertise or a contract hauler. This system ensures that quick response is available 24 hours a day and improves employee accountability.

Additional assistance for pump station trouble calls may be summoned by the CPO. Skilled and/or general labor is available, as well as equipment operators and their respective equipment. The responder will determine labor and equipment needs during the initial assessment of the issue. Equipment available for pump station emergencies includes:

- Stationary and portable diesel generators
- Portable diesel and gasoline powered pumps
- Service trucks with crane bodies
- 25-ton crane truck
- Sludge hauling trucks
- Hand and portable power tools
- Heavy equipment
- Dump trucks
- Spare parts (limited)
- Vactor and camera trucks (provided by Line Maintenance).

Work orders associated with pump station emergencies are completed and documented in Hansen. The success and effectiveness of Water Services' efforts are measured through a variety of performance indicators, such as response time, effectiveness of remedies, and number of well-trained personnel available to monitor and respond to pump station emergencies. The formal Emergency Response Plan is included as part of the City's Sewer Overflow Response Plan (SORP) dated 2010.

#### **viii. FORCE MAINS**

The Force Main Maintenance Program and Air Release Valve (ARV) Program consists of five elements: GIS, condition assessment, corrosion investigation, preventive maintenance, and documenting of maintenance activities.

Water Services initially inspect force main sewers in isolated areas through the use of infrared video/thermal imagery conducted as part of the annual aerial flyover contract. If an anomaly is found, field inspectors in the Line Maintenance Division are sent out to determine if the anomaly was an active leak on the force main sewer. This program is discussed further in the Remote Sewer Inspection Program on later in this report. The Line Maintenance Division also assists in the repair of force main breaks only on a point repair basis.

The Blue River Wastewater Treatment Plant is responsible for the ARVs on the force main sewer. The inspection, maintenance, contract work, is under their direct authority. The ARVs are checked annually at a minimum, and if time, semi-annually.

**ix. SMOKE TESTING**

The purpose of the Smoke Testing Program is to identify specific public and private sources of stormwater I/I into the SSS and CSS that can be eliminated or reduced through rehabilitation or repair. Smoke testing along with CCTV inspection, manhole inspections, and flow monitoring comprise the Sanitary Sewer Evaluation Survey (SSES) program elements. Smoke testing helps to identify significant sources of stormwater I/I, including private service laterals and illegal connections such as downspouts and area drains. Smoke testing can also be used to determine the location of sewer main defects likely contributing I/I to the system.

The City has developed a standard protocol for smoke testing. Water Services keeps a hard copy of this protocol along with electronic copies. This document accompanies all smoke testing based RFPs. Smoke testing is performed by outside firms as dictated by specific projects. Data is analyzed and used for system improvements as outlined in the Collection System Maintenance section below.

In 2014, smoke testing was performed as part of the Middle Blue River Basin Neighborhood Sewer Rehabilitation, Blue River South Basin I/I Reduction and Town Fork Creek Neighborhood Sewer Rehabilitation Projects. Line segments within these three project areas totaling approximately 192 miles of sewer were smoke tested to detect I/I sources in the public and private sectors.

Each positively identified source was photographed and located using a GPS device. A defect feature class was created and is included in the geodatabase.

**x. FLOW AND RAINFALL MONITORING**

Flow and rainfall monitoring is being performed in conjunction with Appendix D of the Consent Decree. Additional flow and rainfall monitoring will be performed in individual sub-basins to aid in the design of proposed improvements.

Water Services has developed a standard protocol for flow and rainfall monitoring and data analysis. Once the flow and rainfall data is received, it is stored on a server at Water Services and is reviewed by the Overflow Control Program team. The design professional conducts an analysis of the data for design of system improvements. Additional details and project-specific information on the flow monitoring program is described in more detail in Appendix D updates as part of this report.

**xi. CCTV INSPECTION**

The purpose of the City's CCTV Inspection Program is to visually assess the condition inside of the collection system. The program relies on the use of National Association of Sewer Service Companies (NASSCO) standardized ratings to characterize conditions. Currently, CCTV inspections are conducted to investigate a known trouble area and as a follow-up to line cleaning. Water Services has developed a standard protocol for CCTV inspections.

In 2014, the City televised approximately 312 miles of sewer lines, thereby meeting the Consent Decree requirements of at least 70 miles annually. This mileage includes the mileage in the combined sewer system previously discussed in NMC 1. Water Services tracks CCTV inspection information in Hansen with information available in WinCan.

**xii. REMOTE SEWER INSPECTION PROGRAM**

The Remote Sewer Inspection Program is implemented to inspect remote portions of the sanitary sewer system in an economical and efficient manner to identify anomalies warranting further inspection. This is done through an aerial flyover contract that identifies and locates potential areas of ground seeps into the watershed, specifically leaks from local underground sewer lines situated near or along the river, creeks and tributary streams in remote locations.

The work is an aerial flyover of approximately 308 miles of isolated sewer lines and force mains. The specialized equipment requires a small aircraft equipped with a video camera and thermal infrared/integrated GPS tracking. These tools detect temperature anomalies along remotely located portions of the collection system. The temperature anomalies indicate flow may be either exfiltrating or overflowing from the collection system and that further investigation is necessary.

After the flyover is performed, the infrared footage is analyzed and adjusted to remove any known anomalies such as lights, animals or other obvious heat sources. For those heat sources that cannot be characterized, and that may be resulting from sewer system leaks, Water Services staff visually inspects those areas. If staff members discover a leak, a work order is issued for the repair.

A flyover was performed in January 2014. As a result, 138 anomalies were discovered. Using the supplied GPS coordinates, the Line Maintenance Division visually inspected the anomalies. No anomalies were found to be sewer related. The remaining anomalies were the results of small ponds, dried up creeks with small pools of water, natural groundwater seepage, storm drainage pipes, excessive dog waste, animal carcasses, and other similar items.

**c. Collection Systems Maintenance**

**i. MANHOLE REPAIRS**

The purpose of the Manhole Repair Program is to ensure the structural integrity of manholes in the system, to reduce infiltration into manholes, to control odor problems at manholes, to increase accessibility to buried manholes, and to prevent public harm due to structural failures.

Manhole repairs often reduce infiltration into manholes. This helps ensure capacity exists for conveyance of sanitary sewer flows. The Manhole Repair Program also addresses the structural integrity of manholes. This reduces the likelihood a manhole would structurally fail causing blockage in the system that may trigger either SSOs or CSOs. The Manhole Repair Program also helps to



minimize overflows by increasing the accessibility of buried manholes. Greater accessibility for inspection and maintenance activities will minimize overflows with maintenance related causes.

Activities associated with this program include the repair or replacement of manhole components in the upper three feet of the structure by the Line Maintenance Division manhole repair crew or manhole replacement by a heavy repair crew. The division's manhole repair crew implements various types of repairs, including:

- Lid and ring replacement
- Lid grade adjustment
- Brick replacement

The manhole repair crew does not repair manholes suffering severe structural failure. These manholes are typically removed and replaced. A heavy repair crew in the Line Maintenance Division conducts the work. In 2014, staff inspected 5,680 manholes, and 288 manholes were repaired or replaced.

## ii. **MAINLINE SEWER REPAIRS**

Actual physical repairs are made to the gravity sewer lines by the Line Maintenance Division. The repairs are performed to make upgrades and improvements to mainline sewers as needed to ensure adequate capacity, keep flow in pipes, reduce and eliminate I/I, and maintain the design conveyance of the pipes in the system.

Overflows are minimized by reducing the levels of I/I entering the system and by fixing deteriorating pipes that keep the flow in the collection system. A reduction in I/I levels leaves more system capacity available for conveyance of sanitary sewer flow, eliminating one significant cause of overflows. Maintaining the pipe also removes restrictions that could potentially cause blockages and overflows and further helps ensure capacity.

The type of repair method used is dependent upon several factors including:

- Pipe size
- Pipe type
- Pipe location
- Flow
- Surface conditions
- Severity of I/I

The City utilizes several repair technologies, including:

- Open cut
- Cured in place lining

- Horizontal directional drilling
- Boring and jacking
- Tunneling
- Pipe bursting
- Slip lining
- Grouting of joints
- Point repairs

Historically, work orders have been prioritized based on available assessment information and sound judgment. Work orders associated with mainline sewer repairs are tracked and stored in Hansen. Repair work performed by in-house construction crews is entered into Hansen by Collection Systems personnel, and repair work performed by outside contractors is entered into Hansen by Engineering personnel.

Water Services employs repair crews. However, there is also a significant amount of mainline sewer repair work completed by outside contractors. Water Services also relies on outside contractors for construction work that requires either special equipment or expertise to perform. In-house inspectors monitor work conducted by outside contractors. Specifications for construction work are included in formal contracts used to manage outside firms.

In 2014, approximately 4,500 linear feet of sewer line repairs were performed as a part of OCP projects as well as Water Services' annual sewer repair contract.

### **iii. SEWER CLEANING**

The two purposes of the Sewer Cleaning Program are to perform preventive maintenance cleaning on the gravity sewer system and to clean trouble or emergency areas. The preventive maintenance cleaning is intended to ensure the system design capacity is available and to prevent non-structural blockages caused by either root intrusion or buildup of grease or debris. A large percentage of annual sewer cleaning is on lines that are part of a routine preventive maintenance schedule. Water Services conducts emergency cleaning in response to emergency calls. The remaining cleaning activities are unscheduled trouble or emergency.

City crews also perform corrective cleaning in response to stoppages, trouble calls, and city requests. If Water Services receives repeated trouble calls for a particular line segment, the line segment is placed on a frequent interval preventive cleaning cycle. CCTV inspection typically follows all sewer cleanings. All sewer cleaning originates with a Hansen generated work order. Completed work is also tracked in Hansen.

The City performs both hydraulic and mechanical cleaning. Mechanical cleaning is performed using either a rod machine or a bucket machine. Hydraulic cleaning is

performed using jettors. As was stated previously, the following types of equipment are used by the Sewer Cleaning Program:

- Jet trucks;
- Jet-Vac trucks;
- Rodding machines;
- Easement machines; and
- Bucket machines.

Water Services stores all data related to the Sewer Cleaning Program in Hansen. Cleaning records include information such as the date, time and location of the cleaning, method of cleaning used, names of staff members who performed the cleaning, and any further actions that were initiated from the cleaning.

In 2014, the City cleaned approximately 514 miles of sewer lines, thereby meeting the Consent Decree requirements of at least 283 miles annually. This mileage includes the mileage in the CSS area previously discussed in NMC 1.

#### **iv. RESPONSE PLAN**

The City's Building and Private Property Backup Response Plan was developed to provide procedures for response and preventive maintenance. The purpose of the plan is to restore the public sewer line to a functioning condition and perform any cleanup that may be required while working within the applicable laws of the City.

If, while conducting preventive cleaning activities, a basement backup occurs that is found to be the responsibility of Water Services, the property owner will be directed to contact the City's Claims Department. The Claims Department will hire a private contractor to perform the clean-up work. If there is a claim or lawsuit, then the law department works with the property owner to install a backflow device (if they choose to have the device installed). This installation would be located on private property, and Water Services is typically not informed if the homeowner elected to have the device installed or not.

### **d. Collection System Capacity**

#### **i. CAPACITY ASSESSMENT AND ASSURANCE**

The City's current procedure for capacity assurance is as follows:

- City Planning – Land Development Division reviews new development additions. The developer's engineering consultant is responsible for certifying that the proposed development will not overload the receiving sanitary sewer system. They must verify that the receiving trunk sewer was sized adequately according to APWA standards and verify that the receiving pump station has sufficient capacity to handle the additional flows.

- For single taps:
  - City Planning- Land Development Division grants or authorizes the connection;
  - Water Services issues connection inspection permits for all connections;
  - Water Services performs the inspection of the physical connection;
  - Public Works (and/or Parks and Recreation Department for roads under its jurisdiction) issues excavation permits for excavation within the public right-of-way or easement;
  - Public Works issues any required traffic closure permits; and
  - Building Officials issue a plumbing permit for the service line on private property.
- City Planning – Land Development Division has the authority to refuse authorizing the connection if there is a history of capacity issues or if the City has issued a moratorium on new connections in a specific area.
- City Planning is responsible for reviewing plans and inspecting connections to the existing sewer system for a major infrastructure permit per Chapter 64 of the Code of Ordinance. Water Services supports City Planning – Land Development when requested, on larger proposed developments or unique drainage or sanitary sewer service areas.

## XIII. POST CONSTRUCTION MONITORING PROGRAM PERFORMANCE CRITERIA – APPENDIX D

### a. Flow Monitoring Program

#### i. SHORT-TERM FLOW MONITORING

Short-term flow monitoring is conducted by the OCP Program Management team. Information about short-term flow monitoring activities for 2014 is listed below.

Middle Blue River Pilot Project: In the spring of 2014, flow monitoring was performed to facilitate additional performance evaluation of the completed green infrastructure improvements. This additional monitoring included four flow meters in the pilot project area. Flow monitoring data submittal is expected in August 2014.

Blue River South Inflow and Infiltration (I/I) Reduction Projects 1 and 2: Additional flow and rainfall monitoring, consisting of eight temporary flow meters and one rain gauge, was conducted beginning in April 2014. Flow monitoring was performed for 90 days to provide additional data to supplement data obtained during the spring of 2013 for use in design of I/I reduction improvements.

Round Grove: In the spring of 2014, additional flow monitoring was conducted to further estimate post-construction flow rates and quantify the amount of I/I removal. Flow monitoring was performed using 14 meters from late March through early July.

Various I/I Projects: In the spring of 2014, pre-construction flow and rainfall monitoring was performed for 90 days. Monitoring occurred in five I/I project areas to provide information for the identification and quantification of I/I sources. Monitoring was performed for Line Creek/Rock Creek Basins Area 1 Project, Blue River South Area 3 Project, Blue River Central Areas 1 and 2 Projects, and the Blue River North Project. Eight rain gauges were also installed in the project areas to supplement coverage provided by the City's existing ALERT gauging system.

#### ii. LONG-TERM FLOW MONITORING

Table 2 in Appendix D of the Consent Decree presents the initially planned suite of flow monitoring locations for select CSO outfalls and combined sewer collection system locations, along with their required installation schedule.

Long-term flow monitoring continued at multiple locations within the combined sewer system. As of December 31, 2014, flow monitoring was conducted at 18 combined sewer outfall locations with seven outfalls, as listed below, added beginning in April 2014. *Table 6* summarizes the long-term monitoring locations through the end of 2014. Water Services receives flow data on a quarterly basis.

- Outfall W003

- Outfall W002
- Outfall BR031
- Outfall BR063 (2 flow meters)
- Outfall BR066
- Outfall BR067
- Outfall BR076

In late 2014, Water Services began working with the EPA to implement several modifications to the monitoring plan. These modifications will permit collection of sufficient data to meet the Consent Decree’s objectives and lower costs to the City’s customers by nearly \$1 million. Water Services is expected to submit a revised monitoring plan to EPA in spring 2015.

Table 6: Long-Term Monitoring Locations (2014)

Site ID	Project Area	Manhole Number	Monitored Line	Year Implemented	# of Sensors
<b>BR069 (1)</b>	Middle Blue River	S128-356	Incoming/outgoing main lines at diversion structure	2011	3
<b>BR069 (2)</b>	Middle Blue River	S128-056	Incoming	2011	1
<b>BR059 (1)</b>	Middle Blue River	S147-011	Incoming/outgoing main lines at diversion structure	2011	2
<b>BR059 (2)</b>	Middle Blue River	S147-013	Incoming	2011	1
<b>BR061</b>	Middle Blue River	S097-005	Outgoing overflow	2012	1
<b>BR062 (1)</b>	Middle Blue River	S106-032	Incoming dry weather	2012	1
<b>BR062 (2)</b>	Middle Blue River	S106-034	Incoming combined sewer flow	2012	1
<b>BR064</b>	Middle Blue River	S122-206	Outgoing overflow	2012	1
<b>BR071</b>	NEID	S028-035	Outgoing overflow	2013	1
<b>BR072</b>	NEID	S028-077	Incoming	2013	1
<b>BR073</b>	NEID	S028-954	Outgoing overflow	2013	1
<b>BR074</b>	NEID	S027-860	Outgoing overflow	2013	1
<b>BR075</b>	NEID	S009-017	Outgoing overflow	2013	1
<b>BR077</b>	NEID	S028-955	Outgoing overflow	2013	1
<b>W003</b>	Turkey Creek/CID	S029-820	Incoming	2014	1
<b>W002</b>	Turkey Creek/CID	S029-058	Outgoing overflow	2014	1
<b>BR031</b>	NEID	S012-047	Outgoing overflow	2014	1
<b>BR063 (1)</b>	Middle Blue River	S122-397	Outgoing overflow	2014	1
<b>BR063 (2)</b>	Middle Blue River	S122-420	Outgoing overflow	2014	1
<b>BR066</b>	Middle Blue River	S148-039	Outgoing overflow	2014	1
<b>BR067</b>	Middle Blue River	S148-051	Outgoing overflow	2014	1
<b>BR076</b>	NEID	S006-801	Outgoing overflow	2014	1

## b. Water Quality Testing

The 2014 reporting period is the fourth year of monitoring conducted under the Integrated Water Quality Monitoring Program (IWQMP). Since April 2011, Water Services staff members have conducted sampling and field measurements at 20 smaller water locations. A Water Services contractor has conducted sampling and field measurements at three locations on each the Kansas River and Missouri River. Laboratory analyses were conducted by the Water Services laboratory. Sampling and analyses were conducted according to the methods prescribed in the Integrated Water Quality Monitoring Program<sup>4</sup> and the associated Quality Assurance Project Plan<sup>5</sup>.

The details of the monitoring program, including sampling locations, frequency of monitoring, and water quality parameters are presented in the IWQMP. The IWQMP specifies monitoring to be conducted every other week. Field measurements include temperature, pH, dissolved oxygen, and aesthetic observations. Samples are collected and delivered to the Water Services laboratory for analysis of E. coli, TSS, and conductivity. Monitoring was conducted during the 2014 recreation season, which extends from April 1 through October 31.

The implementation of the IWQMP in 2014 was successful in obtaining 95 percent of the planned samples for both the small stream sites and the large river sites. Also, the collection frequencies for field duplicate samples and field rinse blank (FRB) samples (both at 10 percent of samples) met or exceeded the planned numbers (10 percent for duplicates; 5 percent for FRBs). These numbers all exceeded the requirements specified in the sampling and quality assurance plans. Monitoring was also conducted outside the recreation season as weather conditions permitted.

A brief summary of the 2014 water quality monitoring results is presented for E. coli, dissolved oxygen, and TSS in *Table 7*.

In 2014, an internal review of the 2011-2013 monitoring results was conducted to assess potential changes to the IWQMP. The review indicated that consideration should be given to elimination or reduced frequency of sampling to monthly at four sampling locations (BC-01, BC-05, BR-03, and BR-06). The review also recommended that consideration be made to collect one sample at the center channel at the MR-01 and KR-01 locations. However, the decision was made to continue implementation of the IWQMP without changes for the 2014 season. Continued review and assessment of monitoring results will be conducted and changes made to the IWQMP, as needed.

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<sup>4</sup> *LimnoTech, December 28, 2010*

<sup>5</sup> *LimnoTech, 2005, revised 2010*

Table 7: Summary of 2014 OCP Water Quality Monitoring

Site	E. Coli (Count/100 ml)				Dissolved Oxygen (mg/L)		TSS (mg/L)	
	No. of samples	Geometric mean	No. of Samples-recreational season	Geometric mean-recreational season	No. of samples	Average	No. of Samples	Average
BC-01	23	411	15	755	23	8.8	23	13
BC-02	20	351	15	540	20	7.4	20	10
BC-03	22	994	15	1,305	23	9.9	23	10
BC-04	23	531	16	900	23	8.0	23	14
BC-05	23	346	16	516	23	8.1	23	16
BC-06	24	419	16	641	24	9.0	24	18
BC-07	23	161	16	306	24	7.1	24	22
BR-01	23	212	15	211	23	8.0	23	27
BR-02	24	209	17	277	22	8.0	24	28
BR-03	22	168	14	245	23	7.7	22	30
BR-04	24	205	15	317	23	8.2	24	28
BR-05	23	150	15	272	22	8.0	23	27
BR-06	23	1,316	15	1,399	23	8.1	23	31
BR-07	20	1,613	15	1,873	20	7.7	20	40
BR-08	23	2,462	15	2,969	22	8.8	23	33
BR-09	23	150	14	176	23	10.1	23	15
IC-01	24	254	15	379	24	9.7	24	17
PV-01	21	143	15	198	20	9.6	21	18
TF-01	21	1,577	16	1,361	22	8.9	22	14
MC-01	25	216	15	151	25	8.1	25	10



		E. Coli (Count/100 ml)			Dissolved Oxygen (mg/L)		TSS (mg/L)		
Site	No. of samples	Geometric mean	No. of Samples-recreational season	Geometric mean-recreational season	No. of samples	Average	No. of Samples	Average	
Large River Sites	MR-01-R	14	276	14	276	14	7.9	14	317
	MR-01-C	14	282	14	282	14	7.9	14	337
	MR-01-L	14	329	14	329	14	8.1	14	290
	MR-02-R	28	155	28	155	28	7.8	28	220
	MR-02-C	14	246	14	246	14	7.8	14	259
	MR-02-L	14	364	14	364	14	7.6	14	232
	KR-01-R	14	142	14	142	14	7.8	14	160
	KR-01-C	14	105	14	105	14	8.4	14	165
	KR-01-L	14	152	14	152	14	8.6	14	157

*Note: Three locations were monitored at each of the large river sites (MC, KR), one each in the right channel (R), the center channel (C), and left channel (L).*

## XIV. SUPPLEMENTAL ENVIRONMENTAL PROJECT PLAN – APPENDIX E

As described in Appendix E of the Consent Decree, the original Supplemental Environmental Project (SEP) Plan included the implementation of a Sewer Connection and Septic Tank Closure Program. The program included the installation of a sewer service line (i.e. lateral) to the homes of participating property owners and closure of their septic tanks from operation consistent with City ordinances. This program provided grant funding assistance on a sliding scale to households at or below 100 percent of the area median income. The City initially believed that 533 properties would be eligible for the program, but after a re-evaluation, only 277 properties were eligible. Letters and applications were sent to those properties that were considered eligible for assistance, and 21 percent of the eligible properties have been connected to the system. Because of the low participation in the Federal SEP, Water Services proposed and prepared an alternative SEP.

An Alternative SEP was submitted to USEPA on July 28, 2014; an updated Alternative SEP was submitted to USEPA on August 22, 2014 based on meeting discussions held with USEPA officials on August 8, 2014. On November 3, 2014, Water Services submitted written responses to USEPA questions and comments received in a letter dated September 12, 2014. At the end of this reporting period, USEPA had not yet made a final determination regarding approval of Water Services revised Alternative SEP.

The proposed alternative SEP is for a sustainable parking lot at Water Services' Swope Campus featuring numerous best management practices (BMPs) to provide both water quantity and water quality benefits. The parking lot would become a regional model demonstrating the effectiveness of BMPs for on-site stormwater management and water quality enhancement.

In an effort to maximize the community benefits of this project, this Alternative SEP project will achieve the following objectives:

- Restore the parking area for WSD staff, guests and customers.
- Reduce the quantity of stormwater runoff and improve water quality of stormwater that discharges from the Swope Park Campus to the Blue River.
- Serve as a regional model to demonstrate the effectiveness of various BMP technologies to the public.

The proposed Alternative SEP will include rain gardens, wetlands, bioswales, bioretention areas and native vegetation to provide these water quality benefits. These BMPs will work together to capture, infiltrate, and clean the stormwater runoff before it is conveyed to the Blue River. Additional sustainable infrastructure improvements include using four different types of pervious pavement, including two types of permeable pavers, porous asphalt, and pervious concrete to demonstrate the effectiveness of each.

This Alternative SEP project will achieve significant water quality enhancements by capturing stormwater runoff and maximizing infiltration into the soil. Typical pollutants removed include oils and greases, sand, grit and deicing salts. The BMPs will capture these pollutants and naturally break them down.

Supplemental sustainable improvements include the use of LED lighting in the parking lot to reduce energy consumption by 25 percent and increase light levels. The parking lot will also be equipped with two electric car charging stations and provisions for four additional stations in the future.

## **XV. SCHEDULE FOR IMPLEMENTATION OF DISINFECTION TECHNOLOGY AT WASTEWATER TREATMENT PLANTS— APPENDIX F**

Disinfection improvements have been completed. All six of the City's wastewater treatment plants are now equipped with effluent disinfection.

## ATTACHMENT A: DISCHARGE REPORTS

The following is an example of a Discharge Report as submitted by the Kansas City Water Services Department to the Missouri Department of Natural Resources (MDNR). In order to conserve resources, electronic copies of all reports submitted to the MDNR in 2014 are included on the enclosed disc.

## ATTACHMENT B: REPORTS SUBMITTED UNDER CURRENT NPDES PERMITS

In order to conserve resources, electronic copies of the following reports submitted to MDNR in 2014 are included in the enclosed disc.

- Monthly Operating Reports
- Industrial Pretreatment Program Annual Report – 2013
- Municipal Separate Storm Sewer System Permit Annual Report – May 1, 2013 – April 30, 2014
- Sewer Extension Authority Report – 2013
- Birmingham Inflow/Infiltration Report – 2013
- Municipal Separate Storm Sewer System Permit Audit Report – 2014

## ATTACHMENT C: LIST OF CRITICAL FACILITIES AND INSPECTION FREQUENCY

Table 8 below is the start of the critical facilities list and associated inspection frequencies. In order to conserve resources, an electronic copy of the full list is included in the enclosed disc.

Table 8: Critical Structures Inventory – Kansas City, MO

STRUCTURE NUMBER	LOCATION	MAP NUMBER	MH NUMBER	RECEIVING STREAM	INSPECTION INTERVAL
1	100 DELAWARE DIVERSION	S028	35	MISSOURI RIVER	7
2	100 MAIN STREET DIVERSION	S028	302	MISSOURI RIVER	30
3	100 GILLIS AVE DIVERSION 600FT W	S028	954	MISSOURI RIVER	7
4	100 LYDIA AVE DIVERSION	S027	860	MISSOURI RIVER	30
5	* 101 PROSPECT AVE PUMP STATION	S009	800	MISSOURI RIVER	30
6	1931 N CHOUTEAU TRFY* MILWAUKEE PUMP STATION	S006	801	MISSOURI RIVER	30
7	7300 HAWTHORNE DIVERSION	S012	47	BLUE RIVER	30
8	320 BELMONT AVE	S024	209	BLUE RIVER	14
9	WILSON & CAMBRIDGE	S024	87	BLUE RIVER	30
10	801 E 9TH ST, IN PARKING LOT	S035	435	BLUE RIVER	7
11	7601 TRUMAN RD	S036	18	BLUE RIVER	14
12	1800 CRYSTAL AVE	S048	210	BLUE RIVER	14
13	3557 STADIUM DRIVE	S059	9	BLUE RIVER	14
14	3333 STADIUM DRIVE	S059	1	BLUE RIVER	14
16	5015 STATE LINE RD	S078	629	BRUSH CREEK	7
17	1308 W 50TH TER	S078	22	BRUSH CREEK	3
18	4941 WESTWOOD RD	S078	174	BRUSH CREEK	7
19	1204 W 50TH ST	S078	186	BRUSH CREEK	7
20	4979 WARD PARKWAY	S078	323	BRUSH CREEK	7
21	4938 HOLLY ST	S078	190	BRUSH CREEK	7
22	807 W 48TH ST	S078	354	BRUSH CREEK	14
23	4821 ROANOKE PARKWAY	S078	344	BRUSH CREEK	30
24	717 WARD PARKWAY	S078	340	BRUSH CREEK	7
25	4700 BROADWAY	S078	488	BRUSH CREEK	3
26	4849 WORNALL RD	S079	134	BRUSH CREEK	7
27	111 NICHOLS RD	S079	232	BRUSH CREEK	7
28	1 WARD PARKWAY	S079	159	BRUSH CREEK	7
29	4908 BROOKSIDE BLVD	S079	93	BRUSH CREEK	14
30	4925 OAK ST	S079	82	BRUSH CREEK	14