



Kansas City's Overflow Control Program

[SEMI-ANNUAL REPORT](#)

Reporting Period: January 1, 2012 through June 30, 2012

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Kansas City's Overflow Control Program

ANNUAL REPORT

Reporting Period: January 1, 2012 through June 30, 2012

September 19, 2012

To the reader:

Please find enclosed the third semi-annual report related to Kansas City's Overflow Control Program. This report covers the semi-annual period from January 1, 2012 to June 30, 2012. Pursuant to the Consent Decree, this report has a required submittal date no later than September 30, 2012.

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

By signing below, I certify under penalty of law that the document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted, and that the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Thank you for your participation and cooperation in this important program. If you have any questions, please contact the undersigned at (816) 513-0203.

Sincerely,



Terry Leeds
Director, Water Services Department, City of Kansas City, Missouri

cc: Matthew J. Gigliotti, Assistant City Attorney, City of Kansas City, Missouri
Mark P. Jones, Assistant City Attorney, City of Kansas City, Missouri

SEMI-ANNUAL REPORT
Reporting Period: January 1, 2012 through June 30, 2012



SEMI-ANNUAL REPORT

Reporting Period: January 1, 2012 through June 30, 2012

CITY OF FOUNTAINS
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KANSAS CITY
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SEMI-ANNUAL REPORT

Reporting Period: January 1, 2012 through June 30, 2012

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SEMI-ANNUAL STATUS REPORT PURPOSE AND SCOPE

On September 27, 2010, the Consent Decree and its associated Appendices related to reducing overflows in Kansas City's sewer system was entered in the United States District Court for the Western District of Missouri (4:10-cv-0497). In accordance with Section IX.A. of the Consent Decree, this document satisfies the semi-annual reporting requirement for the reporting period between January 1, 2012 and June 30, 2012. This semi-annual status report is intended to update the regulatory agencies as to Kansas City's progress on implementing control measures defined in Appendix A of the Consent Decree.

KANSAS CITY'S SEWER SYSTEM

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

Kansas City's overall sanitary sewer system is comprised of both combined and separate sewer systems. A combined sewer system is a single sewer system that carries both wastewater and stormwater. Kansas City has approximately 58 square miles of combined sewers. Typically these systems are in the oldest areas of the City and are stressed to carry the large amounts of stormwater that now run off from our urban landscape. During moderate to heavy rainfall events, the system may reach capacity, overflow, and discharge a mixture of wastewater and stormwater directly to our streams and rivers. Although these overflows will be reduced over time, the discharge of combined sewer overflows is not uncommon in combined sewer systems and is authorized under a National Pollutant Discharge Elimination System (NPDES) permits issued to Kansas City's Water Services Department (WSD) by the Missouri Department of Natural Resources.

The remaining 260 square miles of Kansas City's sanitary sewer system are considered a separate system. A separate sanitary sewer system is designed to collect only wastewater. However, rainwater can enter the system through joints, broken pipes, manholes, and unpermitted direct connections causing the system to overload during rain events. When this system exceeds its capacity, it too has the ability to overflow a mixture of wastewater and stormwater.

KANSAS CITY'S OVERFLOW CONTROL PROGRAM

Kansas City's Overflow Control Program was developed to meet regulatory requirements related to reducing overflows from the combined sewer system and preventing overflows from the separate sewer system. Individual elements of the Overflow Control Program became part of an enforceable document on September 27, 2010, with the entry of a Consent Decree in United States District Court. The Consent Decree is a culmination of nearly a decade of negotiation between the City, the Environmental Protection Agency (EPA) and Missouri Department of Natural Resources (MDNR) related to reducing overflows. The City and its regulatory partners have agreed to meet those requirements over a 25-year time period by completing a planned list of improvements targeted at capturing for treatment a percentage of combined sewer flows and eliminating sanitary sewer overflows during a theoretical rainfall event.

The Consent Decree includes requirements targeted at capital construction, management, operations and maintenance of the City's sewer systems. Consent Decree components include:

- Capital Projects targeted at reducing overflows through Combined Sewer Overflow (CSO) Control Measures and Separate Sewer Overflow (SSO) Control Measures;

- Nine Minimum Controls Plan targeted at operationally reducing and addressing combined sewer overflows through a series of minimum control efforts;
- Capacity Management Operation and Maintenance Plan targeted at reducing overflows by adequately operating and maintaining the sewer system;
- Post Construction Monitoring Plan targeted at long-term monitoring and assessment of overflow reduction;
- Supplemental Environmental Project targeted at reducing septic system use in the sewer area;
- Installation of Disinfection Technology at Wastewater Treatment Plants.

REPORTING PERIOD ACTIVITY

The following specific scheduled milestones, as laid forth in Consent Decree Appendix A, were met on schedule during the reporting period from January 1, 2012, through June 30, 2012.

Appendix A – Performance Measures

- Middle Blue River Basin
 - Distributed Storage: Outfall 069
 - Consent Decree Required Start Date – 2012
 - Actual Start Date – July 2011
 - Distributed Storage: Outfall 059
 - Consent Decree Required Start Date – 2012
 - Actual Start Date – July 2011
 - Small Sewer Rehabilitation: Middle Blue River
(outside the Middle Blue River Basin Green Solutions Pilot Project area)
 - Consent Decree Required Start Date – 2014
 - Actual Start Date – July 2011
- South of the Missouri River Separate Sewer System
 - Inflow and Infiltration Reduction: South of the Missouri River
 - Consent Decree Required Start Date – 2012
 - Actual Start Date – September 2011
 - Storage Tank: 87th Street Pump Station (Phase I)
 - Consent Decree Required Start Date – 2012
 - Actual Start Date – August 2011
 - Force Main: Round Grove
 - Consent Decree Required Start Date – 2012
 - Actual Start Date – August 2011

PUBLIC PARTICIPATION

Several public involvement activities for the Overflow Control Program were undertaken during the reporting period. Presentations about the Overflow Control Program made to various organizations include:

- American Council of Engineering Companies, Kansas City – February 14, 2012
- Environmental and Water Resources Institute, Kansas City – March 7, 2012
- Northland Regional Chamber of Commerce – March 8, 2012
- Middle Blue River Basin Green Solutions Pilot Project, Rain Barrel Workshop – April 28, 2012
- Middle Blue River Basin Green Solutions Pilot Project, Rain Barrel Workshop – May 3, 2012
- Southtown Council – May 17, 2012
- Shepherd's Center – May 18, 2012
- Dodson Industrial District – June 26, 2012
- Environmental Excellence Business Network – June 29, 2012

Additional public participation activities during the reporting period occurred in conjunction with activities of the Middle Blue River Basin Green Solutions Pilot Project, discussed in subsequent sections.

MIDDLE BLUE RIVER BASIN GREEN INFRASTRUCTURE PILOT PROJECT

The Overflow Control Program includes funding dedicated to developing green infrastructure pilot projects and partnerships in the combined sewer basins. While proven individually or as part of small systems throughout the nation, green infrastructure has yet to be utilized in a widespread effort to address combined sewer overflows. The City is hopeful that its efforts will lead to a better understanding of the strengths and weaknesses of green infrastructure.

Construction for the first green infrastructure pilot project, the Middle Blue River Basin Green Solutions Pilot Project, continued through the reporting period. This pilot focuses on the use of green infrastructure to provide distributed storage of stormwater throughout a 100-acre area of the Marlborough neighborhood. The area is primarily residential, but does include commercial businesses. The project is generally bounded on the north by 73rd Street, on the south by 77th Terrace, on the east by Holmes Road, and on the west by The Paseo.

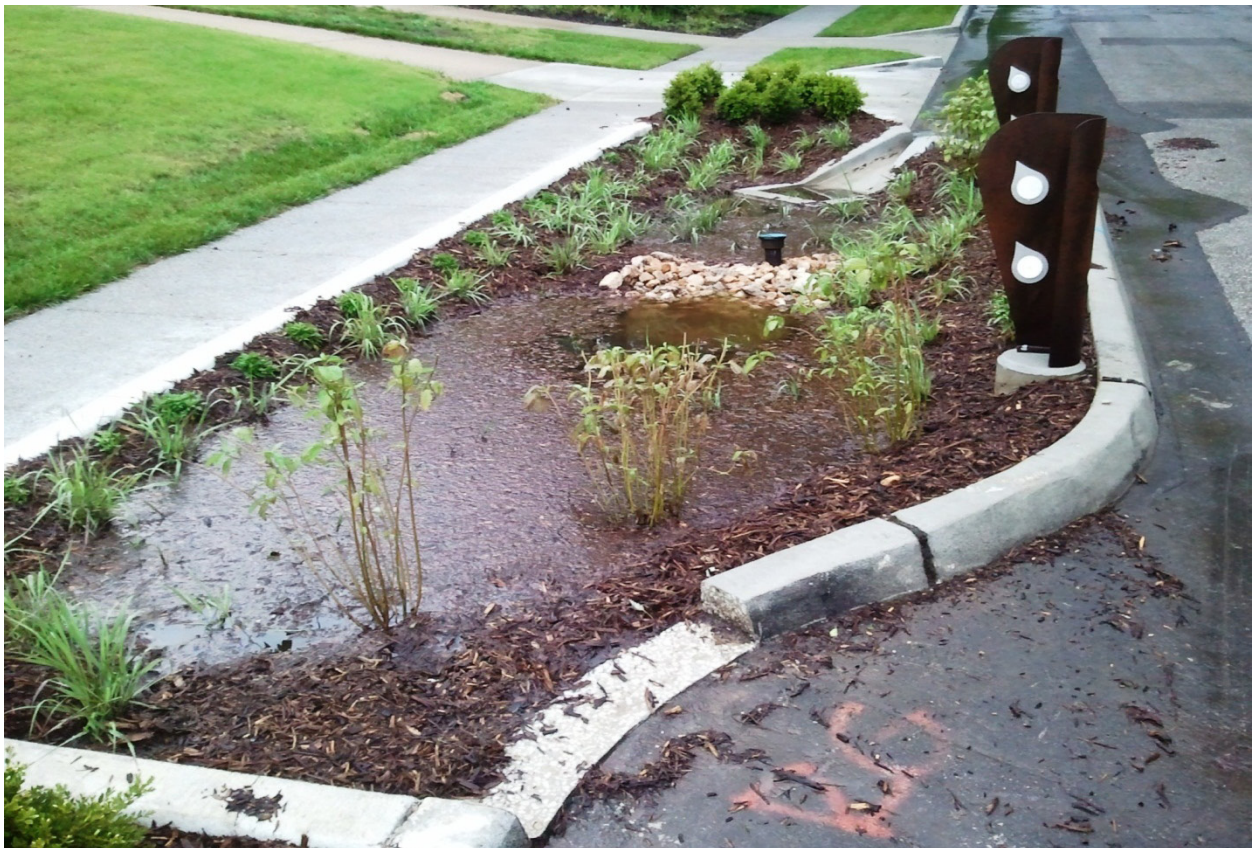
In addition to gaining valuable information about the effectiveness of green infrastructure in controlling combined sewer overflows, this initial pilot will also evaluate alternatives for achieving additional program objectives, including:

- Effectiveness of green infrastructure as a systematic solution;
- Codes and ordinances in conflict with green infrastructure utilization;
- Socio-economic benefits/change;
- Construction techniques and costs on a wide-scale programmatic level;
- Potential changes in City services in green infrastructure areas;

- Maintenance approaches and costs;
- Public/Private partnership opportunities; and
- Community interaction and support of green infrastructure practices.

Construction activities in the Middle Blue River Basin Green Infrastructure Pilot Project area (pilot area), conducted during the reporting period, included the installation of Stormwater Best Management Practices (BMPs) to reduce flows in the collection system. Construction of the BMPs began in May 2011 and, once complete, will include approximately 150 BMPs. Work accomplished during the reporting period is summarized as follows:

- Finalized installation of porous sidewalk in select areas. This application of porous sidewalk serves to simultaneously provide a new walking surface (where the preceding sidewalk was seriously deteriorated) and incorporate a method to minimize surface runoff and allow the rainfall to return to the natural environment.
- Finalized installation of curbs and sidewalks, where previously no curbs existed and sidewalks were in disrepair.
- Stormwater BMPs, of various designs, were installed (as follows):
 - Installation of plants in all improvement areas
 - Planting of 100 trees
 - Installation of reflective markers along ribbon curbs and curb extension rain gardens
 - Installation of pipe and inlet covers



Photograph of a rainfall event on 75th Terrace

Project hardscape areas (i.e. where concrete is needed) were completed during the reporting period. Due to warm winter and early spring conditions, landscaping of BMPs began in early March 2012.

Construction in a fully developed project area with different land uses (residential and commercial) has shown to be a significant challenge. Working around extensive utilities in the project area, and dealing with the uncertainties of where underground conflicts were encountered, caused increased challenges during construction. Because the conflicts experienced on the west side of Troost Avenue were considered significant, the scope of work on the east side of Troost was modified to include only surface-level improvements such as planting of trees within the right-of-way and small corner rain gardens.

The Advanced Drainage Concepts (ADC) Team comprised of partners from U.S. Environmental Protection Agency, Mid-America Regional Council, University of Missouri- Kansas City, University of Alabama, and Tetra Tech continued their work to monitor rain gardens in the pilot area. In late April and early May 2012, the team installed five monitoring boxes at different locations to gather quantitative and qualitative data. Different types of BMPs were selected for quality parameter analyses inclusive of bacteria, nutrients, metals and solids. Quality analysis is a volume constrained analysis and is conducted with the help of sample splitters installed in the stormwater BMPs. After a significant rain event these split samples are distributed for analysis to the following laboratories: University of Missouri Kansas City, Region 7 and University of Alabama. For quantitative analyses of a BMP, flow sensors were installed at the inlet weir for inflow rate and at the outlet weir for overflow rate. A flow sensor was also installed in the bed for retention rate.



Photograph of a monitoring station on 76th Street

Public involvement in the pilot area included one meeting regarding property code enforcement, two rain barrel workshops, and a bus tour event. Residents were kept informed about events in the pilot area through a project update in February 2012 and another update and workshop invitation in April 2012.

In partnership with Kansas City's Neighborhood and Community Services Department, a new code enforcement process was tested in the pilot area area. Residents and property owners in the pilot area were invited to a public meeting prior to the code enforcement sweep. The meeting was held February 20, 2012, attendees were informed about the types of violations the City would be citing. The attendees also received information about assistance programs that they may be eligible to help pay for any needed improvements. In March, 341 properties were investigated. Of those properties, 97 were considered in violation of a nuisance or property maintenance code violation. Follow-up has occurred, and as of June 27, only seven tickets were issued and an abatement of over 90 percent of defects was observed.

Two rain barrel workshops were held for the pilot area on April 28 and May 3. The purpose of the workshops was to demonstrate how simple green solutions on private property can keep stormwater out of the wastewater system. Participants were given information about downspout disconnection, shown a demonstration on how to install a rain barrel, and given information about rain gardens. At the workshops, residents in the pilot area were encouraged to sign up to receive one or two of forty-eight free rain barrels that were made available courtesy of Coca-Cola Bottling Company. Workshop participants were provided with informational materials to take away about how to disconnect a downspout, install a rain barrel, and how to plant a rain garden. They were also given information about the City's efforts to improve water quality and reduce sewer overflows through the installation of green solutions in the public right-of-way. Approximately 20 pilot area residents attended the two workshops, which were held at two different properties in the pilot area. After the workshops, workers from New Reflections KC installed the donated rain barrels for interested residents. Installation of the rain barrels was completed by June 1, 2012.

Members of the Middle Blue River Basin consultant team conducted workforce training with a contractor from the Blue River Watershed Association (BRWA) and laborers with New Reflections KC so that they could conduct the workshops. The consultant team met with the workforce to discuss the purpose and goals of the project, including information about the Overflow Control Program and the pilot project. Before the two workshops were held, the project team facilitated a mock workshop at an actual location. Project team members focused training on assembling/installing rain barrels with some discussion on downspout disconnection. The workforce participants also learned how to conduct a workshop and assist with the two workshops that were planned.

A tour of the pilot area was organized along with a business networking event on June 29, 2012. The Environmental Excellence Business Network, in association with a local non-profit organization, Bridging the Gap, held their monthly meeting near the pilot area. After a presentation by WSD Overflow Control Program team members and a representative from the EPA regional office, a bus tour of the pilot area was given. Over 50 people attended the event which showcased the improvements and monitoring stations installed by EPA.

With the project nearing completion, a public celebration event is expected to occur in July 2012. The Pilot Project is anticipated to be substantially completed by Fall 2012.

CONSENT DECREE APPENDIX A: COMBINED SEWER OVERFLOW CONTROL MEASURES

Approximately 58 square miles within Kansas City are served by combined sewers. This area is generally bound by the Missouri/Kansas state line on the west, 85th Street on the south, the Blue River on the

east, and the Missouri River on the north. The area served by the combined sewer system is subdivided into seven principal basins: Gooseneck Creek, Lower Blue River, Town Fork Creek, Brush Creek, Middle Blue River, Northeast Industrial District and Turkey Creek/Central Industrial District. North of the Missouri River, the Charles B. Wheeler Municipal Airport is also served by combined sewers.

The Consent Decree governs the implementation of control measures in the combined sewer system, the cost of which is estimated at approximately \$1.4 billion in 2008 dollars. Repairs to the existing system are scheduled to occur early in the implementation of the required control measures. As illustrated above, the early years will also include aggressive pilot projects focused on developing green infrastructure solutions. The middle years of the program will focus on maximizing the capacity within the existing system and analyzing the results of source volume reductions and pilot projects. The final years of the program will address necessary improvements to the City's wastewater treatment plants and construction of structural storage solutions, currently proposed as deep storage tunnels.

Middle Blue River Basin

Distributed Storage: Outfall 059 and 069

Construction of the Middle Blue River Basin Green Solutions Pilot Project began in 2011 and is scheduled for substantial completion in July 2012, as discussed in previous sections of this report. This pilot project encompasses the first 100 acres of distributed storage improvements planned for the 475-acre area contributing to combined sewer outfalls 069. Progress toward additional basin improvements outside the pilot area have continued in 2012.

Bids were solicited and received in December 2011 for two separate contracts to provide temporary flow monitoring and field investigation services for the project area contributing to combined sewer outfalls 059 and 069. Activity related to these contracts began during the reporting period and are detailed in subsequent sections. Results obtained from the flow monitoring and field investigation will guide design efforts for future distributed storage improvements. A draft Request for Qualifications/Proposals (RFQ/P) document has been created in anticipation of contracting with a design professional(s) for future basin improvements in late 2012. Future improvements have been divided into four project areas delineated along sewershed boundaries that contribute to combined sewer outfalls 059 and 069.

Temporary Flow Monitoring

The contract for temporary flow monitoring was awarded to George Butler and Associates and subcontractors (GBA) with a notice-to-proceed date of February 28, 2012. The contracted flow monitoring period is from April 1, 2012 to September 30, 2012. As part of GBA's contract, 12 flow meters have been installed at strategic locations throughout the tributary to Outfalls 059 and 069. In addition, rain gauges have been installed to correlate rainfall intensity with flow. At the end of the semi-annual reporting period, three months' worth of rainfall and flow data have been submitted and reviewed. Dry conditions have persisted across the area during the reporting period thereby resulting in a lack of data needed for model calibration.

Field Investigations

The contract for field investigations was awarded to ACE Pipe Cleaning and subcontractors (ACE) with a notice-to-proceed date of May 7, 2012. The contract is scheduled to be substantially complete in November 2012. ACE has been contracted to perform the following tasks: GPS survey of manholes and catch basins, catch basin cleaning, catch basin inspection, manhole inspection, smoke testing, sewer lateral inspection, pipe cleaning, CCTV inspection, and dyed water testing. At the end of the semi-annual reporting period, ACE has completed surveying of the manholes and inlets. In addition, ACE has begun cleaning and inspecting inlets and inspecting manholes.

Small Sewer Rehabilitation

The previously discussed Field Investigation contract, as performed by ACE, will provide information to guide design efforts for future small sewer rehabilitation work.

CONSENT DECREE APPENDIX A: SEPARATE SEWER OVERFLOW CONTROL MEASURES

Kansas City's separate sanitary sewer system is comprised of nine principal basins covering 260 square miles of the City. The four separate sanitary sewer system basins north of the Missouri River are the Northern and Northwestern watersheds and the Line Creek/Rock Creek and Birmingham/Shoal Creek Basins. The five separate sanitary sewer system basins south of the Missouri River are the Blue River North, Round Grove, Blue River Central, Blue River South and Little Blue Basins.

The Consent Decree governs the implementation of control measures in the separate sanitary sewer system, the cost of which is estimated at approximately \$1 billion in 2008 dollars. These projects involve early efforts to reduce inflow and infiltration of stormwater into the system by repairing the existing system where cost-effective. A combination of wet weather storage and treatment will be utilized to address inflow and infiltration which cannot be efficiently kept out of the system.

South of the Missouri River Separate Sewer System

Inflow and Infiltration Reduction: South of the Missouri River

The South of the Missouri River Basin has been divided into five separate watersheds: Little Blue River, Blue River South, Blue River Central, Blue River North, and Round Grove. The Consent Decree contains a start date and completion date for the Basin collectively; it does not require independent start and completion dates for the individual watersheds.

A Sanitary Sewer Evaluation Survey (SSES) was previously conducted for the Round Grove watershed in 2007. Defects in the public and private system were identified and recommendations were made to reduce both public and private inflow and infiltration (I/I) sources to achieve 29 percent I/I removal. To prepare for this project, public sector I/I removal recommendations from the 2007 SSES report were compiled and bid documents were prepared. Bid documents included specifications and maps depicting the required manhole and sewer line repairs. Recommendations included rehabilitation of approximately 775 manholes, 18,000 feet of CIPP, 4,000 feet of sewer replacement and 477 service connection repairs. A construction contract was awarded to Havens Construction Company, Inc. and subcontractors (Havens) with a notice-to-proceed date of June 4, 2012. In June, Havens mobilized to the site and began point repairs, manhole casting replacement, and manhole cementitious lining.



Photograph of Rehabilitated Manhole

The private I/I removal recommended in the 2007 SSES report was not included in the bid project and a specific course of action is being evaluated.

As required by the Consent Decree in the Basin, I/I removal is scheduled to occur within 5 watersheds, divided into distinct sub-basins that can be individually monitored for I/I removal effectiveness. The Overflow Control Plan (Plan) includes costs and a schedule for I/I removal in the Separate Sewer System basins. Equally-weighted phases were developed to spread costs over multiple years. Based on information contained in the Plan, and aside from the Round Grove watershed, projects have been further delineated, given distinct names for tracking purposes, and linked to impacted projects downstream. A scope of work outline for performing investigations was developed. The objective of the investigations is to gather information on system defects to identify and quantify I/I sources, develop rehabilitation and I/I source removal recommendations, and develop construction plans and specifications. Assessment of the effectiveness of I/I removal will also be performed by conducting pre-rehabilitation and post-rehabilitation flow and rainfall monitoring and data analyses. In the Blue River South Watershed, a draft RFQ/P was developed in order to select a Design Professional (DP) to design I/I improvements for two distinct project areas consisting of approximately 296,000 linear feet of sewer lines.



Before (left) and After (right) Photographs of a Point Repair

Force Main: Round Grove

In order to increase the capacity at the Round Grove Pump Station and provide additional protection with redundant force mains, the existing 24-inch force main (that was previously abandoned) will be rehabilitated and put back into service. The 24-inch force main will operate in tandem with the existing 30-inch force main. Once the 24-inch force main is put back into service, improvements to increase pumping capacity at the Round Grove Pump Station will be completed. To prepare for this project, the 24-inch force main was visually inspected to determine its structural integrity. Plans and specifications were developed to rehabilitate portions of the line and install HDPE pipe, via directional boring, under the Blue River. The construction component was bid on April 17, 2012. It is anticipated that a construction notice-to-proceed will be issued in Fall 2012.



Photograph of the Round Grove Force Main

Storage Facility: 87th Street Pump Station (Phase I)

An RFQ/P was issued in 2011 for design professional services for Phase I of the 87th Street Storage Tanks and Pump Station Rehabilitation. Phase I includes construction of 20 million gallons (MG) of storage capacity and rehabilitation/modification of existing pumps and equipment necessary to support wet weather pumping to the storage unit. Responses were received in December 2011. Black and Veatch (B&V) was selected to perform site evaluation and preliminary design activities, and a notice-to-proceed was issued on June 6, 2012. Due to the complex nature of the project, B&V is currently contracted to perform an analysis of two different storage techniques: storage tanks and shallow tunnels. The results of this analysis are expected in September 2012 after which a 30% design of the selected alternative will be completed. After completion of the 30% design, the City may elect to contract for final design and construction using design-build project delivery or traditional design-bid-build project delivery, depending on schedule requirements. If the City chooses to pursue design-build delivery, the design professional's scope of services may include development of a design-build RFQ/P for procurement of services. If the City chooses to pursue a traditional design-bid-build delivery method, the design professional's scope of services may include final design, bidding and construction phase services.

SCHEDULED ACTIVITY FOR THE NEXT REPORTING PERIOD

Expected activities for the next reporting period, from July 1, 2012, to December 31, 2012, are presented below. This list should not be construed as an explanation of all activities that will be occurring in the second half of 2012. Certain Consent Decree activities, such as Nine Minimum Controls (NMC); Capacity, Management, Operations and Maintenance (CMOM); Public Participation; Project Planning; and Data Management, will continue for the duration of the Consent Decree and are therefore not specifically discussed below.

- Control Measures
 - Middle Blue River Pilot Project – Issuance of substantial completion is expected in Fall 2012.
 - Distributed Storage Outfall BR069 and BR059 – Contracts are expected to be completed for short-term flow monitoring and field investigations by year end. Should rainfall be inadequate to properly calibrate the model, it may be necessary to either extend the existing flow monitoring contract or issue a new Request for Proposals. Issuance of an RFQ/P for engineering design phase services is expected to occur during the reporting period.
 - Small Sewer Rehabilitation, Middle Blue River – Contracts are expected to be completed for field investigations.
 - Inflow and Infiltration Reduction, Round Grove Creek (South of the Missouri River) – Construction is expected to continue throughout the reporting period.
 - Storage Tank, 87th Street Pump Station (Phase I) – It is anticipated that initial site investigation activities will occur and design activities will begin.
 - Force Main, Round Grove – A construction notice-to-proceed is expected to be issued to the selected contractor.
 - Inflow and Infiltration Reduction, Blue River South Basin Projects 1 and 2 (south of Missouri River) – Issuance of the RFQ/P for Design Professional Services is anticipated to occur.
 - Small Sewer Rehabilitation, Town Fork Creek – Pre-design/planning activities are expected to

continue. These activities include project definition, determination of project delivery method, scope of work development, pre-contracting activities and development of a RFQ/P for design professional.

- Pump Station Upgrade, Turkey Creek – Pre-design/planning activities are expected to continue.
- Inflow and Infiltration Reduction, Line Creek/Rock Creek Basin Phase I – Pre-design/planning activities are expected to continue.
- Long-Term Flow Metering – It is anticipated that a contract for long-term flow metering for additional metering sites will be executed in the second half of 2012. A notice of intent to contract has been issued to ADS, LLC. The scope of work includes 18 metering sites spanning a period of 28 months (as indicated in the Consent Decree Appendix D – Table 2).

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