Kansas City, Missouri
Water Services Department

Overflow Control Program

2004 Annual Report

February 10, 2005

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1 INTRODUCTION

1.1 Annual Report Purpose

The Kansas City's Water Services Department (WSD) has prepared this Annual Report to document the City's wet weather accomplishments and progress during 2004. The report is divided into sections and provides program details for each of the following:

- Combined Sewer Overflow (CSO) – Long Term Control Plan (LTCP);
- Sanitary Sewer System (SSS) – Control Plan (CP);
- SSS Operation and Maintenance;
- Nine Minimum Controls; and
- Capital Projects.

1.2 Wet Weather Program

In 2003, WSD established a Wet Weather Program by consolidating existing programs to address sewer backups, receiving stream water quality, sewer overflows, and stormwater flooding. The program includes three major components: the Overflow Control Program (OCP)**,** which is focused on the combined and separate sanitary sewer systems**;** KC-ONE, which is focused on stormwater management; and, Streamway Management Program, which is focused on river and stream management.

1.2.1 Overflow Control Program

Kansas City's sewer systems are extensive and serve an area of almost 317 square miles. The combined sewer system (CSS) serves almost 18 percent (56 square miles) of this area. With the exception of some isolated septic system areas, the remaining 261 square miles are served by separate sanitary and storm sewer systems, with the sanitary component referred to as a sanitary sewer system (SSS).

The Overflow Control Program (OCP) is a multi-faceted and long-term undertaking initiated by the City to develop a system-wide program to address sanitary sewer overflows within the CSS and SSS. The Overflow Control Program's mission is to "*protect the public health and the environment, and meet regulations at an appropriate cost*." As part of this mission, the OCP is developing a Long Term Control Plan (LTCP) for the CSS and a Control Plan (CP) for the SSS. The CSO LTCP and the SSS CP together form the Kansas City Overflow Control Plan. The Overflow Control Plan will identify the required facilities and improvements to the sewer system along with estimated costs, proposed funding strategy, and implementation schedule.

The Overflow Control Plan builds on significant planning, design, and construction activities currently underway within the CSS and SSS. To date, the City has invested millions of dollars in capital projects to improve, rehabilitate, and repair sewers and treatment plants. Capital improvements projects for 2004 are

described in Section 6 of this report. High priority capital improvement projects will continue to be implemented during development of the Overflow Control Plan.

1.2.2 KC-ONE

KC-ONE is a similarly extensive program that will result in a comprehensive stormwater management plan and capital improvements program. This program began in 2004 and is consolidating individual master plans that have been prepared or are underway for 35 watersheds covering the entire city into a single overall master plan. The OCP and KC-ONE are closely coordinated to implement compatible system improvements focused on basement backups, surface flooding, overflows, water quality, sewer condition, sewer capacity, and stormwater conveyance capacity.

1.2.3 Streamway Management

Streamway Management was established in 1998 as the Special Projects Division in the Public Works Department. This function was transferred to Water Services Department in 2004 in recognition of the synergy with other components of the OCP. The purpose of Streamway Management is completion of large scale multi-purpose projects related to streams and rivers in cooperation with other agencies using non-traditional funding sources. Work performed to date includes mostly waterway development projects on the Blue River, Brush Creek and Turkey Creek in conjunction with the Corps of Engineers and other local agencies.

1.3 Overflow Control Program Schedule

Major OCP components and associated schedule are:

- Initial Activities (6 months)
  - Develop protocols
  - Contracting process
- System Characterization (12 months)
  - Data collection
  - Data evaluation
  - Develop models
- OCP Control Plan Preparation (24 months)
- Obtain Concurrence from Community and Elected Officials (6 months)
  - Review by community
  - Review by elected officials
- Public Involvement Program (continuous)

In 2004, the OCP completed the Initial Activities phase and has begun the System Characterization phase of the program. During performance of all OCP phases, the City will continue to implement system capital improvements and take advantage of any opportunities for early implementation of improvements identified in the control plans.

2 CSO LONG TERM CONTROL PLAN

Under federal and state regulations, Kansas City must develop a plan to control CSOs. The regulations have specific requirements for developing a CSO LTCP. In response to these regulations, Kansas City is required to characterize the existing CSS and receiving waters, involve the public, evaluate alternatives, select improvements, and implement the LTCP. This section provides information on the following:

- Completed work – Work Plan for the CSO Long Term Control Plan; and
- Current (2004) CSO Long Term Control Plan Progress.

2.1 Work Plan for the CSO Long Term Control Plan

In November 2002, Kansas City began development of the CSO Long Term Control Plan Work Plan (LTCPWP), and the Work Plan was completed in the second quarter of 2004. Major work plan development activities included:

- objectives and performance measures development;
- water quality standards review;
- existing data assembly and review;
- data gap identification;
- regulatory agency coordination; and
- public participation

On May 14, 2004, the CSO LTCP Work Plan was submitted to the Missouri Department of Natural Resources, Missouri Attorney General, and the U.S. Environmental Protection Agency. A presentation was given to these agencies outlining data to be collected during Work Plan preparation, particularly as related to current system conditions. The Work Plan establishes the approach to be followed for preparation of the CSO Long Term Control Plan. In the Work Plan, the CSS area was divided into seven study areas, or basins, for characterization and evaluation purposes. Flow metering, water quality sampling and analysis, and precipitation analysis will be performed by specialty contractors for the entire CSS area. The results of this work will be provided to and used by engineering consultants to develop plans for each individual basin. The plan for each basin will characterize the existing system, identify alternatives to address overflows, evaluate alternatives, and recommend an overall approach. The plans will be integrated into a comprehensive CSO LTCP for the entire CSS.

2.2 CSO Long Term Control Plan 2004 Progress

The LTCP process will develop cost-effective controls that address water quality standards in the receiving waters. LTCP development must be based on credible data and sound science, comprehensive evaluations for a full range of control alternatives, and extensive public participation along with stakeholder involvement. This section summarizes 2004 progress on preparation of the CSO LTCP.

2.2.1 WSD Organization and Capability/Capacity Assessment

WSD authorized the creation of a new division, the Overflow Control Division, to manage the future OCP work. At the end of the year, efforts were in progress to fill the Division Manager position. The assessment included a detailed analysis of staffing requirements (full-time, temporary, contract, or consultant) to assure adequate staff are available for control plan development and subsequent implementation. WSD and the OCP Team have completed an initial assessment of organizational structures and operational procedures necessary for effective management of the Overflow Control Program.

2.2.2 Public Participation

An extensive public participation program was initiated during preparation of the Work Plans. The public participation program is designed to educate and involve the public on activities of the OCP, dealing with both the CSS and the SSS. The public participation plan is designed to inform and secure support for the control plans as they are developed. Several new committees were formed consisting of the public and interested stakeholders, officials from various levels and city departments, and WSD staff. Existing committees are also involved. Public meetings were held at various locations within the City in 2004 to present and discuss the proposed control plan. The following is a list and description of these stakeholder groups:

a) **Wet Weather City Committee** – Because sewer system performance is a complex issue that affects other City Departments, this committee was created to share information, assist in the development of alternatives and strategies, and provide feedback to OCP. This committee includes decision-makers and/or technical experts from the Mayor's Staff, City Manager's Office, Water Services, Law, Finance, Fire, Codes Administration, Health, City Planning and Development, Public Works, Environmental Management, Parks & Recreation, Housing & Community Development, and Neighborhood & Community Services.

b) **Wet Weather Community/Public Panel** - The Wet Weather Community Panel was appointed by the Mayor to address several public participation goals, including building an informed group of external stakeholders, fostering a constructive interchange among the various interests, and accessing technical assistance and input. Panel members provided information and feedback to the OCP Team as they developed recommendations for the OCP Work Plan, and they provided the OCP Team with insight into the community's values. Wet Weather Community Panel membership of approximately 40 people was designed to reflect a balance of interests represented by citizens, Council District representatives, environmental groups, Mid-America Regional Council, business representatives, and local technical specialists.

c) **Brush Creek Community Partners –** Brush Creek Community Partners (BCCP) is a not-for-profit organization formed to promote development and protection of Brush Creek. Its members include neighborhood groups, public agencies with interests in the Brush Creek corridor and representatives of private businesses located within the corridor. The OCP met with BCCP members to provide them with an update on what is being done and to receive their input.

d) **Brush Creek Coordinating Committee –** The Brush Creek Coordinating Committee meets bi-monthly. It is made up of representatives of City Departments with interests in the Brush Creek Corridor as well as representatives of other government agencies (Corps of Engineers, for example) working in the corridor and community based groups such as neighborhood associations and BCCP. The goal of this group is to coordinate development projects within the corridor to avoid conflicts and to make effective use of synergies. The OCP meets with this committee to provide update them on OCP work within the Brush Creek Corridor.

e) **Town Fork Creek Coordinating Committee** – This committee meets bi-monthly to discuss projects within the Town Fork Creek basin. It is made up of representatives of governmental agencies at the federal and local level as well as neighborhood associations. The objective is to provide a forum for discussion and coordination of projects within the basin to maximize synergies and to avoid conflicts. OCP meets with this committee providing them an update on OCP work within the Town Fork Creek basin.

f) **Blue River Summit** – The Blue River Summit was held on May 20, 2004. Approximately 200 people from various interests in the Blue River Watershed attended. Groups included federal, state, and local officials representing Kansas and Missouri; environmental groups; business interests; neighborhood representatives; technical experts, nonprofit associations; and the general public. OCP staff attended and participated in the discussions regarding basin planning and water quality.

g) **Brush Creek Summit –** The Brush Creek Summit was held on October 20, 2004. Approximately 60 people attended from various interest groups in the Brush Creek Watershed. Groups included federal, state, and local officials representing Kansas and Missouri; environmental groups; business interests; neighborhood representatives; technical experts, nonprofit associations; and the general public. OCP staff attended and participated in the discussions regarding basin planning and water quality. OCP was a presenter and panelist regarding the Overflow Control Program.

h) **Johnson County/Wyandotte County and MARC –** WSD saw the potential for regional cooperation on wet weather issues because some of Kansas City's 35 watersheds extend into two states, multiple counties and local cities. To explore those possibilities, initial meetings

were held during 2004 and attended by WSD, Johnson County Wastewater, Johnson County Stormwater, Unified Government Board of Public Utilities, and Mid-America Regional Council. Topics of regional interest have been discussed at meetings of this group looking for opportunities to work cooperatively where common goals and interests exist. Future meetings may be expanded to include other agencies in the region.

i) **Greater Kansas City Chamber of Commerce Environment Committee** – OCP met with the Greater Kansas City Chamber of Commerce Environment Committee to make a presentation on the OCP scope and approach.

j) **Kansas City Area Economic Development Council** – WSD met with the Kansas City Area Economic Development Council to provide them with an overview of the OCP.

k) **Others** – In addition to the public participation activities discussed here, additional activities that are specifically related to the CSS are discussed in Section 5.8.

2.2.3 Program and Agency Coordination

To help assure compliance with regulatory requirements, there has been on-going consultation with numerous agencies during preparation of the control plan. Activities during the past year included:

a) **State and Federal Agencies** – WSD met regularly with the MDNR, the Missouri Attorney General's office (MoAG), and U.S. EPA Region 7 to report progress on the OCP, including both the CSO LTCP and the SSS CP components. On May 14, 2004 WSD presented the control plan work plans to MDNR, MoAG, and EPA. At this meeting, WSD presented the content of the work plans, the results of the research that had been conducted at that time into the condition of the system and options available for reduction of overflows, and a detailed approach for the development of the control plans. On June 7, 2004, a meeting was held with MDNR and MoAG to discuss immediate critical path components of the work plans in detail, including rain gauging, flow metering, and water quality sampling. An additional meeting with MDNR, MoAG and EPA took place on July 9, 2004 to further discuss these topics and MDNR provided verbal approval to proceed.

b) **Corps of Engineers** – The Corps of Engineers has active projects in Brush Creek, Blue River and Turkey Creek. The primary objective of these projects is flood control. OCP attends quarterly meetings, as well as project meetings as needed, with the Corps and other agencies to coordinate planning efforts of the OCP with the projects being implemented by those other agencies within the basins.

c) **Clean Water Commission** – OCP provided a tour of the CSS to the Clean Water Commission (CWC) and members of MDNR staff in conjunction with a CWC meeting in Kansas City on September 28 and 29, 2004. The purpose of the tour was to provide information on what the CSS is and how it works.

d) **United States Geological Survey (USGS)** – Cooperative funding agreements with USGS to conduct water quality sampling were continued in 2004. WSD initiated the agreement with USGS to conduct water quality sampling in Brush Creek and Blue River in 1998 and has continued the effort through 2004. This sampling is done as a cooperative effort between OCP and USGS to support a watershed approach to the CSO LTCP.

2.2.4 Protocols, Manual and Plans

Protocols, manuals, and plans were developed in the summer and fall of 2004 to standardize methods to be followed by all consultants performing similar basin planning tasks and technical service firms providing data to be used during the development of the LTCP. These documents establish standard procedures that will assist the OCP when integrating the individual plans for each basin into the comprehensive LTCP. The following paragraphs describe the documents that have been prepared:

a) **Sampling Protocol** – This protocol defines the monitoring objective, monitoring locations and frequency, documentation, field measurements, sample collection/handling/delivery, and standard operating procedures to be followed during sampling of the receiving streams and CSO/Stormwater systems. In addition to establishing the procedures to be followed by the sampling contractors, this document also informs the basin planning firms what information will be provided to them from the sampling.

b) **Metering Protocol** – The Metering Protocol establishes standardized procedures for flow and rainfall monitoring, data processing and management, and installation of temporary flow monitors and rain gauges. The protocol will be used by the metering contractor, WSD staff and the OCP Team.

c) **Modeling Protocol** – The Modeling Protocol is a guide for developing, calibrating, and verifying a comprehensive, dynamic computer model for the sanitary and combined sewer systems. Each of the basin engineers will develop a model for the sewer system within their study area. The modeling protocol will assure that those models are prepared in a consistent manner so that they can be merged into a single model. Models will also be consistent with those prepared as part of the stormwater master planning efforts (KC-ONE).

d) **Data Management Protocol** – Large quantities of data will be used in the development of the LTCP. The Data Management Protocol establishes standard procedures and formats for transferring data between generators and users of data.

e) **Field Data Collection Manual** – This document will be used by contractors collecting field data during manhole inspections and facility surveys. The manual includes public and OCP notification procedures, guidelines for inspections and data collection, data quality review standards, and requirements for data reporting format.

f) **Administration Manual** – The Administration Manual provides guidance for all members of the OCP Team with communication and reporting procedures. Topics addressed in the manual include OCP description and team organization, scheduling, financial management, communications, document style and format standards, document management, program websites, and MBE/WBE utilization.

g) **QA/QC Manual** – The Quality Assurance/Quality Control Manual is an appendix to the Administration Manual. It defines QA/QC procedures and guidelines for the OCP Team with the objective to produce and deliver a quality product according to defined standards, thereby leading to OCP success. The QA/QC Manual establishes review procedures and documentation requirements that apply to all deliverables produced by or for the OCP Team.

h) **QAPP** – A Quality Assurance Project Plan (QAPP) was developed and included in the RFPs for the Laboratory Analytical Services, the Receiving Water Sampling, and CSO/Stormwater Sampling contracts. The QAPP includes information on organization, responsibilities, procedures, quality control checks, data management and reporting. It provides guidance, specifications, and standardized procedures for the proper execution of water quality monitoring activities by WSD and its contractors such that the resulting data is useful, reliable, and credible.

2.2.5 Design Professional Services Contracts

Following CSO LTCP Work Plan submittal to MDNR in May 2004, detailed Scopes of Service were prepared for engineering services. In July, a Request for Interest was issued for professional services for the seven CSS basin areas as shown in Figure 2-1. On August 6, 2004, a Request for Qualifications (RFQ) was issued to firms determined to be qualified to prepare plans for the CSS basins.

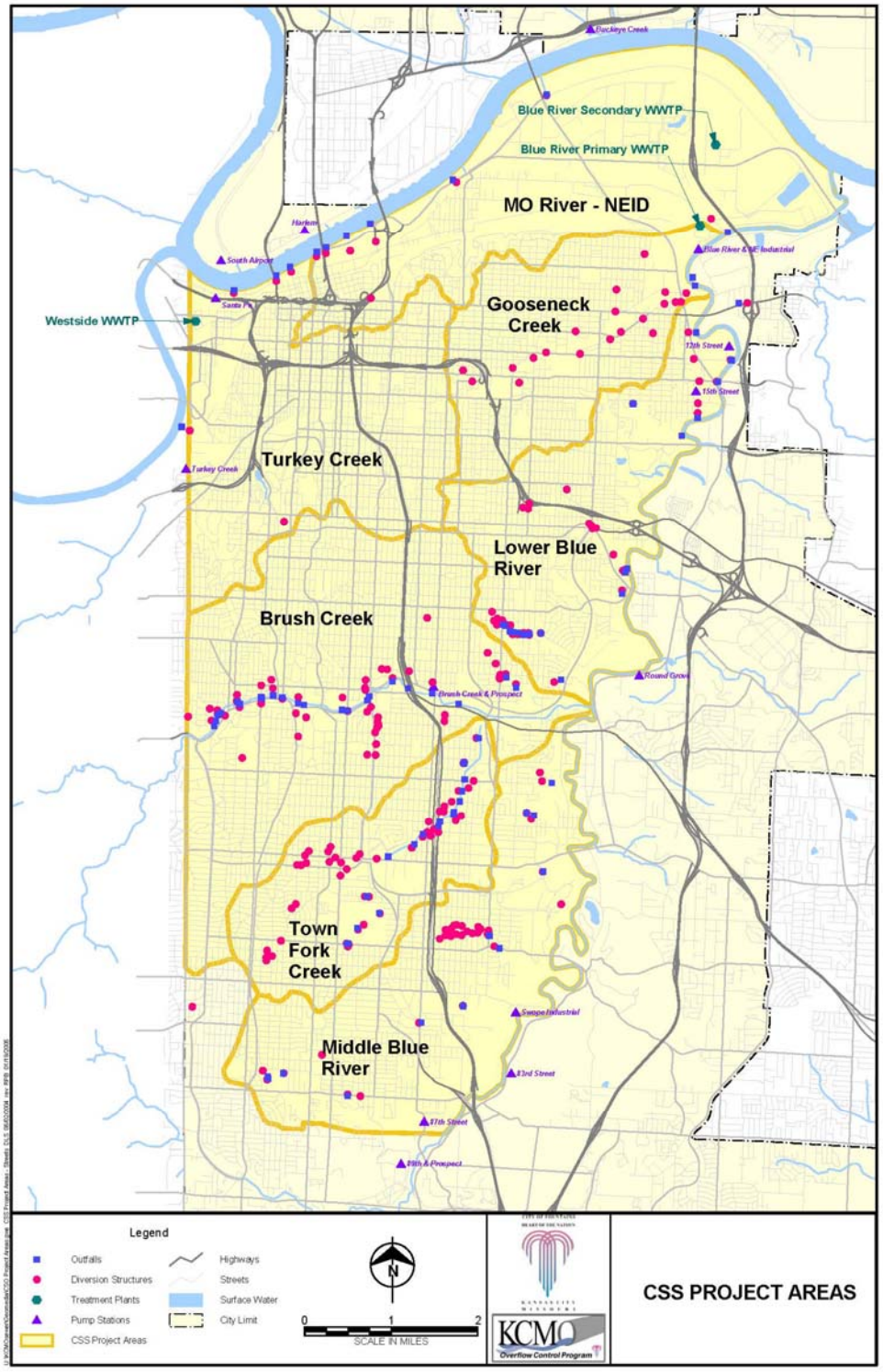
A mandatory RFQ pre-submittal meeting was held on August 11, 2004 at which firms could ask questions and receive clarifications about the projects. Statements of qualifications were received on September 10, 2004 from thirteen firms. After review and evaluation, short listed firms were interviewed by the City Selection Committee on October 15, 2004. Following the interviews, four firms were selected to prepare the plans for the seven CSS basins.

A conference call to discuss the development of cost proposals was held on September 27, 2004 with each of the selected engineering firms. The firms submitted their cost proposals in November 2004. A conference call was held on December 1, 2004 with all the firms to review, in general, the cost proposals, discuss areas of apparent mis-scoping based on cost proposals received, and solicit ideas of how to control costs while obtaining the data necessary to complete the work. Following the call, individual meetings in December 2004 were held with the firms to review the scopes of work and the cost proposals. It is expected that the engineering firms will be under contract in the first quarter of 2005.

The seven CSS study areas and selected firms are:

- Turkey Creek – Black & Veatch;
- Missouri River – Northeast Industrial District (NEID) – Black & Veatch;
- Gooseneck Creek – CH2M Hill;
- Lower Blue River (downstream from Brush Creek) – CH2M Hill;
- Middle Blue River (upstream from Brush Creek) – HDR Engineering;
- Brush Creek – Camp Dresser & McKee; and
- Town Fork Creek – Camp Dresser & McKee.

Figure 2-1
CSS Project Areas



2.2.6 Professional/Specialized/Technical Services Contracts

Following Work Plan submittal in May 2004, detailed Scopes of Service were prepared for technical service contracts. On October 8, 2004, Requests for Proposals (RFP) for professional / specialized / technical (PST) service contracts were issued by WSD. The five contracts for which RFPs were issued are:

- CSO/Stormwater Sampling;
- Receiving Water Sampling;
- Temporary Flow Metering;
- Radar Rainfall Monitoring; and
- Laboratory Analytical Services.

A mandatory informational meeting was held on October 19, 2004. Following receipt of the proposals on November 10, 2004, the proposals were reviewed and assessed based on their conformance with the requirements of the RFPs, the proposing firms' capabilities and experience, and cost. Items requiring clarification were identified and each proposing firm was contacted to discuss these issues during the week of November 22, 2004. Following these discussions, Severn Trent Laboratories (STL) was identified as the preliminary selection for award of the laboratory analytical services contract and MEC Water Resources was identified as the preliminary selection for award of the sampling contract. The temporary flow metering contract was awarded to Hydromax USA, and the radar rainfall monitoring contract was awarded to OneRain. Negotiations were then conducted with MEC Water Resources and STL during the beginning of December 2004. Final recommendations on scope of services, costs, and selection of contractors were made on December 17, 2004. All PST contracts should be executed during the first quarter of 2005.

2.2.7 Blue River Interceptor Sewer and Brush Creek/Blue River Hydrodynamic Model

The West Blue River Interceptor Sewer (BRIS) conveys flows collected along the west side of the Blue River to the Blue River Wastewater Treatment Facility. This major sewer conveys combined sewer flows to treatment from the Middle Blue River, Town Fork Creek, Brush Creek, Lower Blue River, and Gooseneck Creek Project Areas. The BRIS also receives separate sanitary sewer flows via the 87th Street Pumping Station and the Round Grove Pumping Station. The Blue River Wastewater Treatment Facility also receives flow from the NEID Pumping Station, which serves both combined and separate sewer areas.

OCP staff is preparing a model of the West Blue River Interceptor Sewer. The model will be used to determine the sewer's capacity and to allocate it among the various basins contributing flow to the interceptor upstream of the Blue River Wastewater Treatment Facility.

a) **Blue River Interceptor Sewer Model** – During 2004, initial activities on development of the model included field data collection and review of existing mapping and inventory data. Field data collection included manhole location and condition inspection, depth to invert measurements, and partial completion of a GPS survey. Existing mapping was used to

identify the extent of the sewer to be modeled and to identify the connection structures that will interface with models prepared by the engineering firms for the individual basins. Draft exhibits prepared include a model schematic drawing and a location exhibit superimposed on aerial photography. Inventory data was collected from the existing City GIS, from the City's maintenance management files, and from existing hydraulic models.

b) **Receiving Stream Hydrodynamic Modeling** - Model development to simulate the hydrodynamics and water quality in Brush Creek and the Blue River was initiated in 2004. Available bathymetric information was compiled and field reconnaissance surveys were conducted. The Full Equations Model (FEQ) modeling framework developed by the USGS was selected to simulate stream hydrodynamics and the Water Quality Analysis Simulation Program (WASP) modeling framework developed by EPA was selected to simulate water quality. Inputs for the FEQ hydrodynamic model were assembled and initial modeling runs were conducted to test model performance.

2.2.8 Water Quality Sampling

OCP conducted sampling in conjunction with the USGS to obtain data on existing water quality. A summary of the water quality sampling conducted in 2004 is as follows:

a) Continuous real-time water-quality data (either 15-minute or 1-hour intervals) was collected at one location on both the Blue River and Brush Creek from April through December 2004. Data from these stations is made available to the pubic on the USGS website. Mean daily values were also calculated and posted on the website. Parameters included:
   - Temperature;
   - pH;
   - Dissolved oxygen;
   - Specific conductance; and
   - Turbidity.

b) Continuous discharge measurements (5 to 15-minute intervals) at 7 sites (1 on Brush Creek; 4 on the Blue River; 1 on Indian Creek) during all of 2004. Mean daily discharge values were calculated from the continuous data, quality assured, and prepared for publication in the USGS annual report and on their website.

c) Base flow sampling was conducted three times:
   - February 2004
     - Benthic macro invertebrate sampling (including 1 site on Brush Creek, 6 sites Blue River, and 2 reference sites)
     - Standard field parameters (at all sites)

USGS Station on the Blue River

- April 2004 (2 sites on Brush Creek, 3 sites on Blue River, and 1 site on Indian Creek)
  - Nutrients
  - Trace metals
  - BOD/COD
  - TOC, DOC
  - Fecal indicator bacteria
  - Standard field parameters
  - Discharge
- August and September 2004 at 17 sites (including 6 sites on Brush Creek, 8 sites on the Blue River, 1 on Town Fork Creek, 1 unnamed tributary in Penn Valley Park) for:
  - Nutrients
  - Trace metals
  - BOD/COD
  - TOC, DOC
  - Fecal indicator bacteria
  - Standard field parameters
  - Chlorophyll-a
  - Discharge

d) Storm flow sampling at 6 sites (2 on Brush Creek; 3 on the Blue River; 1 on Indian Creek)
- 2 storms, one in May 2004 and one in June 2004
  - Nutrients
  - BOD, COD
  - TOC, DOC
  - Fecal indicator bacteria
  - Discharge

e) Microbial source tracking library samples collected (dogs, geese, human sewage) in August 2004 and December 2004.

USGS assembled and began evaluation of the data collected from October 2000 through October 2004 and is currently preparing a report to be issued in 2005 that will present the data and evaluation results.

3 SSS CONTROL PLAN

Like most U.S. cities, Kansas City's SSS is subject to SSOs and basement backups during wet weather. SSO control objectives are to comply with national and state regulations, substantially reduce backups and overflows, protect public health and the environment, prolong the useful life of sewer system assets, and provide adequate system capacity for the current and future needs of Kansas City residents and businesses. This section provides information on the following:

- SSS Control Plan Work Plan, and
- SSS Control Plan 2004 Progress.

3.1 Work Plan for the SSS Control Plan

In September 2003, WSD began developing the SSS Control Plan Work Plan. The Work Plan was completed in the second quarter of 2004.

On May 14, 2004, the Work Plan was submitted to the Missouri Department of Natural Resources, Missouri Attorney General and the U.S. Environmental Protection Agency. At that time, a presentation to these agencies outlined current system conditions, data collection during preparation of the Work Plan, and described the approach for SSS Control Plan preparation.

In the Work Plan, the SSS area is divided into five study areas. Four of the study areas have been identified as priority study areas because of their interaction with the CSS – use of common assets that require evaluation of these study areas be closely coordinated with the evaluation of the CSS. In addition, previously completed studies in these areas recommended improvements to major facilities. These recommendations will be reevaluated in light of the city-wide plan being developed by the OCP. The Line Creek/Rock Creek basin is a priority area because an excess flow storage facility was previously considered for the basin. The Round Grove priority area will have an I/I project performed to locate I/I sources and to determine an improvement plan. The Blue River South study area is identified as a priority area because it contributes substantial flow to the Blue River Interceptor. The Birmingham study area is identified as a priority area because of wet weather flow issues.

The fifth project area represents the balance of the SSS system and much of this area is less developed at the present time. The SSS in this area has not historically been evaluated to the same extent as the system has been in the priority project areas, but may see increased development pressure in the future. The objective of the evaluation in this project study area is to provide a baseline for future work.

3.2 SSS Control Plan 2004 Progress

The SSS Control Plan (CP) will identify the requirements for rehabilitation and improvement of the SSS to prevent wet weather SSOs and basement backups. CP development will be based on credible data and sound science, comprehensive evaluations for a full range of control alternatives, and extensive public education and stakeholder involvement.

Development of the control plan involves system characterization, alternatives development, evaluation, selection, implementation, and project management. This section summarizes the 2004 progress on preparation of the SSS Control Plan.

3.2.1 Public Participation

There will be interaction between the SSS and the CSS control plans. Since the public does not differentiate between the two plans, public involvement will be performed as a single effort. The public participation program described in Section 2.2.2 includes the efforts related to the SSS.

3.2.2 Program and Agency Coordination

Due to the interrelationship between the SSS and the CSS control plans, program and agency coordination efforts by the OCP deal with both of these systems. The program and agency coordination described in Section 2.2.3 includes the efforts related to the SSS.

3.2.3 Protocols, Manual and Plans

The Metering, Modeling, and Data Management Protocols along with the Field Data Collection, Administration and QA/QC Manuals, previously discussed in Section 2.2.4, are also applicable to the SSS project areas

3.2.4 Design Professional Services Contracts

Following the submittal of the SSS Work Plan in May 2004, detailed Scopes of Service were prepared for professional engineering contracts. In July, a Request for Interest was issued for design professional services for the five SSS project areas shown in Figure 3-1. On August 6, 2004, a Request for Qualifications (RFQ) was issued to firms determined to be qualified to prepare control plans for each of the five SSS basins.

A mandatory RFQ pre-submittal meeting was held on August 11, 2004 at which firms could ask questions and receive clarifications about the projects. Statements of qualifications were received on September 10, 2004 from thirteen firms. After review and evaluation, qualified firms were interviewed on October 15, 2004 and five firms were selected to prepare the five plans. It is expected that the engineering firms will be under contract by the first quarter of 2005.

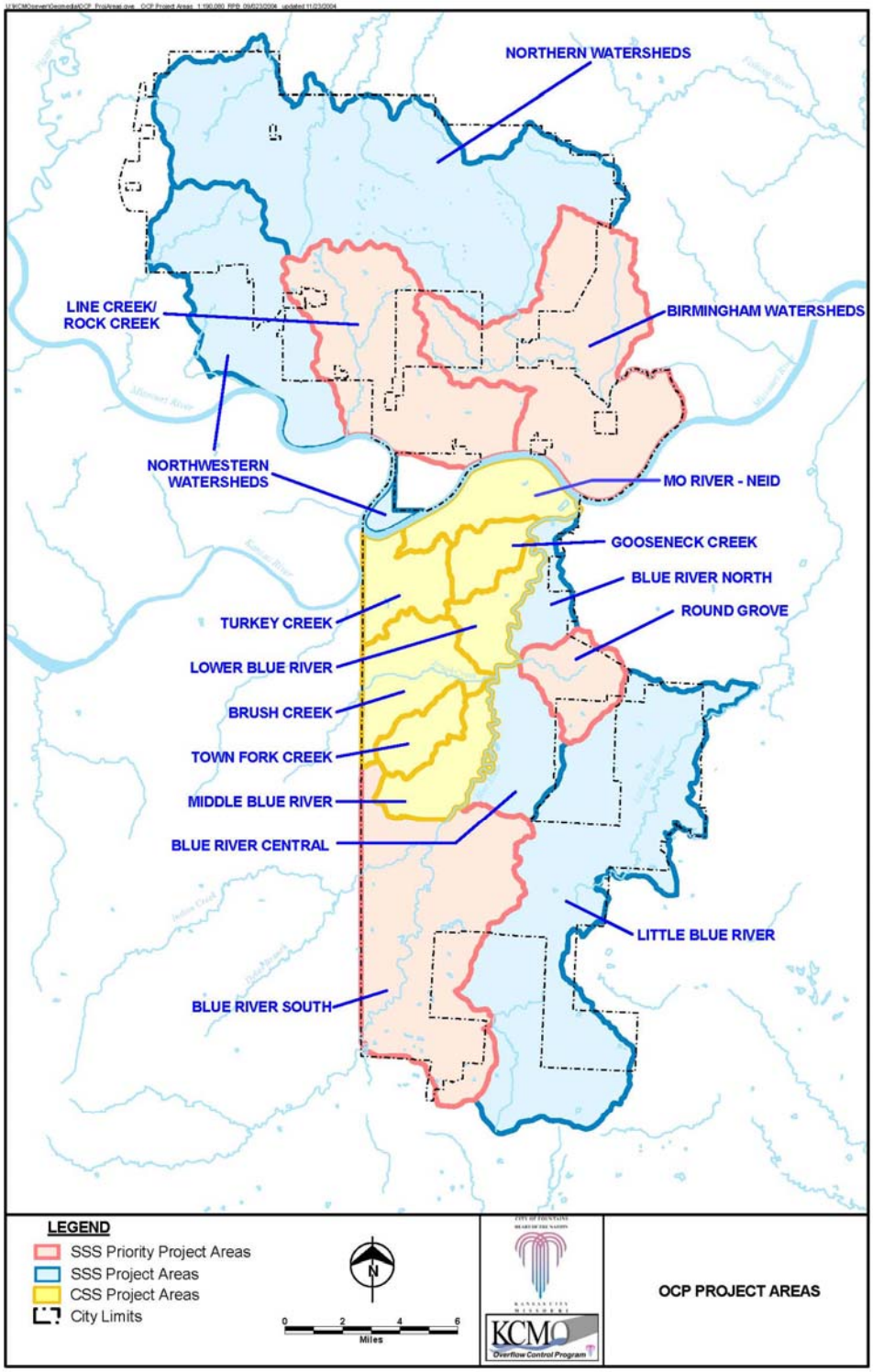
The five SSS study areas and selected firms are:

- Line Creek/Rock Creek (priority project area) – HNTB;
- Birmingham (priority project area) – Bucher Willis & Ratliff;
- Round Grove (priority project area) – Wade & Associates;
- Blue River South (priority project area) – HDR Engineering; and
- One project area comprising the remainder of the sanitary sewer area (Northern Watersheds, Northwestern Watersheds, Blue River North, Blue River Central and Little Blue River) – George Butler Associates.

3.2.5 Professional/Specialized/Technical (PST) Services Contracts

PST contracts for temporary flow metering, sampling, radar rainfall processing, and laboratory analysis were negotiated for both the SSS CP and the CSO LTCP. The PST contract selection process was previously discussed in Section 2.2.6. Only temporary flow metering and radar rainfall processing will be used in support of the SSS CP. Up to 53 temporary flow metering sites will be located in the SSS area

Figure 3-1
SSS Project Areas



4 SSS OPERATION AND MAINTENANCE

Operation and maintenance is critical to proper functioning of the sanitary sewer system. This chapter provides information on what WSD has done in 2004 to reduce overflows from the SSS. A similar discussion related to CSS operation and maintenance is provided in Section 5, which addresses the Nine Minimum Controls.

Key topics included in this section are:

- Operation and Maintenance Activities;
- SSS Overflows Summary; and
- Remote Line Inspection Program.

4.1 Operation and Maintenance Activities

WSD's Wastewater Line Maintenance Division has primary responsibility for operating and maintaining the collection system. The Wastewater Treatment Division is responsible for operation and maintenance of the eight treatment plants as well as 38 pump stations located throughout the City. Treatment plants currently operated by WSD are the Todd Creek, Rocky Branch, Northland Mobile Home Park, Fishing River, Birmingham, Blue River (primary and secondary), and Westside.

SSS operation and maintenance is performed by the Line Maintenance crews. Sewer investigations are independent of the inspection work by the Engineering Division or the Industrial Waste Division (see Section 5.1.1). Inspections are generally conducted during dry weather to identify overflows and remove blockages or accumulated debris if found, reveal excessive infiltration/inflow, record structural deterioration and determine repair needs. The scheduled inspections are by direct manhole observation and television inspections.

Line Maintenance crews perform routine maintenance on the system. There are thirteen crews, ten of which are assigned to the SSS area. Routine maintenance includes televising/inspecting, cleaning, and repairing sewer line and/or manholes.

In 2004, the Line Maintenance Division cleaned 1,806,037 feet and televised 89,632 feet of sewer line. Sewer cleaning crews clean sewer line segments, manholes, and diversion structures. In addition, the City currently has a City-Wide Sewer System Cleaning contract (on an as-needed basis) to remove and prevent accumulations of debris and sediment that restrict flow.

4.2 Remote Line Inspection Program

On April 1, 2004 an overflow was discovered from the collection system in a remote area. In response to this event, a program has been developed to be more proactive in the identification of collection system overflows in remote portions of the WSD service area. Sewers included in the program are 30-inch

diameter or larger and are located in remote (typically zoned agricultural or park) areas. Approximately 100 miles of sewer pipe are included in the program.

The Kansas City, Missouri Police Department has helicopters equipped with infrared (IR) imaging equipment and has indicated support for the Remote Line Inspection Program. An aerial inspection program would use IR imaging technology to identify warm spots during cold weather which will then be investigated to determine the cause for the identified anomaly. If a sewer system release is found, it would be immediately investigated to determine the cause and a repair effort initiated.

The proposed program was submitted to MDNR on October 26, 2004. During the fall and early winter, coordination continued between WSD and the Police Department. Implementation of the program is expected in early 2005. A summary report of results will be submitted to MDNR. The report will describe the investigations and surveys, the results obtained, and program modifications to be implemented before the next line inspection aerial survey.

5 NINE MINIMUM CONTROLS

The Nine Minimum Controls (NMC) are identified in U.S. EPA's CSO Control Policy "… as the minimum technology-based controls that can be used to address CSO problems without extensive engineering studies or significant construction costs, prior to the implementation of long-term control measures." In 1996, Kansas City submitted the required NMC report to MDNR, which accepted that document. Kansas City has submitted similar reports encompassing every year subsequent to 1996. This section of the Annual Report represents NMC progress in 2004 by WSD and includes the following:

- NMC 1 – Proper Operation and Regular Maintenance Programs;
- NMC 2 – Maximization of Storage in the Collection System;
- NMC 3 – Review and Modification of Pretreatment Requirements;
- NMC 4 – Maximization of Flow to the POTW for Treatment;
- NMC 5 – Elimination of CSOs During Dry Weather;
- NMC 6 – Control of Solids and Floatable Material in CSOs;
- NMC 7 – Pollution Prevention Programs to Reduce Contaminants in CSOs;
- NMC 8 – Public Notification to Ensure the Public Receives Adequate Notification of CSO Occurrences and CSO Impacts
- NMC 9 – Monitoring to Effectively Characterize CSO Impacts and the Efficacy of CSO Controls

5.1 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." – EPA, **CSO Guidance for Nine Minimum Controls**

5.1.1 Operation & Maintenance Activities Overview

The Wastewater Line Maintenance Division and the Wastewater Treatment Division of the Water Services Department (WSD) are primarily responsible for this control measure. The Wastewater Treatment Division is responsible for the operations and maintenance of the two wastewater treatment plants located within the CSS area (the Blue River Treatment Plant and the Westside Treatment Plant).

The operations and maintenance (O&M) of the CSS involves the use of the Sewer Investigation Section, the sewer cleaning crews, and the Sewer Repair Section. Although sewer cleaning crews are the primary inspectors of the CSS infrastructure, the Sewer Investigation Section and the Sewer Repair Section are used when appropriate. Three sewer cleaning crews are dedicated to diversion structure cleaning, inspection and maintenance. The work they conduct is independent of the inspection work done by the Industrial Waste Division under Minimum Control Number 3 or the Engineering Division under Control Number 2.

In 2004, WSD continued to adhere to the guidelines set forth in its CSO Sewer Maintenance Manual. The CSO Sewer Maintenance Manual was under review in 2004 and is scheduled for revision in early 2005. The manual provides guidelines to personnel for the proper operation and maintenance of the CSS. Guidelines include: routine maintenance procedures, schedules for routine inspections, emergency response protocol, dry weather overflow reporting procedures as well as training and safety practices.

5.1.2 Wet Weather Operations Plans

In 2004, the Wastewater Treatment Division formalized wet weather operations plans for the Westside Wastewater Treatment Plant (WWTP) and the Blue River WWTP. Blue River WWTP is the largest treatment plant and serves the majority of the City. The goals of the plan are to reduce sewer overflows in specific areas within the City critical to the performance of the CSS through operation practices, minimize releases at the constructed diversion structures and the treatment facility, and maximize treatment in the facility. Copies of the plans are in Appendix B.

5.1.3 Routine Maintenance

Sewer cleaning and repair crews perform routine maintenance of the system. Throughout 2004, wastewater cleaning crews cleaned sewer line segments, and diversion structures. In addition, WSD contracted to provide routine cleaning services discussed later in the chapter. In 2004, the Line Maintenance Division performed 2,138 investigations and 2,029 inspections of the collection system.

The Stormwater Line Maintenance Division performed routine maintenance as well. In 2004, 16,602 storm inlets were cleaned and inspected, and 248 storm inlets were repaired or replaced. Additionally, five contracts were executed to replace about 2,000 catch basins at a cost of approximately $7.5 million.

5.1.4 Non-Routine Maintenance and Emergency Procedures

Line Maintenance crews respond to overflows reported to WSD. The WSD website (www.kcmo.org) provides an after-hours emergency number for citizens or businesses to call upon discovery of any such occurrence.

5.1.5 Training

Training for personnel involved in the operation and maintenance of the CSO system is provided by experienced Crew Leaders, Supervisors, and the Maintenance Superintendent of Wastewater Maintenance. Formal training includes TV inspection, equipment operation, proper coding of problems, and heavy duty equipment operation. All personnel involved in the operation and maintenance of the CSO system are trained in Safe Work Procedures, Confined Space Entry, and Traffic Control. Training is conducted in the classroom as well as on-the-job.

5.1.6 Summary of Inspections and Maintenance

In 2004, the Wastewater Line Maintenance and Wastewater Treatment Divisions performed inspections and maintenance activities on the collection systems, treatment plants, and diversion structures.

The Wastewater Line Maintenance Division inspects the CSO diversion structures. The diversion structures are designed to divert sanitary flows during dry weather to the treatment plants. High flows during wet weather are designed to overflow to Brush Creek, Blue River, Kansas River, and Missouri River or their tributaries. The inspection interval varies for each structure based on historical records of performance and sensitivity of nearby surface waters to CSO. Inspections are conducted to identify overflows, accumulated debris, and ability for correct operation of the structure during the next storm, and repair needs. The inspections are conducted mainly during dry weather for blockages, excessive deposits of solids, excessive infiltration/inflow, and structural deterioration that need to be corrected. In 2004, the City created a CSO Diversion Structure Inventory that allows the CSO inspection crews to readily view detailed information on each CSO diversion structure, such as CSO inspection log forms, CSO inventory sheets, schematics, profiles, and sectional views of the structure.

5.1.7 Sewer Cleaning

Sewers have been cleaned resulting in the increase of available conveyance and storage capacities with no additional construction or modifications of existing facilities. In 2004, the Wastewater Line Maintenance Division cleaned 1,806,037 feet of sewer. WSD currently has a City-Wide Sewer System Cleaning Contract to use as needed to remove and prevent accumulations of debris and sediment that restrict flow in large diameter lines.

5.1.8 Television Inspections

Closed-circuit television (CCTV) inspection is part of the Line Maintenance Division's work. In 2004, the Division televised 89,632 feet of sewer. CCTV data (observed line defects) is transferred to the Hansen maintenance management system databases where repair priorities are established.

5.2 NMC 2 – Maximization of Storage in the Collection System

"The second minimum control consists of making relatively simple modifications to the CSS 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." – EPA, **CSO Guidance for Nine Minimum Controls**

5.2.1 Alternative Methods to Maximize Collection System Storage

Alternative technologies for optimization of the CSS are discussed in this section.

5.2.1.1 Source Control Technologies

Source controls improve the quantity or quality of runoff that enters the collection system. These measures are usually labor-intensive and may lead to higher operation and maintenance costs but do not involve large capital improvement projects. In 2004, the City performed activities such as street sweeping, construction site control, catch basin cleaning, and industrial pre-treatment to remove obstructions of flow, thus maximizing the existing collection system storage. These activities will be discussed further in Section 5.6 under the sixth minimum control.

In 2004, WSD continued to identify areas in the collection system that required smoke testing to identify sewer defects and sources of storm water entering the system. The following is a list of smoke testing projects conducted by WSD in 2004:

- **Westover Road:** Smoke testing of 6,000 feet of sanitary sewer serving the south side of the 400 – 600 blocks of west Westover and north side of 57th Street.
- **Brookside Smoke Testing:** Smoke testing of approximately 262,000 feet is planned for the sanitary sewer in the Brookside area in early 2005 as a follow-up to the smoke testing conducted in the Westover Neighborhood.

Upon completion of the testing, residents have/will be informed of the results and are encouraged by WSD to disconnect sources contributing stormwater to the system.

5.2.1.2 Sewer System Optimization

WSD is optimizing the collection system through activities such as diversion structure consolidation. In 2004, Twenty-Eight CSOs were either permanently removed, modified so that they no longer function as an overflow, or they have been removed as a CSO because they never existed. Documentation of the CSO removal was provided to MDNR in a letter dated May 12, 2004.

5.2.1.3 Inflow Reduction

Infiltration/Inflow (I/I) studies and resulting rehabilitation in tributary upstream separate sewer basins can increase available conveyance and storage capacity. WSD has completed 19 comprehensive I/I studies in 18 drainage basins. Rehabilitation work performed by WSD in 2004 to reduce I/I includes:

- **Craig Road Sewer Rehabilitation** - Approximately 5,619 feet of 8, 10, and 15-inch sewer line were rehabilitated and upsized using the pipe bursting method to recover pipe capacity**.**
- **Fairlane Subdivision Relief Sewer** - Replacement of 1,578 feet of 21-inch HDPE pipe by pipe bursting/reaming methods, installation of 405 feet of 18-inch HDPE pipe by pipe bursting/reaming methods, installation of 695 feet of 15-inch HDPE pipe by pipe bursting methods, installation of nine 5-foot diameter manholes, and installation of one special box structure.

5.2.2 Procedures in Place for Maximizing Collection System Storage

In 2004, the Systems Engineering Division focused its efforts on rehabilitation, modification, and cleaning of critical sewers in the CSS. Sewer rehabilitation and sewer cleaning were performed throughout the year to address critical areas found through smoke testing and inspections.

5.2.2.1 Sewer Rehabilitation

During inspection, a sewer line is cleaned of debris and then televised. If repairs are required, the sewer is lined with a cured in-place pipe, slipliner, gunite or shotcrete, or is replaced with new pipe as necessary. Capacity is increased as clogged lines are cleared of debris prior to inspection.

Below is a list of the sewer rehabilitation projects in the planning, design, or construction stages in 2004. See Chapter 6 for a detailed description of each project.

- Category I – Projects in the planning phase in the 2004 calendar year:
  - **Brookside Sanitary Sewer Improvements Phase 5 (Brookside Interceptor):** The upsizing of approximately 10,500 feet of sanitary sewer along Brookside from 51st Terrace to Meyer Blvd was in the preliminary design phase at the end of 2004.
  - **Romanelli West Sewer Improvements:** Determination of I/I sources to the collection system and cost effectiveness of removing those sources.

- Category II – Projects in the design phase in the 2004 calendar year:
  - **Brookside Sanitary Sewer Improvements – Phase 3:** The upsizing of approximately 2,900 feet of sanitary sewer as well as the upsizing of approximately 21,500 feet of storm drain. The project also includes the cleaning and replacement of catch basins.
  - **Brookside Sanitary Sewer Improvements – Phase 4 (Crestwood):** The rehabilitation of approximately 5,500 feet of sanitary sewer and the upsizing of approximately 4,500 feet of storm drains.
  - **Dora Avenue Sewer Rehabilitation – Phase 3:** Design of the rehabilitation of 8,072 feet of combined sewer was completed and a construction contract was approved.
  - **Meadow Lake Sewer Rehabilitation:** This consists of sewer improvement and replacement in the Meadow Lake subdivision. This will relieve sewer backups and restore sewer capacities.
  - **Ruskin Heights Sewer Rehabilitation** - Rehabilitation of 50,000 feet of 8- to 15-inch sewers and over 100 manholes to reduce inflow/infiltration sources and eliminate basement backups. Design was completed in 2004.

- Category III – Projects in the construction phase in the 2004 calendar year.
  - **Brookside Sanitary Sewer Improvements – Phase 2 (Huntington Rd. Relief):** Construction of approximately 2,600 feet of relief storm drain as well as 2,600 feet of relief sanitary sewer.
  - **Lea Manor Subdivision Sewer Rehabilitation:** Replacement/upsizing of approximately 3,000 feet of 8- to 12-inch sewer. This will help relieve sewer backups in the Lea Manor Subdivision.
  - **Freight House District Sewer Rehabilitation:** The rehabilitation of approximately 21,000 feet of 12- to 66-inch sewer in the Freight-House District area of Kansas City. This is being done due to age of the sewer as well as for future expansion and development in the area.
  - **Midtown Sewer Rehabilitation – Phase III**: This is a continuation of the first two projects and will consist of the same scope. Construction was completed in August 2004.

5.3 NMC 3 – Review and Modification of Pretreatment Requirements

"Under the third minimum control, the municipality should determine whether nondomestic 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 nondomestic source is causing a specific health, water quality, or environmental problem." – EPA, **CSO Guidance for Nine Minimum Controls**

In 2004, the Industrial Waste Control Division continued to regulate nondomestic discharges to the Kansas City, Missouri sewer system, including the CSS areas. The Division is responsible for implementing and enforcing the Federal Pretreatment program and Chapter 60 Article IV of the Kansas City Code of Ordinances. The Division's activities include the Pretreatment Program, a Surcharge Program for high strength (BOD, TSS, FOG) wastewaters, and an Oil & Grease Management Program.

5.3.1 Federal Pretreatment Program

The Industrial Waste Control Division's administration of the Federal Pretreatment Program is subject to regular review by both MDNR and EPA Region VII. The annual report of KCMO's Pretreatment Program activities is filed with MDNR each March. For each Significant Industrial User (SIU), the Industrial Waste Division has identified the regulated discharge flow volume, potential pollutants of concern, drainage basins, and the pump station(s) which serves the SIU. Over half of the SIUs permitted under the program are located in the CSS area. Each of these businesses is inspected annually and is monitored periodically for conformance with its wastewater discharge permit conditions. Increasingly, stormwater management issues are also dealt with during SIU inspections.

5.3.2 Surcharge Program

The Surcharge Program involves sampling nondomestic wastewaters and applying a surcharge for BOD, TSS or FOG concentrations above that in "normal domestic sewage" as defined in Chapter 60 of the City's Code of Ordinances. In general, the customers affected by this program are food handling operations such as restaurants. At times, the surcharge program has been instrumental in making customers aware of the effects of their discharges on the sewer system and causing them to change their operations or housekeeping procedures.

5.3.3 Oil & Grease Management Program

The Oil & Grease Management Program's objective is to encourage nondomestic sources to limit discharge of oil and grease to the sewer system. The primary nondomestic sources of oil and grease discharges to the sewer system are restaurants, many of which are in the CSS area. Because of the potential for grease stoppages to cause problems in the CSS area, the Oil & Grease Management Program is an essential part of Kansas City's implementation of NMC 3. The Oil & Grease Management Program encompasses outreach, inspections and enforcement.

One segment of the Health Department's Food Safety Manager's Training Class is devoted to best management practices for fats, oils and grease. When a facility is inspected by Industrial Waste Control, a handout about these best management practices is provided in a format for easy posting. Facility personnel are informed about Ordinance requirements regarding oil and grease discharges and about the potential for enforcement if these requirements are not met.

In 2004, a total of 967 food service facilities were inspected, 564 of them in the CSS area. There were a total of 56 enforcement actions undertaken. The success of this program is evidenced by the fact that in 2004 there were no combined sewer overflows caused by grease from nondomestic sources.

5.3.4 Review of Pretreatment Requirements

Every year the Industrial Waste Control Division reviews the pretreatment program to determine whether changes are warranted. Considerations such as economic and environmental impacts are taken into account when evaluating potential changes. These include an assessment of the nondomestic discharges to the CSS, and the impact of nondomestic discharges on CSOs.

5.4 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." – EPA, **CSO Guidance for Nine Minimum Controls**

5.4.1 Control Measures

The Blue River and Westside WWTPs serve Kansas City's CSS. Wet Weather Operating Guidelines were formalized for both of these facilities to provide general operating procedures before, during and after a wet weather event. The objective of these guidelines is to maximize the amount of flow treated at these facilities during wet weather events thereby reducing the magnitude and duration of CSOs.

The plants work to achieve maximum treatment of first flush CSS water during wet weather events without lowering the quality of the plant effluents. During a wet weather event, numerous operational decisions must be made. Following are some of the decisions necessary to effectively manage storage of combined stormwater and wastewater in the collection system and optimize treatment in the WWTP.

5.4.1.1 Blue River WWTP

- Storage is controlled through adjustment of the diversion structure gates and the NEID Pump Station. Adjustment of the gates determines the flow rate into the WWTP and controls the volume of storage in the collection system, until excess combined wet weather flow is diverted to the Blue River.

Diversion Structure - Blue River WWTP

- Flow rates are determined by the capacity of the WWTP and the flow entering the NEID Pump Station. By adjusting the flow entering the diversion structure, internal WWTP overflows are avoided.
- Balancing the flow between the diversion structure gates, the NEID Pump Station and WWTP bypass helps prevent sewer overflows in populated areas.

5.4.1.2 Westside WWTP

- Storage is controlled through adjustment of the gates at Turkey Creek Pump Station and Santa Fe Pump Station.
- Flow rates are determined by the capacity of the WWTP and the flow entering the Pump Stations.
- Monitoring and controlling the flows from the pump stations balances the flow to the WWTP.

5.4.2 Description of Planned Physical Changes to Treatment Facilities

The Blue River and Westside WWTP Facility Plans, and the Wastewater Master Plan – Kansas City South of the Missouri River, contain recommendations for two projects that will have a positive effect on reducing overflows during wet weather. The following projects addressing these recommendations were in progress in 2004:

- Blue River WWTP - Primary Junction Box and Diversion Chamber Modifications: This project was completed in 2004. It includes plant modifications to the sluice gates, actuators and controls at the Primary Junction Box and Diversion Chamber will upgrade operation of these critical structures which are used to balance storage in the collection system and flows to the plant.
- Westside WWTP - Turkey Creek Pump Station Modifications: The feasibility study for this project was completed in 2004 and the final design contract has been negotiated. The project will improve the grit and debris removal allowing proper operation of the pumps. Increasing pump capacity at Turkey Creek Pump Station will reduce combined sewer overflows in the Kemper Arena site.

5.4.3 Sanitary Sewer Modeling Studies

Modeling of the major interceptors and pumping stations that deliver flow to the treatment plants is part of the LTCWP. In 2004, work started on obtaining mapping and condition data for manholes and diversion structures along the Blue River Interceptor Sewer. This will provide data for hydraulic modeling of one of the interceptors that deliver flow to the Blue River WWTP. Existing and future conditions will be simulated for specific rain events and over a typical year. Monitoring data and model input data helps define current flow/overflow conditions and provide capacity information for evaluation.

5.5 NMC 5 – Elimination of CSOs During Dry Weather

"The fifth minimum control includes any measures taken to ensure that the CSS does not overflow during dry weather . . . DWO control measures include improved O&M, as well as physical changes to regulator and overflow devices." – EPA, **CSO Guidance for Nine Minimum Controls**

5.5.1 Control Measures

WSD is committed to the goal of minimizing dry weather overflows (DWOs) from the CSS. Control measures that have been implemented during 2004 include:

- Inspection of the system to identify DWOs;
- Correction of the DWOs;

5.5.2 Implementation and Documentation

5.5.2.1 Inspection to Identify DWOs

All diversion structures are inspected on a regular basis to verify that they are functioning properly. This includes diversion structure regulators and overflow devices, which direct dry weather flows to the WWTP or divert excess wet weather flows to an overflow line. These include overflow weirs or dams, control plates, interceptor grates and drop structures.

5.5.2.2 Correction of the DWOs

Three primary causes of DWOs from the CSS in 2004 were broken sewer mains, grease blockage and debris in manholes. Other causes included debris in the sanitary sewer line, root stoppages and a force main break. Immediate corrective action is taken upon discovery of a DWO. Lines are cleaned to remove blockages and repairs are made to broken sewers and force mains. After verification that normal flow has been restored, the area is cleaned.

5.6 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 . . ." - EPA, **CSO Guidance for Nine Minimum Controls**

5.6.1 Methods and Considerations for Removing Solids and Floatables from Combined Sewage

Diversion structures in the CSS use several methods to direct dry weather flows to the WWTP or divert wet weather flows to an overflow line. The diversion structures also trap solids and floatables. In 2004 diversion structures were inspected and cleaned on a routine basis to provide for proper operation.

5.6.2 Methods and Considerations to Prevent Extraneous Solids and Floatables from Entering the CSS

Some of the ongoing methods to prevent solids and floatables from entering the CSS include the following.

- Catch Basin Cleaning and Repairs – WSD is responsible for the proper functioning of catch basins citywide. The Stormwater Maintenance Division performs catch basin cleaning and minor repairs. Section 5.1.3 describes work activity in 2004.

- Street Sweeping – Street sweeping is conducted by the Public Works Department. Downtown streets are swept twice per week May through November and once per week December through April. Residential streets are swept four times per year and arterial streets are swept eight times per year.

Table 5-1
2004 Street Sweeping Program Results

Location	Debris Collected (cubic yards)	Distance Swept (miles)
Residential	29,013	14,207
Downtown	595	2,409
Arterial	2,285	2,355
Total	31,893	18,971

- Construction Site Erosion Control - Soil erosion control can reduce the amount of turbidity, nutrients, metals and sediment in the receiving water. Sedimentation problems can potentially reduce hydraulic capacity. Implementation and enforcement of erosion control regulations can be most effective by limiting erosion at construction sites.

  The City enforces erosion control measures at public, commercial and residential construction sites throughout the City. Public and commercial sites are regulated by Public Works through enforcement of "Erosion and Sediment Control Specifications" approved by MDNR on November 23, 1992. Residential sites are regulated under the City's Codes Administration Department.

  Work has continued through 2004 to adopt APWA Section 5100 Design Criteria – Erosion and Sediment Control and revisions to Section 2100 Clearing and Site Preparation. These specifications provide updated design principles, best management practices and strategies to prevent or minimize erosion on a construction site.

5.7 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." – EPA, **CSO Guidance for Nine Minimum Controls**

The pollution prevention measures covered in this minimum control were implemented by WSD 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 include the Household Hazardous Waste Program, Storm Drain Stenciling Program, Keep Kansas City Beautiful Campaign and Food Code Training Classes. Street sweeping is another program WSD uses in their pollution prevention efforts and is covered in Section 5.6, "Control of Solids and Floatable Material in CSOs."

5.7.1 Household Hazardous Waste Program

The Household Hazardous Waste (HHW) Management Program accepts, manages and recycles or safely disposes of excess or unwanted household chemicals from residents in 32 Jackson County cities, as well as, residents in unincorporated areas of Jackson and Clay Counties. In addition, the program accepts hazardous materials from city-operated facilities. Though the program was anticipated to have a throughput of 425,000 pounds of household hazardous waste, it is presently close to 1,400,000 pounds annually. As a part of this program, WSD manages the Regional Household Hazardous Waste Facility and the Swap Shop and, along with the Mid-America Regional Council (MARC), holds Mobile Household Hazardous Waste Collection Events.

5.7.1.1 Regional Household Hazardous Waste Facility

The Regional Household Hazardous Waste Facility accepts the following items:

- Paint and paint products (all types);
- Household cleaners;
- Aerosols;
- Pesticides;
- Lawn and garden products;
- Automotive fluids;
- Used oil;
- Fuels;
- Car batteries;
- Household batteries; and
- General household chemicals.

Residents of the participating communities may use the facility without charge. The facility does not accept the following:

- Commercial or business waste;
- Radioactive waste;
- Medical waste;
- Propane or butane cylinders; and
- Any materials from businesses, including charities, churches and not-for-profit organizations.

5.7.1.2 Swap Shop

The Swap Shop offers reusable products from those that have been brought to the HHW Facility or mobile collection events. It was open Tuesdays through Saturdays from 9 a.m. to 4 p.m. in 2004 to anyone including residents, not-for-profit organizations, contractors, etc. The following typical items are available on a first-come, first-served basis:

- Household paint;
- Automotive paint;
- Oil;
- Antifreeze;
- Spray paint;
- Fertilizers; and
- Miscellaneous craft items, etc.

All items were free except for paint, which was sold in 5-gallon buckets for $10.

5.7.1.3 Mobile Collection Events

Mobile Collection Events are funded by the City of Kansas City, Missouri, and the Mid-America Regional Council Solid Waste Management District and are staffed by a crew of trained city personnel. The events usually take place at a school, church or other public parking lot. Table 5-2 shows the events hosted in 2004 and the items accepted at each event.

Table 5-2
2004 Mobile Household Hazardous Waste Collection Events

Date	Host Community	Type of Waste Collected
April 3	Independence	HHW
April 17	Blue Springs	ABOP
May 1	Garden City	ABOP
May 15	Platte City	HHW
May 15	Smithville	ABOP
June 12	Richmond	HHW
June 26	Lake Lotawana	ABOP
August 7	Raymore	HHW
August 7	Pleasant Hill	ABOP
August 21	Belton	HHW
September 18	Oak Grove	HHW
October 2	Riverside	HHW
October 30	Liberty	HHW
October 30	Sugar Creek	HHW

[1] HHW (Household Hazardous Waste) – These events accepted automotive fluids, batteries, fuels, household cleaners, lawn & garden products, pesticides, paints and related products.
[2] ABOP (Antifreeze, Batteries, Oil & Paint) – These events accepted only antifreeze, batteries, oil & paint (no aerosols).

5.7.2 Keep Kansas City Beautiful Campaign

Keep Kansas City Beautiful (KKCB) involves citizens, neighborhoods, businesses, organizations and schools in litter prevention, community beautification and waste reduction and recycling through various programs highlighting these specific issues. Some of the programs under the umbrella of the Keep Kansas City Beautiful Campaign include the Storm Drain Stenciling Program (see Section 5.7.2.1), Earth Day at the Zoo (see Section 5.7.2.2), the Great American Cleanup and encouraging visitors to eliminate litter on the City's festival grounds. KKCB's current focus areas include litter abatement, public awareness and education.

5.7.2.1 Storm Drain Stenciling Program

WSD and the Office of Environmental Management sponsor the Storm Drain Stenciling Program to protect area streams and rivers. They encourage community groups and schools to make the stenciling part of community services projects and lessons on the environment. Volunteer groups are provided with stenciling kits to mark catch basin inlets in their neighborhoods. The stencil includes the message "Dump No Waste – Drains to Stream" and a fish logo. The work of the volunteers informs local residents to not dispose household chemicals and other wastes into storm drains which discharge directly into streams, rivers and lakes.

5.7.2.2 Earth Day at the Zoo

WSD took part in Earth Day at the Zoo on April 24th. The celebration included an "Earth Day Walk" to raise money for local environmental education, information tables set up by area organizations, live entertainment and hands-on activities for children and adults. One of the activities was a trash fishing game, which was sponsored by many City Departments, including WSD.

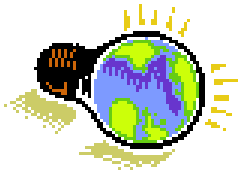
5.7.3 Food Code Training Classes

Since the fall of 2001, WSD's Industrial Waste Division and the Food Protection Program of the Health Department have offered training classes to restaurant personnel in the area of code compliance. The Food Safety Manager's class is designed to provide information necessary for restaurant personnel to operate their food establishments in compliance with the KCMO Food Code and KCMO Sewer Use Ordinance. Each class includes a section on "Best Management Practices for Fats, Oils & Grease and is taught by the Oil and Grease Management Program Coordinator from WSD. The purpose of the section is to teach participants the proper disposal of fats, oils & grease and the negative impacts when they are not disposed of properly, thereby aiding the department's pollution prevention efforts. Classes were offered every 2 months in 2004 and reached approximately 500 participants.

5.7.4 Week of Water

The annual Week of Water Festival took place on October 8th and 9th at English Landing Park in Parkville, MO. More than 30 exhibitors from around the metropolitan area (including WSD) attended the festival. WSD conducted hands-on, interactive activities that focused on watershed information, non-point source pollution prevention and stormwater quality.

5.7.5 Kansas City Environmental Education Network



The Kansas City Environmental Education Network is a program of the Mid-America Regional Council which focuses its efforts on environmental education in the Kansas City area. They plan environmentally-themed events, publish a newsletter and provide resources to area schools and youth organizations to include environmental topics in lesson plans and activities. WSD was involved in planning events in 2004 and produced a CD that was handed out to participants at the Environmental Education Forum held on November 18, 2004.

5.8 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." – EPA, **CSO Guidance for Nine Minimum Controls**

5.8.1 CSO Notification

Signs have been installed near water bodies receiving combined sewer overflows (such as these along Brush Creek) warning bystanders to avoid contact with the water during rain events. The telephone number on the sign directs the caller to the WSD Dispatcher on call 24 hours per day, 7 days per week. Citizens can report CSO problems to the dispatcher, who then forwards the messages to the appropriate WSD staff. Both the signs and the steel posts are inspected monthly by the Wastewater Line Maintenance Division.

5.8.2 Public Education Program

WSD had a multi-faceted public education program in 2004 that included meetings with neighborhoods, cable television, pamphlets, brochures, and internet websites.

5.8.2.1 Public Involvement

Periodic meetings were held to inform the public about improvement projects within the CSS and to solicit their views and concerns regarding the services provided by WSD. Evaluation forms enabled meeting participants to voice comments, critiques and suggestions. Comments in the evaluations allowed WSD presenters to assess how residents' needs are being met in the meetings and gave direction for topics to include in future public meetings. Meetings held in 2004 are shown in Table 5-3.

Table 5-3
KCMO Water Services Department Public Meetings in 2004

Date	Meeting Focus/Title	Meeting Topics
1/22/04	Wet Weather Community Panel Meeting No. 6	Discussed the Wet Weather Program financial considerations.
3/10/04	Rocky Branch and First Creek Watersheds	Discussed managing stormwater in the Rocky Branch and First Creek Watersheds
4/15/04	Wet Weather Community Panel Meeting No. 7	Presented an overview of the CSO Long-term Control Plan and SSS Control Plan
5/20/04	Blue River Summit	Discussed watershed planning, stormwater management standards, brownfields redevelopment, etc.
6/24/04	Mill Creek Watershed	Discussed managing stormwater in the Mill Creek Watershed.
6/29/04	Crestwood Neighborhood	Public information meeting presenting phasing plans and anticipated schedules for recommended improvements.
6/17/04	Brush Creek Watershed	Public meeting to collect resident's input on managing stormwater in the Brush Creek watershed.
9/3/04	Brookside Merchants Association	Public information meeting to present an update on the improvement project.
9/16/04	Westover Neighborhood Flooding Problems	Public information meeting to explain scope and schedule for the Brookside Watershed Sewer Improvement Project, discussed inflow and infiltration impacts on sanitary sewers, agreed to smoke testing in the neighborhood.
11/04/04	Wornall Homestead Homes Association	Public information meeting to present an update on the improvement project.
11/16/14	Westover to 57th Street between Wornall and Ward Parkway	Public information meeting to discuss results of smoke testing and provided information about disconnecting private I&I sources such as downspouts.
11/17/04	58th Terrace to 59th Street between Wornall and Ward Parkway	Public information meeting to discuss results of smoke testing and provided information about disconnecting downspouts.
12/7/04	Huntington Relief Sewer	Construction notification meeting and general discussion of overall Brookside project.

5.8.2.2 Door Hangers and I/I Brochures

A brochure entitled "Sewer Backups & Overflows / What you can do" (see Appendix A) has been produced and is now being distributed at public meetings and during sewer inspections and cleaning. It details for the homeowner how excess water enters the combined and sanitary sewer systems, what they can do to help reduce the amount of water entering the system and what the City is doing to improve the situation. At the end of 2004, the door hangers were still being produced, but should be ready for distribution in the near future. Two other brochures were distributed in 2004. One was "Pick Up After Your Pet", which explained the importance of cleaning up after pets to prevent the spread of disease and

to protect waterways. The other was "Storm Drain Stewardship" (see Appendix A), which explained what storm drains are and the importance of not using them to dispose of unwanted materials.

5.8.2.3 Broadcast Media

In addition, WSD was featured in a "Talk of the Town" broadcast covering the summer flooding in the Brookside neighborhood and related improvement projects. WSD has developed a video and script explaining the wet weather effects on the sewer system for distribution in 2005.

5.8.2.4 Public Webpages

The WSD Wet Weather Program created a webpage in 2004 to highlight the planning process, problems, and projects in both the Overflow Control Program (OCP) and the KC-ONE Stormwater Management Plan.

WSD continues to update the webpage for Brookside Watershed Improvement Program as well. Its purpose is to provide Brookside residents with current information about the upcoming storm drainage and sanitary sewer improvements to the area and includes information on how they can reduce area flooding and sanitary sewer back-ups.

5.8.2.5 Industrial Waste Newsletter

The "Industrial Waste Newsletter" (see Appendix A) provides informative, non-technical news articles about a wide variety of topics to industrial permittees in Kansas City, MO, and Kansas City, KS. Published in March, June, September and December, the newsletter was distributed to approximately 100 readers via e-mail in 2004. Some of the topics covered in 2004 included:

- Disposing of hazardous electronics;
- Explanations of regulations and permit requirements affecting area residents and businesses;
- Community water and wastewater issues;
- Effects of drugs in wastewater;
- Pollution prevention and source reduction; and
- Water conservation.

5.9 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" – EPA, **CSO Guidance for Nine Minimum Controls**

5.9.1 CSO Locations

The City has approximately 200 diversion structures, which are connected to approximately 86 CSO outfalls. Currently, the CSO diversion structures and outfalls to each of the primary waters are:

- 10 diversion structures and 9 outfalls to the Missouri River;
- 92 diversion structures and 35 outfalls to the Blue River;
- 97 diversion structures and 40 outfalls to Brush Creek;
- 2 diversion structures and 1 outfall to the Kansas River; and
- 1 diversion structure and 1 outfall to Penn Valley Lake.

5.9.2 Water Quality Monitoring by WSD

WSD's Laboratory Division collects weekly stream samples from eight locations along Brush Creek for fecal coliform and fecal strep. This sampling effort is part of a long-term sampling program that has been conducted by the WSD since 1995. The eight sampling locations are:

- State Line & Shawnee Mission Pkwy;
- East of Roanoke Bridge;
- Ward Parkway & Jefferson;
- East of Brookside Bridge;
- West of Oak Bridge;
- East of Rockhill Bridge;
- East of Last Dam; and
- East of Van Brunt & Elmwood.

This sampling program was reviewed by WSD's Long Term Control Plan (LTCP) consultant during 2004 and revisions proposed to provide optimum value and credibility of the data for supporting the Overflow Control Program (OCP). A sampling plan was developed and a new field instrument was purchased to allow measurement of dissolved oxygen, temperature, pH, and conductivity in the field. Sampling training was also conducted for the laboratory staff. The revised program will be initiated in early 2005 and will replace the eight sampling locations with 10 locations, including four locations on Brush Creek, one on Town Fork Creek, one on the Missouri River, one on Penn Valley Lake, and three on the Blue River.

5.9.3 Water Quality Monitoring by USGS

WSD has established a well-defined water quality monitoring process through an agreement with the USGS within the Brush Creek and Blue River CSO basins since 1998. Further efforts to improve and expand this monitoring effort are currently underway. WSD plans to execute a second cooperative agreement with the USGS to continue their water quality monitoring effort in Brush Creek and the Blue River in Kansas City, Missouri. WSD also plans to expand their water quality monitoring effort with the USGS to include a new sampling program in the Missouri and Kansas Rivers. This expanded effort is planned to begin in 2005.

Throughout 2004, WSD has also continued its agreement with the USGS agency to conduct CSO outfall stream sampling on Brush Creek and the Blue River. There are eight water quality monitoring locations and flow gauging stations as part of this sampling program. They are as follows:

- Blue River @ Blue Ridge;
- Indian Creek @ 103rd Street;
- Blue River near Bannister Road;
- Brush Creek @ Ward Parkway;
- Brush Creek @ Rockhill Road;
- Brush Creek @ Elmwood Avenue;
- Blue River @ Stadium Drive; and
- Unnamed tributary @ Penn Valley Park.

Also, as part of Phase III of this program, samples from 17 sites within the Blue River Basin were collected to provide water-quality data to support development of a CSO control water-quality model. These locations are as follows:

- Brush Creek @ Mission Road;
- Brush Creek @ Ward Parkway;
- Brush Creek @ Rockwell Lane;
- Brush Creek @ Main Street;
- Brush Creek @ Rockhill Road;
- Brush Creek @ Woodland Avenue;
- Brush Creek @ Benton Boulevard;
- Brush Creek @ Elmwood Avenue;
- Unnamed tributary @ Penn Valley Park;
- Blue River near Bannister Road;
- Blue River @ Prospect Park;
- Blue River @ Gregory Boulevard;
- Blue River @ Raytown Road;
- Blue River @ Stadium Drive;
- Blue River below Gooseneck Creek; and
- Blue River below I-470.

5.9.3.1 Assessment of Urban Water Quality in the Blue River Basin in Kansas City, Missouri

Portions of the following text have been extracted verbatim from the USGS Scope of Work for "Assessment of Urban Water Quality in the Blue River Basin in Kansas City, Missouri, by Don Wilkison and Dale Blevins."

> "In 1998, the USGS began a program with the City of Kansas City, Missouri to characterize water quality in the Blue River Basin. Findings of the first phase were published in 2002, the "Effects of Wastewater and Combined Sewer Overflows on Water Quality in the Blue River Basin, Kansas City, Missouri and Kansas, July 1998 to October 2000" report. The second phase interpretive report for the period of 2001 to 2003 is currently in draft form and expected to be published in 2005. A second

cooperative agreement between the City of Kansas City, Missouri and the USGS is in process to continue this sampling program through 2008.

In Phase III, the focus is to characterize long-term water-quality and stream ecology trends in receiving waters in the Blue River Basin, to identify the important sources of various contaminates and processes effecting the concentrations and fate of stream contaminants, to provide data in support of development of a long-term CSO control plan, and to provide baseline data before controls are implemented."

5.9.3.2 Monitoring the effects of sewer overflows and effluents on water quality of the Missouri River in Kansas City, Missouri

WSD and USGS have proposed an expanded scope of work for water quality monitoring in 2005. The objective of this monitoring is to assess the dilution and mixing characteristics of sewage effluents in the Missouri and Kansas Rivers. There are two phases to this assessment.

The first phase will begin in 2005 and will include a detailed bathymetric and velocimetric survey on a seven mile reach of the Missouri River. The data will be used to qualitatively locate dominant flow paths and likely areas of advective mixing. If the first phase shows no significant impact of the sewer overflows in the rivers, the assessment will be complete and the second phase will not be undertaken.

If deemed necessary, the second phase would begin after completion of the first phase and include the collection of data needed for modeling the dilution and mixing of discharges into the Missouri and Kansas Rivers. This data would be used to assess plume locations, plume sizes, plume overlapping, the effects of different loadings on plumes, different discharges in the receiving streams and overall effects on water quality in the Missouri and Kansas Rivers. The primary result of Phase II would be a USGS Scientific Investigations Report describing the methods of data collection and the effects of sewage overflows on water quality in the rivers.

6 CAPITAL PROJECTS

This section provides information about capital improvement projects initiated or completed in 2004 that relate to the Wet Weather Program and the OCP sub-program. The capital projects generally fall into one of the following categories:

- Collection System Projects; or
- Facilities Projects.

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

- 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; and
- Project Photograph – if available.

6.1 Collection System Projects

6.1.1 Brookside Sanitary Sewer Improvements – Phase 2 (Huntington Relief Sewer)
6.1.2 Brookside Sanitary Sewer Improvements – Phase 3
6.1.3 Brookside Sanitary Sewer Improvements – Phase 4 (Crestwood)
6.1.4 Brookside Sanitary Sewer Improvements – Phase 5
6.1.5 Dora Avenue Sewer Rehabilitation – Phase III
6.1.6 CID Stormwater Phase 1 East Branch
6.1.7 City-Wide Manhole Rehabilitation – Phase VIII
6.1.8 City-Wide Sewer Repair Contract – 2004
6.1.9 City-Wide Sewer Repair Contract – 2005
6.1.10 City-Wide Television Inspection of Sanitary Sewers – 2005
6.1.11 Craig Road Sewer Rehabilitation
6.1.12 Emergency Sewer Repair 1600 Dora Avenue
6.1.13 Fairlane Subdivision Relief Sewer
6.1.14 Freight House District Sewer Rehabilitation
6.1.15 Gracemore Relief Sewer
6.1.16 Lea Manor Sewer Rehabilitation
6.1.17 Midtown Sewer Rehabilitation – Phase III
6.1.18 Romanelli West Sewer Study
6.1.19 Ruskin Heights Sewer Rehabilitation

6.2 Facilities Projects

6.2.1 Birmingham Pump Station Improvements
6.2.2 87th Street Wastewater Pump Station Improvements
6.2.3 KCI Industrial Park Pump Station and Forcemain
6.2.4 Primary Junction Box and Diversion Chamber Modifications at Blue River WWTP
6.2.5 Rocky Branch WWTP Expansion
6.2.6 Turkey Creek Pump Station Modifications

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

Brookside Sanitary Sewer Improvements - Phase 2 (Huntington Relief Sewer)

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

Scope: Construction of new sanitary sewer and storm drainage pipes to increase system capacity.

Location: The project area is bounded by 61st Terrace to the North, Huntington Road to the South, Brookside Boulevard to the East and Pennsylvania Ave. to the West.

Description: The second phase of improvements designed to reduce flooding and sewer back-ups through installation of new sanitary sewer and storm drainage pipe. The current systems are located in yards and under houses. The project consists of installation of 2,800 feet of relief storm drain and 2,600 feet of relief sanitary sewer in the street away from basements to reduce the chance for sewage back-ups. Both the existing and new pipes will be used, expanding the carrying capacity of the systems.

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

Project Manager: Karine Papikian/ Ed Tohill
Planner: Burns & McDonnell
Designer: Burns & McDonnell
Contractor: GC Construction

Construction Start: Dec-2004
Construction End: May-2006
Operational Date: N/A

Project Cost: $2,900,000.00
Project Status: Under Construction

Kansas City Overflow Control Program

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

Brookside Sanitary Sewer Improvements - Phase 3

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

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

Location: The Brookside Neighborhood- generally 57th Street to 65th Street; Ward Parkway to Wornall

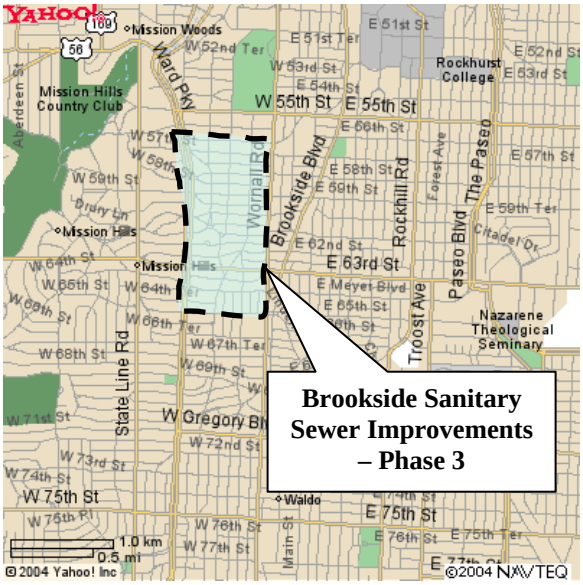
Description: The third phase of improvements designed to reduce flooding and sewer back-ups through replacement of catch basins in streets to carry stormwater runoff, upsizing 21,500 feet of existing storm drainage, and upsizing 2,900 feet of sanitary sewer pipe system primarily located within yards. 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/ Ed Tohill
Planner: Burns & McDonnell
Designer: Burns & McDonnell
Contractor: N/A

Design Start: April-2004
Design End: May-2006
Operational Date: N/A

Project Cost: $8,000,000.00
Project Status: Under Design



Kansas City Overflow Control Program

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

Brookside Sanitary Sewer Improvements - Phase 4 (Crestwood)

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

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

Location: Crestwood Neighborhood- 54th Street to 56th Street; Brookside Boulevard to Holmes

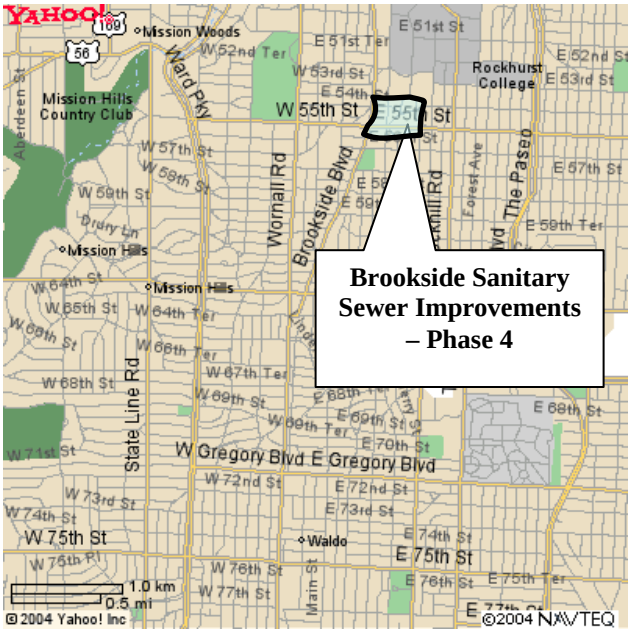
Description: The fourth phase of improvements designed to reduce flooding and sewer back-ups through replacement of catch basins in streets to carry stormwater runoff, repair of 5,500 ft. of the sanitary sewer systems and possible upsizing of 4,500 ft. of storm drainage. The project also includes separation of the combined sewer system.

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

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

Design Start: Apr-2004
Design End: May-2006
Operational Date: N/A

Project Cost: $3,400,000.00
Project Status: Under Design



Kansas City Overflow Control Program

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

Brookside Sanitary Sewer Improvements - Phase 5

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

Scope: Soil drilling, sampling, and an alignment routing study for large interceptor sewer.

Location: The project is located along Oak from Brush Creek to 51st Terrace and along Brookside from 51st Terrace to Meyer Blvd.

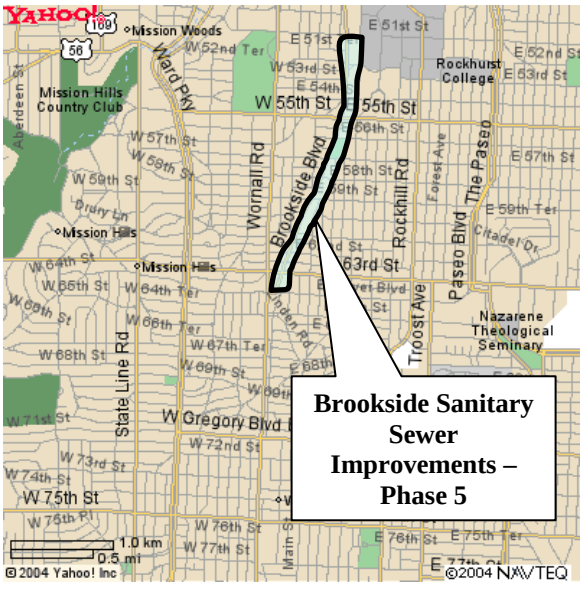
Description: The fifth phase of improvements designed to reduce flooding and sewer back-ups through upsizing 10,500 feet of the existing sanitary sewer pipe to increase carrying capacity and construction of larger interceptor parallel to the existing storm drainage interceptor pipe. The preliminary design phase consists of an alignment routing study for a new larger interceptor.

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

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

Design Start: Aug-2004
Design End: May-2005
Operational Date: N/A

Project Cost: $13.6 million to $16.6 million
Project Status: Preliminary Design Phase



Kansas City Overflow Control Program

Council District(s): ***1***
Watershed: ***NEID***

Dora Avenue Sewer Rehabilitation – Phase III

Contract No.: ***811***
Project No.: ***81000182***

Scope: The project consists of cured-in-place sewer lining and manhole rehabilitation work.

Location: The project area is bounded by Front Street to the North, Lexington Avenue to the South, Olive Street to the East and I-35 Highway to the West.

Description: The existing combined sewer system overflows during wet weather due to inflow and infiltration and storm water runoff. Rapid or significant rain events often result in flooding and sewer backups. Approximately 8,072 feet of 24-inch to 72-inch of combined sewers including all manholes are undergoing rehabilitation using a structural cured-in-place lining to recover pipe capacity.

Benefit: Increase structural integrity of the sewer system and increase pipe capacity.

Project Manager: Matt Thomas
Planner: Water Services Department
Designer: Water Services Department
Contractor: Insituform Technologies USA Inc.

Design Start: 2/21/03
Design End: 7/01/04
Operational Date: N/A

Project Cost: $2,374,211.00
Project Status: Design Complete, Construction contract approved in 2004

Kansas City Overflow Control Program

Council District(s): ***2***
Watershed: ***Turkey Creek***

CID Stormwater Phase 1 East Branch

Contract No.: ***057***
Project No.: ***81000204***

Scope: Construction of new storm sewers to increase system capacity and reduce flooding.

Location: The site of the work is the public right-of-way of Woodswether Road between Santa Fe Street and Madison Avenue, Madison/Bellview Avenue between Woodswether Road and 8th Street, and 8th Street.

Description: This area of the Central Industrial District was subject to frequent flooding due to lack of system capacity. The project consists of installation of 2000 feet of new storm sewers ranging in size from 24-inches to 66-inches, curb inlets, manholes, and other work.

Benefit: Increased capacity in the combined sewer, flooding reduction

Project Manager: Terry Godard
Planner: Taliaferro & Brown
Designer: Taliaferro & Brown
Contractor: J. E. Dunn/Wilson Plumbing

Construction Start: December 2003
Construction End: February 2005
Operational Date: N/A

Project Cost: $2.2 Million
Project Status: Under Construction

Kansas City Overflow Control Program

Council District(s): ***2***
Watershed: ***Line Creek***

City-Wide Manhole Rehabilitation - Phase VIII

Contract No.: ***777***
Project No.: ***8100155***

Scope: City-wide manhole rehabilitation.

Location: Line Creek Subbasins 9, 10, 13, 14, 17, 22 in Platte County, Kansas City

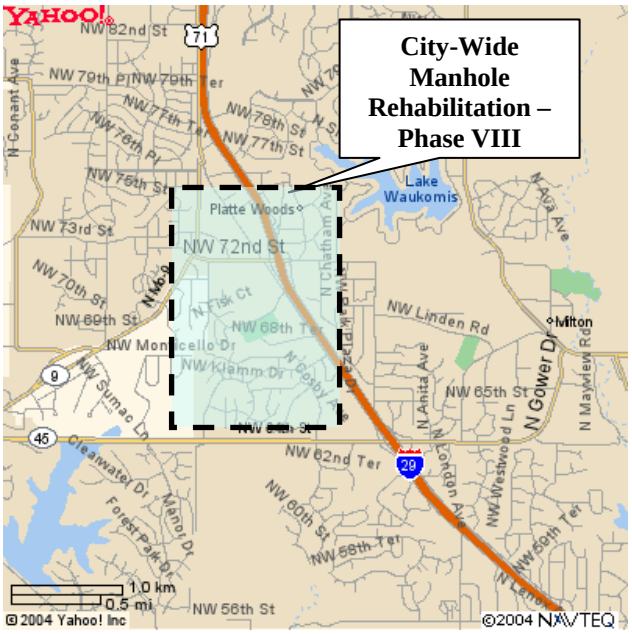
Description: The previous I/I study in the Line Creek drainage basin recommended manhole rehabilitation in the area to reduce inflow/infiltration sources in the existing sewer system. This project is one of many contracts approved as a part of the ongoing program by Water Services Department to rehabilitate or repair manholes throughout the City.

Benefit: The project will improve the efficiency of the wastewater collection process.

Project Manager: Matt Thomas
Planner: Water Services Department
Designer: Water Services Department
Contractor: Ace Pipe Cleaning

Construction Start: 5/14/03
Construction End: 7/12/04
Operational Date: 7/12/04

Project Cost: $672,884.50
Project Status: Construction Complete



Kansas City Overflow Control Program

Council District(s): N/A
Watershed: N/A

City-Wide Sewer Repair Contract - 2004

Contract No.: ***805***
Project No.: ***8100176***

Scope: Sewer repairs throughout the city.

Location: City-wide

Description: Ongoing program by Water Services Department to repair the sewers throughout the City. The project consists of the repair of private sewer line failures within public rights-of-way or easements, and the repair and replacement of small sections (5' to 25') of existing 8-inch, 10-inch, 12-inch, 15-inch, 18-inch, and 21-inch diameter public sewer mains. A total of 129 separate projects were completed in 2004 with an average cost of approximately $4000 per project.

Benefit: Repair of sewers throughout the city, increased system capacity and efficiency.

Project Manager: Karine Papikian
Planner: Water Services Department
Designer: Water Services Department
Contractor: Wilson Plumbing

Construction Start: 6/23/03
Construction End: 7/27/04
Operational Date: N/A

Project Cost: $510,105.00
Project Status: Completed

Council District(s): N/A
Watershed: N/A

City-Wide Sewer Repair Contract - 2005

Contract No.: ***849***
Project No.: ***8100223***

Scope: Sewer repairs throughout the city.

Location: City-wide

Description: Ongoing program by Water Services Department to repair the sewers throughout the City. The project consists of the repair of private sewer line failures within public rights-of-way or easements, and the repair and replacement of small sections (5' to 25') of existing 8-inch, 10-inch, 12-inch, 15-inch, 18-inch, and 21-inch diameter public sewer mains.

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Benefit: Repair of sewer throughout the city, increased system capacity and efficiency.

Project Manager: Karine Papikian
Planner: Water Services Department
Designer: Water Services Department
Contractor: Wilson Plumbing

Construction Start: 10/26/04
Construction End: 12/27/05
Operational Date: N/A

Project Cost: $614,350.00
Project Status: Active

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

City-Wide Television Inspection of Sanitary Sewers - 2005

Contract No.: ***846***
Project No.: ***8100218***

Scope: Closed circuit television inspection contract to identify areas for rehabilitation work.

Location: The project is located primarily in the Brookside and Crestwood Neighborhoods

Description: Related to the Brookside Sewer Project, the project involves digital video recording the inspection per the request of the Kansas City Water Services Department of approximately 33,333 linear feet of various diameters of sanitary sewer at $1.50 per linear foot.

Benefit: Recommendations for future rehabilitation.

Project Manager: Karine Papikian
Planner: Water Services Department
Designer: Water Services Department
Contractor: ACE Pipe Cleaning

Construction Start: 10/08/04
Construction End: 10/08/05
Operational Date: N/A

Project Cost: $50,000.00
Project Status: Active

Council District(s): ***6***
Watershed: ***Blue River South***

Craig Road
Sewer Rehabilitation

Contract No.: ***774***
Project No.: ***8100152***

Scope: The project consists of manhole rehabilitation and upsizing the sewer using the pipe bursting method.

Location: Craig Road is located in southern Kansas City and is bounded by 106th Street to the North, 110th Street to the South, Stark Avenue to the East and Richmond Avenue to the West.

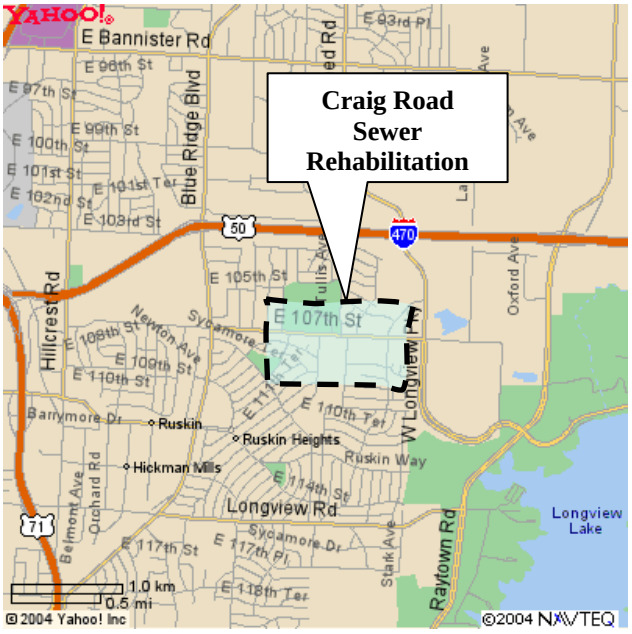
Description: The previous I/I study in the Craig Road drainage basin recommended rehabilitation in the area to serve the new development and reduce inflow/infiltration sources in the existing sewer system. Approximately 5,619 feet of 8, 10, and 15-inch sewer line were rehabilitated and upsized using the pipe bursting method to recover pipe capacity**.**

Benefit: Removal of infiltration/inflow sources and increased pipe capacity.

Project Manager: Matt Thomas
Planner: Water Services Department
Designer: Water Services Department
Contractor: Wiedenmann & Godfrey Construction, Inc.

Construction Start: 5/07/03
Construction End: 1/06/04
Operational Date: 1/06/04

Project Cost: $658,050.44
Project Status: Construction complete



Kansas City Overflow Control Program

Council District(s): ***1***
Watershed: ***NEID***

Emergency Sewer Repair 1600 Dora Avenue

Contract No.: ***822***
Project No.: ***8100194***

Scope: The project consisted of repairing a collapsed brick sewer

Location: The project is located in the area of 1600 Dora Avenue.

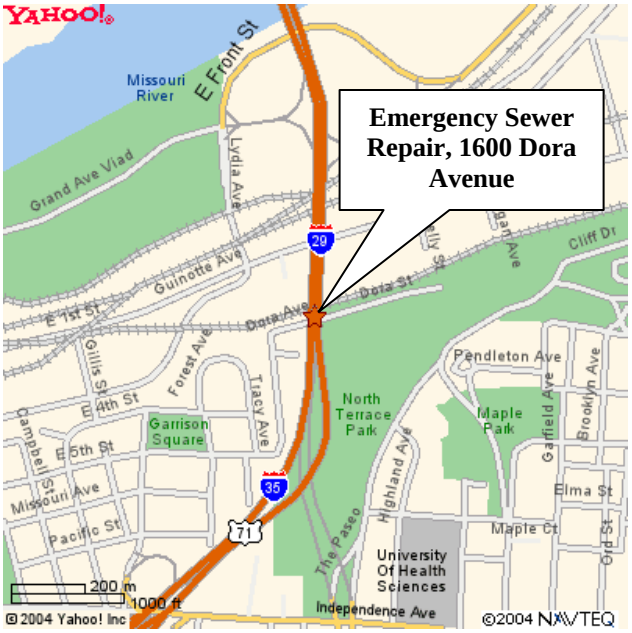
Description: The collapsed brick sewer caused significant blockage of the combined sewer system resulting in overflows. The repair of 205 feet of collapsed brick sewer was performed by tunneling from a downstream manhole to the obstruction and installing steel liner plates and a 36-inch CMP through the collapsed sewer.

Benefit: The obstruction was cleared, the pipeline was cleaned, and the overflows were eliminated.

Project Manager: Brian Schroeder
Planner: Water Services Department
Designer: Water Services Department
Contractor: Ace Pipe Cleaning, Inc.

Construction Start: 4/30/04
Construction End: 7/12/04
Operational Date: 7/12/04

Project Cost: $500,000.00
Project Status: Construction complete



Kansas City Overflow Control Program

Council District(s): ***6***
Watershed: ***Little Blue River***

Fairlane Subdivision Relief Sewer

Contract No.: ***663***
Project No.: ***8100124***

Scope: Relief sewer construction.

Location: The project is bounded by Bannister Rd. to 95th St. and Freemont Ave. to Marion Ridge Rd.

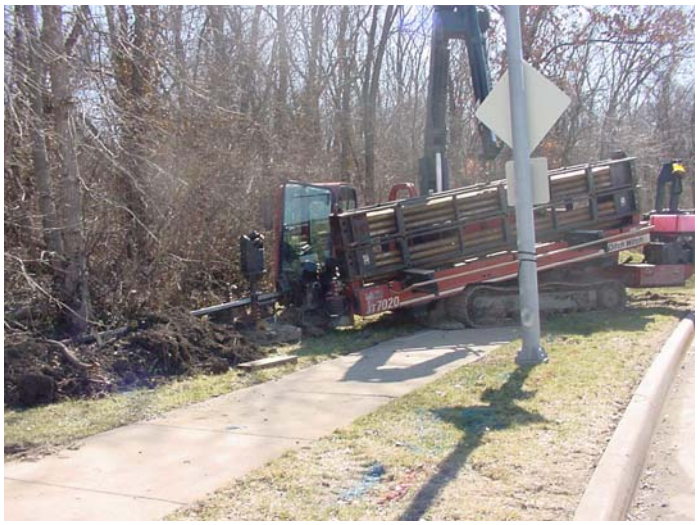
Description: The previous I/I study in the Fairlane Subdivision drainage basin recommended construction of a relief sewer in the area to serve new development, reduce inflow/infiltration sources in the existing sewer system, and eliminate basement backups. The project consisted of replacement of 1,578 ft. of 21-inch HDPE pipe by pipe bursting/reaming methods, installation of 405 ft. of 18-inch HDPE pipe by pipe bursting/reaming methods, installation of 695 ft. of 15-inch HDPE pipe by pipe bursting methods, installation of nine 5-foot diameter manholes, and installation of one special box structure.

Benefit: New relief sewer, increased pipe capacity, and reduction of basement backups.

Project Manager: Karine Papikian
Planner: Water Services Department
Designer: GBA
Contractor: Nowak Construction

Construction Start: 11-12-03
Construction End: 9-08-04
Operational Date: 9-08-04

Project Cost: $775,000.00
Project Status: Construction complete



Kansas City Overflow Control Program

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

Freight House District Sewer Rehabilitation

Contract No.: ***831***
Project No.: ***8100202***

Scope: The project consists of cured-in-place sewer lining and manhole rehabilitation work.

Location: The Freight House District is located in southern downtown Kansas City. The project area is bounded by 16th Street to the North, 22nd Street to the South, Baltimore Avenue to the East and Broadway Boulevard to the West.

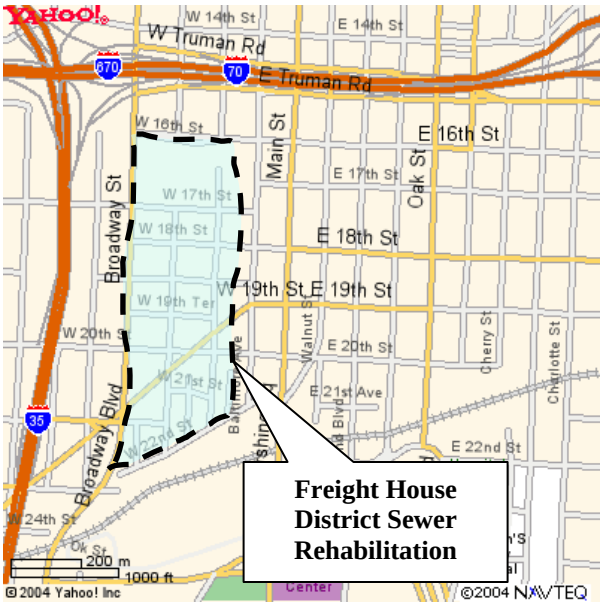
Description: The existing 100-year-old combined sewer system overflows during wet weather due to inflow and infiltration and storm water runoff. Rapid or significant rain events often result in flooding and sewer backups. Approximately 21,000 feet of 12-inch to 66-inch sewer lines are undergoing rehabilitation using a structural cured-in-place lining to recover pipe capacity.

Benefit: Increased pipe capacity.

Project Manager: Matt Thomas
Planner: Water Services Department
Designer: Water Services Department
Contractor: Insituform Technologies USA Inc.

Construction Start: 5-24-04
Construction End: 4-20-05
Operational Date: N/A

Project Cost: $2,527,283.00
Project Status: Under Construction



Kansas City Overflow Control Program

Council District(s): ***1***
Watershed: ***Birmingham, Lower Shoal Creek Basin***

Gracemore Relief Sewer

Contract No.: ***692***
Project No.: ***0099780***

Scope: The project consists of construction of approx. 4630 feet of gravity relief sewer

Location: Gracemore subdivision directly west of Shoal Creek at the intersection of N.E. San Rafael Drive and N.E. 51 Street.

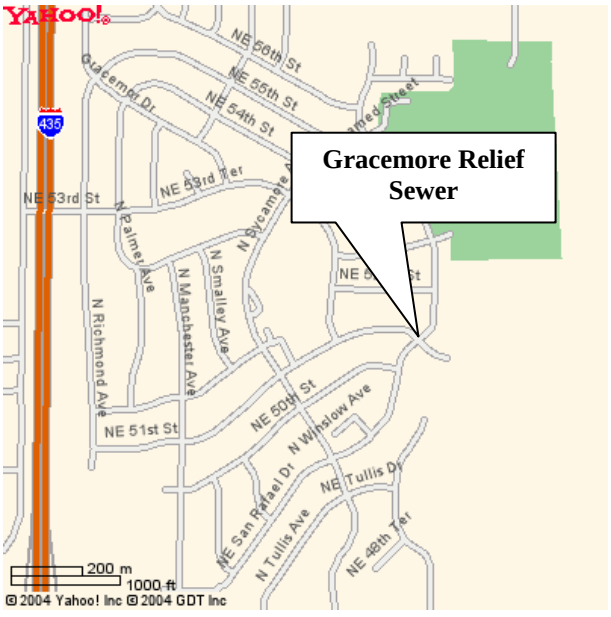
Description: The sewer system had insufficient capacity and caused basement backups. The gravity relief sewer was constructed with the installation of approximately 4360 feet of pipe to connect the existing collection system within the Gracemore subdivision to an existing 108" gravity main running east of Shoal Creek. The project also consisted of installation of 5760 feet of 8-inch to 15-inch pipe using various methods and installation of sixteen (16) new manholes.

Benefit: New relief sewer and increase pipe capacity.

Project Manager: Karine Papikian
Planner: Burns & McDonnell
Designer: Burns & McDonnell
Contractor: Pyramid Excavation & Construction, Inc.

Construction Start: 01/05/04
Construction End: 11/30/04
Operational Date: 11/30/04

Project Cost: $1,196,956.00
Project Status: Construction complete



Kansas City Overflow Control Program

Council District(s): ***6***
Watershed: ***Blue River***

Lea Manor
Sewer Rehabilitation

Contract No.: ***776***
Project No.: ***8100141***

Scope: Sewer and manhole rehabilitation

Location: Lea Manor is located in South Kansas City bounded by north and south with 95th St. and 100 Ter. respectively and east and west with State Line and Madison Ave. respectively.

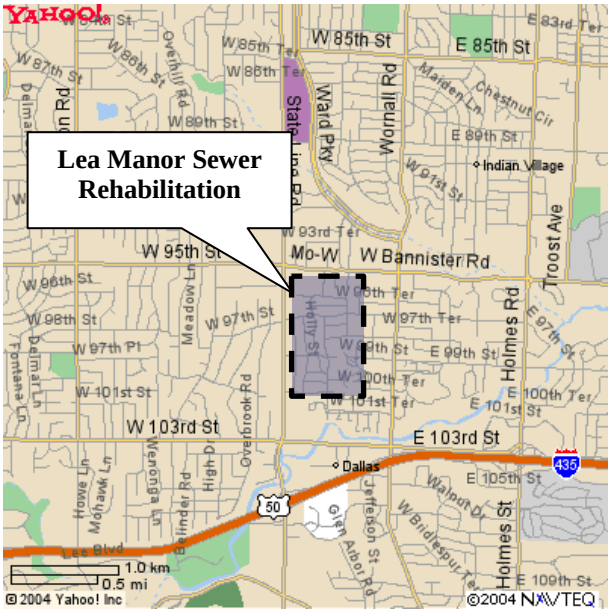
Description: The project consisted of the replacement of approx. 1,381 lf. 8" VCP, upsizing of approx.1800 lf. of 8" VCP, reconnection of 23 services, and replacement/rehabilitation of manholes.

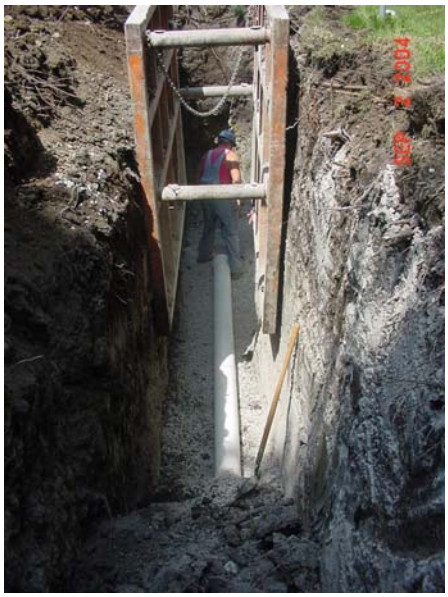
Benefit: Increased pipe capacity and efficiency of the collection system.

Project Manager: Matt Thomas
Planner: Water Services Department
Designer: Water Services Department
Contractor: Wilson Plumbing

Construction Start: 6/17/04
Construction End: 12/28/04
Operational Date: 12/28/04

Project Cost: $306,094.00
Project Status: Construction complete





Kansas City Overflow Control Program

Council District(s): ***3***
Watershed: ***Turkey Creek***

Midtown Sewer Rehabilitation - Phase III

Contract No.: ***780***
Project No.: ***8100153***

Scope: The project consists of cured-in-place sewer lining and manhole rehabilitation work.

Location: The project is bounded by Troost Avenue to Paseo Blvd. and from 22nd Street to 27th Street in Kansas City, Jackson County, Missouri

Description: The old combined sewer system overflowed during wet weather due to inflow and infiltration and storm water runoff. The project consisted of rehabilitation of approx. 541 linear feet of 12-inch, 3,180 linear feet of 15-inch, 3,430 linear feet of 18-inch, 2,760 linear feet of 21-inch, 743 linear feet of 30-inch clay and brick concrete sewers including manholes in the area.

Benefit: Improve structural integrity of sewers and increase pipe capacity

Project Manager: Karine Papikian
Planner: Water Services Department
Designer: Water Services Department
Contractor: Instituform Technologies USA, Inc.

Construction Start: 08/25/03
Construction End: 8/19/04
Operational Date: 8/19/04

Project Cost: $722,694.00
Project Status: Construction complete

Kansas City Overflow Control Program

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

Romanelli West Sewer Study

Contract No.: ***784***
Project No.: ***8100159***

Scope: Identify inflow/infiltration sources and prioritize public sector sewer system repairs.

Location: Generally, from State Line Road to Ward Parkway and 57th Street to 67th Street.

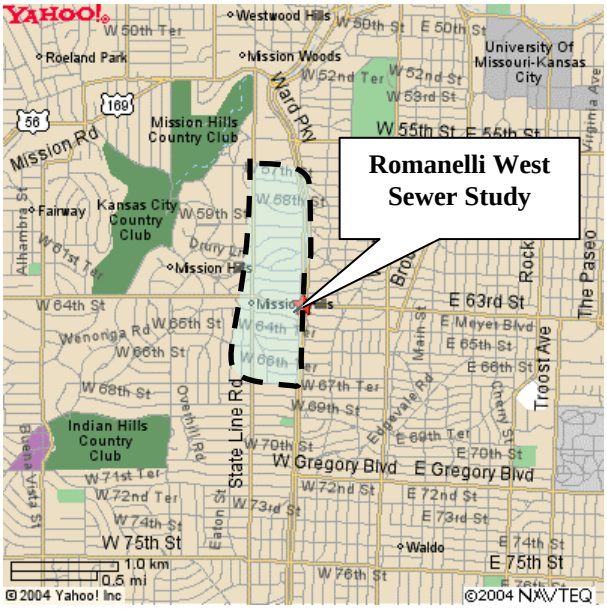
Description: The sanitary sewers within the study area are over 80 years old and are subject to excessive infiltration and inflow (I/I). The study was conducted through smoke testing, inspections of lines and manholes and compilation of all system inventories in a database. WSD is currently developing a Capital Improvements Plan for improving the collections system based from the recommendations in the study.

Benefit: Reduction of I/I and increase efficiency of the sewer system.

Project Manager: Julie Jenson
Planner: Water Services Department
Designer: Larkin Group
Contractor: N/A

Design Start: N/A
Design End: N/A
Operational Date: N/A

Project Cost: $90,000
Project Status: Completed March 2004



Kansas City Overflow Control Program

Council District(s): ***6***
Watershed: ***Little Blue River***

Ruskin Heights Sewer Rehabilitation

Contract No.: ***810***
Project No.: ***81000181***

Scope: Rehabilitation of existing sewers and manholes.

Location: The project is bounded by Spring Valley Road, Blue Ridge Blvd., Longview Road, and 110th Street

Description: The previous I/I study in the Ruskin Heights Subdivision drainage basin recommended rehabilitation of existing sewers and manholes to reduce inflow/infiltration sources and eliminate basement backups. The project consists of rehabilitation of over 100 manholes and 50,000 lf of 8-inch to 15-inch pipe by pipe bursting, open cut, or cured-in-place lining.

Benefit: Significant I/I reduction, increased pipe capacity, and reduction of basement backups.

Project Manager: Matt Thomas
Planner: Water Services Department
Designer: Water Services Department
Contractor: N/A

Design Start: December 2003
Design End: December 2004
Operational Date: N/A

Project Cost: $5,000,000 estimated
Project Status: Design Completed in 2004

Kansas City Overflow Control Program

Council District(s): ***1***
Watershed: ***Birmingham***

Birmingham Pump Station Improvements

Contract No.: ***733***
Project No.: ***8100102***

Scope: Birmingham Pump Station Improvements

Location: 11011 NE Birmingham Road, Kansas City, MO

Description: The pump station is approximately 35 years old and required improvements to meet current usage demands and current health and safety codes. Primary plant improvements included replacement of two front-cleaned, chain-operated bar screens with mechanically-cleaned, climber, inclined bar screens, a new heating and ventilating system for the screen room and pump control rooms and other mechanical improvements. Other improvements included new explosion-proof electrical equipment for the screen room, modifications to the existing monitoring system to include a remote signal for bar screen failure and replacement of two backflow preventers with associated piping.

Benefit: Improved control and screening capabilities and safer working conditions for WSD employees.

Project Manager: Richard Parmeter
Planner: Water Services Department
Designer: Water Services Department
Contractor: AD Jacobson Company

Construction Start: November 13, 2002
Construction End: September 18, 2003 (Substantially complete)
Operational Date: March 2, 2004(Final Completion)

Project Cost: $975,087.17
Project Status: Complete

Kansas City Overflow Control Program

Council District(s): ***6***
Watershed: ***Blue River***

87th Street Wastewater Pump Station Improvements

Contract No.: ***713***
Project No.: ***8100104***

Scope: Improvements to the pump station mechanical and control systems

Location: 8700 Prospect Road, Kansas City, MO

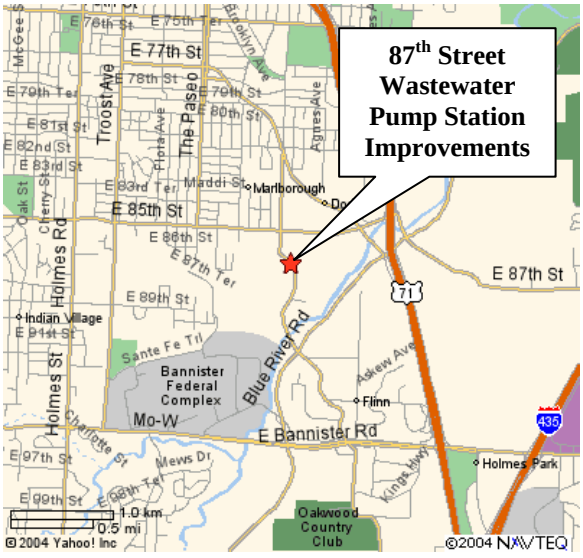
Description: The existing pump station is subject to extensive grit accumulation that interferes with operation of screening equipment. In addition, aging control equipment required upgrades for proper operation. Improvements included adjustment of mechanical bar screens #1 and #2; installation of stainless steel screens on channel floor; installation of stilling wells in forebay and wet wells; upgrades to the control system; rehabilitation of five existing sluice gates; removal of accumulated grit and solids from the wet well.

Benefit: Improved grit and debris removal; upgraded control systems; improved flow control

Project Manager: Kurt Bordewick/James Kirby
Planner: Water Services Department
Designer: Water Services Department, Engineering Division
Contractor: Foley Company

Construction Start: May 27, 2002
Construction End: Sep-2004
Operational Date: Operation was maintained throughout construction

Project Cost: $390,394.00 (final construction)
Project Status: Complete



Kansas City Overflow Control Program

Council District(s): ***2***
Watershed: ***Northwestern***

KCI Industrial Park Pump Station and Forcemain

Contract No.: ***628***
Project No.: ***0099145***

Scope: Replacement of existing pump station

Location: 100555 North Amity Road, Kansas City, MO

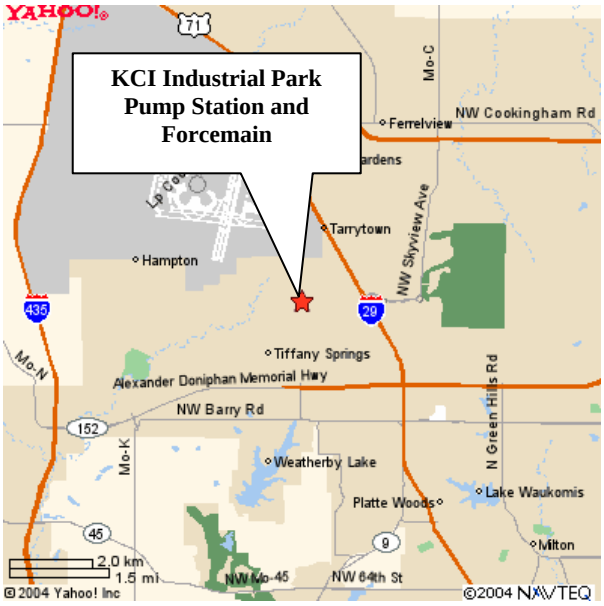
Description: The existing small mechanical treatment plant was constructed in the 1970's and required extensive repairs and upgrades. Studies indicated that replacement of the facility with a pump station and forcemain connected to the Todd Creek WWTP would be more cost effective then upgrading the plant. The new pump station consists of duplex submersible pumps, valve vault with pre-engineered fiberglass building, approximately 6750 linear feet of 6" diameter forcemain, and site improvements.

Benefit: Reduced maintenance and operational costs. Treatment of wastewater in a modern treatment plant.

Project Manager: Richard Parmeter
Planner: Water Services Department
Designer: Archer Engineering
Contractor: Commercial Mechanical Incorporated

Construction Start: June 14, 2004
Construction End: December 31, 2004 (Pump station operational)
Operational Date: March 1, 2005(Final Completion)

Project Cost: $522,238.00
Project Status: 99% complete



Kansas City Overflow Control Program

Council District(s): ***1***
Watershed:
Missouri River - NEID

Primary Junction Box and Diversion Chamber Modifications at Blue River WWTP

Contract No.: ***790***
Project No.: ***8100146***

Scope: Miscellaneous improvements to the Primary Junction Box and Diversion Chamber

Location: 7300 Hawthorne Road, Kansas City, MO

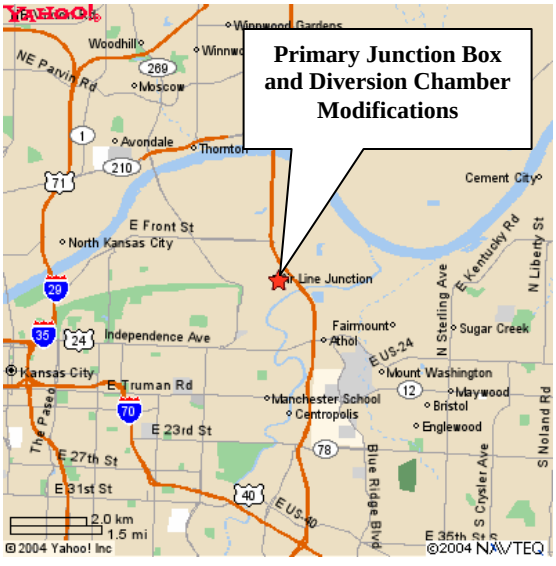
Description: The project includes improvements to the Primary Junction Box, Diversion Chamber, Blue River Pumping Station and Sludge Control Building. The improvements include refurbishing, modifying or replacing several sluice gates, placing a new fiber optic conductor and new control conductors and modifying control systems and electrical power and appurtenant facilities.

Benefit: Allow for better operation of the plant.

Project Manager: Richard Parmeter
Planner: Water Services Department
Designer: Black and Veatch

Contractor: Foley Company
Construction Start: September 4, 2003
Construction End: March 22, 2004 (Substantial Completion)
Operational Date: June 22, 2004(Final Completion)

Project Cost: $308,829.18
Project Status: Complete



Kansas City Overflow Control Program

Council District(s): ***2***
Watershed: ***Northern***

Rocky Branch WWTP Expansion

Contract No.: ***812***
Project No.: ***8100203***

Scope: Expansion of the Rocky Branch Wastewater Treatment Plant from a current capacity of 750,000 gpd to 2,000,000 gpd.

Location: Rocky Branch WWTP, 500 Northeast 132nd Street, Kansas City, MO

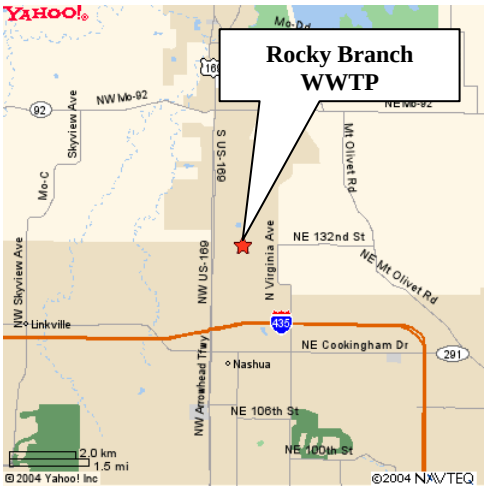
Description: The existing wastewater treatment plant was constructed in the 1970's to serve a relatively rural area of Kansas City. Extensive commercial and residential growth within the service area has occurred and flows to the plant have reached the maximum capacity of 750,000 gpd. In order to provide capacity for future growth, the existing plant is being replaced with new facilities. These facilities include an influent pump station, a headworks building with screening and grit removal, two aeration basins, an aeration basin blower building, two secondary clarifiers and an effluent flume. The existing lagoons will be modified for peak flow storage and the existing treatment basin will be converted to an aerobic digester/sludge storage basin.

Benefit: The capacity of the facility will be increased to 2,000,000 gpd to accommodate the needs of future growth within the plant's service area and effluent discharges will meet current MDNR Standards.

Project Manager: Richard Parmeter
Planner: Water Services Department
Designer: Archer Engineering
Contractor: Hill-Huffman Engineering and Construction, LLC

Construction Start: April 20, 2004
Construction End: December 1, 2005 (Based on the current schedule)
Operational Date: July 29, 2005 (Based on the current schedule)

Project Cost: $9,555,000.00
Project Status: 30% complete



Kansas City Overflow Control Program

Council District(s): ***4***
Watershed: ***CID***

Turkey Creek Pump Station Modifications

Contract No.: ***833***
Project No.: ***8100173***

Scope: Study and preliminary design modifications for the Turkey Creek Pump Station.

Location: 2301 State Line Rd, Kansas City, MO

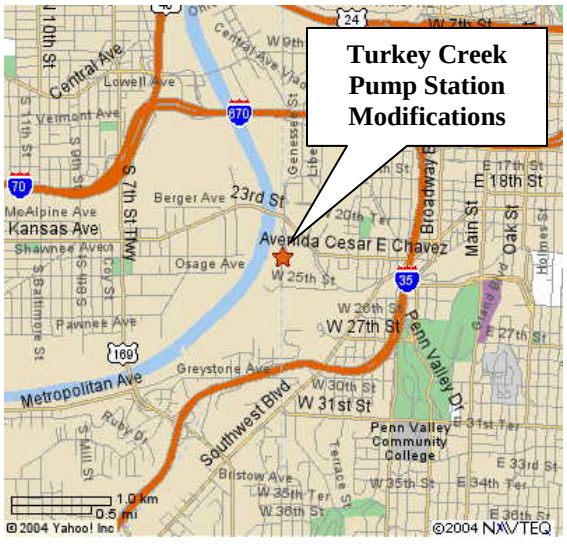
Description: The existing pump station is subject to extensive grit accumulation that interferes with operation of aging screening and pumping equipment. In addition, increased pump capacity is needed with upgraded control and electrical equipment for proper operation. The proposed improvements to the pump station include rock box and debris removal improvements, barscreen and rake improvements, wetwell and piping modifications and upgrades, replacement of pumping units, electrical system upgrades, instrumentation and control system integration and miscellaneous mechanical upgrades.

Benefit: Improved removal of settleable solids and debris. Upgraded pumping and control systems. Improved control of combined sewer overflows in Kemper Arena area.

Project Manager: Bon Marie Gardner
Planner: Water Services Department
Designer: Camp Dresser & McKee
Contractor: In design phase (contractor not selected)

Design Start: May-04 (study and preliminary design)
Design End: Dec-04 (study and preliminary design)
Operational Date: (not determined)

Project Cost: $119,300 (study), $900,000 (estimated design), $8,400,000 (estimated construction)
Project Status: Completed study and preliminary design



Kansas City Overflow Control Program

Appendix A

Public Education Documents

Sewer Backups & Overflows

What you can do

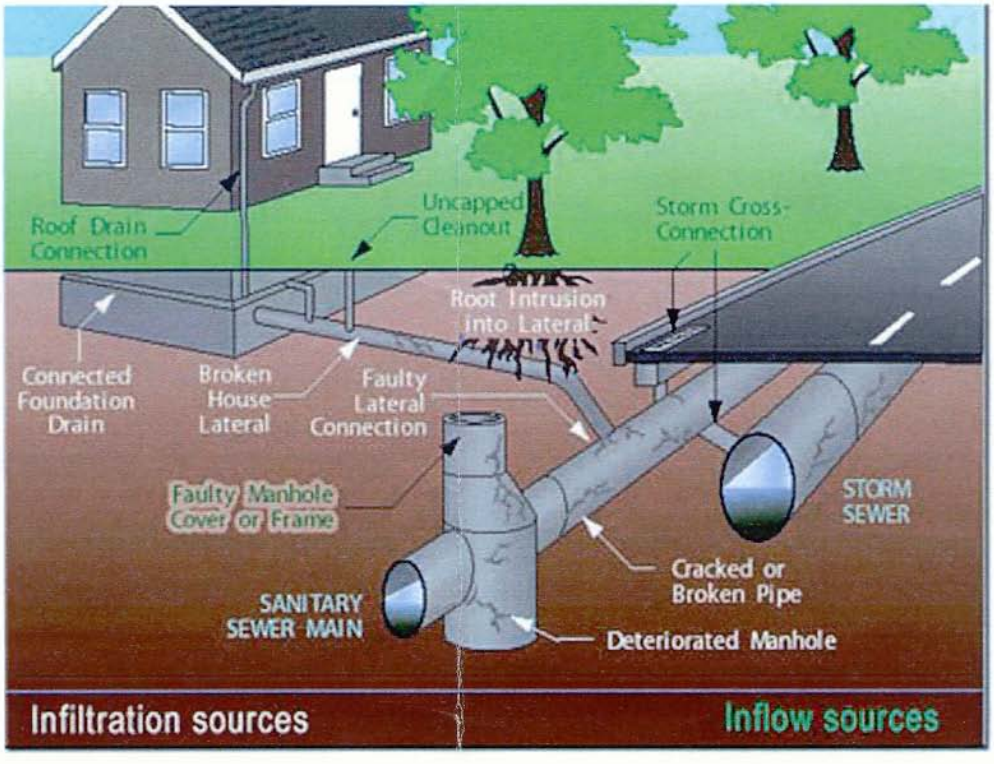
During nearly every rainfall or snowmelt, excess water gets into the sanitary sewer system. This excess flow can cause the sewer system to overflow and may backup into basements. The City of Kansas City, Missouri's Overflow Control Program is addressing overflows and reducing backups. This brochure explains how citizens can help.

KCMO
WATER SERVICES
DEPARTMENT

Kansas City, Missouri
Water Services Department
4800 E. 63rd Street
Kansas City, Missouri 64130

email: water@kcmo.org

For more information, visit our webiste at:
www.kcmo.org



How is water getting in?

Excess water can enter through an improper connection or can leak into the sanitary sewer system through a number of sources:

- sinks, drains and sump pumps should not be connected to the sewer system
- rainwater can enter at the sewer cleanout or at the manhole if not properly sealed
- groundwater can leak into the system through broken pipes and manholes
- plumbers may have connected the storm system to the sanitary sewer system.

The City is working to:

- clean and maintain the publicy owned portion of the system
- Repair and rehabilitate public sewer lines and manholes
- Disconnect storm and sewer cross connection in some locations

Use water wisely!

Install low flow toilets and shower heads.

Take shorter showers.

Install a rain barrel to collect and store rainwater to be used on your garden or lawn.

Don't leave water running when shaving, brushing your teeth and your washing hands.

What can you do?

Citizens play a key role in reducing overflows.
You can help reduce the amount of water entering the sewer system and overloading it.
To keep your basement dry and protect the environment.

Disconnect From Sewer Line

Do your downspouts drain across your yard, or do they run underground? If they run underground, they are most likely connected to the sewer system. Property owners should also disconnect all sump pumps, as well as patio, deck, driveway, floor and yard drains from the sewer.

Maintain & Repair Lateral Sewer

To determine if sewer backups are the result of a problem with the lateral line serving the house, property owners should contact a licensed drain or sewer cleaning company to reel their private sewer line.

Plant Trees Wisely

Avoid planting trees and shrubs over or near the sewer lines or sewer mains that may be in your yard. Roots can enter and damage sewers causing backups.

Install Backflow Valve

A good way to protect your property from sewage backups is to install a backflow valve designed to block drain pipes temporarily and prevent flow back into the house. Backflow valves or preventers should be installed by a licensed plumber.

Check Sewer "Cleanout" Pipes

The cleanout is usually a small pipe, about 4inches in diameter, outside the house used to access the sewer lateral for cleaning. Make sure the cap to the cleanout pipe is not missing or damaged and replace if necessary. By keeping the cleanout capped, you reduce the amount of rainwater in the sewer system, as well as prevent sewer odors and gasses from escaping.

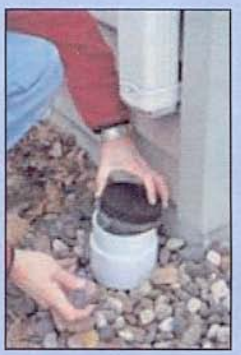
When washing clothes or dishes, wash full loads and use shorter cycles when possible.

Water your lawn and garden in the morning when less water is lost to evaporation, and limit it to one hour per week.

Plant trees and other vegetation to help reduce stormwater runoff by allowing rainwater to soak into the ground.

How to disconnect a downspout

You can make a difference. During a heavy rainstorm, each downspout on your home can deliver 12 gallons gallons of rainwater per minute to the sanitary sewer system. This can contribute to basement backups and sewer overflows. Disconnect your downspouts and keep excess water out of the sewer system.



Step 3: Cap the sewer standpipe. This prevents water from entering. In most cases, you should be able to use a simple rubber cap secured by a hose clamp. You can also use a wing-nut test plug if available cap sizes don't fit.

Step 1:

Measure approximately 9" up from where the downspout enters the sewer connection.

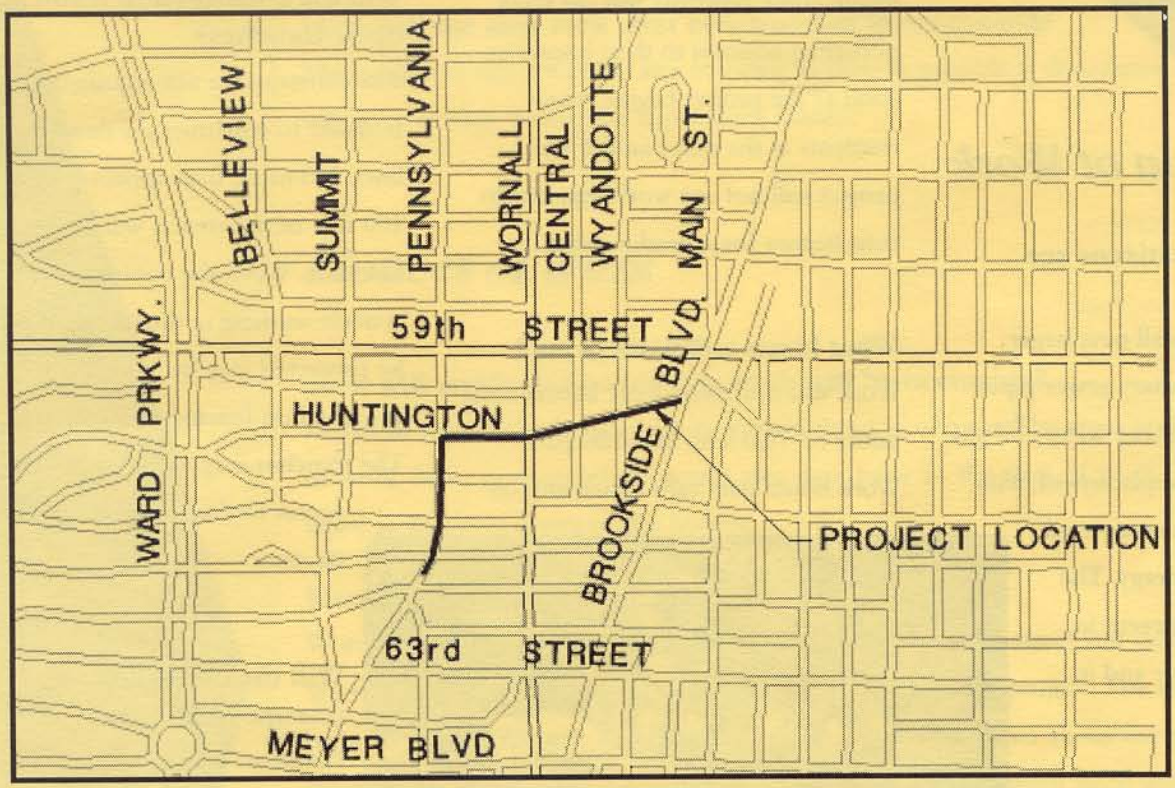
Step 4: Insert the downspout INTO the elbow. If you put the elbow into the downspout, it will leak. You may need to crimp the end of the downspout with a pair of pliers to get a good fit.

Step 2: Cut the downspout with a hacksaw.

Step 5:

Attach a downspout pipe extension to carry water away from the house and foundation. Be sure to insert the elbow into the extension to prevent leaks, and secure with sheet metal screws. Place a splash block at the end of the downspout extension.

Brookside Watershed Improvement Program
Huntington Relief Sewer Construction



What is being done in the Brookside area to address flooding issues?

The Brookside Watershed Improvement Program will reduce flooding and sewer back-ups through construction projects and citizen actions. The program will not eliminate all flooding and sewer back-ups, but it should reduce the severity and damage caused by rain events.

The Brookside Watershed Improvement Program involves a public investment of approximately $30 million to construct improvements to the storm drainage and sanitary sewer systems. The focus of the program is on improved handling of stormwater. The project is being funded with city sales tax dollars through the Public Improvement Advisory Committee (PIAC), revenue from sewer rates and through the State of Missouri Revolving Loan Fund.

The City is ready to start construction of the sewers. What does that mean?

The Huntington Relief Sewers are Phase 2 of the five-phase Brookside Watershed Improvements Program. The project includes the installation of new storm drainage and sanitary sewer pipes. New pipe systems will be installed in streets instead of down sewer easements in backyards where the existing systems are located. The new sewers will be on Pennsylvania between approximately 61st Terrace and Huntington; and on Huntington from Pennsylvania to Brookside.

The Huntington Relief Sewers are intended to increase the capacity of the sewer system, which should reduce the frequency of flooding and sewer back-ups. The new sewers are designed to meet current standards. During large storms, flooding and sewer back-ups may still occur.

KCMO
WATER SERVICES DEPARTMENT

Dec. 7, 2004

Description of Work

What work will citizens see occurring?

This project will install new, larger stormwater and sanitary sewer pipes. It will also include some water and gas line relocation and replacement, with gas line work to be completed by Missouri Gas Energy. The work will occur in streets, in adjacent right-of-way and in easements.

To accomplish this construction, the existing street pavement, curbs, gutters, driveway aprons and some sidewalks along the new sewer route will be removed and replaced. Portions of the street will be a gravel road during construction. Access to driveways will be temporarily blocked during the daytime when the contractor is working on the portion of sewer that crosses that particular driveway.

Work will begin at Brookside Boulevard and progress west along Huntington and south along Pennsylvania approximately a half block south of 61st Terrace. As a result, some residents will see work occurring adjacent to their houses as soon as the project begins, while residents at the other end of the project will not see work adjacent to their homes for several months.

What hours will work occur?

Work will normally occur between the hours of 7:00 a.m. and 6:00 p.m. Work hours may vary depending on hours of daylight, weather and temperature. Additional work hours may be required at times due to unforeseen conditions.

What will happen to the trees along the street?

Trees will be professionally trimmed back to allow for equipment to work in the street and adjacent right-of-way. Trees will only be removed when the work cannot be accomplished without removal.

Will the construction result in open trenches?

The construction will require open trenches to construct the new sewer lines. No more than approximately 100 feet of the trench will be open at one time. When the contractor is not actively working in the trench, it will be protected (e.g. by orange construction fencing and/or cover). The trenches may temporarily block access to driveways during the daytime.

Will the construction disrupt utility service?

Residents may experience short-term gas and water outages due to the construction. The outages should last for only an hour or so. When water is shifted over to the new lines, water service will be turned off for about one hour. When this occurs, the contractor will knock on doors to notify residents that it is about to occur.

Construction sometimes results in unexpected utility outages that may occur without warning. If this occurs, service will be re-established as soon as possible.

Where will construction equipment be parked when not in use?

The contractor will need to leave construction equipment in the work area overnight and at other times when work is not occurring. The equipment will be consolidated in one place and will not block access to streets or driveways.

How will the area look after construction is completed?

The contractor will return the area to a state as close as possible to the original condition. The area will be re-sodded during the appropriate season.

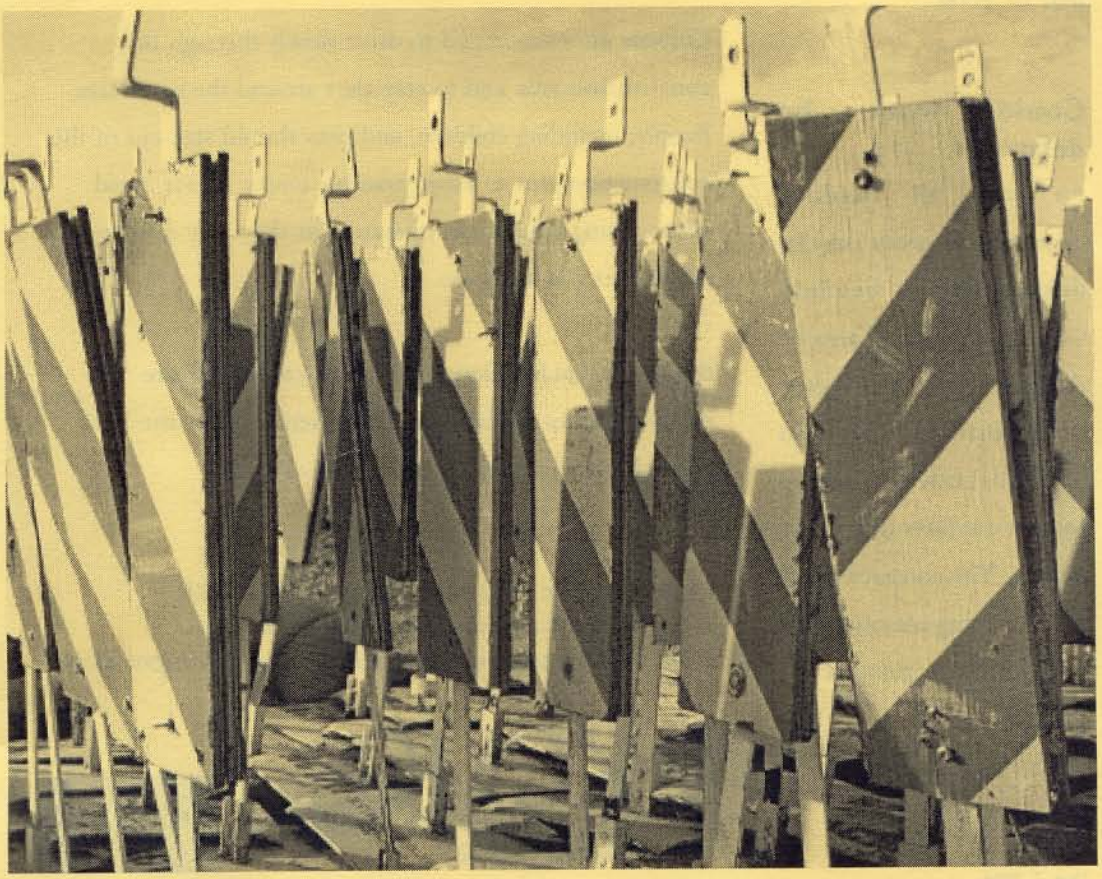
Notices of Work

How will residents know when work will be occurring?

Residents adjacent to the area where work is about to occur will be given notice prior to the start of work. Most notices will be issued two days prior to the start of work. The notices will be taped to the front doors of the houses.

How will people find out about road closings?

When streets are closed, "Road Closed" signs will block the street and detours will be posted. Wornall Road will need to be closed temporarily during the project. The media will be alerted prior to closing Wornall Road, so the public should be alerted about the road closure on the television or radio news or in the newspaper. Detours for Wornall Road will also be posted.



Project Schedule

When will the project begin?

Survey work will occur in December 2004 and January 2005. Removal of the first section of the existing street will begin in mid to late January 2005.

When will the project be completed?

The project is scheduled to be completed in the first half of 2006.

Could work be delayed?

As with all outdoor construction, work may be delayed due to weather. Construction could also be delayed if the contractor runs into unforeseen problems such as extensive rock or conflicts with other utilities. The contractor will do everything reasonable to complete the project on schedule.

The following people may be contacted if you have concerns during construction.

Primary Contact:
Al McKelvy
Kansas City Water Services Inspector
816-784-3157
816-797-0175 (mobile)

Other Contacts:
Karine Papikian, P.E.
Kansas City Water Services Project Manager
816-513-0300

G C Construction Co., Inc.
621 N.W. Duncan Rd. Ste. 5
Blue Springs, MO. 64014
Phone: 816-229-2551
Fax: 816-229-3003
G C Project Manager: Brian T. McCrary, P.E.
G C Construction Project Supervisor: Gary Clevenger

Ways Citizens Can Help

What can citizens do to help the project stay on schedule?

Citizens are encouraged to drive slowly through the construction area and to stay alert around the work area. People, including children, and pets should stay out of the construction area to avoid possible injury. Please avoid approaching equipment operators as they may not be aware that you are there.

Residents that live along the construction route are encouraged to relocate moveable items out of the construction area prior to the start of work.

More information about this project can be found on the Brookside Watershed Improvement Program website. Go to www.kcmo.org/water and click on "Brookside Improvements".

KCMO WATER SERVICES DEPARTMENT

Burns & McDonnell SINCE 1898

Dec. 7, 2004

KCMO
WATER SERVICES
DEPARTMENT

The Water Services Department needs your HELP!

Sewer lines in your area are experiencing a build-up of fats, oils and grease.

You are encouraged to reduce the amount of fats, oils and grease going down the drain.

Please place all cooking fats, oils and grease in a sealed container and put it in the garbage.

This will help keep things flowing!

It takes all of us working together to help protect and preserve our environment.

Thank you for your understanding and assistance.

If you have any questions, please contact the:

Oil & Grease Management Program
(816) 784-1001.

(over)

8780-200 (Rev 3/04)

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WATER SERVICES
DEPARTMENT

Substances that can cause or lead to a blockage or obstruction of a sewer pipe are PROHIBITED! Fats, oils and grease are known to cause sewer blockages.

You can help prevent costly and unsanitary sewer overflows by following a few simple steps:

* Scrape grease and pour cooking oils into a sealable container and place it in the garbage. **Do not pour grease, fats and oils down the drain!**

* Put leftover foods, scraps and fat trimmings in the garbage for pick-up -- **not in the garbage disposal.** Do not use the sewer to dispose of food scraps.

* Dry wipe all pots and dishes. Use a paper towel or napkin to remove greasy leftovers from pots and dishes prior to washing in the sink or dish-washer.

If you have questions, please contact the Oil & Grease Management Program at (816) 784-1001 or visit www.kcmo.org/water.

Thank you for your assistance.

KCMO
WATER SERVICES DEPARTMENT

Industrial Waste Control
1001 Harrison St.
Kansas City, Missouri 64106
(816) 784-1005

Say goodbye to grease and oil without saying hello to sewer overflows

Industrial Waste Control
1001 Harrison St.
Kansas City, Missouri 64106
(816) 784-1005

KCMO
WATER SERVICES DEPARTMENT

Oils and Grease aren't just bad for your arteries and your waistline; they're bad for sewers, too.

Improperly managed oil and grease from restaurants has become a significant problem for wastewater collection and treatment systems. Fats, oils and greases (FOG) coat, congeal and accumulate in pipes, pumps and equipment, leading to the costly and environmentally damaging flows of waste grease into drain lines, sewer lines, lift stations, and Publicly Owned Treatment Works (POTWs). Improper disposal can clog sewer lines resulting in overflows out of sewer systems. Approximately 25% of the reported sewer system overflows in Kansas City are caused by FOG blockage of the sewers.

Where does the oil and grease come from?

Most of us know grease as the byproduct of cooking.
Grease is found in such things as:

- Meat fats
- Lard
- Cooking oil
- Shortening
- Butter and margarine
- Food scraps
- Baking goods
- Sauces
- Dairy products
- Nuts
- Soups, gravies, chili
- Condiments
- Pastas
- Poultry

Why is grease a problem?

- Fats are among the more stable of the organic compounds and are not easily decomposed by bacteria.
- Fats coat, congeal and accumulate on pipes, pumps, and equipment and sometimes obstruct sewer lines.

Improperly disposed grease waste overflowing from a sewer

How to properly dispose of grease and oil

Residual fats, oils and grease (FOG) are byproducts that food service establishments must constantly manage. Typically, FOG enter a facility's plumbing system from dish washing, floor cleaning and equipment sanitation. Sanitary sewer systems are neither designed nor equipped to handle the FOG that accumulates on the interior of the municipal sewer collection system pipes. The best way to manage FOG is to keep the material out of the plumbing systems. The following are suggestions for proper FOG management:

Spill prevention

- Empty containers before they are full to avoid spills.
- Use a cover when transporting grease trap contents to rendering barrel or grease dumpster.
- Provide employees with the proper tools (ladles, adequate containers, etc.) to transport materials without spilling.

Dry clean-up

- Use rubber scrapers or paper towels to remove fats, oils and grease from cookware, utensils, chafing dishes, and serving ware.
- Use food grade paper to soak oil and grease under fryer baskets.
- Use paper towels to wipe down work areas. Cloth towels will accumulate grease that will eventually end up in your drains from towel washing/rinsing.

Maintenance

- Contract with a management company to professionally clean large hood filters.
- Collect fryer oil in an oil rendering tank for disposal or transport it to a bulk oil rendering tank instead of discharging it into a grease interceptor or waste drain.

Grease Traps

- A grease trap captures grease waste and holds it until a rendering company can properly dispose them.
- Grease traps must be cleaned on a continual basis if they are to be effective.
- Backups, odors and drainage problems are signs that the grease trap is not functioning as it should.

Wanted: Your drain's worst enemy

通缉： 下水道天敌--- 油脂魔怪

the Grease Goblin

Last seen
loitering in sinks and drains
最终滞留于洗涤槽和下水道里

Wanted for
causing sewer overflows
原因：导致排水道溢满

This publications has been adapted with permission from a publication by the North Carolina Pollution Prevention and Environmental Assistance Program

Don't feed the Grease Goblin!

YES

- ✓ **Put oil and grease in collection containers with lids**
  将油和油脂物放入有盖子的容器中
- ✓ **Remove oil and grease from kitchen utensils, equipment, and food preparation areas with scrapers, paper towels & brooms**
  用刮刀,纸巾或扫帚将厨房餐具，设备和备放食物处上的油脂去除掉
- ✓ **Keep grease out of wash water**
  使油脂远离洗涤水
- ✓ **Place food scraps in collection containers**
  将残余食物放入容器中

NO

- ⊘ **Pour oil and grease down drains**
  将油脂倒入下水道里
- ⊘ **Wash fryers, griddles, pots, pans, and plates with water until oil and grease are removed**
  在油脂去除之前用洗涤剂清洗煎锅，烤架，平底锅 和盘子
- ⊘ **Use hot water to rinse grease off surfaces**
  用热水冲洗表面上的油脂
- ⊘ **Put food scraps down drains**
  将残余食物倒入下水道里

Help keep this guy out of drains and in the hands of the proper authorities!

将这个家伙远离于下水道，使之受控于许可之下

Water Services Department
Division of Industrial Waste Control
816-784-1005

Industrial Waste Newsletter

The Kansas City Metropolitan Area
Volume 9, Issue 1 March 2004

Natural Treatment of Wastewater

INSIDE THIS ISSUE:

A new alternative that offers higher performance at lower cost and less operator grief has replaced the steam stripper in treating high-strength, process wastewater. Membrane biological reactors (MBRs) have shown to be highly successful in treating high-strength wastewater within the chemical and pharmaceutical industries.

A MBR consists of two components: a biological reactor tank and an ultrafiltration or microfiltration membrane to retain the biological solids in the tank. This serves as a barrier to keep solids in the tank and provide a clarified effluent stream for discharge. The microbial solids use wastewater pollutants and thus multiply their numbers within the reactor.

MBR technology has expanded to include very difficult industrial wastewater. This is due to its ability to sustain high biomass concentrations and long solids retention times. These times indicate the age of the microorganism in the reactor and dictate the effluent quality of the MBR system. Longer SRTs result in greater treatment levels and a more vigorous system. MBR systems have been highly successful in the treatment of recalcitrant compounds, high influent concentrations, widely varying influent concentrations, and strict effluent quality demands.

To learn more about this technology and to read about three case studies where this has been applied, go to: http://www.eponline.com "Wasterwater Treatment Goes Au Naturel", Water and Wastewater Products E-News

Katherine Katsourides

Tips: Auto Service Industry Water Pollution Prevention

The Texas Commission on Environmental Quality and the Texas Water Utilities Association have offered the following tips to help auto service facilities do their part in protecting water quality:

- Know where your wastewater goes
- Keep vehicle fluids and other hazardous wastes out of the sewer system
- Prevent spills, leaks and drips
- Recycle wash water from engine parts cleaning or exterior washing as much as possible.
- Do not allow wastewater to flow into storm drains
- Recycle motor oil, batteries, solvents, paints, and lubricants
- Use only as much paint and thinner as necessary

For more tips visit: http://www.stevenspublishing.com

Katherine Katsourides

Workplace Hazards, Beyond PPE

Workplace safety is dependent on more than just personal protective equipment (PPE) to keep employees safe. Employers should eliminate this misconceived notion and examine additional controls to protect employees. There is one combination of engineering, administrative, and PPE that is the best safeguards from injuries at the workplace..

Engineering Controls eliminate and reduce exposure to chemical or physical hazards by eliminating the hazard at the source. The facility, equipment, and processes are designed to reduce hazards. In addition, hazards are isolated, removed, and redirected through the use of specialty equipment and controls.

Administrative controls are also important in hazard control. These include specific written operating procedures, work permits, and safe work practices. In addition, limited exposure time, monitoring the use of highly hazardous materials, alarms, job rotation, and training are helpful. Human error can affect administrative controls and therefore they should not be used as the sole source of protection.

Personal protective equipment is the last method to ensure worker's safety. This ranges from respirators, hearing protection, protective clothing, safety glasses, and hard hats. Although often PPE has received the most emphasis in safety, a combination of all three controls is needed for an optimum workplace environment.

Exert from "Workplace Hazards: A Threat to Workers' Senses" in March 2004 issue of Occupational Health and Safety

Katherine Katsourides

Control Methods to Tame Odors

With development booming and urban growth extending into secluded areas, wastewater treatment plants are not isolated as they once were. Odor, which used to be a problem for only those at the facility, is now an issue many others have to face. With wastewater plants being surrounded by neighborhoods, the probability for objection and hard feelings is growing. Wastewater professionals need to be advised on how they can effectively and efficiently solve their odor problems. In order to begin work on eliminating this problems, one must understand the nature and source of wastewater odor.

Odor problems are two-fold; there is liquid-phase odor and vapor-phase odor. Most problems are generated by bacterial activity within the water stream, also know as liquid-phase odor. Compounds are generated when wastewater is conveyed from its inception to the treatment plant. During sewer line travel, wastewater becomes anaerobic because dissolved oxygen gets depleted due to the metabolic processes of wastewater microbes. Under these conditions, sulfated-reducing bacteria thrive. They generate hydrogen sulfide which has a characteristic rotten-egg odor. Hydrogen sulfide is also responsible for corrosion problems and toxic conditions.

Odor control during the liquid phase is generally the easiest and more cost effective to treat. This is done by altering the biological conditions of the wastewater or adding chemicals that control the formation of odor-causing compounds or react with them once they are formed. Current treatments also promote the favorable biological growth.

Atmospheric odors are known as vapor-phase odors and rely on other control strategies. These solutions ventilate and treat the point sources of odor. These are also concentrated on removing hydrogen sulfide. The main methods used to control vapor-phase odor are wet chemical scrubbers, biofilters/bioscrubbers, dry chemical scrubbers and activated carbon adsorbers.

In order to completely eliminate odor and achieve the lowest life-cycle cost, both types of odor-control technology must be utilized. In addition, each method has certain advantages and disadvantages and a strategic combination at sensitive point sources must be developed for each individual situation. The best time to act is before odor related complaints are received. Addressing this issue early has the benefits of:

- Reducing damage and corrosion caused by unseen hydrogen sulfide
- Keeping odor from becoming a public issue and preventing negative attitudes towards the facility
- Early attack gives one the freedom to test various approaches without being under crisis-type time pressure.

To learn more about liquid and vapor phase odors, and current methods of treatment go to http://www.eponline.com, "There's More to Odor Than Meets The Nose."

Katherine Katsourides

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WATER SERVICES
DEPARTMENT

UNIFIED GOVERNMENT
Wyandotte County • Kansas City, Kansas

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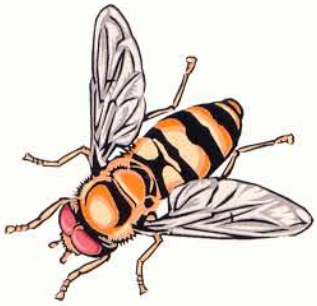

Banning Insecticides Helps Babies

The federal government's ban on two insecticides has impacted newborn babies. In 2000, the federal government banned the household use of chloropyrifos and diazinon, the most common used agents in residential pest control. A study done by Columbia University's Center for Children's Environmental Health has shown that since the ban there has been a significant reduction on the impact of newborns' birth weight and length.

For the study, researchers measured the levels of the two insecticides in blood samples drawn from the umbilical cords of babies after delivery. These samples were taken both before and after the ban and associated with the babies' birth weight and length. The samples were analyzed in spring 2001, summer 2002, and fall 2002. Prior to January of 2001, where the babies contained the highest combined insecticide exposure, they had birth weights averaging half a pound less than infants with no pesticide levels. These babies were also significantly shorter. After January 2001, the impact on birth and weight was no longer apparent. The differences due to pesticides were comparable to the differences present in smoking and non-smoking mothers during pregnancy. This demonstrates an obvious positive effect of the federal ban.

For more information on this article, go to http://www.eponline.com "Study: Federal Ban of Two Insecticides is Helping Newborn Babies."

Katherine Katsourides

Industrial Waste Newsletter

The Kansas City Metropolitan Area June 2004
Volume 9, Issue 2

Inside this Issue:

Sixty Percent Violate Clean Water Act Permits

A report released on March 30, 2004, by the U.S. Public Interest Research Group claims that 60 percent of industrial and municipal facilities exceeded their Clean Water Act permit limits between January 2002 and June 2003. Not only did they exceed their limits, but were in violation by more than 600%. U.S. Representative John F. Tierney states, "This report shows that facilities that are violating the law are doing it in a big way. This is further evidence that now is not the time to cut EPA's enforcement budget. We need to make sure that EPA and States, which have the responsibility for enforcing the Clean water Act, have the resources they need to be able to do their jobs effectively."

The U.S. Public Interest Group also found that nationally, 436 major facilities exceeded their Clean Water Act permit limits for at least 10 of the 18 reporting periods studied. In addition, 35 of those facilities exceeded their permits every reporting period in that time frame. EPA spokeswoman Cynthia Bergman stated that the EPA has a plan underway to address these problems. She stated that the agency is creating a facility watch list to target facilities that have a pattern of "significant noncompliance".

To learn more about this article, go to: "Report: 60 Percent of 'Major' Facilities Violate Clean Water Act Permits", Water and Wastewater Products E-News. www.stevenspublishing.com

Katherine Katsourides

Nonroad Diesel Rule

On May 11, the Bush administration announced the Clean Air Nonroad Diesel Rule. This will cut emission levels from construction, agricultural, and industrial diesel-powered equipment by over 90 percent. In addition, by 2010, 99 percent of the sulfur in diesel fuel will be removed resulting in a dramatic reduction in the soot from diesel engines.

EPA Administrator Mike Leavitt states, "We are going to make that burst of black smoke that erupts from diesels a thing of the past. We're able to accomplish this in large part because of a ... collaboration with engine and equipment manufactures, the oil industry, state officials and the public health and environmental communities."

For more information on the rule, visit http://www.epa.gov/cleandiesel. Excerpt from "EPA Issues Nonroad Diesel Rule", EPA Protection E-News.

Stormwater Pollution Prevention Tips

Storage areas and parking lots contribute trash, hydrocarbons, suspended solids, oil and grease, and heavy metals amongst other things to receiving water through nonstormwater discharges and polluted runoff. The California Stormwater Quality Association's Industrial and Commercial Handbook has compiled a number of tips for properly managing parking and storage areas to prevent pollution.

General Tips:

- Keep parking and storage areas clean and orderly
- Allow sheet runoff to flow into biofilters and/or infiltration devices
- Use sand filters or oleophilic collectors for oily waste in low quantities
- Arrange rooftop drains to prevent drainage directly onto paved surfaces
- Design lot to include semipermeable hardscape
- Discharge soapy water remaining in mop or wash buckets to the sanitary sewer through a sink, toilet, clean-out or wash area with a drain.

Controlling Litter Tips:

- Post "No Littering" signs and enforce anti-litter laws
- Provide an adequate number of litter receptacles
- Clean out and cover litter receptacles frequently to prevent spillage
- Routinely sweep and dispose litter in the trash
- Provide trash receptacles in parking lots to discourage littering

To read more tips consult "Stormwater Pollution Prevention Tips: Parking/Storage Area Maintenance, Part I", Environmental Protection E-News, www.eponline.com

Conserving Water in Cooling Towers

Cooling towers not only consume a great deal of water but also do so inefficiently. The *Water Conservation Guide for Commercial, Institutional, and Industrial Users* lists effective tips to improve the efficiency of cooling towers by reducing water lost.

- Operate bleed-off on a continuous basis - With the traditional "batch" method, cooling towers are bled-off when the mineral concentration, measured as conductivity, reaches a specified level. Large quantities of water are released for a preset period of time until the conductivity reaches a preset low level. Using a continuous basis prevents wide fluctuations in conductivity which wastes water.

- Install conductivity and flow meters— Utilization of this approach allows the operator to closely monitor water use and verify optimum parameter operation.

- Read meters regularly— Log make-up and bleed-off consumption in addition to dissolved solid concentration, evaporation, cooling load and concentration ratio.

- Addition of an automatic control—This will shut off a unit when not in use.

- Selection of treatment vendor—Note to the vendor that water concentration is a priority and ask for estimations of treatment costs and water volumes

- Adjust pH with sulfuric acid—Lowering the pH converts scale-forming minerals into a more soluble form. Water consumption may be reduced up to 25 percent. Note that lowering pH, may result in the need for a corrosion inhibitor.

- Installation of sidestream filtration– Bypassing cooling tower water through a sand filter or high-efficiency cartridge improves water quality by eliminating airborne contaminants and water cloudiness. This lowers the possibility of clogging thus cutting down the need for maintenance.

- Treating water with ozone—Ozone kills many viruses and bacteria and can control corrosion by oxidizing inorganics and soluble ions.

- Recycling and reusing– Bleed-off water can be utilized elsewhere in the plant.

- Exploring other options—Other methods are available to dislodge mineral deposits and scales without the use of chemicals. Some vendors claim that magnets and electrostatic field generators work well.

For more information and tips: "Tips: Conserving Water Used in Cooling Towers, Part I", Environmental Protection E-News, www.stevenspublishing.com

Congratulations MWEA Platinum Award Winners

Aventis Pharmaceuticals

Bioproducts

Georgia Pacific Corporation

Inter-State Studio, Inc.

Positronic Industries, Inc.

RMF Steel Company

Sierra Bullets, Inc.

Tyson Foods, Inc.

UniFirst Corporation

US Plating & Surface Finishing

Wire Rope Corporation of America, Inc.

Applying for a Storm Water Permit

Following are the most common questions and answers concerning storm water permits...

Q: How can I determine if my business is required to have an NPDES storm water permit?
A: Storm water regulations use the Standard Industrial Classification (SIC) to identify industries covered under the law. MDNR's technical bulletin, "The Storm Water Issue", can be found at http://www.dnr.mo.gov/oac/pub223.pdf

Q: How can I determine the SIC code of my business?
A: The code classification system can be found at http://www.osha.gov/oshstats/sicser.html

Q: How do I apply for a general storm water permit?
A: The general permit application Form E and permit fee should be sent to the department's regional office that serves your county. Form E can be found at http://www.dnr.mo.gov/oac/forms/780-0795.pdf and the regional offices are located at http://www.dnr.mo.gov/regions/regions/htm

Q: How do I know what the permit fee will be?
A: Permit fee information can be found at http://www.dnr.mo.gov/wpscd/wpcp/permits/permit-fee-sheet/pdf.

For more information: "Industrial Storm Water Permits –FAQs", *MDNR Tap Into DNR*, Vol.9 No.1 Spring 2004

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Annual Seminar

Date: July 21, 2004
Location: To Be Announced
Topic: Water Reuse/Reduction

More information to be announced.

Industrial Waste Newsletter

The Kansas City Metropolitan Area
Volume 9, Issue 3

September 2004

Inside This Issue:

MISSOURIANS MANAGING E-WASTE

Did you know that hazardous electronics intended for disposal are subject to state and federal hazardous waste regulations? What is commonly referred to as "e-waste" includes printed circuit boards, computer monitors, laptops and other metallic components. However, hazardous electronics intended for legitimate use/reuse may be exempt according to 40 CFR 261.2(e).

Consumers, collectors, transporters, and recyclers need to be aware of what regulations apply to them. The Missouri Department of Natural Resources provides a list of recyclers in Missouri and what they will collect. This list is available at http://www.dnr.state.mo.us/alpd/swmp/rrr/computerlist.htm

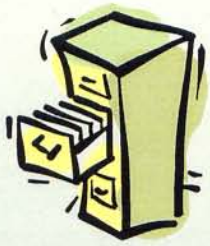
For more information on Electronics Management Requirements and Options for Missouri: http://www.dnr.state.mo.us/alpd/swmp/rrr/Electronics%20Options%20for%20Missouri.pdf

NEW SPCC DEADLINE

The EPA has set new deadlines for meeting certain requirements of the spill prevention, control, and countermeasure (SPCC) program. The Agency was forced to issue clarifications of the requirements in the first half of 2004. These pertained to 2002 amendments. The following deadlines have been issued to onshore and offshore facilities:

- Facilities in operation on or before August 16, 2002, should amend their plans to compliance by February 17, 2006, and implement their plan no later than August 18, 2006.
- Facilities that have become operational between August 16, 2002, through August 18, 2006, and have a discharge as described in 40 CFR 112.1(b) must have their SPCC plan ready and implemented by August 18, 2006.
- Facilities that become operationally after August 18, 2006, and have a discharge as described in 40 CFR 112.1(b) must have an SPCC plan prepared and implemented before they begin operation.

Except from The Environmental Manager's Compliance Advisor, "New SPCC Deadlines Official", Sept. 6, 2004, Issue 622, Pg. 1.



MISUNDERSTOOD REGS

Often environmental, health, and safety managers sign hazardous waste manifests as routine practice not clearly informing themselves of the shipment or what in fact makes the material hazardous. Also commonly, the individual most knowledgeable in the chemical hazards and how to respond, is not the one required to sign the manifest. If this is the case, your company may be in violation of the Department of Transportation's hazardous material regulations and EPA's manifesting requirements for shipping hazardous waste. According to the EPA, anyone who signs the manifest/shipping papers must "have actual knowledge of the facts specified in the generator's certification." In addition, the shipper's certification requirements for hazardous materials apply to each person who offers a hazardous waste for transportation. The EPA feels that the extent of ones knowledge should include, at a minimum, successful completion of the training requirements for hazardous materials employees specified in 49 CFR Part 172, Subpart H. This enables one to know if the waste has been properly classified, described, packaged, marked or labeled and determine if the waste shipment is in proper condition for transportation.

Except from The Environmental Managers' Compliance Advisor. "Most Misunderstood Reg." Sept 6. 2004. Issue 622. Page 9.

CONCERNED ABOUT FLOODING IN THE BROOKSIDE AREA?

The City of Kansas City, Missouri will be implementing the Brookside Watershed Improvement Program. This public improvement will reduce flooding and sewage backups in the Brookside area. The improvement program is a public investment of over $17 million to construct improvements to the storm drainage and sanitary sewer systems. The project is being funded through city sales tax dollars through the Public Improvement Advisory Committee (PIAC), revenue from sewer rates and through the State of Missouri Revolving Loan fund.

After rainfall in this area, sanitary sewage backs up into the basements of some homes and businesses. The reason this happens is because interconnection points connect the sanitary sewer and stormwater drainage system. These interconnections were added to the existing sanitary sewer lines to relieve local sewer problems. However, sanitary sewers were not designed to carry both stormwater and sewage. Today, the practice of installing interconnects is illegal by the "Clean Water Act" (1987).

The Brookside Watershed Improvement Program is broken into five (5) phases. The following is a brief update detailing the status of each phase:

Phase 1: Local Repairs in Brookside and Crestwood were completed in Spring 2002 on schedule.
Phase 2: Huntington Relief Sewers design is complete. Bids were opened on July 20th. Construction is scheduled to begin Fall 2004 with anticipated completion in Spring 2006.
Phase 3: Brookside Neighborhood Improvements survey work, soil drilling and sampling are complete and final design is significantly complete. Anticipated construction is Summer 2006-Spring 2008.
Phase 4: Crestwood Neighborhood Improvements surveying is complete. Soil drilling and sampling will begin Fall of 2004. Final design is underway. Anticipated construction is Summer 2005-Fall 2006.
Phase 5: Brookside Interceptor preliminary design has begun. Soil drilling and sampling design will begin Fall 2004. Anticipated construction is Summer 2007-Spring 2012. The Brookside Main Relief Sewer is expected to be constructed in phases to match available funding.

Excerpt from www.kcmo.org. "Brookside Watershed Improvement Program."

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PSTIF COVERAGE CANCELS WHEN PROPERTY IS SOLD

Tank Owners Beware: When you sell your tanks, your Petroleum Storage Tank Insurance Fund (PSTIF) insurance protection automatically ends. You have the option of either continuing liability protection into the future by purchasing an extended reporting period. But once you are not longer the tank owner, you have no insurance.

Recently, an owner sold his convenience store, but failed to inform the PSTIF. The new owner failed to buy coverage at the time of the sale. When a leak subsequently occurred, no one had insurance coverage. Don't let this happen to you! Contact the PSTIF in advance of any property transactions.

Excerpt taken from Latest Leaks "PSTIF Coverage Cancels When Property is Sold." August 2004. Vol. 7 Issue 4.

Industrial Waste Newsletter

The Kansas City Metropolitan Area
Volume 9 Issue 4

December 2004

Inside This Issue:

Effect of Drugs in Wastewater

Have you ever wondered what happens to antibiotics and other medicine after they perform their work and end up in the waste stream? The National Institute of Standards and Technology has been experimenting as to what happens to pharmaceuticals when they react with chlorine found in waste water treatment. The concerns include possible damage to the environment, animals, or people from bioactive compounds. Chemists studied four pharmaceuticals and found that the reactions were complicated and produced several products. For example, acetaminophen formed multiple products, several of which were highly toxic and it was identified that all the drugs transformed significantly. The effects of these reactions are still being researched to determine if they pose any health or environmental hazards.

From: "Water and Wastewater Products", www.stephenspublishing.com

Coming Clean at the Office

Germ Facts:

- Phones have up to 25,127 germs per square inch
- Keyboards have up to 3,295 germs per square inch and computer mice 1,676 per square inch
- Desks, phones, door knobs, conference tables and other office workplace areas can be breeding grounds for bacteria-spreading germs
- Germs are spread by hand-to-hand contact, but those same hands touch a variety of surfaces in the workplace

Hands-On Tips for Employees:

- Routinely wash your hands with soap, several times throughout the day (including before and after lunch, and after using the restroom).
- Wash your hands vigorously for at least 20 seconds.
- Keep surface cleaner, disinfecting spray, or sanitizing wipes handy for wipe-downs of common items touched.
- Clean your office and restroom doorknobs regularly (the disinfecting spray or wipes would work great)

If you are SICK, stay home!

For more information visit: www.stephenspublishing.com/stephens/ohspub.nsf

Warm Office Linked to Higher Productivity

Chilly workers not only make more errors, but cooler temperatures could increase a worker's hourly labor cost by 10 percent. According to studies done at Cornell University, when the office temperature in a month-long study increased from 68 to 77 degrees Fahrenheit, typing errors fell by 44 percent and typing output jumped 150 percent. The study was done to explore the correlation between changes in the physical environment and worker performance. The results also suggested that raising the temperature to a comfortable thermal zone saves employers about $2 per worker, per hour. The study concluded that temperature is a key variable that can impact performance. For more information visit: "Warm Offices Linked to Fewer Typing Errors, Higher Productivity" at www.stephenspublishing.com/stevens/ohspub.nsf.

Pollution Prevention and Source Reduction

According to the EPA, the following statements define pollution prevention and source reduction:

Pollution prevention is defined as:

> *A "source reduction," as defined under the Pollution Prevention Act, and other practices that reduce or eliminate the creation of pollutants through increased efficiency in the use of raw materials, energy, water, or other resources, or protection of natural resources by conservation.*

"Source reduction" is defined as any practice that:

> *reduces the amount of any hazardous substance, pollutant, or contaminant entering any waste stream or otherwise released into the environment (including fugitive emissions) prior to recycling, treatment, or disposal; and reduces the hazards to public health and the environment associated with the release of such substances, pollutants, or contaminants.*

So how can your business benefit from pollution prevention?
In April of 2002, EPA announced that federal funds were allocated through the Pollution Prevention Incentives for States (PPIS) program. PPIS encourages State, tribal, territorial, and regional-based programs that address the reduction or elimination of pollution across all environmental media: air, land, and water. EPA requires participating agencies to design individual measurement programs to follow up on assessments, to track technical assistance efforts, and to track action on web sites.
The services are offered to companies are web sites, on-site visits/training, and technical assistance. Areas of improvement can include: reduced toxic emissions to air, water, or land; gallons of clean water saved; tons of solid waste eliminated from entering our landfills through recycling or source reduction (reported separately); million metric tons of CO_2 emissions reduced; energy saved in BTU's per year; number of firms served (at workshops, on the phone, at assessments, etc.); dollars saved through the programs; and, other measures that would be appropriate to specific proposals.
For further information regarding participating pollution prevention incentives and programs, visit www.epa.gov/region7/index.htm.

The Kansas City Metropolitan Area

1001 Harrison Street
Kansas City, MO 64106
Phone: 816-784-1009
Fax: 816-784-1015
Email: katherine_katsourides@kcmo.org

The Kansas City Metropolitan Area **Industrial Waste Newsletter** is a periodic publication of the two "Kansas Cities." Letters and articles from its readers are encouraged. We reserve the right to edit or reject submissions. Articles, suggestions, comments and requests to be included on the mailing list may be submitted to Katherine Katsourides, 1001 Harrison St., Kansas City, MO 64106 (816-784-1009) or Scott Craig, Water Pollution Control, 50 Market Street, Kansas City, KS 66118 (913-371-4240). If you have an event you would like displayed on the calendar, call Katherine Katsourides.

Semi-Annual Seminar

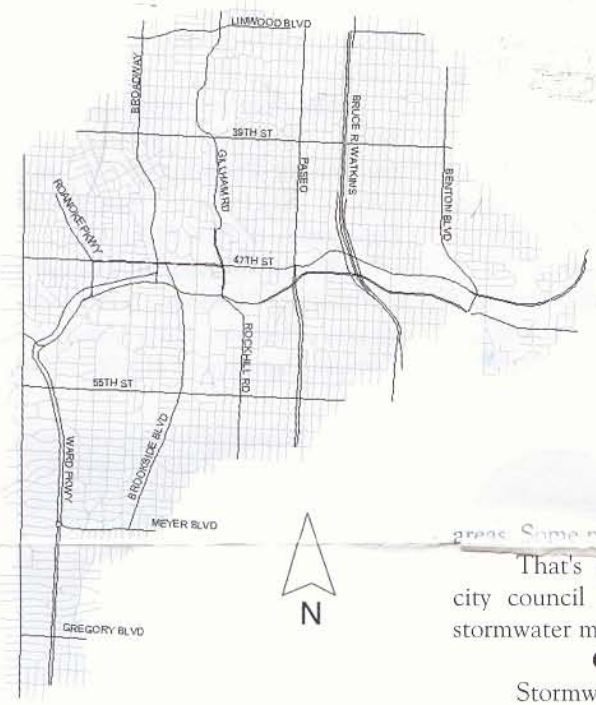
Date: January 26, 2005
Location: 1001 Harrison Street, KCMO
Topic: The Effects of Discharges on the Collection System and Treatment Plant

More information to be announced.

KCMO
WATER SERVICES
DEPARTMENT
4800 E. 63rd Street
Kansas City, MO 64130
www.kcmo.org

Stormwater puts Northland Watersheds in the Spotlight

Brush Creek Watershed



YOU'RE INVITED

Has stormwater affected your home or business? Kansas City needs your input. You are invited to a public meeting on managing stormwater in the Brush Creek watershed.

When: Thursday, June 17, 2004
Where: Missouri Department of Conservation Discovery Center - 4750 Troost Ave.
Schedule: 7 - 9 pm including a Q&A session
Sponsor: Kansas City, Missouri Water Services Department

Impassable bridges. Streets under water. Washed out roads and underpasses.

Stormwater can bring damage and even devastation to low-lying areas. It can also result in personal injury and financial loss.

In the past 10 years, the metro area has suffered from several so-called 100-year or even 500-year floods. They severely damaged some residential and business areas. Some people were at risk or worse.

That's why Kansas City, Missouri's city council has put a high priority on stormwater management.

Gravity rules

Stormwater always takes the easiest path downhill, regardless of what's in the way. Decades ago, farm fields and open areas absorbed much water. Creeks were free-flowing.

Today acres of roofs, parking lots and streets shed rain. More stormwater rushes downhill. Upstream factors, such as development, land use policies and zoning, directly affect downstream flooding and runoff.

Kansas City has been divided into 35 watersheds, the area that drains into a creek, stream or river. Twenty-one of them are in the Northland, the other 14 south of the Missouri River. Watershed assessment and planning are underway, including Brush Creek.

Urban Beauty

The Brush Creek Watershed consists of approximately 7,800 acres (12 square miles) extending from State Line on the west to the confluence of the Blue River on he east. The watershed extends to 31st Street on the north and 75th Street on the south. The watershed is bordered by town Fork Creek on the south. (this major tributary is not included in the study). Brush Creek flows out of Johnson County, Kansas draining approximately 13 square miles of urban area on the Kansas side.

Within Kansas City, the watershed is completely developed and much of the area is is served by combined sewers.

This study includes about 35 miles of

enclosed sewers in 12 major sewers systems and 1.6 miles of open channel.

- homes and businesses
- commercial areas
- greenways and parks

Hydrologic and field studies of the watershed is being conducted by Larkin Engineers Group. They are part of a city-wide stormwater planning process being conducted by Kansas City's Water Services department.

But more information is needed: Residents' experiences with flooding and stormwater. A public meeting will be held on June17, to share information and get input. Once all studies are completed and comments from the public meeting are compiled, Larkin Engineers Group, will evaluate options. From that analysis will come recommendations for city review.

Following "FOCUS"

In 1997, Kansas City completed its 25-year blueprint for the future. "Forging Our Comprehensive Urban Strategy" (FOCUS) was the result of a lengthy, city-wide, citizen-driven planning process. Elements of FOCUS included:

- ✓ 14 Principles for Policy such as "Reaffirm and revitalize the urban core," "Strengthen neighborhoods," "Respect diversity," and "Build metropolitan leadership and regional cooperation."
- ✓ The Northland Plan, which is part of a larger physical environment. "Protecting the natural environment and current character of the Northland are fundamental to the plan." For details see the city's Focus website at www.kcmo.org/planning.nsf/focus>.

Because many watersheds include the surrounding cities of Kansas City, Gladstone, Avondale, Randolph, Birmingham and North Kansas City, it offers an excellent opportunity to carry out FOCUS' Principles for Policy. For example, Kansas City staff and consulting engineers have established ongoing communications with those cities. These communications are just another way of carrying out FOCUS in the Northland.

Plans that get results

Kansas City is committed to stormwater management. Work has started with detailed studies of the city's watersheds. Engineering studies, information from neighboring cities, and input from the public will help planners evaluate alternative approaches. All steps reflect the principles and plans adopted in FOCUS, the city's 25-year blueprint.

The desired outcome? Prudent, affordable stormwater management that protects residents, businesses and the environment.

For further information, contact Terry Godard, project manager, Stormwater Planning & Design, Kansas City, Missouri Water Services Department at 816-513-0353.

For public meeting information, contact Colleen Newman, public information officer, Kansas City, Missouri Water Services Department at 816-513-0232.

Frequently asked questions

Q: How much will stormwater management cost me as a resident or business owner?

A: That will depend on final recommendations, not expected until mid-2005.

Q: How will stormwater management help my neighborhood?

A: The final plans will address street and underpass flooding, inadequate culverts, bridges and more. Those improvements will help traffic and pedestrians get to and from homes and businesses safely.

Q: How much input do citizens have into Brush Creek watershed stormwater management planning?

A: Residential surveys regarding the watershed were conducted in the Fall of 2003. Two public meetings are being held. The first, on June17, 2004 will share information and gain input. The second will be held later in 2004 to present alternatives.

Q: Where is the Brush Creek Watershed located?

A: The Brush Creek Watershed consists of approximately 7,800 acres (12 square miles) extending from State Line on the west to the confluence of the Blue River on the east. The watershed extends to 31st Street on the north and 75th Street on the south. The watershed is bordered by town Fork Creek on the south. (this major tributary is not included in the study).

Q: Why is there more stormwater flooding now than in earlier years?

A: New roofs, parking lots and streets have outstripped Mother Nature's ability to absorb stormwater. Also, the Metro area is experiencing 100-year and 500-year floods more frequently than before.

Q: What is a combined sewer?

A: Combined sewer systems (CSOs) were designed and installed into the city sewer system 100 years ago. CSOs were designed to transport sanitary sewage and rainwater to a wastewater treatment plant. However, during heavy rainfalls, the CSOs were designed to discharge into nearby streams and rivers without receiving treatment.

What is a Watershed?

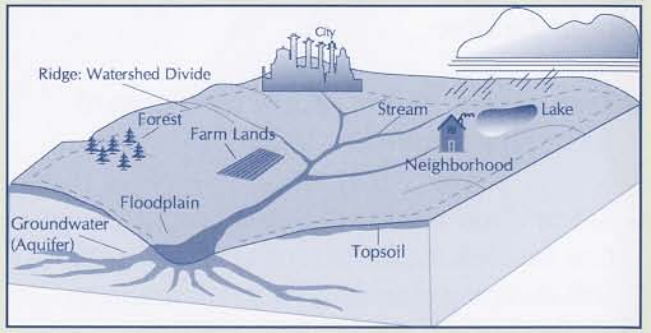
A watershed is an area of land that drains to a common point, such as a nearby creek, stream, river or lake. Every small watershed drains to a larger watershed that eventually flows to the ocean.

Watersheds support a wide variety of plants and wildlife and provide many outdoor recreation opportunities. Protecting the health of our watersheds preserves and enhances the quality of life for Kansas City area residents.

What is Stormwater Runoff?

Stormwater is water from rain or melting snow. It flows from rooftops, over paved streets, sidewalks and parking lots, across bare soil, and through lawns and storm drains. As it flows, runoff collects and transports soil, pet waste, salt, pesticides, fertilizer, oil and grease, litter and other pollutants. This water drains directly into nearby creeks, streams and rivers, without receiving treatment at sewage plants.

Polluted stormwater contaminates local waterways. It can harm plants, fish and wildlife, while degrading the quality of water.



A typical watershed system

MARC

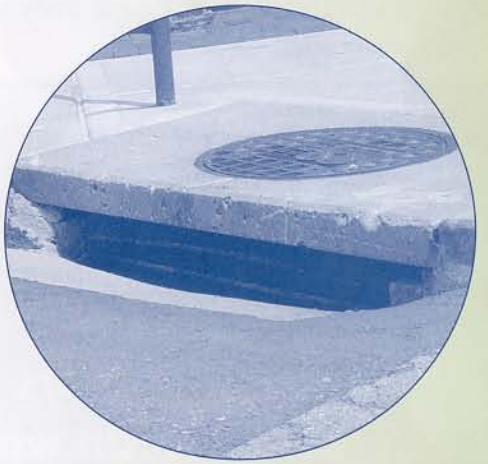
Mid-America Regional Council
600 Broadway, Suite 300
Kansas City, Missouri 64105

For more information, visit www.marc.org/water or call 816/474-4240.

Storm Drain Stewardship

Summer Watershed Tip

Only rain should go down storm drains.



Good Neighbors Care

The Facts About Storm Drains

What is a Storm Drain?

Storm drains are the metal grates found on urban and suburban streets, often at corners and on the sides of curbs and gutters. They help prevent flooding by draining rainwater and melted snow off of streets and other paved surfaces.

Is a Storm Drain System the same thing as a Sanitary Sewer System?

Sewer systems and storm drain systems are not the same. The water that goes down a sink or toilet in your home or business flows through a sewer system to a wastewater treatment plant where it is treated and cleaned. Water that flows down a driveway or street and into a gutter goes into a storm drain which goes directly to a natural body of water, ***untreated***.

What's the Problem?

While storm drains were designed to divert water from streets, they become dangerous water polluters when harmful substances from lawns and streets flow through them.

During a rainfall, water runs down streets and through yards, picking up substances along the way. This "runoff" often contains elements that pollute our waterways, can harm wildlife, and degrade water quality.

Water that enters storm drains is *not* cleaned at a wastewater treatment plant before it flows directly to streams, rivers and lakes.

Some common contaminants in stormwater include lawn chemicals, pet waste, household chemicals like paint, and soaps used for washing cars. Products advertised as "non-toxic" or "biodegradable" are not typically safe for our waterways either — even small amounts of dirt entering storm drains can affect the water quality.

These small amounts of pollution can add up to a big problem when it comes from an area the size of the Kansas City region. Each storm drain can have harmful effects on wildlife, recreation and forestry.

**THIS DRAIN FOR RAIN.
FLOWS TO STREAM.**

What Can You Do?

To help prevent stormwater pollution follow these simple tips:

- ***Use lawn chemicals safely.*** Always follow label instructions and never apply before rain or watering the lawn, unless directed.
- ***Pick up after your pets.*** When walking your pet, remember to bring extra bags to pick up and dispose of waste properly.
- ***Recycle used oil.*** Never place used motor oil in the trash or pour down storm drains. Visit www.marc.org to find the nearest oil recycling center.
- ***Sweep driveways and sidewalks clean.*** Remove debris and residue that could end up in a storm drain from concrete and paved areas around your house
- ***Wash your car the right way.*** Either wash your car at a car wash that filters the wastewater, or wash your car in a grassy area. Avoid washing your car on a driveway or in the street.
- ***Don't dump.*** Never discard trash or yard waste down storm drains or in the street.
- ***Storm drain marking.*** Join or start a group that attaches markers or paints stencils with anti-dumping messages on storm drains to remind citizens where the water flows.

What is a Watershed?

A watershed is an area of land that drains to a common point, such as a nearby creek, stream, river or lake. Every small watershed drains to a larger watershed that eventually flows to the ocean.

Watersheds support a wide variety of plants and wildlife and provide many outdoor recreation opportunities. By protecting the health of our watersheds we can preserve and enhance the quality of life for Kansas City area residents.

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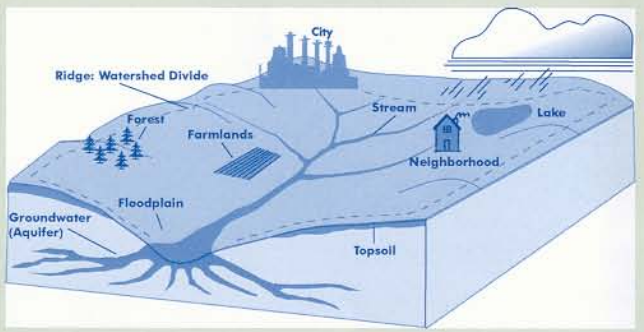
Stormwater is water from rain or melting snow. It flows from rooftops, over paved streets, sidewalks and parking lots, across bare soil, and through lawns and storm drains. As it flows, runoff collects and transports soil, pet waste, salt, pesticides, fertilizer, oil and grease, litter and other pollutants. This water drains directly into nearby creeks, streams and rivers, without receiving treatment at sewage plants.

Polluted stormwater contaminates streams, rivers and lakes. It can kill or damage plants, fish and wildlife, while degrading the quality of our water.



A typical watershed system

For more information, visit www.marc.org/water or call 816/474-4240.

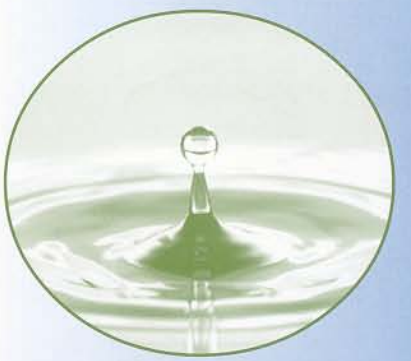
MARC
Mid-America Regional Council
600 Broadway, Suite 300
Kansas City, Missouri 64105
www.marc.org

Printed on 30% Recycled Material

Pick Up After Your Pet

Summer Watershed Tip

If not disposed of properly, pet waste flows directly into waterways, untreated



Good Neighbors Care About Clean Water

Facts About Pet Waste

Every time it rains the potential exists for thousands of pounds of pet waste to wash down storm drains and into streams, rivers and lakes. If not disposed of properly, pet waste flows directly into nearby streams and creeks without being treated at wastewater treatment facilities.

Pet waste can contain bacteria that threaten the health of animals and people, especially children. Pet waste also contains nutrients that encourage excess weed and algae growth. This water then becomes cloudy and green — unattractive for swimming, boating and fishing. Excess nutrients are a major cause of water quality decline.

When pet waste is washed into lakes and streams, the waste decays, using up oxygen and sometimes releasing ammonia. Low oxygen levels and ammonia combined with warm temperatures can kill fish and other aquatic life.

Good neighbors care about clean water

What's the Problem?

A recent USGS study of streams and creeks in the Kansas City region showed that bacteria associated with pet waste was the source of approximately one-quarter of the bacteria in samples collected from local waterways.

When pet waste is disposed of improperly, water quality isn't the only thing that suffers — your health may be at risk, too.

Pets, children playing outside, and adults gardening are most at risk for infection from some of the bacteria and parasites found in pet waste. Diseases that can be transmitted from pet waste include the following:

Salmonellosis: the most common bacterial infection transmitted to humans by other animals. Symptoms include fever, muscle aches, headache, vomiting and diarrhea.

Toxocariasis: roundworms usually transmitted from dogs to humans, often without noticeable symptoms, but may cause vision loss, a rash, fever or cough.

Toxoplasmosis: a parasite carried by cats that can cause birth defects if a woman becomes infected during pregnancy, and can also be a problem for people with depressed immune systems.

Many of our local waterways do not meet state water quality bacteria standards for recreational use. Pet waste is one of the components of non-point source pollution that contributes to our water quality problems, and is one that each of us can help correct.

MARC

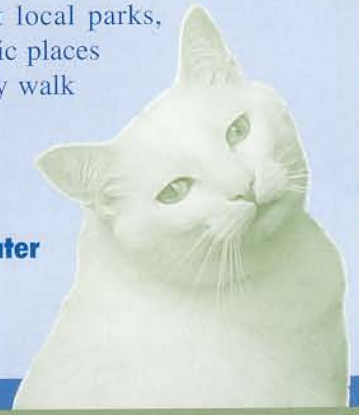
What Can You Do?

Pet waste should never enter storm drains and surface water. Many local communities require pet owners to pick up after pets when away from their property, and to pick up waste from their property if it attracts flies and can pose a health risk.

Fortunately, there are actions pet owners can take to help keep our water clean:

- Pick up pet waste from your yard. It is not a fertilizer.
- Carry disposable bags while walking your dog to pick up and dispose of waste properly. If you dispose of pet waste in the trash, wrap it carefully to avoid spillage during collection.
- Flush your pet's waste down the toilet, so it can be treated at a sewage treatment plant.
- Bury pet waste in your yard, at least 12 inches deep and cover with at least eight inches of soil to let it decompose slowly. Bury the waste in several different locations and keep it away from vegetable gardens.
- Communities are encouraged to provide pet waste disposal bags at local parks, along trails and in public places where people frequently walk their dogs.

For more information, visit www.marc.org/water or call 816/474-4240.



Wilkerson Creek Watershed

Decades ago, Kansas City had acres of open space and streams that ran freely. Then came development. Homes, businesses, retail centers, industrial and commercial sites were built and empty land became scarce. Thousands of roofs, acres of parking lots and miles of streets shed more stormwater than ever before.

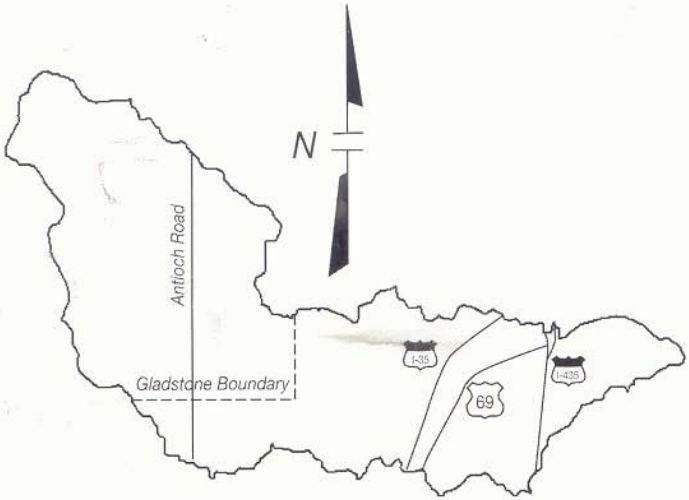
Many neighborhoods and areas got flooded after big rains. Bridges and underpasses were impassable. Residences and businesses were damaged. In some cases, personal risk increased.

Kansas City's Council has put a high priority on stormwater management. Watershed studies are now being conducted in your watershed. Survey crews will be collecting data throughout the Wilkerson Creek Watershed that will be later compiled into a complete watershed study that will identify options for potential improvements.

KCMO
WATER SERVICES DEPARTMENT

For technical information, contact Ruth Turner, manager, Stormwater Planning & Design, City of Kansas City, Missouri, at 816-513-2132. Or check out website at www.kcmo.org/water/home/htm.

YOU'RE INVITED



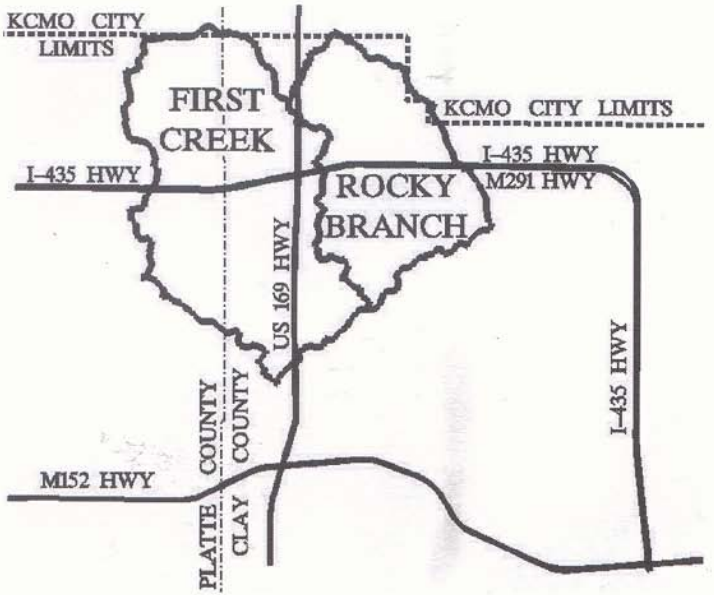
Has stormwater affected your home or business? Watershed master plans will help to guide future development and protect stormwater quality. Kansas City needs your input. You are invited to a public meeting on managing stormwater in the Mill Creek watershed.

When: Thursday, June 24, 2004
Where: Antioch Community Church
4805 NE Antioch Road
Schedule: 7 - 9 pm including a Q&A session
Sponsor: Kansas City, Missouri
Water Services Department

For further information, contact Ruth Turner, project manager, Stormwater Utility Division, Kansas City, Missouri Water Services Department at 816-513-0363.

For public meeting information, contact Colleen Newman, public information officer, Kansas City, Missouri Water Services Department at 816-513-0232.

YOU'RE INVITED



***Meeting Rescheduled**
Please note the new location.

Has stormwater affected your home or business? Watershed master plans will help to guide future development and protect stormwater quality. Kansas City needs your input. You are invited to a public meeting on managing stormwater in the Rocky Branch and First Creek watersheds.

When:	Wednesday, March 10, 2004
Where:	Shoal Creek Elementary School 9000 NE Flintlock Rd.
Schedule:	7 - 9 pm including a Q&A session
Sponsor:	Kansas City, Missouri Water Services Department

For public meeting information, contact Colleen Newman, public information officer, Kansas City Water Services Department at 816-513-0232. For further technical information, contact Mohsen Mahoutchian project manager, Stormwater Utility Division, Kansas City Water Services Department at 816-513-0359.

"Working for the Blue"

--AGENDA--

Date: Thursday May 20, 2004
Time: 8:30 a.m. to 4:30 p.m.

Location: OP Convention Center
Overland Park Convention Center
6000 College Blvd.
Overland Park, KS 66211

Time	Activity	Responsible Party
8:30 – 8:40	Welcome • Purpose of Summit • History leading us up to this point	Dr. Charles Eddy, MARC
8:40 – 8:50	Meeting Kickoff • Overview of the meeting activities • Ground rules • Introductions o Introduce yourself to others at the table o Stand up by group you represent	Sheila Shockey, Facilitator
8:50 – 9:35	What's so great about the Blue River Watershed? • Where are the opportunities & challenges? • Do we have complementary goals?	Vicki Richmond, BRWA & Tom Jacobs, MARC
9:35 – 9:45	**BREAK**	
9:45 – 12:20	Strategy Development	Sheila Shockey, Facilitator

Facilitated small group discussions with participants working to develop specific strategies, answer the following questions and to develop action steps:

- Why is this important?
- How will we go about doing this?
- Who will need to be involved?
- What specifically needs to be done?

Each group will discuss all strategies. Potential strategies include: Watershed planning, stormwater management standards, brownfields redevelopment, multi-purpose projects, riparian corridors, erosion & sediment control, public education/watershed stewardship, trails/neighborhood linkages, habitat restoration, stream restoration, open space preservation, etc.

Time	Activity	Responsible Party
12:20 – 12:30	Prioritize Specific Actions • Most Important • Most Immediate	John Denlinger, Facilitator
12:30 – 1:30	Lunch Provided: Choice of Entertainment	
	A humorous presentation entitled "Who's at Home on the Range?"	Dr. Thorvald Holmes, Jr., Kansas University Natural Museum of History
	OR	
	Take a guided tour of the OP Convention Center Art Collection.	
1:30 to 3:15	Demonstration Projects and Initiatives • Presentations o South Blue River ❖ Subshed Plan/Stream setback o Central Blue River ❖ Confluence Brush Creek/Blue River o North Blue River ❖ Centropolis Loop o Basin-wide ❖ Blue River General Re-evaluation • Sign up for Project/Initiatives Teams	Karin Jacoby, Moderator Eileen Hack, Johnson County Lynda Hoffman, KCMO Marcus Rivas, USEPA Scott Gard, USACE Karin Jacoby, KCMO
3:15 – 3:25	**BREAK**	
3:25 - 3:40	Top 3 Most Immediate and Most Important Actions	Shockey/Denlinger, Facilitators
3:40 – 4:10	Where We Go From Here • Project/Initiative Teams Working Together • Strengthening our Cooperation Framework • Regional Watershed Coordination • Formalizing the Communication Plan	John Grothaus, USACE
4:10 - 4:20	Closing Remarks	Steve Iverson, USACE
4:20 – 4:30	Evaluation Forms	Sheila Shockey, Facilitator
4:30	Adjourn.	

City of Kansas City, Missouri
Wet Weather Community Panel
Meeting # 6
-AGENDA-

Date: Thursday, January 22, 2004

Location: Linda Hall Library
Annex Building
5109 Cherry
Kansas City, Missouri

Time: 3:00 to 5:00 p.m.

Meeting Expectations:

Gain a better understanding of the Wet Weather Program financial considerations.

Timeframe	Activity	Responsible Party
3:00 to 3:10 p.m.	Welcome & Introductions	Allen Muehlher
3:10 to 3:25 p.m.	Overview- Where we are	Allen Muehlher
3:25 to 3:40 p.m.	Expanded Public Education Program	Shiela Shocky
3:40 to 4:10 p.m.	Wet Weather financial Considerations	Jerry Hoffman
4:10 to 4:50 p.m.	Issues Workshop	Sheila Shocky
4:50 to 5:00 p.m.	Next steps and adjourn	Allen Muehlher

City of Kansas City, Missouri
Wet Weather Community Panel
Meeting # 7
-AGENDA-

Date: Thursday, April 15, 2004

Location: Bruce R. Watkins Cultural Heritage Center
3700 Blue Parkway
Kansas City, Missouri

Time: 3:00 to 4:30 p.m.

Meeting Expectations:

Overview of the CSO Long Term Control Plan and SSS Control Plan.

Timeframe	Activity	Responsible Party
3:00 to 3:10 p.m.	Welcome & Introductions	Jim Mellem
3:10 to 3:20 p.m.	Wet Weather Program Overview	Jerry Hoffman
3:20 to 3:30 p.m.	OCP Overview	Jerry Hoffman
3:30 to 3:45 p.m.	CSO LTCP Overview	Hans Holmburg
3:45 to 4:00 p.m.	SSS CP Overview	Dave Anderson
4:00 to 4:10 p.m.	Organization, Schedule and Cost	Jerry Hoffman
4:10 to 4:15 p.m.	Next Steps	Jerry Hoffman
4:15 to 4:30 p.m.	Discussion	Panel

YOU ARE INVITED!!

Water Reuse/Reduction Seminar

There will be several speakers from various industries discussing water reuse/reduction as it is applied in their company. It should be a very informative presentation and hopefully many can attend.

DATE: Wednesday, July 21, 2004
TIME: 8:30 am – 12:00 pm
LOCATION: 1001 Harrison Street
Kansas City, MO 64106

Please RSVP as soon as possible
to Katherine Katsourides, KCMO Water Services
Pretreatment Coordinator at
katherine_katsourides@kcmo.org or at (816) 784-1009

Appendix B

Wet Weather Operating Guidelines

Blue River
Wastewater Treatment Facility

Wet Weather
Operating Guidelines

May 2004

Table of Contents

Section 1 – Introduction

1.1 - Background

This manual contains the Wet Weather Operating Plan for Kansas City, Missouri's Blue River Wastewater Treatment Facility. This is the largest treatment facility serving the majority of the City. The collection system serving the facility contains both sanitary sewers and combined sewers.

1.2 – Goals and Purpose of the Plan

The goals of the Plan are to:

1. Reduce sewer overflows in select areas in the City through operation practices of Blue River Wastewater Treatment Plant.
2. Minimize bypasses at the constructed diversion structures and the treatment facility.
3. Maximize treatment of wastewater in the facility.

The purpose of the Plan is to provide guidelines to facility staff in making operation decisions to meet the goals of the Plan and the requirements of Blue River's NPDES permit.

During a wet weather event, numerous operational decisions must be made to effectively manage storage of the combined storm water and wastewater in the collection system and optimize treatment at the Blue River Wastewater Treatment Plant. Storage is controlled through adjustment of the gates at the Diversion Structure and the NEID Pump Station. Flow rates are determined by the capacity of the plant, the flow entering the NEID Pump Station, and the flow entering the Diversion Structure.

No manual can describe the decision making process for every possible wet weather scenario that will be encountered and include every permutation of process units being out of service for repairs. This manual can, however, serve as a useful reference, which both new and experienced operators can utilize during wet weather events. The manual can be useful in preparing for a coming wet weather event, a source for controlling specific processes during the storm, and a checklist to avoid missing critical steps in monitoring and controlling processes during wet weather. This is to be considered a living document to be revised as experience dictates.

1.3 – Using This Manual

This manual is designed to allow use as a quick reference during wet weather events. It is broken down into sections, which cover major unit processes at the Blue River Wastewater Treatment Facility or major control points in the plant. Each section includes the following information:

- List of unit processes and equipment covered in this section
- Steps to take before a wet weather event and who is responsible for these steps.
- Steps to take during a wet weather event and who is responsible for these steps.

- Steps to take after a wet weather event and who is responsible for these steps.
- Discussion of why recommended control steps are performed.
- Identification of specific circumstances that trigger the recommended changes.
- Identification of things that can go wrong with the process.

Safety of the plant personnel is of primary concern. Consideration must be given to protection of personnel during electrical storms, high winds, and icy conditions. Necessary precautions are to be taken when these conditions are present.

As discussed, this manual is a living document. Users of the manual are encouraged to identify new steps, procedures, and recommendations to add to the descriptions contained herein. Modifications, which improve upon the manual's procedures, are also encouraged. If you have a suggestion for modifications or additions to the manual, mark them on copies of the affected pages and submit them to your supervisor, so they can be considered for insertion in the manual. With continued input from all users of the manual, it will become an even more useful and effective tool.

1.4 - Description of the Blue River Wastewater Treatment Facility

The maximum flow through the plant is limited by the secondary facility. The primary facility has been determined to hydraulically handle a peak wet weather flow of 225 MGD. The secondary facility was determined to have a peak wet weather flow capacity of approximately 104 MGD firm, 138 MGD with all 4 filter trains in operation. The rated capacity of the Blue River Pump Station is 201 MGD firm, 234 MGD with all seven pumps in operation. The rated capacity of the NEID Pump Station is 48 MGD firm, 72 MGD with all three pump running. The total of both Blue River Pumping and NEID Pump station is 249 MGD firm, 306 MGD with all pumps in operation. Blue River Effluent pump station has a rated capacity of 144 MGD firm, 180 MGD with all five pumps in operation. Clearly, the flow must be controlled through the treatment facility with the excess discharged to Blue River.

Diversion Chamber

Following a wet weather event the flow exceeds the capacity of the treatment facility. To prevent the preliminary treatment units from flooding, Gate Valves #1 and #2 in the Influent Diversion Structure are adjusted allowing capacity to enter the plant and to hold the wastewater in the 96" influent line to an elevation of 726' which is the elevation of the first overflow point in the collection area. Prior to this elevation being reached Gate Valve #3 in the Influent Diversion Structure is adjusted to the point that capacity enters the plant through gates #1 and #2, wastewater is held in the line, and the excess flow is diverted to Blue River.

Rock Box

Following the Diversion Chamber the flow entering the plant goes through the Rock Box. Normally the Rock Box is cleaned once a week. The day before a forecasted rain event the rock box is cleaned. The day the rain event occurs the rock box is to be cleaned again and daily thereafter until the day after the rain event. This is not to be done during electrical storms.

Screen House

The wastewater then flows through a parshall flume before entering the screening building. Three of the four mechanical bar screens are placed in constant operation. The screens are checked twice per shift to verify operation and the dumpsters are emptied as necessary.

Blue River – NEID Pumping

The flow then enters Blue River Pump Station to be elevated to the Grit Removal System. The NEID pumpage enters the flow stream on the discharge side of the pumps in the Blue River Pump Station. During high flows the NEID Sewer overflows from a manhole in the intersection of Corrington Avenue and Front Street. To avoid this situation the pumping rate is increased at NEID Pumping and decreased at Blue River Pumping, balanced to maintain plant capacity.

Grit Removal System

The four solids vortex separators have a maximum flow through of 30 million gallons per day each, totaling 120 MGD. During an emergency the old grit channels are available for use. During normal operation the two grit classifiers cycle every three hours. During a rain event the grit classifiers are adjusted to a storm cycle. The length of each cycle is extended. They are returned to normal operation following the wet weather event.

Distribution Chamber / Primary Clarifiers

The grit system effluent flows through the Distribution Chamber enroute to the Primary Clarifiers. The primary effluent flows back through the Distribution Chamber and then to the Primary Junction Box.

Primary Junction Box

The Primary Junction box was designed and constructed with the options of discharging primary clarifier effluent to the river or to Secondary Treatment Pumping or both. The Primary Junction Box contains functional automated sluice gates to control the direction and amount of flow. Discharge to the river from this point is not currently an option.

Secondary Pumping

During normal operation the primary effluent is pumped to the trickling filter towers and flows by gravity through the secondary clarifiers to be discharged in the Missouri River. Under normal conditions two pumps can pump to each trickling filter with a third pump available for recycling. During wet weather flows the recycle pump is turned off.

The Secondary Pumping System piping has been configured to allow a portion of the primary effluent to bypass the trickling filters and be blended with the secondary effluent. This functional option of blending primary and secondary effluent is not currently utilized.

Trickling Filters

During times of low flows the trickling filter effluent is recycled through the filter. As flows increase the recycling pumps are turned off. They are put back in service when the flows return to low dry weather flows.

Effluent Pumping

During high river levels the river gate is closed and the Effluent Pump Station pumps the effluent to the river. The Effluent Pump Station is to be activated at a river level of 29 feet. When the river recedes the river gate is opened and the pumps are taken out of service and the Secondary effluent again flows by gravity to the Missouri River.

Section 2 – Control Room

WHO DOES IT?		WHAT DO WE DO?
SUPERVISORY	IMPLEMENTATION	
Before Wet Weather Event		
CPO	SPO - PO II - PO I	Monitor the weather.
CPO	SPO - PO II - PO I	Monitor levels in NEID and Diversion Structure. Draw the levels down as far as possible prior to a rain event.
CPO	SPO - PO II - PO I	Monitor flows from NEID and Blue River Parshall Flume.
CPO	SPO - PO II - PO I	Check operation and status of Gate 1. Log settings.
CPO	SPO - PO II - PO I	Check operation and status of Gate 2. Log settings.
CPO	SPO - PO II - PO I	Check operation and status of Gate 3. Log settings.
During Wet Weather Event		
CPO	SPO - PO II - PO I	Adjust Gate 1 closed incrementally to control flow into plant.
CPO	SPO - PO II - PO I	Adjust Gate 2 closed incrementally to control flow into plant.
CPO	SPO - PO II - PO I	Adjust Gate 3 open incrementally beginning when maximum flow to Secondary is reached and elevation of influent in the Diversion Chamber reaches 725.5.
CPO	SPO - PO II - PO I	Collect sample of discharge to the river. Record Sample # and pH in the Logbook.
CPO	SPO - PO II - PO I	Monitor flows from NEID and BR Pumping to make sure the maximum amount is being treated and the plant is not being flooded. Monitor bypass, collect sample, and log Sample # and pH in the Logbook.

After Wet Weather Event		
CPO	SPO - PO II - PO I	Adjust Gate 1 open incrementally to release more flow into plant.
CPO	SPO - PO II - PO I	Adjust Gate 2 open incrementally to release more flow into plant.
CPO	SPO - PO II - PO I	Adjust Gate 3 closed incrementally to begin reducing the flow bypassed until bypassing ends.
CPO	SPO - PO II - PO I	Monitor levels and adjust settings on all gates as necessary to maintain maximum flow to the plant and keep elevation below 726.
Why do we do this? The flow into the plant is controlled at this point. Balance the flow to the plant with flow from NEID. Sewer overflows in populated areas are prevented with proper control at this point.		
What triggers the change? Increasing flows in the sewer system trigger the closing of Gates 1 & 2 and opening of Gate 3. Decreasing flows in the sewer system reverse this process.		
What can go wrong? Failure of electric gate valve operators. Erroneous readings in control room of liquid level and gate status thus must be verified at the site. Other process units may be out of service thus reducing the flow that can be accepted by the plant. The appropriate flow must be determined and controlled at this point and at Blue River Pumping.		

Section 3 – Diversion Chamber

WHO DOES IT?		WHAT DO WE DO?
SUPERVISORY	IMPLEMENTATION	
Before Wet Weather Event		
CPO	SPO - PO II - PO I	Check operation and status of Gate 1. Log settings.
CPO	SPO - PO II - PO I	Check operation and status of Gate 2. Log settings.
CPO	SPO - PO II - PO I	Check operation and status of Gate 3. Log settings.
During Wet Weather Event		
CPO	SPO - PO II - PO I	Adjust Gate 1 closed incrementally to control flow into plant.
CPO	SPO - PO II - PO I	Adjust Gate 2 closed incrementally to control flow into plant.
CPO	SPO - PO II - PO I	Adjust Gate 3 open incrementally beginning when maximum flow to Secondary is reached and elevation of influent in the Diversion Chamber reaches 725.5.
CPO	SPO - PO II - PO I	Monitor levels and adjust settings on all gates as necessary to maintain maximum flow to the plant and keep elevation below 726.
After Wet Weather Event		
CPO	SPO - PO II - PO I	Adjust Gate 1 open incrementally to release more flow into plant.
CPO	SPO - PO II - PO I	Adjust Gate 2 open incrementally to release more flow into plant.
CPO	SPO - PO II - PO I	Adjust Gate 3 closed incrementally to begin reducing the flow bypassed until bypassing ends.

CPO	SPO - PO II - PO I	Monitor levels and adjust settings on all gates as necessary to maintain maximum flow to the plant and keep elevation below 726.
Why do we do this? The flow into the plant is controlled at this point. Balance the flow to the plant with flow from NEID. Sewer overflows in populated areas are prevented with proper control at this point.		
What triggers the change? Increasing flows in the sewer system trigger the closing of Gates 1 & 2 and opening of Gate 3. Decreasing flows in the sewer system reverse this process.		
What can go wrong? Failure of electric gate valve operators. Erroneous readings in control room of liquid level and gate status thus must be verified at the site. Other process units may be out of service thus reducing the flow that can be accepted by the plant. The appropriate flow must be determined and controlled at this point and at Blue River Pumping.		

Section 4 – Rock Box

WHO DOES IT?		WHAT DO WE DO?
SUPERVISORY	IMPLEMENTATION	
Before Wet Weather Event		
Maintenance Superintendent	F/M	Clean the Rock box.
During Wet Weather Event		
Maintenance Superintendent	F/M	Clean the Rock Box daily if it is long rain event.

After Wet Weather Event		
Maintenance Superintendent	F/M	Clean the Rock Box.
Why do we do this? To reduce the amount of rocks, grit, and other large debris from entering the plant.		
What triggers the change? Increasing flows in the sewer system will scour heavy material into the plant.		
What can go wrong? If the Rock Box is not cleaned regularly the heavy material will be allowed to enter the screen house and damage or bind the mechanical bar screens. Full dumpsters. Mechanical failure of clamshell or hoist. Lightning Strike – This procedure is not to be performed during an electrical storm.		

Section 5 – Screen House

WHO DOES IT?		WHAT DO WE DO?
SUPERVISORY	IMPLEMENTATION	
Before Wet Weather Event		
CPO	SPO - PO II - PO I	Clean debris from trash racks. Empty trash dumpsters.
CPO	SPO - PO II - PO I	Remove equipment, tools, and debris from lower level.
CPO	SPO - PO II - PO I	Check operation and status of mechanical bar screens.
During Wet Weather Event		
CPO	SPO - PO II - PO I	Periodically check on accumulation of debris on trash racks. Clean if necessary.

CPO	SPO - PO II - PO I	Periodically check on operation of mechanical bar screens in operation. Empty trash dumpsters if necessary.
CPO	SPO - PO II - PO I	Periodically check lower level to make sure it hasn't flooded.
After Wet Weather Event		
CPO	SPO - PO II - PO I	Clean debris from trash racks.
CPO	SPO - PO II - PO I	Empty trash dumpsters.
CPO	SPO - PO II - PO I	Clean lower level if flooded.
Why do we do this? Maintain consistent and maximum amount of flow through the plant.		
What triggers the change? Increase of amount of debris in the flow stream.		
What can go wrong? Failure of mechanical screens. Accumulation of grit or debris in channel. Flooding of lower level and parshall flume due to accumulation of debris, too much flow coming through the Diversion Chamber, or failure of pumps in Blue River Pumping.		

Section 6 – Northeast Industrial District Pump Station (NEID)

WHO DOES IT?		WHAT DO WE DO?
SUPERVISORY	IMPLEMENTATION	
Before Wet Weather Event		
CPO	SPO - PO II - PO I	Check operation and status of Gate 1. Log settings.
CPO	SPO - PO II - PO I	Check operation and status of Gate 2. Log settings.
CPO	SPO - PO II - PO I	Check operation and status of Gate 3. Log settings.

CPO	SPO - PO II - PO I	Check operation and status of Pump 2. Log settings.
CPO	SPO - PO II - PO I	Check operation and status of Pump 3. Log settings.
CPO	SPO - PO II - PO I	Check operation and status of Pump 4. Log settings.
CPO	SPO - PO II - PO I	Clean trash racks and bar screens.
During Wet Weather Event		
CPO	SPO - PO II - PO I	Open appropriate gates to allow maximum flow to be pumped to the primaries but prevent flooding of the screen house basement.
CPO	SPO - PO II - PO I	Turn on appropriate pumps to allow maximum flow to be pumped to the primaries. Maximum flow with 2 pumps running is 48 MGD; with 3 pumps the maximum is 72 MGD.
CPO	SPO - PO II - PO I	Monitor levels and adjust settings on all gates and pumps as necessary to maintain maximum flow to the plant.
CPO	SPO - PO II - PO I	Clean trash racks and bar screens regularly.
After Wet Weather Event		
CPO	SPO - PO II - PO I	Adjust gates to normal settings as influent levels return to normal.
CPO	SPO - PO II - PO I	Return pumps to normal operation as influent levels return to normal.
Why do we do this? Prevent overflows in the Northeast Industrial district by maximizing flow from this area and bypassing from the Diversion chamber. Balance the flow to the plant with flow from Diversion Chamber. Sewer overflows in populated areas are reduced with proper control at this point and the Diversion chamber.		
What triggers the change? Increasing flows in the sewer system trigger the closing of Gates 1, 2, and 3. Decreasing flows in the sewer system reverse this process.		

What can go wrong? Failure of electric gate valve operators. Failure of grinders. Failure of pumps. Accumulation of too much debris on the screens.

Section 7 – Blue River Pumping

WHO DOES IT?		WHAT DO WE DO?
SUPERVISORY	IMPLEMENTATION	
Before Wet Weather Event		
CPO	SPO - PO II - PO I	Check operation and status of Pump 2, 4, 6, and 8. Log settings.
CPO	SPO - PO II - PO I	Check operation and status of Pump 3, 5, and 7. Log settings.
CPO	SPO - PO II - PO I	Check wet well levels.
During Wet Weather Event		
CPO	SPO - PO II - PO I	Turn on appropriate pumps to allow maximum flow to Secondary.
CPO	SPO - PO II - PO I	Monitor levels and adjust settings on all gates and pumps as necessary to maintain maximum flow to the plant.
CPO	SPO - PO II - PO I	Check combined flows of NEID and Blue River Pumping regularly to ensure maximum flow is going to the plant and proper levels are maintained in NEID area.
After Wet Weather Event		
CPO	SPO - PO II - PO I	Adjust gates to normal settings as influent levels return to normal.
CPO	SPO - PO II - PO I	Return pumps to normal operation as influent levels return to normal.

Why do we do this? Reduce overflows in the Northeast Industrial District by maximizing flow from NEID and bypassing from the Diversion Chamber. Balance the flow to the plant with flow from NEID Pumping.
What triggers the change? Increasing flows in the sewer system trigger the process of turning pumps on or off. Decreasing flows in the sewer system reverse this process.
What can go wrong? Failure of valve operators. Failure of pumps. Other process units may be out of service thus reducing the flow that can be accepted by the plant. The appropriate flow must be determined and controlled at this point and at the Diversion Chamber.

Section 8 – Grit Removal System

WHO DOES IT?		WHAT DO WE DO?
SUPERVISORY	IMPLEMENTATION	
Before Wet Weather Event		
CPO	SPO - PO II - PO I	Check operation and status of equipment in grit removal train in channel 2. Check controls for alarms and equipment OOS.
CPO	SPO - PO II - PO I	Check operation and status of equipment in grit removal train in channel 7. Check controls for alarms and equipment OOS.
CPO	SPO - PO II - PO I	Check conveyor belt. Adjust as necessary.
CPO	SPO - PO II - PO I	Check grit system process water supply.
CPO	SPO - PO II - PO I	Check which of the old grit basins is available to be put into service if necessary.

During Wet Weather Event		
CPO	SPO - PO II - PO I	Extend cycle time to 30 minutes for storm event. Monitor the system.
CPO	SPO - PO II - PO I	Adjust grit discharge as necessary.
CPO	SPO - PO II - PO I	Adjust conveyor belt as necessary.
CPO	SPO - PO II - PO I	Clean rollers as necessary.
CPO	SPO - PO II - PO I	Activate old grit basins as necessary and if available.
After Wet Weather Event		
CPO	SPO - PO II - PO I	Return system to normal operation.
CPO	SPO - PO II - PO I	Clean grit classifying area.
<u>Why do we do this?</u> To remove the additional grit that is flushed into the plant by high flows. This protects the equipment from harsh conditions imposed by grit, reduces the solids that must be handled further on in the treatment process, and saves the space occupied by grit.		
<u>What triggers the change?</u> Increasing flows in the sewer system trigger the changing of the grit removal cycle times. Decreasing flows in the sewer system reverse this process.		
<u>What can go wrong?</u> Failure of the automatic controls. Failure of pumps. Failure of the screw augers. The conveyor belt running out of alignment.		

Section 9 – Distribution Box / Primary Clarifiers

WHO DOES IT?		WHAT DO WE DO?
SUPERVISORY	IMPLEMENTATION	
Before Wet Weather Event		
CPO	SPO – PO II – PO I	Check and monitor level of East Holding Tank.
CPO	SPO - PO II - PO I	Check sludge levels in each clarifier in service. Adjust timers for sludge pumps as necessary.
CPO	SPO - PO II - PO I	Check operation of sweep arms.
CPO	SPO - PO II - PO I	Check levels in scum pits and pump if necessary.
During Wet Weather Event – Avoid catwalks during high winds and electrical storms.		
CPO	SPO - PO II - PO I	Check sludge levels in each clarifier in service. Adjust timers for sludge pumps as necessary.
CPO	SPO - PO II - PO I	Check for operation of sweep arms.
After Wet Weather Event		
CPO	SPO - PO II - PO I	Check sludge levels in each clarifier in service. Adjust timers for sludge pumps as necessary.
CPO	SPO - PO II - PO I	Check for operation of sweep arms.
Why do we do this? Solids concentrations well peak with the first flush and decline as event progresses. The intent is to ensure that excessive solids are not held in the clarifier or excessive water is not pumped to the solids storage tank.		
What triggers the change? Varying concentration of solids in the wastewater.		

What can go wrong? Failure of the automatic controls. High level of East Holding Tank may limit sludge pumping. Failure of sludge pumps. Failure of the sweep arms.

Section 10 – Primary Junction Box

WHO DOES IT?		WHAT DO WE DO?
SUPERVISORY	IMPLEMENTATION	
Before Wet Weather Event		
CPO	SPO - PO II - PO I	Monitor level in the Primary Junction box.
During Wet Weather Event		
CPO	SPO - PO II - PO I	Monitor level in the Primary Junction Box.
After Wet Weather Event		
CPO	SPO - PO II - PO I	Monitor level in the Primary Junction box.
Why do we do this? This site provides critical data in the hydraulic grade line. At elevation 725 the primary clarifiers overflow flooding the treatment plant grounds.		
What triggers the change? More wastewater is being pumped from NEID and Blue River Pumping than Secondary Pumping can handle. There is a problem at Secondary Pumping.		

What can go wrong?
Failure of the automatic controls allowing too many pumps to come on at NEID Pumping.

Failure of the automatic controls allowing too many pumps to come on at Blue River Pumping.

Failure of pumps or controls at Secondary Pumping.

Section 11 – Secondary Pumping

WHO DOES IT?		WHAT DO WE DO?
SUPERVISORY	IMPLEMENTATION	
Before Wet Weather Event		
CPO	SPO - PO II - PO I	Check operation and status of pumps.
During Wet Weather Event		
CPO	SPO - PO II - PO I	Turn off recycling pump if the system is set to recycle.
CPO	SPO - PO II - PO I	Turn on appropriate pumps to allow maximum flow to be pumped to the trickling filters.
CPO	SPO - PO II - PO I	Monitor pumps for proper operation.
After Wet Weather Event		
CPO	SPO - PO II - PO I	Return pumps to normal operation as influent levels return to normal.

Why do we do this?
Provide treatment to the maximum volume of wastewater.

Prevent overflows on the treatment plant grounds.

What triggers the change? Increasing flows in the sewer system trigger the process of turning pumps on or off. Decreasing flows in the sewer system reverse this process.
What can go wrong? Failure of valve operators. Failure of pumps. Failure of the automated level control system operating the pumps.

Section 12 – Trickling Filter

WHO DOES IT?		WHAT DO WE DO?
SUPERVISORY	IMPLEMENTATION	
Before Wet Weather Event		
CPO	SPO - PO II - PO I	Monitor operation of trickling filters. Check rotation of the distributor arms, center column flow and final basin for solids and color.
During Wet Weather Event – Avoid top of trickling filter tower during electrical storm and extremely high winds.		
CPO	SPO - PO II - PO I	Monitor operation of trickling filters. Check rotation of the distributor arms.
After Wet Weather Event		
CPO	SPO - PO II - PO I	Monitor operation of trickling filters. Check rotation of the distributor arms.
Why do we do this? To ensure arms are rotating properly.		
What triggers the change? The higher flows cause the arms to rotate faster.		

What can go wrong? The electric drives can fail. The arms can run out of level. The orifices may need to be cleaned. Washing zoogleal film.

Section 13 – Effluent Pump Station

WHO DOES IT?		WHAT DO WE DO?
SUPERVISORY	IMPLEMENTATION	
Before Wet Weather Event		
CPO	SPO - PO II - PO I	Check functionality and status of pumps and gate.
CPO	SPO - PO II - PO I	Monitor river level.
During Wet Weather Event		
CPO	SPO - PO II - PO I	Monitor the river level.
CPO	SPO – PO II – PO I	Monitor level of drainage ditch during high river levels.
CPO	SPO - PO II - PO I	When river reaches 29 foot level close the gate and turn on the effluent pumps.
CPO	SPO - PO II - PO I	Monitor pumps for proper operation.
After Wet Weather Event		
CPO	SPO - PO II - PO I	Monitor river level.
CPO	SPO - PO II - PO I	Return pumps to normal operation as river level recedes.

Why do we do this? Prevent flooding o the Secondary Treatment plant grounds.
What triggers the change? Rising river level.
What can go wrong? Failure of river gate. Failure of pumps.

Westside
Wastewater Treatment Facility

Wet Weather
Operating Guidelines

September 2004

Table of Contents

Section 1 – Introduction

1.1 - Background

This manual contains the Wet Weather Operating Plan for Kansas City, Missouri's Westside Wastewater Treatment Facility. This treatment facility treats wastewater collected from the drainage approximately bounded by Prospect Ave to the east, 31st Street to the south, the state line to the west, and the Missouri River to the north. The collection system serving the facility contains both sanitary sewers and combined sewers. The facility experiences hydraulic loading in excess of the design flow of 22.5 Million Gallons per Day (MGD) due to the age of the collection system and portions of the older system being combined sewers. During wet weather events, when storm water flows enter the combined sewer system, overflows can occur at the pump stations feeding the treatment plant. These pump stations are Turkey Creek and Santa Fe. There are efforts underway addressing the portion of the system containing combined sewers. There are continual efforts to repair, replace, or rehabilitate the aged portions of the sanitary sewers.

1.2 – Goals and Purpose of the Plan

The goals of the Plan are to:

1. Prevent sewer overflows in select areas in the City.
2. Minimize bypass at the constructed diversion structures and the treatment facility.
3. Maximize treatment of wastewater in the facility.

The purpose of the Plan is to provide guidelines to facility staff in making operation decisions to meet the goals of the Plan and the requirements of the NPDES discharge permit.

During a wet weather event, numerous operational decisions must be made to effectively manage storage of the combined storm water and wastewater in the collection system and optimize treatment at the Westside Wastewater Treatment Plant. Storage is controlled through adjustment of the gates at Turkey Creek Pump Station and Santa Fe Pump Station. Flow rates are determined by the capacity of the plant and the flow entering the Pump Stations.

No manual can describe the decision making process for every possible wet weather scenario that will be encountered and include every permutation of process units being out of service for repairs. This manual can, however, serve as a useful reference that both new and experienced operators can utilize during wet weather events. The manual can be useful in preparing for a coming wet weather event, a source for controlling specific processes during the storm, and a checklist to avoid missing critical steps in monitoring and controlling processes

during wet weather. This is to be considered a living document to be revised as experience dictates.

1.3 – Using This Manual

This manual is designed to allow use as a quick reference during wet weather events. It is broken down into sections that cover major unit processes at the Westside Wastewater Treatment Facility or major control points in the plant, and the pump stations. Each section includes the following information:

- List of unit processes and equipment covered in this section
- Steps to take before a wet weather event and who is responsible for these steps.
- Steps to take during a wet weather event and who is responsible for these steps.
- Steps to take after a wet weather event and who is responsible for these steps.
- Discussion of why recommended control steps are performed.
- Identification of specific circumstances that trigger the recommended changes.
- Identification of things that can go wrong with the process.

As discussed, this manual is a living document. Users of the manual are encouraged to identify new steps, procedures, and recommendations to add to the descriptions contained herein. Modifications that improve upon the manual's procedures are also encouraged. If you have a suggestion for modifications or additions to the manual, mark them on copies of the affected pages and submit them to your supervisor, so they can be considered for insertion in the manual. With continued input from all users of the manual, it will become an even more useful and effective tool.

1.4 - Description of the Westside Wastewater Treatment Facility

The permitted design flow for the Westside Wastewater Treatment Plant is 22.5 MGD. All of the flow reaching the plant is pumped by Turkey Creek, Santa Fe, or and Line Creek Pump Stations. These pump stations serve as the headworks of the treatment plant. The firm pumping capacity of Turkey Creek Pump Station is 58 MGD, of Santa Fe Pump station is 22 MGD, and of Line Creek is 24 MGD. It should be noted that the flow at Line Creek Pump station is split; 8 MGD is directed to the Blue River Wastewater Treatment Plant and the balance goes to Westside Wastewater Treatment Plant. Additional minor flows are pumped to the plant from the Harlem and Downtown Airport Pump Stations. The flow must be controlled through the treatment facility. Westside has the capability to discharge primary effluent after primary settling and the capability to discharge prior to primary settling. These flow variations are made possible by existing

valves and piping. By adjusting these valves treatment can be maximized and flow blending achieved. Discussion is provided on process bypass but is not practiced, as flow blending has not been approved by the Missouri Department of Natural Resources.

Headworks – Pump Stations

Turkey Creek Pump Station

Following a wet weather event, the flow exceeds the capacity of the pump station. The sewer system is inundated with combined flow and exits the storm water gates discharging to the Kansas River. When this condition begins the channel gate to the bar screen is closed to 10% open. At this level one pump is required to pump to Westside Treatment Plant at a rate of 11.4 MGD.

Santa Fe Pump Station

Following a wet weather event, the flow exceeds the capacity of the pump station. The sewer system is inundated with combined flow and enters the storm water pumping station via the floodgate, which is normally open. The river gate is normally open allowing the excess flow to discharge to Missouri River. When the river level reaches 22.0 on the Hannibal Bridge Guage (HBG) the river gate is closed. When the river level reaches 25.5 on the HBG Santa Fe Storm Pumps are put on line. When the storm water wet well reaches 6.5 feet the storm water pumps are activated discharging to the Missouri River. During these conditions one pump is required to pump to Westside Treatment Plant at a rate of 4.5 MGD.

Line Creek Pump Station

Line Creek Pump Station splits its flow and pumps to Blue River Wastewater Treatment Plant via the Hillside Levee Sewer and to Westside Wastewater Treatment Plant. The flow to Hillside Levee Sewer is held to a maximum of 8 MGD. Flows through Line Creek Pump Station in excess of 8 MGD are directed to Westside Treatment Plant. The flow directed to Westside Wastewater Treatment Plant is normally around 4 MGD but can exceed 8 MGD during a wet weather event.

Westside Treatment Plant

Plant Control Valve

The Plant Control Valve can be opened to allow the wastewater to flow directly to the plant effluent discharge channel. The valve can be opened completely allowing all of the flow to bypass the plant or partially opened to balance the amount of flow bypassed and the quantity of flow receiving full treatment. This is only done when one of the treatment trains, including the primary basin, is out of service for repair. The untreated flow combines with the final clarifier effluent of the treatment train in service.

When the HBG reaches 43.5 the Effluent Gate Valve is closed at the Levee Wall and the Westside WWTP is taken off line, and the 36" bypass valve is opened.

Grit chamber

The pump station force mains merge into a common header at the front of the plant discharging to the aerated grit chamber. There are no operational controls in the Grit Chamber for a wet weather event.

Primary Clarifiers

The flow enters the primary clarifiers by gravity. The primary effluent flows through bar screens enroute to the aeration basins. The bar screens must be cleaned regularly to avoid backing up the high flows in the primary clarifiers. The Primary Effluent Channel can be valved directly to the effluent channel if one of the secondary treatment trains is out of service for repairs or when influent flows are in excess of 22.5 MGD. The secondary treatment train can provide adequate treatment to 22.5 MGD without significant loss of solids.

Aeration Basins

Mechanical aerators provide mixing and aeration in the aeration basins. The level of the mixed liquor in each aeration basin is controlled by a butterfly valve. The butterfly valves must be opened all of the way to prevent the mixed liquor from being held in the basin, raising the basin level, and causing the mechanical aerators to trip out.

Final Clarifiers

When flow through the plant exceeds 22.5 MGD the return sludge pumps are turned off to prevent solids washout.

Effluent Pumping

When the river level reaches 37.0 on the HBG the river gate is closed and the Effluent Pump Station pumps the effluent to the river. When the river recedes the river gate is opened and the pumps are taken out of service.

Section 2 – Turkey Creek Pump Station

WHO DOES IT?		WHAT DO WE DO?
SUPERVISORY	IMPLEMENTATION	
Before Wet Weather Event		
SPO	PO II	Monitor the weather.
SPO	PO II	Monitor levels in the pump station. Draw the levels down as far as possible prior to a rain event.
SPO	PO II	Check operation and status of Gate 1. Log settings.
During Wet Weather Event		
SPO	PO II	Adjust Gate 1 closed incrementally to 10% to control flow into plant.
SPO	PO II	Make sure only one pump is in operation.
SPO	PO II	Collect sample of discharge to the river. One sample is collected after the first flush. BOD, SS, and pH are tested.
SPO	PO II	Monitor flows from Turkey Creek, Santa Fe, and Line Creek Pump Stations to make sure the maximum amount is being treated and the plant is not being flooded.
After Wet Weather Event		
SPO	PO II	Adjust Gate 1 open incrementally to release more flow into plant.
SPO	PO II	Monitor levels and adjust settings on all gates as necessary to maintain maximum flow to the plant.

Why do we do this? The flow into the plant is controlled at this point in conjunction with Santa Fe and Line Creek Pump Stations. Balance the flow to the plant.
What triggers the change? Increasing flows in the sewer system trigger the closing of Gate 1. Decreasing flows in the sewer system reverse this process.
What can go wrong? Pump failure, loss of power, and inundation of the channels with grit.

Section 3 – Santa Fe Pump Station

WHO DOES IT?		WHAT DO WE DO?
SUPERVISORY	IMPLEMENTATION	
Before Wet Weather Event		
SPO	PO II	Monitor the weather.
SPO	PO II	Monitor levels in the pump station. Draw the levels down as far as possible prior to a rain event.
SPO	PO II	Check operation and status of Gate 1. Log settings.
During Wet Weather Event		
SPO	PO II	Make sure only one pump is in operation.
SPO	PO II	Collect sample of discharge to the river. One sample is collected after the first flush. BOD, SS, and pH are tested.

SPO	PO II	Monitor flows from Turkey Creek, Santa Fe, and Line Creek Pump Stations to make sure the maximum amount is being treated and the plant is not being flooded.
SPO	PO II	Close the River Gate when the river level reaches 22 on the HBG.
SPO	PO II	Activate the Storm Water Pumps when the river level reaches 25.5 on the HBG.
After Wet Weather Event		
SPO	PO II	Adjust Gate 1 open incrementally to release more flow into plant.
SPO	PO II	Monitor levels and adjust settings on all gates as necessary to maintain maximum flow to the plant.
SPO	PO II	Return river gates and Storm Pumps to normal settings when the river drops below 20.0 on the HBG.
Why do we do this? The flow into the plant is controlled at this point in conjunction with Turkey Creek and Line Creek Pump Stations. Balance the flow to the plant.		
What triggers the change? Increasing flows in the sewer system trigger the closing of Gate 1. Decreasing flows in the sewer system reverse this process.		
What can go wrong? Pump failure, loss of power, and inundation of the channels with grit.		

Section 4 – Line Creek Pump Station

WHO DOES IT?		WHAT DO WE DO?
SUPERVISORY	IMPLEMENTATION	
Before Wet Weather Event		
SPO	PO II	Monitor the weather.
SPO	PO II	Monitor levels in the pump station. Draw the levels down as far as possible prior to a rain event.
During Wet Weather Event		
SPO	PO II	Monitor operation of the pump station.
After Wet Weather Event		
SPO	PO II	Monitor operation of the pump station.
<u>Why do we do this?</u> The flow into the plant is monitored at this point in and controlled at the Santa Fe and Turkey Creek Pump Stations. Balance the flow to the plant.		
<u>What triggers the change?</u> There is no change implemented at Line Creek Pump Station, only flow monitoring. Decreasing flows in the sewer system reverse this process.		
<u>What can go wrong?</u> Pump failure and loss of power.		

Section 5 – Westside Wastewater Treatment Plant – Grit Chamber

WHO DOES IT?		WHAT DO WE DO?
SUPERVISORY	IMPLEMENTATION	
Before Wet Weather Event		
SPO	PO II	Clean the Grit Chamber and monitor the air.
During Wet Weather Event		
SPO	PO II	Monitor the air.
After Wet Weather Event		
SPO	PO II	Clean the Grit Chamber and monitor the air.
<u>Why do we do this?</u> To reduce the amount of rocks, grit, and other large debris from entering the plant.		
<u>What triggers the change?</u> Increasing flows in the sewer system will scour heavy material into the plant.		
<u>What can go wrong?</u> If the Grit Chamber is not cleaned regularly the heavy material will be allowed to enter the treatment plant.		

Section 6 – Primary Clarifier

WHO DOES IT?		WHAT DO WE DO?
SUPERVISORY	IMPLEMENTATION	
Before Wet Weather Event		
SPO	PO I	Clean debris from bar screens. Empty trash dumpsters.
SPO	PO II	Check operation and status of sludge collectors and skimmers.
During Wet Weather Event		
SPO	PO I	Periodically check on accumulation of debris on bar screens. Clean if necessary.
SPO	PO I	Periodically check operation of sludge collectors and skimmers.
After Wet Weather Event		
SPO	PO I	Clean debris from bar screens.
SPO	PO I	Empty trash dumpsters.
<u>Why do we do this?</u> Maintain consistent and maximum amount of flow through the plant.		
<u>What triggers the change?</u> Increased amount of debris in the flow stream due to increased flow and scouring of the sewers.		
<u>What can go wrong?</u> Blinding of bar screens. Tripping of clarifier drives.		

Section 7 – Aeration Basins

WHO DOES IT?		WHAT DO WE DO?
SUPERVISORY	IMPLEMENTATION	
Before Wet Weather Event		
SPO	PO I	Check setting of butterfly valve.
SPO	PO II	Check operation and status of mechanical mixers.
During Wet Weather Event		
SPO	PO I	Open butterfly valves all the way to prevent level in aeration basin from raising and tripping out mechanical aerators.
SPO	PO I	If flows exceed 30 MGD turn mechanical aerators off in order to prevent washout of solids.
After Wet Weather Event		
SPO	PO I	Close butterfly valves to normal settings.
SPO	PO I	Turn mechanical aerators back on when flow falls below 30 MGD.
<u>Why do we do this?</u> Maintain consistent and maximum amount of flow through the plant. Retain solids in the plant and minimize solids washout.		
<u>What triggers the change?</u> Increased flow.		
<u>What can go wrong?</u> Increased level in aeration basin will trip mechanical aerators.		

Section 8 – Final Clarifier

WHO DOES IT?		WHAT DO WE DO?
SUPERVISORY	IMPLEMENTATION	
Before Wet Weather Event		
SPO	PO II	Check operation and status of sludge collectors and skimmers.
During Wet Weather Event		
SPO	PO I	Periodically check operation of sludge collectors and skimmers.
SPO	PO I	Turn off sludge return to reduce flow stream thus reducing solids washout.
After Wet Weather Event		
SPO	PO I	Check operation of sludge collectors and skimmers.
SPO	PO I	Reset sludge return to normal operation.
<u>Why do we do this?</u> Reduce turbulence thus solids washout in final clarifier.		
<u>What triggers the change?</u> Increased flow.		
<u>What can go wrong?</u> Tripping of clarifier drives.		

Section 9 – Effluent Pump Station

WHO DOES IT?		WHAT DO WE DO?
SUPERVISORY	IMPLEMENTATION	
Before Wet Weather Event		
CPO	SPO - PO II - PO I	Check functionality and status of pumps and gate.
CPO	SPO - PO II - PO I	Monitor river level.
During Wet Weather Event		
CPO	SPO - PO II - PO I	Monitor the river level.
CPO	SPO - PO II - PO I	When river reaches 37.0 on the HBG close the gate and turn on the effluent pumps.
CPO	SPO - PO II - PO I	Monitor pumps for proper operation.
After Wet Weather Event		
CPO	SPO - PO II - PO I	Monitor river level.
CPO	SPO - PO II - PO I	Return pumps to normal operation as river level recedes.
<u>Why do we do this?</u> Prevent flooding of the treatment plant.		
<u>What triggers the change?</u> Rising river level.		
<u>What can go wrong?</u> Failure of river gate. Failure of pumps.		