Kansas City, Missouri
Water Services Department

Overflow Control Program

2009 Annual Report

March 2010

CITY OF FOUNTAINS
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KANSAS CITY
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KCMO
Overflow Control Program

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1 EXECUTIVE SUMMARY

This Annual Report documents progress and accomplishments related to the Overflow Control Program (OCP) and the Nine Minimum Controls (NMCs) program during 2009. The OCP is responsible for overall program management, public involvement, and regulatory agency coordination associated with the development and submittal of the Water Services Department's (WSD's) *Overflow Control Plan* (Plan). Significant WSD accomplishments in 2009 include:

- Consent Decree Negotiations with Regulatory agencies
- Continuation of public participation efforts
- Continuation of program coordination with regulatory agencies
- Modification of the Plan to reflect review comments and recommendations from Regulatory agencies
- Update of capital and incremental operations and maintenance cost estimates for Plan components
- Evaluation and finalization of:
  - Plan alternatives
  - Funding
  - Implementation options
- Continuation of the Middle Blue River Basin Green Solutions Pilot Project
- Development of a Receiving Water Monitoring Program

The goal of the NMC program is to reduce overflows from the combined sewer system (CSS) and their effects on receiving water quality. Typically, measures are low cost and do not require extensive engineering studies or major construction. Minimum controls are permanent measures that relate to components in the overflow control planning process and Plan development. Implementation of the NMC Program continued in 2009 with accomplishments that include:

- Removed 820 tons of grit and debris from pump stations and wastewater treatment plants (WWTPs)
- Performed 3,932 investigations resulting in 320,740 feet of sewer televised
- Inspected 828 private sewer lines
- Cleaned 1,467,057 feet of sewer lines removing 1,177 cubic yards of material
- Removed an additional 343 cubic yards of material through use of contracted services
- Repaired 2,732 feet of sewer lines
- Repaired 3,633 feet of private sewer lines
- Replaced 1,296 feet of sewer lines
- Replaced 21 manholes
- Rehabilitated 162 manholes

- Inspected and cleaned 14,941 storm inlets
- Repaired or replaced 296 storm inlets
- Swept 19,859 miles of streets

The Wastewater Line Maintenance Division reported the occurrence of 51 dry weather overflows in 2009. The Wastewater Treatment Division reported the occurrence of 70 wet weather bypasses in 2009. Combined, there were 121 overflows/bypasses reported in 2009, which is slightly above the average number reported (114) for the 4 previous years.

2 OVERFLOW CONTROL PROGRAM

The OCP is responsible for overall program management, public involvement, and regulatory agency coordination associated with the implementation of the WSD's *Overflow Control Plan* (Plan). This chapter provides information on the work conducted in 2009 by the OCP including:

- *Overflow Control Plan* implementation
- Public Participation Program
- Water Quality Monitoring
- CMOM and NMC Program

2.1 Overflow Control Plan

As in most U.S. cities, Kansas City's sewer system is subject to wet weather overflows. Its combined sewer system dates back to the 1860s and was designed to convey all wet weather flows. The separate system experiences overflows due to a number of causes including build-up of grease, roots, and debris as well as infiltration and inflow (I/I), vandalism, and aging sewer infrastructure. The Plan's objectives include:

- Comply with federal and state requirements
- Substantially reduce basement back-ups and overflows
- Protect public health and the environment
- Prolong the useful life of sewer system assets
- Provide adequate system capacity for the current and future needs of Kansas City residents and businesses

Pursuant to federal and state permit requirements, and in conformance with Work Plans approved by MDNR and USEPA for both the CSS and the SSS, Kansas City completed development of the *Overflow Control Plan* in 2008 and it was submitted on January 30, 2009.

A summary of work completed or initiated in 2009 is described in the following sections.

2.1.1 Overflow Control Plan Negotiations

The WSD submitted an Overflow Control Plan in January 2009. Negotiations with the regulatory agencies have been initiated and have continued to the present. The goal is to negotiate a Consent Decree to cover the implementation of the Overflow Control Plan in a timely manner and be affordable to the rate payers.

2.1.2 Overflow Control Plan Implementation

After submittal of the Long Term Control Plan in January 2009, WSD proceeded with implementing the plan. The first major project is the Middle Blue River Basin Green Solutions Pilot Project that is described in section 2.1.3.

2.1.3 Middle Blue Basin Green Solutions Pilot Project

In 2008, the City began a bold campaign to address overflows from the aging CSS by investigating and implementing ways to reduce stormwater runoff with green solutions. As the first effort of the Target Green campaign, the City has initiated a green solutions pilot project in an area within the Middle Blue River Basin. The pilot project will measure and evaluate the performance of new methods for capturing stormwater prior to it entering the combined sewer system. These green solutions are an alternative to more traditional gray stormwater improvements such as underground storage tanks and pumping facilities and could save the City time and valuable resources.

The Middle Blue River Green Solutions Pilot Project encompasses approximately 100 acres and extends from 73rd Street to 77th Terrace and Holmes Road to Paseo Boulevard. Lessons learned from the pilot project will be used in future planning for widespread use of green solutions in 744 acres of the Middle Blue River Basin and for green solutions implementation throughout the City.

In late 2009, field studies and survey work were completed to evaluate the existing sewer system. Work performed included:

- Detailed topographical survey
- Rainfall and sewer flow monitoring
- Utility surveys
- Coordination with other City Departments and utilities
- Development of a sewer rehabilitation program

A public participation program has been implemented by WSD to support the pilot project during the conceptual design and final design phases. The goals of the public participation program are to inform, educate, and obtain feedback from residents about the proposed green solutions. The program is also intended to obtain citizen participation for implementation of green solutions on private property.

2.2 Public Participation Program

The Wet Weather Solutions Program included the Overflow Control Program, KC-ONE Program, and Waterways Program within the Water Services Department. These programs were coordinated within the Wet Weather Solutions Program to create a consolidated public participation effort led by the Program Team.

2.2.1 Public Participation Plan Tasks

Public participation activities are critical to a successful Wet Weather Solutions Program. This section provides information on work in 2009 associated with public participation for the Wet Weather Solutions Program.

a) **Wet Weather Solutions Public Participation Plan** – A draft of the Public Participation Plan was completed in November 2005. The draft includes documents supporting the programs activities listed below.

- **CSO Notification Program Plan** –CSO Notification signs continued to be posted in 2009 at over 100 outfall locations along Brush Creek, Town Fork Creek, Missouri River, Penn Valley Lake, and the Blue River where there is public access to waters receiving sewer overflows.
- **Newsletters, E-blasts, and Fact Sheets** – Throughout the public participation process, many articles on various topics were published in the existing city publication *Waterlines* (water bill insert). In 2009, articles were published in four publications of Waterlines. Some of the topics of those articles include:
  - Middle Blue River Basin Green Solutions Pilot Project
  - Kansas City submits Overflow Control Plan
  - Overflow Control Plan Overview
  - New Water, Sewer Rates
  - Turkey Creek Flood Project Continues
  - Wet Weather Solutions Program Presents Draft Overflow Control Plan

  Additionally, eight electronic e-blasts sharing information regarding wet weather issues and related news articles were distributed in early 2009 to approximately 500 people.
- **Wet Weather Video** – The video was revised in 2009 for the Wet Weather Solutions Program that outlines some detailed information on the Conceptual Control Plan and funding issues.
- **Road Show** – The Wet Weather Solutions Program staff began to make presentations in 2006 to neighborhood groups, professional organizations, and various City departments. The road show included a presentation of the Wet Weather Video and a PowerPoint presentation with details on wet weather-related information. In 2009, 5 organizations, departments, or neighborhood groups received a road show presentation totaling nearly 200 persons.
- **Media-** In 2009, the Wet Weather Solutions Program staff worked with local media to write articles in their publications. Publications included the Kansas City Business Journal and the Kansas City Star. Program staff also was interviewed on local news channel, KMBC to discuss wet weather-related issues.
- **Education Outreach-** The Blue River Watershed Association finished their educational outreach in 2009 by working with students at UMKC, Washington Wheatley neighborhood residents, and Crispus Attucks Elementary School. BRWA met with

several neighborhood associations to discuss potential outreach activities and events and they organized a litter clean-up event in the Marlborough neighborhood.

b) **Wet Weather Website / Information Voicemail & Email Address/ Channel 2 Programming-**

- **Wet Weather Website** – The Water Services Department and Wet Weather Solutions Program created a website in 2004 to highlight the planning process, problems, and projects in both the Overflow Control Program (OCP) and the KC-One Stormwater Management Plan: www.kcmo.org/wetweather. In 2009, the website pages were updated to better reflect the Wet Weather Solutions Program. Documents, resource links, and meeting information was updated and added. There are currently over 40 pages of information on the website, not including specific meeting pages.
- **Information Voicemail & Email Address** – The Wet Weather Solutions Program information voicemail (816-513-0124) set up in May 2006 continued to be monitored regularly in 2009. Requests for information are responded to in a timely manner. Citizens and interested persons have left messages with questions on topics such as public meeting information or where to purchase a rain barrel. An email address (KC-OCPInfo@kcmo.org) was also created for the same purpose. Both the voicemail and email address have had little traffic, however many that have utilized the resources found them to be beneficial. Additionally, the voicemail number and email address are published on all documents that are distributed to the public including the Citizen Action Kit documents.

2.2.2 Public Education Program

WSD continued its extensive public education program including meetings with neighborhoods, cable television, pamphlets, brochures, and internet websites all being used. The goal is to raise awareness, educate and connect with the public on issues concerning CSOs and other wet weather issues.

a) **Multi-media Presentations**

In 2009, the WSD coordinated a number of programs that were conducted for the purpose of informing and educating the public, including:

- Distributed Citizen Action Kit to interested persons;
- Distributed 8 articles by e-blasts to over 500 people;
- Presented the Wet Weather Solutions "Road Show" to nearly 200 people for 5 different organizations (see Table 2-1); and
- Updated content to the Wet Weather website.

Table 2-1

KCMO WATER SERVICES DEPARTMENT 2009 PUBLIC MEETINGS

Date	Meeting Focus/Title	Meeting Topics
01/08/09	Wet Weather Road Show Presentation	Presentation on the details of the Wet Weather Solutions Program to the Northland Chamber of Commerce
01/27/09	Wet Weather Road Show Presentation	Presentation on the Wet Weather Solutions Program to the West Plaza Neighborhood Association
02/04/09	Wet Weather Solutions Program Presentation	Presentation given at the 2009 KU Environmental Engineering Conference
03/26/09	Wet Weather Road Show Presentation	Presentation on the Wet Weather Solutions Program to CHMM
03/31/09	Wet Weather Road Show Presentation	Presentation on the Wet Weather Solutions Program to the Center Planning and Development group

2.3 Water Quality

The WSD continued to conduct the Routine Receiving Water Monitoring Program throughout 2009. Field measurements and collection of water quality samples were conducted at a total of ten sites divided into two circuits. Monitoring was conducted weekly and alternated between sites on Brush Creek and Town Fork Creek and sites on the Blue River, the Missouri River, and Penn Valley Lake. In-stream measurements were conducted for dissolved oxygen, temperature, pH, and conductivity. Samples were collected and analyzed for fecal coliform, E. coli, and total suspended solids (TSSs). Additional quality assurance/quality control (QA/QC) samples were also collected and analyzed.

WSD Rain Garden Ground Breaking

The WSD also continued financial support of and cooperation with the United States Geological Survey (USGS) on an on-going water quality study of the Blue River basin in 2009. The USGS maintains streamflow gaging sites on the Blue River and Brush Creek. The USGS also conducts continuous water quality monitoring as well as baseflow and stormflow sampling and analysis for a variety of parameters.

2.3.1 Integrated Water Quality Monitoring Plan

In 2009, the WSD developed an integrated water quality monitoring program intended to meet state and federal regulations governing stormwater, combined sewer overflows, drinking water and waste water treatment plants. The intent of the program is to take a city wide look at all monitoring needs, and develop a scientifically sound monitoring program to address them as effectively as possible. The needs and requirements for the monitoring plan may change over time so an adaptive management approach was used to ensure that the plan continues to satisfy future monitoring needs.

A Quality Assurance Project Plan (QAPP) and a Health and Safety Plan (HASP) were developed for the Integrated Water Quality Monitoring Program. The QAPP includes information on responsibilities,

sampling procedures, quality control checks, data management and reporting. The HASP includes safety precaution information and emergency procedures.

Standard Operating Procedures (SOPs) for the monitoring activities and a Field Documentation Form have also been developed.

2.4 Capacity, Management, Operation and Maintenance (CMOM) Program

A draft CMOM Plan was prepared and submitted to MDNR and USEPA on October 31, 2008. The primary purpose of the CMOM Plan is to document operational procedures currently in-place, and enhancements and modifications that can be made to more effectively achieve regulatory compliance and minimize overflows throughout the Kansas City, Missouri (KCMO) service area. The overall goal of the activities contained within this Program is to improve water quality and meet or exceed the regulatory requirements. The WSD intends to use this CMOM Plan to manage its collection systems' assets and operations.

One component of the overall CMOM Plan is the Nine Minimum Control Plan (NMC). Typically, the NMC Plan is a stand alone plan put in place to reduce overflows from the combined sewer system. Because many of the practices and procedures required for implementation of a NMC Plan are similar or identical to those contained in a CMOM Plan, WSD elected to combine the NMC Plan with the CMOM Plan.

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3 OPERATION AND MAINTENANCE

The Water Services Department published a draft *Capacity, Management, Operations, and Maintenance Plan (CMOM) & Nine Minimum Controls Plan* in October 2008. This report was submitted to both the MDNR and to the USEPA. The purpose of the CMOM portion of this report is to document both the condition and practices of the existing program, as well as present the proposed program improvements that are intended to increase the overall level of regulatory compliance and minimize overflows throughout the service area. Consequently, the focus of this chapter is to list what was done in 2009 to reduce overflows.

3.1 Operation and Maintenance Activities

3.1.1 Wastewater Treatment Division

The operation and maintenance of 38 wastewater pump stations, 17 stormwater pump stations, and 7 WWTPs is the responsibility of the Wastewater Treatment Division. Treatment plants in operation are Todd Creek, Rocky Branch, Northland Mobile Home Park, Fishing River, Birmingham, Blue River (primary and secondary), and Westside. The remainder of this section covers O&M activities typical for all pump stations and treatment plants.

The Blue River and Westside WWTPs receive flow from both combined and separate sewer system areas. The Wastewater Treatment Division maintains Wet Weather Operating Guidelines for these plants. The Guidelines provide guidance for reducing overflows by emphasizing:

- Implementation of proper operating practices
- Minimization of bypasses at the pump stations and treatment plants
- Maximization of treatment plant capacity

Operation of existing interceptors and pump stations to control the flow rate to treatment plants is essential to minimizing plant or upstream manhole overflows. Pumping rates may be increased at one location and decreased at another to maximize flows to the treatment plants while minimizing upstream overflows.

Aeration basins are operated such that flow is consistent and the maximum volume is processed through the plant while minimizing solids washout. Facility operations are typically inspected daily depending on past operational experience specific for each facility. Pumps, motors, blowers, fans, air compressors and control panels are inspected manually, visually and environmentally. This inspection includes the following activities:

- Unusual noises and odors on mechanical equipment are recorded
- Motors are checked for hot spots

- Water/grease/ trash around pumps are recorded and cleaned
- Pump seals are checked for leaks
- Valves are opened and closed checking for movement
- Wet wells are checked and cleaned of grease and other debris
- Sump pumps are activated to ensure operation
- Sump pits are cleaned to prevent pump blockage
- Control panels and breakers are checked for unusual appearance, odors, excessive hot spots
- Telemetry/SCADA are checked to determine conditions of the remote monitoring equipment and hazardous materials
- Chemical storage tanks are checked for spills
- Indoor air quality at each facility is checked for unusual odors and hydrogen sulfide levels
- Air emissions of the incinerator are checked for increased smoke or dust

Finally, the following are checked for stock/accessibility/completeness and/or functionality:

- Spill kits
- Eyewash/shower
- Warning signs
- Emergency signs/procedures
- Fire extinguishers
- Emergency communication device/ placarding
- Material Safety Data Sheets and first aid kits

Operations Division personnel troubleshoot problems, note findings and make corrections. All unresolved issues are reported as a work order. Work orders are submitted to the Maintenance Division.

Management of maintenance procedures involves recording work performed, materials purchased and used, and man hours expended to complete the work. Routine facility maintenance inspection activities include:

- Opening and closing gates
- Adjusting pumping operations
- Cleaning trash racks and bar screens to remove collected debris
- Grit and debris removal (from grit chambers, rock boxes, mechanical bar screens, and vortex/aerated grit processes)
- The operation of primary clarifier sweep arms and skimmers are checked, cleaned and repaired as needed
- Levels and sludge pumps in clarifiers are checked to ensure that excess solids are not held in the clarifier and that excess water is not pumped to the solids storage tank

- Sludge collectors and sludge skimmers in clarifiers are checked to prevent wash out of solids
- Trickling filters operation is monitored by checking that the distributor arm is properly rotating
- Grit conveyor belts are checked for alignment and tracking and cleaned of excessive grit buildup

Grit chambers are cleaned regularly to reduce rocks, grit and other large debris from entering the plant. Rock boxes are cleaned weekly, the day prior to forecasted rain, and daily during rain events. Mechanical bar screens are checked twice per shift (three shifts per day) and emptied as needed thus allowing maximum and consistent plant flow. Trash racks and screens are checked and cleaned as needed during a rain event to maintain consistent and maximum flow through plants.

The total amount of grit and debris removed from all pumping stations and WWTPs in 2009 by the Wastewater Treatment Division was 820 tons.

3.1.2 Wastewater Line Maintenance Division

The Wastewater Line Maintenance Division is responsible for operating and maintaining the collection system. Operation and maintenance of the collection system involves the Sewer Cleaning, Sewer Investigation, and Sewer Repair Sections. The Division staffs trained specialists to perform routine maintenance on the system including television/inspection, cleaning, and repairing sewer lines and manholes. Additionally, the Division uses contract services to perform select operation and maintenance services.

The Sewer Investigation Section responds to complaints received from the public, and other City departments. Inspections include direct manhole observation and televising sewer segments to identify overflows. Inspections typically reveal excessive I/I, record structural deterioration, and determine repair needs. Before televising, cleaning crews remove blockages or accumulated debris.

The Sewer Investigation Section performed 3,932 investigations in 2009. These investigations resulted in 320,740 feet of sewer televised. In addition, the Sewer Investigation Section inspected 828 private lines connecting to the City sewer in 2009. The Systems Collection Division, under a City-Wide Televising Contract, CCTV'd approximately 76,365 feet of sewer line segments.

Line Maintenance Division sewer cleaning crews typically bucket, reel, or vacuum sewer line segments and manholes to remove and prevent accumulations of debris and sediment that restrict flow. The Division cleaned approximately 1,467,057 feet of sewers line segments and manholes in 2009. This effort resulted in removal of 1,177 cubic yards of material from sewer mains and manholes. In addition, the City has a City-Wide Sewer System Cleaning contract used on an as-needed basis. 110,363 feet of sewer line segments and manholes were cleaned through this contract and approximately 343 cubic yards of material was removed.

The Sewer Repair Section completes necessary system repairs or replacement of sewer lines and manholes. Additionally, the Systems Collections Division administers contracts for sewer line and

manhole repairs. System repairs typically involve open excavations to replace sewer pipe or manholes. Manhole rehabilitation involves minor repairs such as patching or raising manhole adjustment rings. Private contractors are utilized to supplement the efforts of the Line Maintenance Division.

The Sewer Repair Section and the Systems Collection Division collectively repaired 2,732 feet of sewer mains, replaced 1,296 feet of sewer mains, and repaired 3,633 feet of private lines in the City right-of-way in 2009. Also, 21 manholes were completely replaced and 162 manholes were rehabilitated during 2009.

3.2 Sewer System Overflows Summary

The Wastewater Line Maintenance Division records the total number of dry weather overflows (DWOs) occurring in the sanitary sewer collection system. The Wastewater Treatment Division records DWOs that occur at treatment plants and pump stations. Collectively, 70 DWOs were reported in 2009 for the entire sewer system. The various causes for DWOs in the SSS include but are not limited to grease stoppages, root invasion, debris in the sewer line, debris in manholes/structures, vandalism, broken and collapsed main lines, pipe deterioration and equipment failure.

Corrective actions including cleanup and repairs on collapsed lines and damaged structures were completed for each overflow event.

The Wastewater Treatment Division also records wet weather bypass events that occur at the treatment plants and pump stations. The above average rainfall for the Kansas City area resulted in a total of 51 wet weather overflows reported in 2009 for the sewer system. Bypasses were reported to the Kansas City Regional Office of MDNR.

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4 NINE MINIMUM CONTROLS

The condition and practices of the existing NMC program are reported in the draft *Capacity, Management, Operations, and Maintenance Plan (CMOM) & Nine Minimum Controls Plan.* This chapter focuses on documenting program accomplishments in 2009.

The goal of the NMC is to reduce overflows from the CSS and their effects on receiving water quality. By definition, the NMC's are low cost measures. As such they do not require extensive engineering studies or major construction and should be capable of implementation in less than approximately two years. Minimum controls are not temporary measures, but are related components in the overflow control planning process and development of the *Overflow Control Plan.*

Table 4-1 identifies each NMC and summarizes significant control measure accomplishments for 2009. Control measure accomplishments are explained in further detail under the applicable NMC section.

Table 4-1 2009 NMC Accomplishments

1	Proper operation and regular maintenance programs	✓ Routine maintenance procedures ✓ Routine inspection schedules ✓ Emergency response protocol ✓ Training and safety practices ✓ Wet weather overflow reporting procedures ✓ Inspected flow regulating structures ✓ Conducted CCTV inspections ✓ Cleaned CSS interceptor & collection lines
2	Maximization of storage in the collection system	✓ Source control technologies ✓ Optimized sewer system ✓ Inflow reduction and storage
3	Review and modification of pretreatment requirements	✓ Inventory nondomestic CSS discharges ✓ Assessed nondomestic CSO discharge impacts ✓ Evaluated feasible modifications
4	Maximization of flow to Publically Owned Treatment Works (POTW)	✓ Updated wet weather operating guidelines ✓ Controlled & optimized WWTP grit & flow ✓ BRWWTP Stress Testing
5	Elimination of CSOs during dry weather	✓ Inspected to identify DWOs ✓ Corrected primary causes of DWOs ✓ Dry weather overflow reporting procedures ✓ Routine preventative cleaning of system
6	Control of solids and floatable materials in CSOs	✓ Repaired & cleaned catch basins ✓ Street sweeping ✓ Construction site erosion control ✓ Grit removal
7	Pollution prevention programs to reduce contaminants in CSOs	✓ Household Hazardous Waste Program ✓ Keep Kansas City Beautiful Campaign ✓ 10,000 Rain Gardens – Media/Education Campaign ✓ Food Code Training Classes ✓ Industrial Waste Newsletter
8	Public notification	✓ CSO notification ✓ Public education program
9	Monitor to characterize CSO impacts and effectiveness of CSO controls	✓ Inspected CSS interceptor & collection lines ✓ Compiled CSS interceptor into database ✓ Identified & mapped CSO structures & outfalls ✓ Water quality monitoring

4.1 NMC 1 – Proper Operation and Regular Maintenance Programs

"The first minimum control should consist of a program that clearly establishes operation, maintenance, and inspection procedures to ensure that a CSS and treatment facility will function in a way to maximize treatment of combined sewage and still comply with NPDES permit limitations. Implementation of this minimum control will reduce the magnitude, frequency, and duration of CSOs by enabling existing facilities to perform as effectively as possible. Essential elements of a proper operation and maintenance (O&M) program include maintenance of suitable records and identification of O&M as a high management priority." - USEPA, **CSO Guidance for Nine Minimum Controls**

4.1.1 Operation & Maintenance Control Measures

The Wastewater Line Maintenance Division of WSD is responsible for O&M control measures in the CSS. This Division performs regular inspection, cleaning and repair of the collection system. The Wastewater Treatment Division is responsible for the O&M of the Blue River and Westside WWTPs which treat all the flow from the CSS areas.

The O&M of the CSS involves the use of the:

- Sewer investigation section
- Sewer cleaning crews
- Sewer repair section

Line Maintenance Division has three sewer cleaning crews dedicated to flow regulating structure cleaning, inspection and maintenance. This work is separate from the inspection work performed by the Engineering Division under NMC 2 or the Industrial Waste Control Division under NMC 3.

The Line Maintenance Division adheres to guidelines established in the CSO Sewer Maintenance Manual. The Manual, updated annually, provides guidelines to personnel for the proper O&M of the CSS. Guidelines include:

- Schedules for routine inspections
- Emergency response protocol
- Dry weather overflow reporting procedures
- Training and safety practices

4.1.2 Wet Weather Operating Guidelines

The Wastewater Treatment Division maintains Wet Weather Operating Guidelines for Blue River WWTP and Westside WWTP. The goal of the guidelines is to reduce sewer overflows by maximizing the flow through the treatment plants.

4.1.3 Routine Maintenance

Sewer cleaning crews and the sewer repair section perform routine maintenance of the system. Crews routinely cleaned sewer line segments and flow regulating structures throughout 2009, as detailed in Chapter 3. The WSD also contracted with private industry to provide supplemental cleaning support services. The WSD keeps a wastewater maintenance log that tracks the year's maintenance activities.

The Stormwater Line Maintenance Division also performed routine maintenance within the CSS areas. There were 14,941 storm inlets cleaned and inspected and 296 storm inlets repaired or replaced in 2009.

The Wastewater Line Maintenance Division and Systems Collection Division replaced 184 manhole rings and lids in 2009.

4.1.4 Non-Routine Maintenance and Emergency Procedures

The sewer investigation section, sewer cleaning crews, and the sewer repair section respond to all reported bypasses. The WSD website provides an after-hours emergency number for citizens or businesses to call upon discovery of bypasses in progress.

4.1.5 Training and Safety Practices

Training for personnel involved in the sewer system O&M consists of on-the-job-training, classroom training, and 15-minute tailgate sessions. Training is provided by experienced Crew Leaders, Supervisors, the Maintenance Superintendent of the Line Maintenance Division, WSD's Safety Officer, and when necessary outside professionals. All personnel involved in O&M received training in the following:

- First aid (CPR is optional)
- Driving (safe / defensive procedures)
- Traffic control (proper procedures, setup and safety)
- Confined space entry (proper use of equipment)
- JetVac cleaning or backhoe operations
- Competent person shoring
- WinCan TV inspection software
- General safety procedures for driving, trench, equipment operation, fall protection, fire prevention, ladder safety, and lifting/back

4.1.6 Summary of 2009 Inspections, Maintenance and Cleaning

The WSD performed inspections and maintenance activities on the collection systems, treatment plants, and flow regulating structures. The summary of activities includes:

- Wet weather overflows (WWOs) reporting procedures
- Inspected flow regulating structures
- Conducted CCTV inspections

- Cleaned CSS interceptor and collection lines

The Wastewater Treatment Division is responsible for reporting WWOs (bypasses) which occur at pump stations and WWTPs. A bypass event starts when a gate is opened and ends when the gate is closed. An event might last four hours or four days as a result of one rainfall or a series of rainfall events. There were 51 WWOs reported in 2009 for the CSS area.

The CSS contains diversion structures that are designed to direct dry weather flows to Blue River WWTP or Westside WWTP. These structures direct a portion of wet weather flows to Brush Creek, Blue River, Kansas River, and Missouri River or their other immediate tributaries. The inspection interval varies for each structure based upon historical records of performance and the sensitivity of nearby surroundings and surface waters. The Line Maintenance Division continued their diversion structure inspection program in 2009. Inspections were conducted, mainly during dry weather, to identify:

- Overflows
- Accumulated debris and blockages
- Excessive I/I
- Operational status of the structure
- Repair needs

The Line Maintenance Division stores internal line CCTV data in the Hansen maintenance management system database where it can be retrieved. The Hansen database is maintained and organized by sewer line.

The WSD's sewer cleaning program assures and maintains the available system conveyance and storage capacities. The WSD supplements this program with a city-wide sewer system cleaning contract. Private industry is contracted to remove and prevent accumulations of debris and sediment that restrict flow on an as-needed basis

4.2 NMC 2 – Maximization of Storage in the Collection System

"The second minimum control consists of making relatively simple modifications to the lines to enable the system to store wet weather flows until downstream sewers and treatment facilities can handle them. More complex modifications should be evaluated as part of the LTCP." - USEPA, **CSO Guidance for Nine Minimum Controls**

4.2.1 Procedures in Place for Maximizing Collection System Storage

The WSD focused its efforts in 2009 on rehabilitation, modification, and cleaning of critical sewers in the CSS to assure maximum collection system storage capacity. Sewer rehabilitation and sewer cleaning were performed throughout the year to address critical areas found through smoke testing and inspections.

During CCTV inspection, the sewer line is cleaned of all debris then televised. Capacity is restored when clogged lines are cleared of debris. The inspection also identifies any necessary repairs required to assure maximum capacity is available. The repairs may include trenchless cured in place pipe lining, trenchless sliplining, pipe bursting, or open cut sewer replacement. The Engineering Division typically bids this work out to private contractors when the Line Maintenance Division does not have the manpower to perform the work.

4.3 NMC 3 – Review and Modification of Pretreatment Requirements

"Under the third minimum control, the municipality should determine whether non-domestic sources are contributing to CSO impacts and, if so, investigate ways to control them. Once implemented, this minimum control should not require additional effort unless CSS characterization and modeling indicate that a pollutant from a non-domestic source is causing a specific health, water quality, or environmental problem." - USEPA, **CSO Guidance for Nine Minimum Controls**

The Industrial Waste Control Division continued to regulate non-domestic discharges in 2009. The Division is responsible for implementing and enforcing Chapter 60 Article IV of the Kansas City Code of Ordinances. The Division also administers several city-wide programs including:

- The Federal Pretreatment Program
- The Universal Surcharge Program
- The Oil & Grease Management Program
- An annual review of pretreatment requirements
- The Inter-jurisdictional Sewer Service Program

These activities are described in further detail in the draft *Capacity, Management, Operations, and Maintenance Plan (CMOM) & Nine Minimum Controls Plan* report. Division accomplishments in 2009 include:

- We have two industries that were published as a public notice in March in the Kansas City Star for significant noncompliance. Nostrum Laboratories was published for significant noncompliance for late reporting, for both 1st half and 2nd half of compliance determination periods. RMF Steel is significant noncompliance for late reporting during the second half of the compliance reporting period.
- There were 28 total Notice of Violation (NOV) for 2009. Fifteen NOVs were from the first half of the reporting period Jan 1, 2009 - June 30, 2009. Thirteen were from the second half of the reporting period July 1, 2009 - December 31, 2009. The total fees assessed was $750.00

The Industrial Waste Control Division assisted in the Annual Joint Industrial Users Seminar held by KCK Unified Government and Johnson County. It took place April 28, 2009 at the Hilton Garden Inn in Kansas City, Kansas.

Topics covered are:

- Preparing for an Emergency Brad Becker (Haz-Mat Response, Olathe, Kansas)
- Industrial Hazardous Waste Violations - Prevention & Resolution Rebecca Wenner (Kansas Department of Health and Environment)
- Metro Ozone Non-compliance - Industry Implications Jennifer Logan (Johnson County Environmental Department)
- Giving Waste a Second Chance - An Industrial Experience Stacey Lamer (Bartlett & West Engineers, Lawrence, Kansas)
- Deffenbaugh's Landfill - Industrial Trash Disposal Concerns Phil Askey (Johnson County Environmental Department)
- The Recycling Crisis & The Future of Going Green Julie Coon (Johnson County Environmental Department)
- Strategic Goals - Reducing Your Waste Streams Nancy Larson (Kansas Small Business Environmental Assistance Program)
- Local Updates

4.4 NMC 4 – Maximization of Flow to the POTW for Treatment

"The fourth minimum control entails simple modifications to the CSS and treatment plants to enable as much wet weather flow as possible to reach the treatment plants. The objective of this minimum control is to reduce the magnitude, frequency, and duration of CSOs that flow untreated into receiving waters. Municipalities should identify and evaluate more complex CSS and POTWs (publicly owned treatment works) modifications as part of their LTCPs." - USEPA, **CSO Guidance for Nine Minimum Controls**

Control measures maximizing wet weather flows to the Blue River and Westside WWTP reduce the volume of overflows from the CSS. Documentation of flow maximizing control measures provided a resource to identify and evaluate simple modifications affecting capacity including:

- Updated wet weather operating guidelines
- Controlled grit removal
- Optimized flow rate
- Studied WWTP capacity impacts

4.4.1 Wet Weather Operating Guidelines

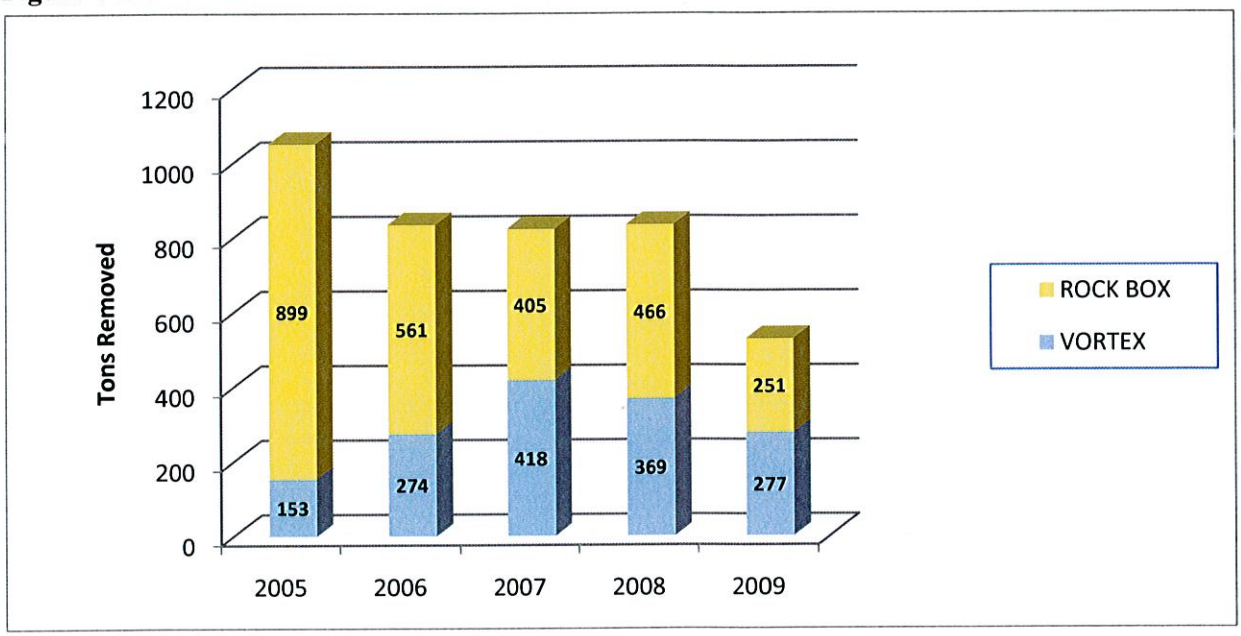
Wet Weather Operating Guidelines were last updated in February 2005 and distributed to Chief Plant Operators for implementation. The goals of the guidelines include the following:

- To prepare the WWTP for storm events by reducing rocks and grit accumulation
- To reduce overflows from the CSS by monitoring pumping levels
- To minimize bypasses at diversion structures by regulating incoming flow
- To maximize treatment of wet weather flows by balancing process operations

4.4.2 Controlled Grit Removal

All efforts to control the quantity of grit reaching the WWTP will maximize and improve the efficiency of treatment processes. Grit entering the WWTP is removed by a number of methods including the rock box, mechanical bar screen, vortex separator, and an aerated grit chamber. Figure 4-1 compares the annual tons of grit removed by the rock box and the vortex system at the Blue River WWTP for the past several years.

Figure 4-1 Grit Removal-Blue River WWTP



4.4.3 Optimized Flow Rate

The Blue River WWTP receives flow from the Blue River Interceptor Sewer (BRIS) and the NEID interceptor sewer. The diversion chambers ahead of Blue River Pump Station and the NEID Pump Station regulate flow to the plant to avoid internal WWTP overflows.

All flow to the Westside WWTP is pumped from the sources listed below. Collectively, these pump stations have enough pumping capacity to overload Westside WWTP. These conveyance systems are managed to maximize the wet weather flows to the plant.

- Turkey Creek Pump Station - Monitored and balanced CSS flow to WWTP
- Santa Fe Pump Station - Monitored and balanced CSS flow to WWTP
- Line Creek Pump Station - Monitored SSS flow only; with approximately 50% to Westside WWTP and 50% to Blue River WWTP via the collection system. Normal operational methods give Line Creek Pump Station preference during wet weather events to minimize sanitary sewer overflows
- Downtown Airport Pump Station – CSS & SSS flow
- Harlem Pump Station – SSS flow

4.5 NMC 5 – Elimination of CSOs During Dry Weather

"The fifth minimum control, elimination of CSOs during dry weather, includes any measures taken to ensure that the CSS does not overflow during dry weather flow conditions. Since the NPDES program prohibits dry weather overflows (DWOs), the requirement for DWO elimination is enforceable independent of any programs for the control of CSOs. DWO control measures include improved O&M, as well as physical changes to regulator and overflow devices..." - USEPA, **CSO Guidance for Nine Minimum Controls**

The WSD continues to implement measures to minimize DWOs. Control measures implemented in previous years that were continued in 2009 included:

- Inspect to identify DWOs
- Correct primary causes of DWOs
- Notification to MDNR when DWO occurs
- Routine preventative cleaning of system
- Report DWOs by Wastewater Treatment Division

4.5.1 Inspect to identify DWOs

The Line Maintenance Division inspects flow regulating structures on a routine basis to verify that they are functioning properly. This includes diversion structures and flow splitters. Diversion structures are defined as structures that direct excess wet weather flows to receiving waters. Flow splitters are defined as structures that divert flows in 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). The inspection interval varies for each structure based on historical records of performance and the sensitivity of the area surrounding the structure. Structures are inspected to assure proper operation and to identify the occurrence of dry weather overflows.

4.5.2 Correct Primary Causes of DWOs

The causes for DWOs in 2009 were varied and include grease stoppages, root stoppages, debris stoppages, and structural pipe problems. The primary cause of each DWO is corrected and MDNR is

notified of the occurrence within 24 hours. Follow-up written reports are made within five days of the original notification. In all occurences, the area around the DWO is cleaned and inspected for any debris or contaminants. If grease was determined to be a primary cause of the DWO, the Industrial Waste Control Division is notified of the occurence for further investigation.

4.5.3 Routine Preventative Cleaning of System

The City continued its preventative cleaning program in 2009 as described in Chapter 2. The City-Wide Sewer System Cleaning project primarily involved cleaning of larger diameter sewers, heavily silted lines, or lines that had severe blockages. This was a city-wide project, but many of the lines cleaned were in the CSS. The primary purpose of this contract was to supplement the sewer cleaning efforts of the Line Maintenance Division.

4.5.3.1 Reported DWOs by Wastewater Treatment Division

DWOs or bypasses which occur at pump stations and WWTPs are investigated and reported by the Wastewater Treatment Division. MDNR is notified within 24 hours of discovery and a Wastewater Bypass Report Form is submitted within 5 days of the occurrence.

4.6 NMC 6 - Control of Solids and Floatable Material in CSOs

"The sixth minimum control is intended to reduce, if not eliminate, visible floatables and solids using relatively simple measures. Simple devices including baffles, screens, and racks can be used to remove coarse solids and floatables from combined sewage . . ." - USEPA, **CSO Guidance for Nine Minimum Controls**

The WSD and other City departments employ several methods for preventing extraneous solids and floatables from entering the CSS including:

- Repair and clean catch basins
- Street sweeping
- Construction site erosion control

4.6.1 Repair and Clean Catch Basins

WSD is responsible for the proper functioning of all catch basins throughout the City. The Stormwater Line Maintenance Division performs catch basin cleaning and repairs. The Division cleaned and inspected 14,941 inlets in 2009.

4.6.2 Street Sweeping

The Water Services Department sweeps streets on a routine schedule to reduce trash, silt and other debris on the streets and in the sewer system. Improved residential streets city-wide are swept on three cycles May through December and once between January and April. The main arterial system is swept on four cycles between May and November. The Downtown system (within the downtown loop) is swept on 61 cycles between May and November and on 19 cycles between December and April. The Department swept 19,859 miles of streets in 2009.

4.6.3 Construction Site Erosion Control

Soil erosion from construction activity can increase the quantity of turbidity, nutrients, metals and sediment in the receiving sewer and 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 reducing these constituents in the flow in the CSS. Construction work is required to conform to City engineering and construction standards for all public or private work.

4.7 NMC 7 – Pollution Prevention Programs to Reduce Contaminants in CSOs

"The seventh minimum control, pollution prevention, is intended to keep contaminants from entering the CSS and thus receiving waters via CSOs. Most of the suggested measures involve behavioral change rather than construction of storage or treatment devices." - USEPA, **CSO Guidance for Nine Minimum Controls**

The pollution prevention measures covered in this minimum control were supported by the City to encourage residents and business owners to minimize or eliminate their contaminants from entering the combined sewers and, in turn, the rivers and streams. The programs and documentation include:

- Household Hazardous Waste Program
- Keep Kansas City Beautiful Campaign
- 10,000 Rain Gardens
- Food Handler Training Classes
- Industrial Waste Newsletter
- Street sweeping (see NMC 6)

4.7.1 Household Hazardous Waste Program

The HHW Program continued to accept, manage and recycle or safely dispose of excess or unwanted household chemicals in 2009. The program accepted chemicals from residents in 32 communities throughout Cass, Clay, Jackson, Platte, and Ray counties as well as residents in unincorporated areas of Jackson, Cass, Platte and Clay Counties. The program provides residents a clean alternative for disposal of used oil and other chemicals that may otherwise be disposed in storm drains or other inappropriate places. In addition, the program accepts conditionally exempt quantities of hazardous materials from city-operated facilities. Throughout the year the program served 8,247 households and took in approximately 1,091,716 pounds of household hazardous waste. As a part of this program, WSD manages a permanent HHW Facility and the Swap Shop. A Regional HHW Collection Program is coordinated by the Mid-America Regional Council (MARC) Solid Waste Management District in cooperation with Kansas City and the City of Lee's Summit. The regional program sponsors HHW Mobile Collection Events as summarized in Table 4-2. This program was recognized by the USEPA for excellent implementation of an Environmental Management System. The mobile collections events collected nearly 238 tons of waste in 2009.

Table 4-2 2009 HHW Mobile Collection Events

April 4	Independence	85,585
April 18	Blue Springs	52,482
May 2	Northland KC	40,320
May 16	Harrisonville	10,741
May 30	Lone Jack	5,855
June 6	Gladstone	27,112
June 20	Central KC	43,920
June 27	Grain Valley	16,717
August 1	Belton	40,076
August 15	Platte County	20,850
August 29	KC Southland	34,821
September 12	Cass County	29,047
September 26	Kearney	23,821
October 10	Riverside	12,372
October 24	Liberty	32,143

Note: These events accepted HHW including automotive fluids, batteries, fuels, household cleaners, lawn & garden products, pesticides, paints and related products.

4.7.2 Keep Kansas City Beautiful Campaign

The Keep Kansas City Beautiful Campaign efforts in 2009 included litter prevention, community beautification and waste reduction and recycling through various programs highlighting these specific issues. The campaign's current focus areas include litter abatement, public awareness and education, with programs including:

- EarthFest/EarthWalk
- Great American Cleanup
- Kansas City Environmental Education Network
- Week of Water

a) **EarthFest/EarthWalk**

Earth Day 2009 celebrates Kansas City as one of the Top 25 Green Cities in the U.S., as noted by The Green Guide, an environmental consumer guide. The ranking is based on factors such as air quality, electricity use and production, green space, public health, recycling programs and a host of other factors. Many events were held throughout the City to demonstrate why Kansas City is truly a Top 25 Green City.

b) **Great American Cleanup**

During the 2009 Great American Cleanup, KKCB supported 80 events in which 5,536 volunteers gave 16,608 hours to clean up 68 communities. Their efforts resulted in:

- Cleaning 280 tons of trash
- Clearing 56 illegal dumping sites
- Recycling more than 445 pounds of metal
- Collecting 14,476 scrap tires
- Cleaning 36 miles of streets
- Cleaning 10 acres of wetlands
- Collecting 300 pounds of clothes
- Held 15 educational workshops
- Conducted 3 awareness events that reached 630 people

4.7.3 10,000 Rain Gardens

The 10,000 Rain Gardens program was initiated in fall 2005 to improve water quality by reducing stormwater runoff and pollutants. Kansas City is researching available water quality grants to fund the construction of rain gardens in the urban core neighborhoods. Potential grant funding and local matching funds will also include installation of rain barrels and disconnecting of downspouts. Rain gardens provide an opportunity to reduce water pollution and stream degradation by establishing this low impact development technique as a standard best management practice (BMP) for city departments, property owners, businesses, and developers.

4.7.4 Industrial Waste Newsletter

The Industrial Waste Control Division sent out one newsletter in 2009. All 68 SIU's received the newsletter. The topics included the compliance determinations for the industries, Memorandum of Understanding for the Dental Amalgam program, and recycling/energy reduction information.

4.8 NMC 8 - Public Notification to Ensure the Public Receives Adequate Notification of CSO Occurrences and CSO Impacts

"The intent of the eighth minimum control is to inform the public of the location of CSO outfalls, the actual occurrences of CSOs, the possible health and environmental effects of CSOs, and the recreational or commercial activities curtailed as a result of CSOs. The measure selected should be the most cost-effective measure that provides reasonable assurance that the affected public is informed in a timely manner." - USEPA, **CSO Guidance for Nine Minimum Controls**

4.8.1 CSO Notification

The WSD has a sign at each of the 90 outfall locations. Each sign identifies the outfall and provides a telephone number directing the caller to the WSD dispatcher on call 24 hours per day, 7 days per week. Citizens can report CSOs to the dispatcher, who then forwards the messages to the appropriate WSD staff. In addition, a contact number is provided if the public wants more information.

4.8.2 Public Education Program

WSD's extensive public education program continued in 2009. The 2009 program elements are highlighted in the *Overflow Control Plan* submitted in January 2009. The program goal is to raise awareness, educate and connect with the public on issues concerning CSOs and other wet weather issues.

4.9 NMC 9 – Monitoring to Effectively Characterize CSO Impacts and the Efficacy of CSO Controls

"The ninth minimum control involves visual inspections and other simple methods to determine the occurrence and apparent impacts of CSOs. This minimum control is an initial characterization of the CSS to collect and document information on overflow occurrences and known water quality problems and incidents that reflect use impairments by CSOs. Changes in the occurrences of such incidents can provide a preliminary indication of the effectiveness of the NMC" - USEPA, **CSO Guidance for Nine Minimum Controls**

The City continued to conduct regularly scheduled visual inspections of both the system's diversion structures and the receiving streams to determine the occurrence and apparent impacts of overflows in compliance with conditions of the Blue River and Westside WWTP operating permits.

* * * * *

5 PROJECTS

This section provides information about capital improvement projects initiated, extended through, or completed in 2009 that relate to the Wet Weather Solutions Program and the OCP. The capital projects generally fall into one of the three following categories:

- Collection system projects
- In-Fill sewer projects
- Facilities projects

A project data sheet is presented for each project. The capital project data sheets contain the following information where applicable and available:

- Project Name
- Council District(s)
- Watershed(s)
- Contract Number
- Project Number
- Scope
- Location
- Description
- Benefit
- Project Manager
- Planner
- Designer
- Contractor
- Design / Construction Start
- Design / Construction End
- Operational Date
- Project Cost
- Project Status
- General Location Map – if applicable
- Project Photograph – if available

5.1 Collection System Projects

5.1.1 Brookside Sanitary Sewer Improvements Phase 3A & 3B

5.1.2 Brookside Sanitary Sewer Improvements Phase 5

5.1.3 Middle Blue River Green Solutions Pilot Project

5.2 In-Fill Sewer (Septic Tank Elimination Program)

5.2.1 Line Creek Sewer Rehabilitation 2010

5.3 Facilities Projects

5.3.1 Asset Management Program

5.3.2 Santa Fe Pump Station Improvements

* * * * *

*Council District(s): **4***
*Watershed: **Brush Creek***

Brookside Sanitary Sewer Improvements Phase 3A & 3B

*Design Contract No.: **654***
*Project No.: **81000654***
*Const. Contract No.: **856***
*Project No.: **81000378***

Scope: The project consists of catch basin repair and/or replacement, construction of new storm drains, and sanitary sewer repair and/or replacement.

Location: The Brookside Neighborhood is generally bounded by 57th to 65th Street and Ward Parkway to Wornall.

Description: The third phase of improvements is designed to reduce flooding and sewer back-ups through replacement of catch basins in streets to carry stormwater runoff, upsizing approximately 21,500 feet of existing storm drainage, and upsizing approximately 2,900 feet of sanitary sewer pipe system primarily located within yards. The larger pipes will increase the carrying capacity of both the storm drainage and sanitary sewer systems.

Benefit: Removal of infiltration/inflow sources, reduction of sewer back-ups, and increased pipe capacity.

Project Manager: Karine Papikian

Planner: Burns & McDonnell

Designer: Burns & McDonnell

Contractor: Dennis Johnson Construction, Inc. – Phase 3A

Design Start: April 2004

Design End: December 2007-Phase 3A

Notice to Proceed: April 2008

Operational Date: Summer 2009 – Phase 3A

Project Cost: $10,000,000 (Design and Estimated Construction – Phase 3A & 3B)

Project Status: Construction complete – Phase 3A – June 2009

Design complete - Phase 3B – December 2007

Construction – Phase 3B – to begin summer 2010 (if funding is available)

Kansas City Overflow Control Program

Council District(s): ***4***
Watershed: ***Brush Creek***

Brookside Sanitary Sewer Improvements Phase 5

Design Contract No.: ***654***
Project No.: ***81000654***

Scope: Soil drilling, sampling, alignment routing study, and final design of a large interceptor sewer.

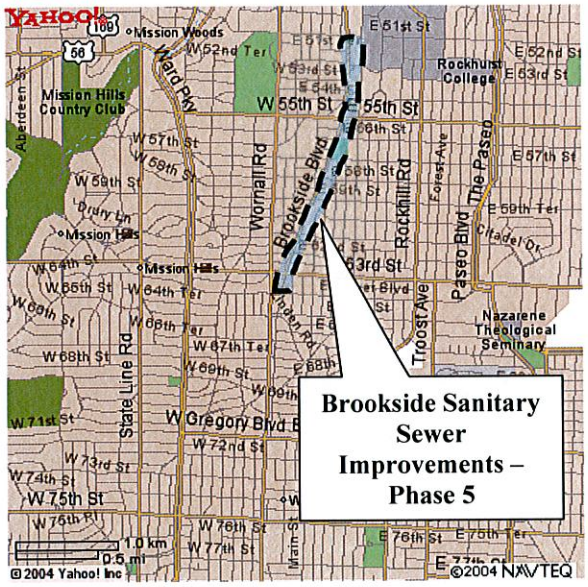
Location: The project is located along Brookside Boulevard from Brush Creek Boulevard to Meyer Boulevard.

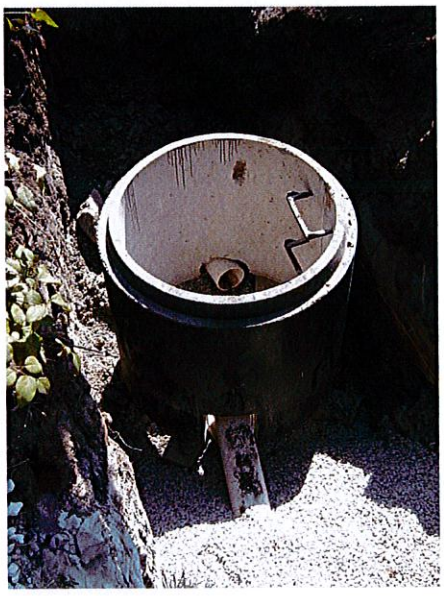
Description: The fifth phase of improvements primarily consists of the design and construction of a new larger relief sewer parallel to the existing storm drainage interceptor pipe. The design also includes rehabilitation and installation of approximately 10,500 feet of the existing sanitary sewer pipe to increase carrying capacity and to reduce flooding and sewer back-ups in the vicinity.

Benefit: Removal of infiltration/inflow sources, reduction of sewer back-ups, and increased pipe capacity.

Project Manager: Karine Papikian
Planner: Burns & McDonnell
Designer: Burns & McDonnell
Contractor: N/A

Design Phase 5A & 5B: December 2009 - completed
Operational Date: Construction of Phase 5A – 2014 Fiscal Year
Construction of Phase 5B – 2016 Fiscal Year
Project Cost: $30,000,000 (Design and Estimated Construction)





Kansas City Overflow Control Program

Council District(s):5
Watershed: Middle Blue River

Middle Blue River Green Solutions Pilot Sewer Rehabilitation Project

Contract No.: 0770
Project No.: 81001

Scope: Complete basic planning for the pilot project and obtain physical data necessary for preliminary and final designs to proceed in a timely fashion.

Location: The project area is approximately 100 acres and extends from 73rd Street to 77th Terrace and from Holmes Road to Paseo Boulevard. The initial field investigation will extend to an additional 86 acre control area adjacent to the pilot area that extends south to 79th Street and east to Paseo Boulevard.

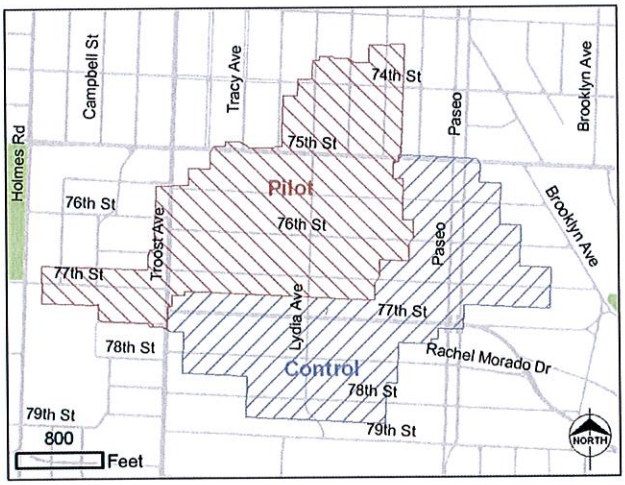
Description: The Water Services Department is undertaking a pilot project to measure and evaluate the performance of green solutions. Green Solutions will be used to capture stormwater to reduce combined sewer overflows within a portion of the Middle Blue River Basin.

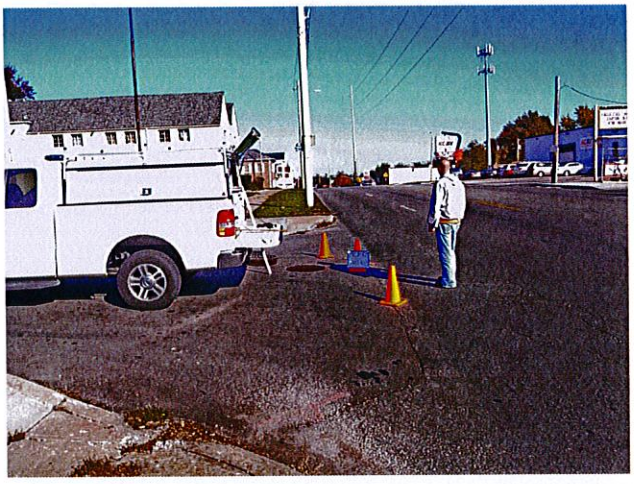
Benefit: To reduce levels of infiltration and inflow and peak wet weather flows within a portion of the Middle Blue River Basin in an effort to ultimately reduce the volume of wet weather overflow from the drainage basin.

Project Manager: Francis Reddy
Construction Manager: Karine Papikian
Planner: OCP
Designer: URS/DR&G
Contractor: N/A

Preliminary Design Start: September 2008
Preliminary Design End: March 2009
Operational Date: Spring 2011, Final Completion Summer 2011

Project Cost: $2.5 Million (Preliminary Design)
Project Status: Design Phase – completed - Bid Phase





Kansas City Overflow Control Program

Council District(s): All
Watershed: All

Line Creek Sewer Rehabilitation 2010

Contract No.: 1009
Project No.: 81000582

Scope: Rehabilitation of sewer lines along Line Creek north of the Missouri River in Kansas City Missouri.

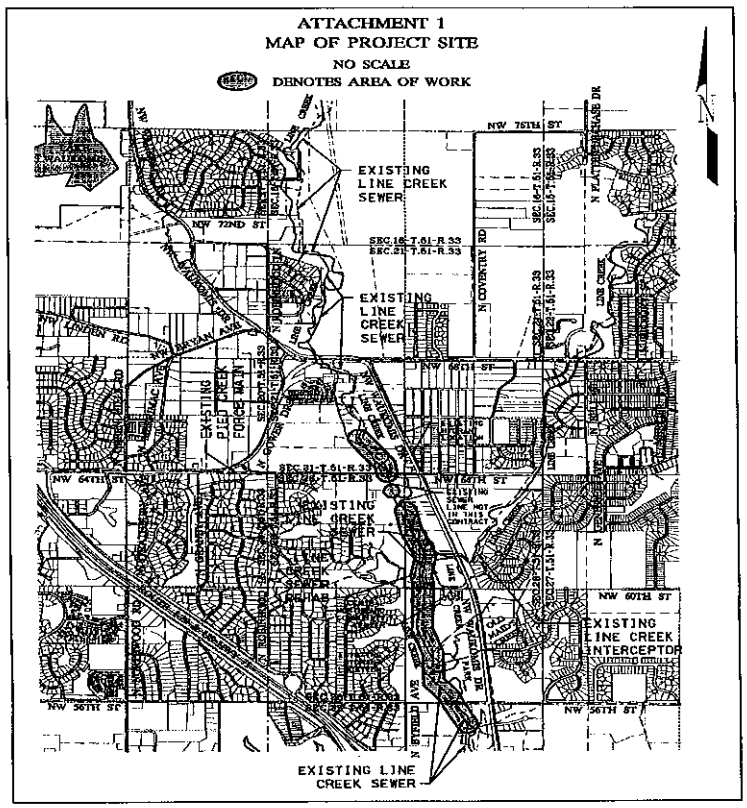
Location: The project is located primarily in Kansas City, Platte County, Missouri.

Description: Trenchless rehabilitation of approximately 6,692 linear feet of sanitary sewer lines (2,296 linear feet of 36-inch, 2,452 linear feet of 48-inch, and 1,944 linear feet of 54-inch. This project also includes the rehabilitation of all manholes between NW 64th Street and NW Waukomis Drive along Line Creek.

Benefit: Recommendations for future rehabilitation to extend the life of the sewer system.

Project Manager: Matt Thomas
Planner: Water Services Department
Designer: Water Services Department
Contractor: SAK Construction
Project Start: March 1, 2010
Project End: February 2011
Operational Date: February 2011
Project Cost: $1,578,000
Project Status: Active

LOCATION MAP



Kansas City Overflow Control Program

*Council Districts: **All***
*Watershed: **All***

Asset Management Program

Contract No.: 958
*Project No.: **81000356***

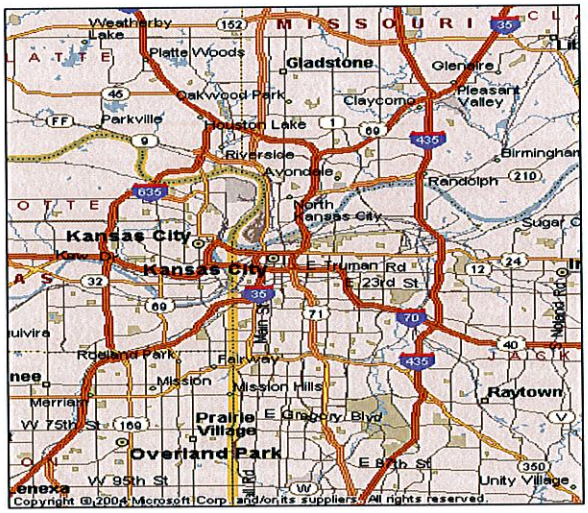
Scope: Preparation of an Asset Management Program in three steps. Step one being the effort required through a Work Plan. Second would be the efforts required in developing a State of Assets Report for Water Services Department's facilities and systems management. Third would be the implementation of the plan.

Location: Citywide - all wastewater facility and system assets, in and above ground.

Description: Water Services overall goal for an Asset Management Plan is to develop sound strategies to maintain business sustainability. Purpose of the Asset Management Program is to provide information, identify gaps, and highlight opportunities to develop this sustainable business through improved life-cycle management and decision-making in the areas of traditional assets, people resources, and business culture.

Benefit: Managed asset repair, replacement, and capital improvements with a pre-planned revenue stream to cover those costs while maintaining customers with a high quality level of service and implementing the latest regulatory updates and requirements.

Program Manager:	Unassigned
Planner:	Water Services Department
Selection:	NTP issued to Consultant on October 19, 2007
Consultant:	Camp, Dresser & McKee, Inc.
Program Start:	October 19, 2007 (Work Plan), Anticipate May 2009 for State of Assets Report
Program End:	October 2008 (Work Plan Only), Anticipate December 2009 (State of Assets Report)
Operational Date:	N/A
Project Cost:	$392,100.00 (Work Plan), Estimate $500,000 (State of Assets Report & Organization Structure)
Project Status:	On Hold



Kansas City Overflow Control Program

Council District(s): ***2***
Watershed: ***North Kansas City***

Santa Fe Pump Station Improvements

Contract No.: ***949***
Project No.: ***81000298***

Scope: Improvements to the Santa Fe Wastewater Pumping Station.

Location: 1200 Woodswether Road, Kansas City Missouri.

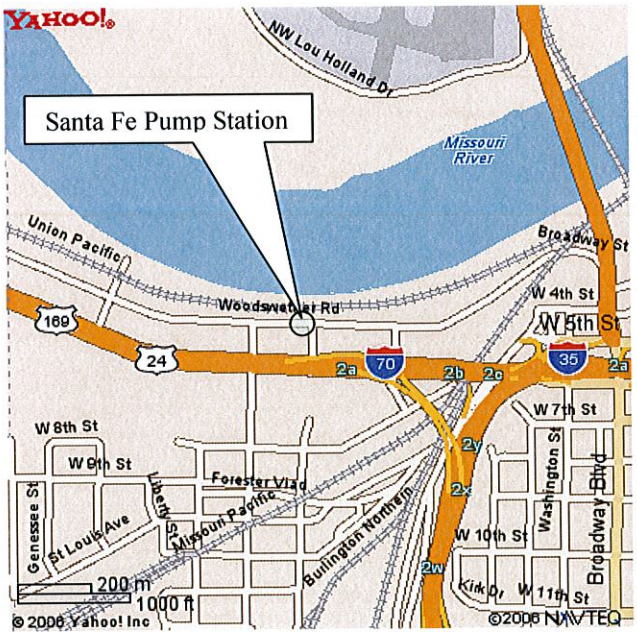
Description: Construction of two grit collecting manholes including associated street repair; as well as improvements to the wastewater pumping station facility for a complete, usable, and reliable facility. Improvements for pump station grit removal process, screening process, and other ancillary facility improvements.

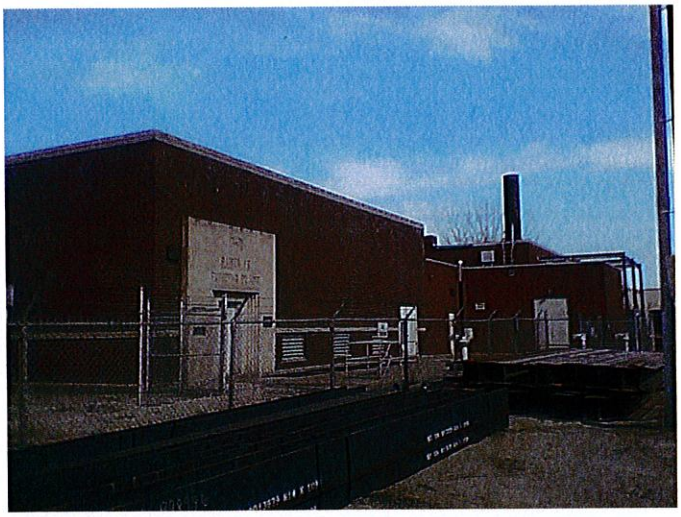
Benefit: Reduced maintenance and operational costs; reliable pumping of wastewater; reduce grit and sand flowing to the pump station

Project Manager: Bon Marie Gardner
Planner: Water Services Department
Designer: Carollo Engineers PC
Contractor: Pyramid Excavation & Construction

Construction Start: November 2008
Construction End: On going
Operational Date: March 2010

Project Cost: $ 4,545,070
Project Status: Active





Kansas City Overflow Control Program