

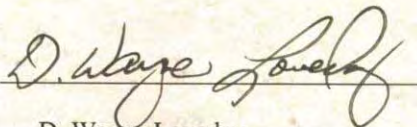
Quarterly Progress Report

Volume 15

Fourth Quarter Report
October 1 through December 31, 2008

Submitted to EPA on January 28, 2009

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering such information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



D. Wayne Loveday

1.28.09

Date



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Executive Summary

On February 11, 2005, the Knoxville Utilities Board (KUB) entered into a Consent Decree with the United States, the State of Tennessee, the Tennessee Clean Water Network, and the City of Knoxville. The following Quarterly Progress Report is submitted to fulfill the reporting requirements described in Section XIX of the Consent Decree.

Consent Decree language, pages 82-83: *“Beginning thirty (30) Days after the first Calendar Quarter following the Date of Entry, and thirty (30) Days after each Calendar Quarter thereafter until termination of the Consent Decree, KUB shall submit to the Parties, and simultaneously place in the PDR, a Quarterly Progress Report. Quarterly Progress Reports shall not be subject to the Public Review Requirement of Section VI.A.2. However, KUB shall receive questions and comments from the public for KUB’s review for a period of twenty (20) Days following placement in the PDR. Each Quarterly Progress Report shall contain:*

1. *A summary of compliance with and activities related to implementation of the Phase 1 CAP/ER and Phase 2 CAP/ER, including: the status of construction projects in comparison to the schedules that have been established pursuant to the Consent Decree for those projects; and schedule deadlines and milestones achieved during Calendar Quarter and expected during the next Calendar Quarter;*
2. *A summary of compliance with and activities related to implementation of the CPE and CCP;*
3. *A summary of implementation of and compliance with the Process Controls Program;*
4. *A summary of the implementation of the Capacity Assurance Program for the Calendar Quarter, including the number of, and anticipated flow from, sewer connections that have been authorized, by Sewerbasin, a description of the projects that have been authorized and the number of credits earned and banked by KUB that will be expended for those projects, by Sewerbasin, and any exceptions granted for connections for essential services;*
5. *Identification of any transfer of an ownership interest, operation, management, or other control of the Treatment Works, or any portion thereof.*
6. *A description of the status of compliance or non-compliance with the requirements of this Decree and, if applicable, the reasons for non-compliance, including a list of all violations that are subject to stipulated penalties under Section X of this Decree.*
7. *A spreadsheet and summary of all SSOs, Bypasses, Diversions and effluent limit violations that occurred during the previous Calendar Quarter. Information on Building Backups may be provided in separate spreadsheets and summaries from other SSOs. The spreadsheets and summaries shall identify:*
 - a. *For all SSOs, the location, source, date, time, duration, pathway (if any), receiving water (if any), the reason for each SSO, the total SSO volume, the volume returned to the WCTS, and the volume not captured;*
 - b. *For all Bypasses and Diversions, the location, date, time, duration, volume and reason for each Bypass and Diversion; and the total Bypass and Diversion volumes;*
 - c. *For all effluent limit violations, all information required to be reported on KUB’s Discharge Monitoring Reports.*
8. *The water quality monitoring data and other information required pursuant to Section VII.D.1.(e).(v).”*

KUB compiled this Quarterly Progress Report to detail the events that occurred during the fourth quarter of 2008 from October 1 through December 31. This is the fifteenth quarterly report required of KUB under this Consent Decree. The Consent Decree requirements pertaining to the Phase 2 CAP/ER will not be fulfilled in this report since it has not become due; rather, a description of the status of development for this program is given. The Consent Decree reporting requirements for this program will be met after EPA has provided approval.

Report Organization

Section 1: Phase 1 CAP/ER and Phase 2 CAP/ER – Summarizes the compliance with and activities related to implementation of the Phase 1 CAP/ER, including the status of construction projects in comparison to the schedules that have been established pursuant to the Consent Decree for those projects; and schedule deadlines and milestones achieved during the Calendar Quarter and expected during the next Calendar Quarter.

Section 2: Comprehensive Performance Evaluation and Composite Correction Plan – Summarizes the compliance with and activities related to the implementation of those deliverables.

Section 3: Process Controls Program – Summarizes the implementation of and compliance with the deliverable.

Section 4: Capacity Assurance Program – Summarizes the implementation of the Capacity Assurance Program for the Calendar Quarter, including the number of, and anticipated flow from, sewer connections that have been authorized, by sewerbasin, a description of the projects that have been authorized and the number of credits earned and banked by KUB that will be expended for those projects, by sewerbasin, and any exceptions granted for connections for essential services.

Section 5: Transfers of Ownership – Identifies any transfers of ownership interest, operation, management, or other control of the treatment works, or any portion thereof.

Section 6: Compliance and Non-Compliance with the Consent Decree – Describes the status of compliance or non-compliance with requirements of the Consent Decree.

Section 7: SSOs, Bypasses, Diversions, and Effluent Limit Violations – Provides a spreadsheet and summary of all SSOs, Bypasses, Diversions, and effluent limit violations.

Section 8: Water Quality Monitoring Data – Summarizes all sampling that was conducted, the results of the sampling, and the projected data collection for the reporting period.

Status of Deliverables

Below is a list of significant dates on which KUB submitted deliverables to EPA or received approval for deliverables. To date, KUB has submitted all deliverables in accordance with the schedule set forth in the Consent Decree.

October 28, 2008

- Submitted to EPA – Quarterly Progress Report 3rd quarter 2008

Section 1 Phase 1 CAP/ER and Phase 2 CAP/ER

Consent Decree language, pages 82-83: *“Each Quarterly Progress Report shall contain... A summary of compliance with and activities related to implementation of the Phase 1 CAP/ER and Phase 2 CAP/ER, including the status of construction projects in comparison to the schedules that have been established pursuant to the Consent Decree for those projects; and schedule deadlines and milestones achieved during Calendar Quarter and expected during next Calendar Quarter.”*

KUB began developing a Corrective Action Plan/Engineering Report (CAP/ER) in January 2004, following the completion of the Phase I Sanitary Sewer Overflow Evaluation Report (SSOER) required by the Agreed Order with the Tennessee Department of Environment and Conservation (TDEC) and, subsequently, the Consent Decree. The objective of the Phase I CAP/ER is to identify facility improvements needed to address the conditions causing SSOs occurring in the collection system during the period of 2001-2004 with the goal of eliminating the SSO locations on the Long-Term List and to support future growth needs. KUB submitted the Phase 1 CAP/ER to EPA on October 28, 2005. Comments were received from EPA on February 23, 2006. Per EPA’s letter, KUB submitted a 30-day response to EPA’s comments on March 27, 2006. The Revised Phase 1 CAP/ER was submitted to EPA on May 22, 2006, and subsequently approved by EPA on June 30, 2006. All work necessary to meet the objectives of the Phase 1 CAP/ER will be completed by June 30, 2013. The Phase 2 CAP/ER will be submitted to EPA by September 11, 2009.

Requested Project Extensions and Changes

Project and Reason	Original Completion Date	Revised Completion Date
No extensions were requested during this reporting period		

EPA Approved Project Extensions and Changes

All previously approved project extensions and changes are listed below.

- **1-1 Upper First Creek Collector Project (Mini-basin 1A1, 2A2, and 3D1)** – End date extended from FY 06/07 to FY 07/08. Due to the expanded scope, an additional extension was requested in the Phase I CAP/ER Annual Report 2008. End date was extended from FY 07/08 to FY 08/09 and is on schedule.
- **1-20 Vine Middle School Rehabilitation Project** – End date extended from FY 06/07 to FY 07/08 and was completed as scheduled.
- **2-4 Dutch Valley Collector Rehabilitation (Sewershed 10B1)** – End date was extended to September 2007 and was completed as scheduled.
- **2-5 Rickard and Wilson Collector Rehabilitation (Sewershed 10C1)** – End date was extended to September 2007 and was completed as scheduled.
- **S-1 Ginnbrook Pump Station Rehabilitation** – End date was extended from FY 06/07 to FY 08/09 and was completed as scheduled.
- **S-5 South Knoxville/Knob Creek Storage Facility** – Project was removed from CAP/ER and replaced with the project below.
- **Revised S-5 Neubert Springs Collector and West Ford Valley Trunk Rehabilitation** – End date scheduled as FY 08/09 was completed as scheduled.

- **2-1 Lower Second Creek Replacement/Rehabilitation at I40/I275 Junction** – End date was extended from FY 08/09 to FY 09/10 and is on schedule.
- **2-2 Lower Second Creek Replacement/Rehabilitation at Woodland** – End date was extended from FY 07/08 to FY 08/09 and is on schedule.

Current Capital Improvement Plan for FY 04/05 - FY 08/09

The following is a list of facility improvement projects included in the Capital Improvement Plan for fiscal years 04/05 to 08/09. These projects were in various stages during the reporting period, including preliminary engineering, design, construction, and completion. Many of these projects are “find and fix” rehabilitation projects. Find work is defined as the inspection (i.e. flow monitoring, CCTV, manhole inspections, smoke testing, etc.) and design phase of the project. Fix is defined as the construction phase that may include manhole rehabilitation/replacement, main line rehabilitation/replacement, and lower lateral rehabilitation/replacement. Other projects are trunkline capacity improvements or wet-weather storage. Each of these projects is considered part of the overall Phase 1 CAP/ER.

Ongoing Projects

First Creek

1. **1-1 Upper First Creek Collector Project (Mini-basin 1A1, 2A2, and 3D1)** – Find and fix work to identify and address cause of overflow in the vicinity of 4811 Beverly Road, 4144 Oakland Drive, and 5511 Dogwood Road. Project scope was expanded to include comprehensive assessment of the entire sub-basin (approximately 105,000 ft). An extension for this project was approved in August 2006. Due to the expanded scope, an additional extension was requested in the Phase I CAP/ER Annual Report 2008. Design is complete. Project has been bid and awarded. The expected completion date is June 2009.

Second Creek

1. **Lower Second Creek Replacement/Rehabilitation at I40/I275 Junction** – Perform sewer system assessment and design rehabilitation and replacement of various trunk and collector lines located in sub-basin 23 near the intersection of interstates 40 and 275. Sewer assessment and design is underway. Project scope will be redefined in lieu of storage placement upstream of the Second Creek trunk sewer running from Dameron south to I40. Original scope was to upsize this portion of trunkline; however, peak shaving at the Bernard Avenue storage tank will offset the need for additional trunkline capacity. Construction of other rehabilitation is scheduled to begin immediately in FY 08/09. Schedule may be adjusted for new project definition. Evaluation of project scope is underway. Construction of CCP storage at Bernard Avenue is underway.
2. **Lower Second Creek Replacement/Rehabilitation at Woodland** – Perform sewer system assessment and design rehabilitation and replacement of various trunk and collector lines located in sub-basin 23 near Woodland Avenue. Sewer assessment is underway. Design is nearing completion. Construction will begin in January 2009.

Third Creek

1. **3-6 I40 and Middlebrook Pike Trunk Sewer Replacement** – Preliminary engineering is underway.

2. **3-7 Neyland Drive Trunk Replacement** – Project is in preliminary engineering as part of the CCP storage being evaluated at the Kuwahee WWTP.
3. **3-8 Third Creek Bike Trail Trunk Replacement** – Project is in preliminary engineering as part of the CCP storage being evaluated at the Kuwahee WWTP.

Fourth Creek

1. **4-1 Chukar Road Rehabilitation** – Design is underway. Construction will commence in 1st quarter 2009.
2. **4-2 Gleason Road Rehabilitation** – Design is underway. Construction will commence in 1st quarter 2009.
3. **4-3 Middlebrook Pike Rehabilitation** – Design is underway. Construction will commence in 1st quarter 2009.
4. **4-4 Northshore Drive Trunk Sewer Replacement** – Replace approximately 3600 ft of existing trunk sewer with 36 inch. Construction should commence in the 2nd quarter 2009. A schedule extension will be requested in the 2009 Annual CAP/ER Report to complete the Phase II portion of work. Design is underway.
5. **4-6 Shadyland Drive Rehabilitation** – Design is underway. Construction will commence in 1st quarter 2009.

South Knox

1. **Blount Avenue Trunkline (Goose Creek)** – Project will examine major trunkline along Blount Avenue in South Knoxville. It will include field survey, line cleaning, and CCTV inspection. Design report has been prepared and presents recommendation on needed improvements. Phase I construction is complete. Phase II construction has been initiated and will be completed in January 2009. Design of the Goose Creek siphon upgrade is underway and is expected to be complete by January 2009. Construction manager has been selected and permit process has been initiated. Work will commence once all permits are secured and TDOT clears KUB to work on Neyland Drive.

Williams Creek

1. **Williams Creek Sub-basin 19 Rehabilitation** – The project is to perform rehabilitation in sub-basin 19A2 to reduce R-value to 2%. Investigative work has been performed on the approximately 105,000 ft in the entire sub-basin 19 area. Rehabilitation projects in 19A1 and 19B1 are substantially complete. Rehabilitation in 19A2/A3 is underway and is projected to be complete in November 2008. The original CAP/ER completion date for the 19A2 project was in FY 10/11. This project was shifted to higher priority due to the large number of private lateral problems and CSSAP rating. Project also coincides with water quality monitoring program work in Williams Creek. All rehabilitation projects in sub-basin 19 are substantially complete.

Completed Projects

First Creek

1. **Fountain Road** - Upsized 3700 ft of gravity sewer using open cut and pipe bursting methods. Replaced manholes and services.
2. **Fair Drive Phase II** - Rehabilitated 3691 ft and replaced 2458 ft of existing 8-12 inch gravity sewer along Fair Drive.
3. **Greenfield Lane** - Replaced approximately 3300 ft of existing sewer with 8-inch and 12-inch PVC and ductile iron pipe.

4. **Whites Creek Phase III** - Replaced 300 ft of 12-inch, 300 ft of 16-inch, 2700 ft of 24-inch, and 5000 ft of 36-inch sewer.
5. **First Creek Sub-basins 3 and 4 Rehabilitation** – Rehabilitated 26,500 ft of line and replaced 10,500 ft. Project included CCTV, smoke testing, and manhole inspections.
6. **Lower First Creek Storage** - Designed and built 5 million gallon (MG) wet-weather storage tank to control sewer overflows near North Hoitt Avenue during rain events.
7. **Upper First Creek Storage** - Designed and built 9 MG wet-weather storage tank to control sewer overflows near Old Broadway during rain events.
8. **Fountain City Trunkline Replacement** - Replaced and upgraded approximately 6000 ft of trunk sewer connecting lines in upper Fountain City to Upper First Creek storage tank. The project addressed SSOs along Broadway, Cedar Lane, and Fountain Road.
9. **Sub-Basin 8B2** – Characterized the condition of 24,900 ft of pipe to determine rehabilitation needs.
10. **1-20 Vine Middle School Rehabilitation Project** – Completed find and fix work to identify cause of overflow in the vicinity of 214 Bertrand Street.
11. **First Creek 8A1** - Rehabilitated approximately 21,067 ft, and replaced approximately 10,273 ft of sewer.

Second Creek

1. **Second Creek Pilleaux PS Collector** - Rehabilitated 19,600 ft of collection system piping in mini-basin 05A4. Project included inspection (CCTV, smoke test, manhole inspections), design, and rehabilitation of lines requiring repair.
2. **Second Creek Sub-basin 15 Rehabilitation** - Rehabilitated approximately 23,500 ft of pipe in mini-basin 15D2. Project included inspection (CCTV, smoke test, manhole inspections), design, and rehabilitation of lines requiring repair.
3. **Second Creek 23E1** - Inspected a total of 28,067 ft of pipe for find and design rehabilitation needs for Mini-basin 23E1. Project included inspection (CCTV, smoke test, manhole inspections), design, and rehabilitation of lines requiring repair.
4. **Dutch Valley Collector Rehab (Mini-basin 10B1)** - Assessed and rehabilitated, where needed, approximately 16,400 ft of collector pipe. This project was combined with the Rickard and Wilson Collector Rehab project below.
5. **Rickard and Wilson Collector Rehab (Mini-basin 10C1)** - Assessed and rehabilitated, where needed, approximately 19,000 ft of collector pipe. Project was combined with Mini-basin 10B1.

Third Creek

1. **Mynderse, Western, and Canna** - Replaced approximately 1700 ft of 8-inch sewer and pipe-burst approximately 3400 ft of 8-inch up to 10-inch and 12-inch pipe to address wet-weather capacity restrictions resulting in overflows near Pleasant Ridge Road.
2. **Third Creek 28B1*** - Investigated rehabilitation needs for collectors in mini-basin 28B1 (approximately 7900 ft of pipe). Project included inspection (CCTV, smoke test, manhole inspections), design, and rehabilitation of lines requiring repair. Plans are being developed for a future rehabilitation project. No construction is planned in the short-term.
*The project named Third Creek 28B1 replaces Third Creek 28C1 that appeared in the Quarterly Progress Report for the Second Quarter 2005. After additional studies, it was determined that flows from 28B1 more likely contributed to overflows along Sutherland Avenue and North Bellemeade, as listed in the SSOER.
3. **Third Creek Storage** - Designed and constructed 4.5 MG wet-weather storage tank to control sewer overflows near Western Avenue and Third Creek Road during rain events.
4. **Upper McKamey Trunk Sewer Replacement** – Project replaced approximately 1600 ft of 12-inch and 15-inch trunk sewer. This project further enhanced improvements already made in Third Creek to address overflows along McKamey Road.

5. **Third Creek Basin 11** – Assessed and rehabilitated approximately 129,657 ft in sub-basin 11. Project included inspection (CCTV, smoke test, manhole inspections), design, and rehabilitation of lines requiring repair.
6. **Third Creek Road Trunk Sewer Replacement** – Project included approximately 3100 ft of 24-inch and 30-inch trunkline. The project replaced and upgraded the trunkline from Western Avenue along Third Creek to the Third Creek storage facility. It addressed overflows occurring at 5600 Western Avenue. Project was extended approximately 2000 ft to reach the new location of the Third Creek Storage Facility at the KUB Hoskins Center.
7. **Third Creek Basin 9 Phase I** – Assessed and rehabilitated collector sewer in 9A1, 9A2, 9A4, and 9D1 (CAP/ER Scope).
8. **Third Creek Basin 9 Phase II** - Designed rehabilitation methods for collectors in Sub-basin 9 (approximately 177,900 ft). Project included inspection (CCTV, smoke test, manhole inspections), design, and rehabilitation of lines requiring repair.

Fourth Creek

1. **Pinebrook Drive Sewer Replacement** – Replaced 330 ft of 8-inch gravity sewer partially exposed by erosion of the bank of the adjacent drainage channel.
2. **Walker Springs Rehabilitation (Mini-Basin 32A4)** – Performed find, and design work in Mini-basin 32A4 in the Walker Springs area. Inspection included 43,000 ft of smoke testing, 43,000 ft of CCTV, and 228 manhole inspections. Plans will be developed for future rehabilitation work.
3. **Walker Springs Storage** – Designed and constructed 3.25 MG wet-weather storage tank to control sewer overflows near Walker Springs Pump Station during rain events.
4. **Papermill Drive Phases I, II, and III** – Designed and constructed replacement of approximately 4000 ft of 15-inch, 18-inch, and 2100 ft of 36-inch sewer in the Papermill Drive area to increase conveyance capacity and reduce sewer overflows.

South Knox

1. **Maryville Pike** – Designed and replaced 800–1,200 ft of 24-inch sewer located in Witherspoon Superfund site. Design rerouted sewer around site.
2. **South Haven Phase I and Phase II** – Relocated, rehabilitated, and upsized approximately 4700 ft of existing collector sewers to increase conveyance capacity and reduce inflow and infiltration (I/I).
3. **Island Home Rehabilitation** – Rehabilitated 9400 ft and replaced 1200 ft of collector sewers to reduce I/I.
4. **East Ford Valley Rehabilitation** – Rehabilitated approximately 16,000 ft of sewers in Mini-basin 41A4. Project included inspection (CCTV, smoke test, manhole inspections), design, and rehabilitation of lines requiring repair.
5. **Stone Road Rehabilitation** – Rehabilitated approximately 13,500 ft of sewers in Mini-basin 41B1. Project included inspection (CCTV, smoke test, manhole inspections), design, and rehabilitation of lines requiring repair.
6. **South Haven Rehabilitation Phase III** – Rehabilitated approximately 21,700 ft of sewers in Mini-basin 40F1. Project included inspection (CCTV, smoke test, manhole inspections), design, and rehabilitation of lines requiring repair.
7. **Ginnbrook Pump Station** – Evaluated pump station and force main to ensure adequate capacity. Also included improvements to wet-well, pump system, and valve vault. The force main was re-routed.
8. **Neubert Springs Collector and West Ford Valley Trunk Rehabilitation** – Rehabilitated 10000 ft of 15- to 18-inch trunk sewer along West Ford Valley Road. Completed find work in sub-basins 41C1, 41C2, and 41A2. Completed trunkline

rehabilitation on West Ford Valley. Rehabilitated collector line in sub-basin 41C1, C2, and A2.

Williams Creek

1. **Delrose Force Main Replacement** – Designed and replaced approximately 5,000 ft of 16-inch ductile iron pipe force main that had severe structural problems.
2. **Williams Creek Trunk Line Replacement** – Designed and replaced approximately 3,700 ft of 24-inch sewer to correct structural problems.

Loves Creek

1. **Shelbourne Road Rehabilitation** – 26,900 ft of gravity sewer was rehabilitated along with 30 manholes in sub-basins 6A4 and 6A5. This work addressed the SSO located on Shelbourne Road.

Section 2 Comprehensive Performance Evaluation Program (CPE) and Composite Correction Plan (CCP)

Consent Decree language, pages 82-83: *"Each Quarterly Progress Report shall contain... A summary of compliance with and activities related to implementation of the CPE and CCP."*

The CPE was submitted to EPA on February 24, 2006, and was approved on July 24, 2006.

The CCP was posted in the public document repository on June 19, 2007, and comments were accepted until July 18, 2007. The CCP was submitted to the EPA on July 23, 2007.

On November 19, 2007, KUB received notice from EPA extending their review period of the CCP until December 22, 2007. On January 4, 2008, KUB received a letter from EPA disapproving the CCP. In a letter dated February 20, 2008, KUB requested to extend the deadline for responding to EPA's comments until March 25, 2008, which was approved by EPA.

KUB submitted the Revised CCP to EPA on March 21, 2008.

Following the submittal of the Revised CCP in March 2008, KUB, EPA, TDEC, and DOJ participated in several discussions to address both technical issues related to the work outlined in the CCP and legal issues pertaining to the relationship between the CCP, Consent Decree, and outstanding appeals of KUB's NPDES Permits. These discussions culminated in all parties agreeing to a revised schedule for the CCP plant upgrades. The Revised CCP will be submitted again in January 2009. Among the changes agreed upon by all parties was to issue an amendment to the Consent Decree, which specifically addresses extending the compliance schedule for completing the work outlined in the Revised CCP.

Section 3 Process Controls Program

Consent Decree language, pages 82-83: *“Each Quarterly Progress Report shall contain... A summary of implementation of and compliance with the Process Controls Program.”*

The Process Controls Program (PCP) was implemented twice during this reporting period; once at Kuwahee and once at Fourth Creek. All parameters were followed and Diversions were based on PCP parameters.

In a letter to EPA dated August 28, 2008, KUB concluded that the PCP needed no modifications or revisions and proposed continuing to use the PCP as previously approved. KUB committed to make revisions to the PCP as upgrades required by the CCP are made to Kuwahee and Fourth Creek WWTPs in the future. Until then, KUB agreed to provide updates regarding the number of initiations and any resulting Diversions in the Quarterly Progress Report.

Section 4 Capacity Assurance Program

Consent Decree language, pages 82-83: *“Each Quarterly Progress Report shall contain... A summary of the implementation of the Capacity Assurance Program for that Calendar Quarter, including the number of, and anticipated flow from, sewer connections that have been authorized, by Sewerbasin, a description of the projects that have been authorized and the number of credits earned and banked by KUB that will be expended for those projects, by Sewerbasin, and any exceptions granted for connections for essential services.”*

The Capacity Assurance Program (CAP) was submitted to EPA for review on February 8, 2006. EPA reviewed and approved the program on April 7, 2006. KUB started reviewing building permits based on the approved CAP on June 6, 2006, which was within the 60-day timeframe for implementing the program after receiving EPA approval.

To review building permits more efficiently using the CAP criteria agreed on with the EPA, KUB worked with a consultant, Camp, Dresser, & McKee, to develop an Information Management System (IMS). The IMS assists KUB in managing the CAP program by determining the amount of wastewater each proposed building would add to KUB's wastewater system based on its location. The IMS also helps track rehabilitation credits that KUB earns through its CAP/ER and MOM programs.

Appendix A includes a list of capital projects that KUB performed to gain rehabilitation credit in its sewer system. As stated in the Consent Decree, the list of authorized sewer connections was maintained and updated as necessary until full implementation of the CAP as approved by EPA. Therefore, the list will no longer be included as part of this quarterly report.

There were no exceptions granted for connections for essential services during this reporting period.

Section 5 Transfers of Ownership

Consent Decree language, pages 82-83: *“Each Quarterly Progress Report shall contain... Identification of any transfer of an ownership interest, operation, management, or other control of the Treatment Works, or any portion thereof.”*

There has been no transfer of an ownership interest, operation, management, or other control of the Treatment Works, or any portion thereof, during this reporting period.

Section 6 Compliance and Non-Compliance With the Consent Decree

Consent Decree language, pages 82-83: *“Each Quarterly Progress Report shall contain...A description of the status of compliance or non-compliance with the requirements of this Decree and, if applicable, the reasons for non-compliance, including a list of all violations that are subject to stipulated penalties under Section X of this Consent Decree.”*

6.1 Submission of Deliverables

To date, KUB has submitted all deliverables in accordance with the schedule set forth in the Consent Decree. The following sections detail all activity related to deliverables that occurred during the past quarter. Also noted are the dates each submittal was available for public comment in the Public Document Repository (PDR), when the deliverable was submitted to EPA, when EPA responded with comments, when KUB responded to those comments, and when EPA approval was received.

6.1.1 Quarterly Progress Report Third Quarter 2008

Consent Decree language, pages 82-83: *“Beginning thirty (30) Days after the first Calendar Quarter following the Date of Entry, and thirty (30) Days after each Calendar Quarter thereafter until termination of the Consent Decree, KUB shall submit to the Parties, and simultaneously place in the PDR, a Quarterly Progress Report.”*

On October 28, 2008, KUB submitted to EPA and placed in the PDR the Quarterly Progress Report for the third quarter 2008. This deliverable was not subject to the Public Review Requirement of Section VI.A.2, but was available for public comment from October 28, 2008, until November 16, 2008. No comments were received during that period.

6.2 Violations Subject to Stipulated Penalties

During this reporting period, KUB incurred ten Unpermitted Discharges. Table 1 below lists all violations subject to stipulated penalties as outlined in the Consent Decree.

Table 1. Violations Subject to Stipulated Penalties

Violation	Date	Address	Cause
Unpermitted Discharge	10/22/08	438 Maryville Pike	Vandalism
Unpermitted Discharge	10/24/08	405 Merchants Drive	Blockage
Unpermitted Discharge	11/4/08	3413 Pilkay Road	Blockage
Unpermitted Discharge	11/5/08	1036 E. Emerald Avenue	Blockage
Unpermitted Discharge	11/9/08	1036 E. Emerald Avenue	Blockage
Unpermitted Discharge	12/10/08	615 Sevier Avenue	Blockage
Unpermitted Discharge	12/10/08	1210 E. Moody Avenue	Heavy Rainfall
Unpermitted Discharge	12/11/08	1216 Watercross Drive	Heavy Rainfall
Unpermitted Discharge	12/11/08	4144 Oakland Drive	Heavy Rainfall
Unpermitted Discharge	12/11/08	7112 Shadyland Drive	Heavy Rainfall

Section 7 SSOs, Bypasses, Diversions, and Effluent Limit Violations

Consent Decree language, pages 82-83: *“Each Quarterly Progress Report shall contain... A spreadsheet and summary of all SSOs, Bypasses, Diversions, and effluent limit violations that occurred during the previous Calendar Quarter. Information on Building Backups may be provided in separate spreadsheets and summaries from other SSOs. The spreadsheets and summaries shall identify:*

- a. For all SSOs, the location, source, date, time, duration, pathway (if any), receiving water (if any), the reason for each SSO, the total SSO volume, the volume returned to the WCTS, and the volume not captured;*
- b. For all Bypasses and Diversions, the location, date, time, duration, volume and reason for each Bypass and Diversion; and the total Bypass or Diversion volumes;*
- c. For all effluent limit violations, all information required to be reported on KUB’s Discharge Monitoring Reports.”*

7.1 SSOs

Appendix B lists all SSOs that occurred during this reporting period. During this period, there were 24 SSO events. Of that number, 14 were due to blockages by either grease, debris, roots, or a combination thereof; four were due to broken pipe; four were due to heavy rainfall; one was due to construction failure; and one was due to vandalism. Of the 24 SSO events, 18 were in the 0 – 1000 gallons volume range, five were in the 1001 – 10,000 range, and one event totaled greater than 10,000 gallons. Durations for events during this period are as follows: 14 ranged from 0 – 2 hours, six ranged from 2.1 - 5 hours, and four were greater than 5 hours.

The four heavy rainfall events occurred as a result of a two-day rainfall event with accumulation totaling over four inches of rain. During this event, KUB’s newly constructed storage facilities contained over 15 million gallons of flow. That volume was released back into the collection system as flows subsided.

7.2 Building Backups

Appendix C lists all Building Backups that occurred during this reporting period. During this period, there were five Building Backups. Four were due to blockage and one was due to electrical failure.

7.3 Bypasses

No Bypasses occurred during this reporting period.

7.4 Diversions

Table 2 contains all Diversion event information that occurred during this reporting period. During this reporting period, there was one Diversion at Kuwahee and one at Fourth Creek. No Diversions occurred at Loves Creek or Eastbridge WWTPs.

7.5 Effluent Limit Violations

Table 3 contains all effluent limit violations that occurred during this reporting period. The table contains the information as it is reported in KUB’s Discharge Monitoring Reports. During this reporting period, there were no effluent limit violations at Kuwahee, Fourth Creek, Loves Creek, or Eastbridge WWTPs.

Table 2: Bypasses and Diversions

WWTP	Did an event occur?	Type of Event	Date Diversion gate opened	Time Diversion gate opened	Date Diversion gate closed	Time Diversion gate closed	Date Diversion flow reported	Duration (hrs)	Volume (MG)	Total Event Duration (hrs)	Total Event Volume (MG)	Reason for Event
Kuwahee	Yes	Diversion	12/11/2008	11:45			12/11/2008	11.42	15.21	11.42	15.21	High flow event due to excess rainfall
					12/11/2008	23:10						
Fourth Creek	Yes	Diversion	12/11/2008	11:00			12/11/2008	13.0	5.37	15	5.69	High flow event due to excess rainfall
					12/12/2008	2:00	12/12/2008	2.0	0.32			
Loves Creek	No											
Eastbridge	No											

Table 3: Effluent Limit Violations

WWTP	Did an event occur?	Date	Parameter	Type	Limit	Value
Kuwahee	No	-	-	-	-	-
Fourth Creek	No	-	-	-	-	-
Loves Creek	No	-	-	-	-	-
Eastbridge	No	-	-	-	-	-
SS - Settleable Solids	mg/l - milligrams per liter					
TSS - Total Suspended Solids	cfu –Colony Forming Unit					
ml/l – milliliters per liter	lbs - Pounds					

Section 8 Water Quality Monitoring Data

Consent Decree language, pages 82-83: *“Each Quarterly Progress Report shall contain... The water quality monitoring data and other information required pursuant to Section VII.D.1.(e).(v).”*

8.1 Sampling Conducted and Results

Appendix D lists all sampling that was conducted during the reporting period and the results thereof. In addition to routine monitoring in all creeks, and responding to Sanitary Sewer Overflows (SSO), KUB Water Quality personnel conducted dry and/or wet weather investigative sampling on Fourth Creek, Baker Creek, Goose Creek and Williams Creek. Much of this investigative sampling included the use of Real Time Polymerase Chain Reaction (RT-PCR) source testing to identify potential sewer impacts.

Fourth Creek

The three routine sites along Fourth Creek during November had elevated fecal coliform and *E. coli* counts for a dry sampling period during this time of year (Table 1). KUB submitted samples for RT-PCR analysis to determine if the elevations in *E. coli* were collection system related. The low total *Bacteroides* and the lack of human *Bacteroides* suggests the *E. coli* and fecal coliform elevations are not sewer related. Subsequent routine sampling in December did not exhibit the same elevations in bacterial counts.

Goose Creek

In October, KUB Water Quality personnel responded to a question regarding a sign posting on Goose Creek. The sampler observed the signage which had been posted for several years indicating the water was unfit for human contact. General water quality measurements as well as samples for bacteriological testing were collected on 10/14/08. The sampler did not pull the signs since the creek has other posting regarding recreational use and human contact. Routine water quality monitoring was performed the following day and is also reported in Routine Monitoring report.

KUB submitted samples for RT-PCR analysis for the routine samples taken on Goose Creek in December (Table 2). Although the fecal coliform and *E. coli* were elevated at these sites, the total *Bacteroides* and human *Bacteroides* concentrations in the sample were low. The lack of appreciable human *Bacteroides* suggests that the elevations of *E. coli* and fecal coliform are not sewer related.

Williams Creek

In August and September 2008, KUB conducted wet and dry sampling on Williams Creek. The first set of dry weather samples showed elevations of *E. coli* and fecal coliform counts in the three most upstream sampling sites. The final set of dry weather investigative samples from the five sample sites is included in Table 3. (The RT-PCR results were not available to be included in the previous quarterly report). This final sample set exhibited elevations in fecal coliform and *E. coli* in primarily the upper most sampling point, routine site 2.02. The total and human *Bacteroides* concentrations for that site were similar to the first dry weather sampling event. The lack of appreciable human *Bacteroides* suggests that the elevations we have seen with regards to *E. coli* are not sewer related.

Baker Creek

In August, KUB conducted wet and dry investigative sampling on Baker Creek. There were elevations of fecal coliform and *E. coli* concentrations in the upper most regions of the creek as illustrated in the first dry weather sampling event (August 2008). However, the only appreciable elevation of *Bacteroides*, both total and human, on Baker Creek occurred

at the lowest sampling site, routine site 0.36. It was concluded that the elevations in all enteric bacteria might be due to a transient issue, like a broken sewer lateral rather than a consistent issue, like a leaking sewer main. During December, KUB Water Quality personnel collected an additional five samples during dry weather at those sites previously studied (Table 4). This most recent sampling of those five sites did not show significant elevation in total nor human Bacteroides concentrations. The recent dry weather data confirms that the elevations are not due to a leaking sewer main. Investigation in this area will continue.

KUB also submitted routine monitoring samples from Baker Creek in November and December for RT-PCR analysis to determine the possible source of E. coli elevations (Table 4). Neither set of samples contained appreciable amounts of total and human Bacteroides, suggesting that the elevations of E. coli were not sewer related.

KUB completed the second set of Wet Weather Investigative sampling on Baker Creek (Table 5). Water Quality personnel monitored four sites on the creek (three of which were routine monitoring sites) and collected samples and water quality measurements four different times. The first sampling event occurred before the rainfall began, the second event occurred right before the peak of the rainfall. The third sampling event was conducted after the peak of the rainfall subsided and creek depths were beginning to decrease, and the fourth event occurred when creek flows returned to baseline. Each sample was analyzed for fecal coliform, E. coli, as well as total and human Bacteroides. As expected, the fecal coliform, E. coli and total Bacteroides concentrations elevated as the rainfall progressed. The peak of the rainfall happened shortly after the second sampling event. For the majority of the sites, there was not an appreciable elevation of fecal bacterial concentrations after the peak of the rainfall. Elevations in bacterial counts after the rainfall peak can indicate capacity issues in the adjacent sewer mains. Visual inspections of the proximal sewer mains in the study areas also did not indicate the sewers had reached capacity. The only sample site that showed an appreciable elevation of total Bacteroides concentration after peak rainfall was routine site 0.53. Interestingly, the E. coli and fecal coliform concentrations at that site actually decreased after the rainfall peak. Some of the sample sites did exhibit elevations of fecal coliform and E. coli after the peak of the rainfall, but did not exhibit appreciable increases in total or human Bacteroides concentrations. KUB will continue to monitor Baker Creek and investigate areas of bacterial elevations on the creek. The recent RT-PCR data generated does not rule out the possibility of sewer-related issues as a source of impacts in the area, but this data does not indicate capacity related issues near the creek.

During routine monitoring on Second Creek in November, unusually low dissolved oxygen was measured at routine site 5.76. The fecal coliform concentration for that sample was also elevated, but the E. coli concentration was not. Routine monitoring in December did not yield comparable results for that routine site. KUB will continue to monitor Second Creek and investigate occurrences further.

KUB also submitted samples from a recent SSO for RT-PCR testing as a test to confirm the utility of this source testing method to identify sewer impacts (Table 6). The total and human Bacteroides content in the post-overflow downstream sample is extremely high when compared to the upstream sample, as expected.

8.2 Projected Data Collection

During the first quarter of 2009, KUB will continue to monitor the 24 routine sampling locations in the sewer basins of eight area creeks. KUB will collect samples from the following locations during the first quarter of 2009:

Sample Locations by Creek Mile or Site Number

Creek Name	Creek Mile #	Creek Mile #	Creek Mile #
First Creek	0.45	2.57	6.33
Second Creek	0.30	1.54	5.76
Third Creek	0.87	2.08E	4.80W
Fourth Creek	0.55	1.33	1.78
Baker Creek	0.36	0.53	1.45
Goose Creek	0.55	1.19E	1.80E
Loves Creek	0.85	1.89	3.45
Williams Creek	0.89	1.70	2.02

In the first quarter of 2009, KUB will conduct Dry and Wet Weather investigations on Goose Creek. KUB will also continue to investigate elevations on Baker Creek and Williams Creek as they arise.

Appendix A

Capital Projects and Rehabilitation Credits

Capital Projects and Rehabilitation Credits

	Project Name	Credit Type	Basin	WWTP	Credits Banked (gpd)	Status
1	Comprehensive Rehab 03B1a	Comprehensive Rehabilitation	1st Creek	Kuwahee	321,030	Project Complete
2	Comprehensive Rehab 03B2a	Comprehensive Rehabilitation	1st Creek	Kuwahee	302,366	Project Complete
3	Comprehensive Rehab 04B1a	Comprehensive Rehabilitation	1st Creek	Kuwahee	334,626	Project Complete
4	Comprehensive Rehab 08A1	Comprehensive Rehabilitation	1st Creek	Kuwahee	1,589,952	Project Complete
5	McC Campbell Lane Sewer Replacement	Find & Fix Gravity Main	1st Creek	Kuwahee	25,543	Project Complete
6	Knox Road Trunkline Replacement	Find & Fix Gravity Main	1st Creek	Kuwahee	36,728	Project Complete
7	vented manhole cover replacement (7A1)	Manhole Cover	1st Creek	Kuwahee	13,333	Project Complete
8	vented manhole cover replacement (7A1)	Manhole Cover	1st Creek	Kuwahee	13,333	Project Complete
9	vented manhole cover replacement (7A1)	Manhole Cover	1st Creek	Kuwahee	13,333	Project Complete
10	Comprehensive Rehab 15D2	Comprehensive Rehabilitation	2nd Creek	Kuwahee	1,450,008	Project Complete
11	Comprehensive Rehab 05A4 & 05A3	Comprehensive Rehabilitation	2nd Creek	Kuwahee	43,904	Project Complete
12	Comprehensive Rehab 09A2	Comprehensive Rehabilitation	3rd Creek	Kuwahee	296,664	Project Complete
13	Comprehensive Rehab 09A1	Comprehensive Rehabilitation	3rd Creek	Kuwahee	219,345	Project Complete
14	Walker Springs Storage Tank	Storage Tank	4th Creek	Fourth Creek	3,250,000	Project Complete
15	Comprehensive Rehab 40F1	Comprehensive Rehabilitation	South Knox / Knob Creek	Kuwahee	83,600	Project Complete
16	Comprehensive Rehab 41A4	Comprehensive Rehabilitation	South Knox / Knob Creek	Kuwahee	371,994	Project Complete
17	Comprehensive Rehab 41B1	Comprehensive Rehabilitation	South Knox / Knob Creek	Kuwahee	152,958	Project Complete
18	Wilson Ave, Chesnut St., Donnell St. (Asset Replacement)	Find & Fix Gravity Main	Williams Creek	Kuwahee	28	Project Complete
19	Williams Creek Trunkline Replacement	Find & Fix Gravity Main	Williams Creek	Kuwahee	168,667	Project Complete
20	Rushland Park Off Site Sewer Rehabilitation	Find & Fix Gravity Main	Loves Creek	Loves Creek	3,803	Project Complete
21	Emily Avenue Pump Station Abandonment	Find & Fix Gravity Main	Loves Creek	Loves Creek	141,600	Project Complete
22	Fair Drive - Phase I	Find & Fix Gravity Main	1st Creek	Kuwahee	130,928	Project Complete
23	Comprehensive Rehab 23E1	Comprehensive Rehabilitation	2nd Creek	Kuwahee	4,215,003	Project Complete
24	vented manhole cover replacements (08B2)	Manhole Cover	1st Creek	Kuwahee	4,669	Project Complete
25	vented manhole cover replacement (16B1)	Manhole Cover	1st Creek	Kuwahee	667	Project Complete
26	vented manhole cover replacements (28C1)	Manhole Cover	3rd Creek	Kuwahee	1,334	Project Complete
27	10" mainline replacement (33A2)	Find & Fix Gravity Main	4th Creek	Fourth Creek	5,409	Project Complete
28	vented manhole cover replacements (22C2)	Manhole Cover	3rd Creek	Kuwahee	16,002	Project Complete
29	vented manhole cover replacements (63)	Manhole Cover	Sinking Creek	Loves Creek	66,665	Project Complete
30	10" mainline replacement (6C1)	Find & Fix Gravity Main	Loves Creek	Loves Creek	24,620	Project Complete
31	Comprehensive Rehab 06A5	Comprehensive Rehabilitation	Loves Creek	Loves Creek	263,358	Project Complete
32	Comprehensive Rehab 06A4	Comprehensive Rehabilitation	Loves Creek	Loves Creek	386,304	Project Complete
33	vented manhole cover replacement (39D2)	Manhole Cover	South Knox / Knob Creek	Kuwahee	667	Project Complete
34	vented manhole cover replacement (39D4)	Manhole Cover	South Knox / Knob Creek	Kuwahee	667	Project Complete
35	vented manhole cover replacement (39D3)	Manhole Cover	South Knox / Knob Creek	Kuwahee	2,668	Project Complete
36	vented manhole cover replacement (20A6)	Manhole Cover	Loves Creek	Loves Creek	1,334	Project Complete
37	vented manhole cover replacement (20A7)	Manhole Cover	Loves Creek	Loves Creek	667	Project Complete
38	vented manhole cover replacement (13A2)	Manhole Cover	3rd Creek	Kuwahee	667	Project Complete
39	vented manhole cover replacement (13B1)	Manhole Cover	3rd Creek	Kuwahee	13,335	Project Complete
40	vented manhole cover replacement (28B1)	Manhole Cover	3rd Creek	Kuwahee	1,334	Project Complete
41	12" mainline replacement (44)	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	4,278	Project Complete
42	manhole frame seal repair (67)	Manhole Repair	Loves Creek	Loves Creek	2,304	Project Complete
43	Whites Creek Trunk Line Replacement (02)	Find & Fix Gravity Main	1st Creek	Kuwahee	50,106	Project Complete
44	Comprehensive Rehab 09D1	Comprehensive Rehabilitation	3rd Creek	Kuwahee	381,376	Project Complete
45	Comprehensive Rehab 09A4	Comprehensive Rehabilitation	3rd Creek	Kuwahee	408,317	Project Complete
46	Lower First Creek Storage Tank	Storage Tank	1st Creek	Kuwahee	5,000,000	Project Complete
47	vented manhole cover replacement (11B2)	Manhole Cover	3rd Creek	Kuwahee	13,333	Project Complete
48	vented manhole cover replacement (13C1)	Manhole Cover	3rd Creek	Kuwahee	2,667	Project Complete
49	vented manhole cover replacement (22A2)	Manhole Cover	3rd Creek	Kuwahee	667	Project Complete
50	vented manhole cover replacement (22B1)	Manhole Cover	3rd Creek	Kuwahee	667	Project Complete
51	Creek Head Drive sewer line replacement (32A4)	Find & Fix Gravity Main	4th Creek	Fourth Creek	11,132	Project Complete
52	Manhole replacement (19A3)	Find & Fix Gravity Main	Williams Creek	Kuwahee	207	Project Complete
53	Papermill drive sewer line replacement (33A2)	Find & Fix Gravity Main	4th Creek	Fourth Creek	103,769	Project Complete
54	Wells Rd sewer line replacement (39C2)	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	1,728	Project Complete
55	Power Park Manhole Rehab (45)	Find & Fix Gravity Main	Knob Creek	Kuwahee	3,596	Project Complete
56	Blount Ave abandoned lateral (39A1)	Disconnect abandoned lateral	South Knox / Knob Creek	Kuwahee	2,000	Project Complete
57	Woodbine Ave sewerline Rehab (19A2)	Find & Fix Gravity Main	Williams Creek	Kuwahee	2,683	Project Complete
58	Pleasant Ridge Rd Sewer line improvements (09A1)	Find & Fix Gravity Main	3rd Creek	Kuwahee	207	Project Complete
59	Papermill drive sewer line replacement (27A1)	Find & Fix Gravity Main	Fourth Creek	Fourth Creek	18,211	Project Complete
60	Wilson Rd Manhole Rehab (10C1)	Find & Fix Gravity Main	2nd Creek	Kuwahee	831	Project Complete
61	Maryville Pike Trunk Replacement (39C1)	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	72,880	Project Complete
62	Upper McKamey Trunk Replacement (11B1 11B2)	Find & Fix Gravity Main	3rd Creek	Kuwahee	64,324	Project Complete
63	Fox Manor Blvd sewer line replacement (32A4)	Find & Fix Gravity Main	4th Creek	Fourth Creek	31,510	Project Complete
64	Power Park Manhole Rehab (47)	Manhole Repair	South Knox / Knob Creek	Kuwahee	7,700	Project Complete
65	Sutherland Ave Sewer Line Replacement (28B1)	Find & Fix Gravity Main	3rd Creek	Kuwahee	20,383	Project Complete
66	Fountain City Trunkline Replacement (03B1 03B2)	Find & Fix Gravity Main	1st Creek	Kuwahee	72,512	Project Complete
67	vented manhole cover replacement (11B2)	Manhole Cover	4th Creek	Fourth Creek	13,333	Project Complete

Capital Projects and Rehabilitation Credits

68	vented manhole cover replacement (39D2)	Manhole Cover	South Knox / Knob Creek	Kuwahee	13,333	Project Complete
69	Comprehensive Rehabilitation 19A2	Comprehensive Rehabilitation	Williams Creek	Kuwahee	521,631	Project Complete
70	17B1 Manhole Replacement	Find & Fix Gravity Main	1st Creek	Kuwahee	1,803	Project Complete
71	Vine Middle School sewerline Rehab (24D1)	Find & Fix Gravity Main	1st Creek	Kuwahee	23,491	Project Complete
72	Comprehensive Rehabilitation (08B2)	Comprehensive Rehabilitation	1st Creek	Kuwahee	841,370	Project Complete
73	Third Creek Storage Tank (21A1)	Storage Tank	3rd Creek	Kuwahee	4,000,000	Project Complete
74	Comprehensive Rehabilitation (19A1)	Comprehensive Rehabilitation	Williams Creek	Kuwahee	313,938	Project Complete
75	Comprehensive Rehabilitation (19B1)	Comprehensive Rehabilitation	Williams Creek	Kuwahee	328,300	Project Complete
76	Comprehensive Rehabilitation (10B1)	Comprehensive Rehabilitation	2nd Creek	Kuwahee	191,698	Project Complete
77	Comprehensive Rehabilitation (10C1)	Comprehensive Rehabilitation	2nd Creek	Kuwahee	67,840	Project Complete
78	Disconnected Stormwater Detention Pond Sevier Ave (40C1)	Disconnect Storm Sewer	South Knox / Knob Creek	Kuwahee	97,333	Project Complete
79	Sub Basin 63 Sinking Creek Drainage rehabilitation (63)	Comprehensive Rehabilitation	South Knox / Knob Creek	Loves Creek	72,110	Project Complete
80	West Ford Valley Trunkline replacement (41A1)	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	236,704	Project Complete
81	Blount Avenue Trunkline Replacement (39A1)	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	225,376	Project Complete
82	Brookvale Point Repairs (02A3)	Find & Fix Gravity Main	1st Creek	Kuwahee	52,079	Project Complete
83	Park Pump Point Repairs (45)	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	11,522	Project Complete
84	Wayland Road Storage Tank (67)	Storage Tank	Loves Creek	Loves Creek	20,000	Project Complete
85	Comprehensive Rehab (19A3)	Comprehensive Rehabilitation	Williams Creek	Kuwahee	325,090	Project Complete
86	Comprehensive Rehab (41A2)	Comprehensive Rehabilitation	South Knox / Knob Creek	Kuwahee	39,330	Project Complete
87	Comprehensive Rehab (41A5)	Comprehensive Rehabilitation	South Knox / Knob Creek	Kuwahee	119,327	Project Complete
88	Jersey Ave sewer rehabilitation (SubBasin 23)	Find & Fix Gravity Main	1st Creek	Kuwahee	419	Project Complete
89	East Magnolia sewer rehabilitation (SubBasin 24)	Find & Fix Gravity Main	1st Creek	Kuwahee	846	Project Complete
90	Walker Blvd Sewer Rehabilitation (SubBasin 16)	Find & Fix Gravity Main	1st Creek	Kuwahee	1086	Project Complete
91	Kingston Court Sewer Rehabilitation (SubBasin 29)	Find & Fix Gravity Main	3rd Creek	Kuwahee	3727	Project Complete
92	Clinch Ave Sewer Rehabilitation (SubBasin 30)	Find & Fix Gravity Main	1st Creek	Kuwahee	442	Project Complete
93	Badgett Drive Sewer Rehabilitation (SubBasin 22)	Find & Fix Gravity Main	3rd Creek	Kuwahee	214	Project Complete
94	Dickson Street Sewer Rehabilitation (SubBasin 20)	Find & Fix Gravity Main	Loves Creek	Loves Creek	417	Project Complete
95	W New Street Sewer Rehabilitation (SubBasin 24)	Find & Fix Gravity Main	1st Creek	Kuwahee	2844	Project Complete
96	Rennoc Rd Sewer Rehabilitation (SubBasin 4)	Find & Fix Gravity Main	1st Creek	Kuwahee	2853	Project Complete
97	Spicewood Lane Sewer Rehabilitation (SubBasin 13)	Find & Fix Gravity Main	3rd Creek	Kuwahee	216	Project Complete
98	Chapman Highway Sewer Rehabilitation (SubBasin 39)	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	212	Project Complete
99	McCroskey Ave Sewer Rehabilitation (SubBasin 17)	Find & Fix Gravity Main	1st Creek	Kuwahee	1,076	Project Complete
100	East 5th Ave Sewer Rehabilitation (SubBasin 24)	Find & Fix Gravity Main	1st Creek	Kuwahee	447	Project Complete
101	Simms Rd Sewer Rehabilitation (SubBasin 39)	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	2,955	Project Complete
102	Maynard Ave Sewer Rehabilitation (SubBasin 16)	Find & Fix Gravity Main	1st Creek	Kuwahee	423	Project Complete
103	Minibasin 10B1 & 10C1 find & fix	Find & Fix Gravity Main	2nd Creek	Kuwahee	15,689	Project Complete
104	Third Creek Trunkline Replacement	Find & Fix Gravity Main	3rd Creek	Kuwahee	483,793	Project Complete
105	Disconnected Stormwater 15" discharge pipe Island Home blvd	Disconnect Storm Sewer	South Knox / Knob Creek	Kuwahee	1,720,000	Project Complete
106	Paved Manhole Rehabilitation 40A2	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	20,140	Project Complete
107	Paved Manhole Rehabilitation 40F2	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	6,515	Project Complete
108	Paved Manhole Rehabilitation 40G1	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	13,571	Project Complete
109	Paved Manhole Rehabilitation 39E1	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	2,576	Project Complete
110	Paved Manhole Rehabilitation 03C1	Find & Fix Gravity Main	1st Creek	Kuwahee	3,615	Project Complete
111	Paved Manhole Rehabilitation 02A1	Find & Fix Gravity Main	1st Creek	Kuwahee	6,491	Project Complete
112	Paved Manhole Rehabilitation SB 38	Find & Fix Gravity Main	3rd Creek	Kuwahee	5,797	Project Complete
113	Paved Manhole Rehabilitation 18A1	Find & Fix Gravity Main	1st Creek	Kuwahee	4,540	Project Complete
114	Paved Manhole Rehabilitation 39E1	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	34,671	Project Complete
115	Paved Manhole Rehabilitation 39D1	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	8,000	Project Complete
116	Paved Manhole Rehabilitation 39A2	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	13,335	Project Complete
117	Paved Manhole Rehabilitation 39C3	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	26,670	Project Complete
118	Broken Manhole Lid Replacement (67)	Find & Fix Gravity Main	Loves Creek	Loves Creek	26,666	Project Complete
119	Manhole Replacement (61)	Find & Fix Gravity Main	Loves Creek	Loves Creek	2,304	Project Complete
120	Woodbine Aver Sewer Rehab Phase II (19A2)	Find & Fix Gravity Main	Williams Creek	Kuwahee	855	Project Complete

Appendix B

SSOs

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Date	Time	Street #	Street	Plant	Watershed	Basin	Overflow Location	Pathway	Receiving Water	Cause of SSO/KUB Response	Total Volume (Gallons)	Recovered Volume (Gallons)	Non-Recovered Volume (Gallons)	Duration (Hours)	Unpermitted Discharge
10/6/2008	8:21 PM	1211	ROCKY HILL ROAD	FC	Fourth Creek	36	MH 55	Soil Saturation		The sewer main was flushed to remove the blockage caused by grease and roots.	217	0	217	1	No
10/22/2008	12:42 AM	1224	MORRELL ROAD	FC	Fourth Creek	36	MH 56	Soil Saturation		The sewer main was flushed to remove the blockage caused by debris and pipe sags.	60	0	60	1.25	No
10/22/2008	9:22 AM	438	MARYVILLE PIKE	KUW	South Knoxville	39	MH 27-2	Soil Saturation, Recovery and Swale to Unnamed Tributary to Goose Creek	Goose Creek	The bypass pump was damaged and parts were removed overnight due to vandalism.	100,000	23,000	77,000	8	Yes
10/24/2008	12:45 PM	405	MERCHANTS DRIVE	KUW	Second Creek	5	Leaking Joint	Soil Saturation and Swale to Ditchlines to Second Creek	Second Creek	The sewer main was flushed to remove the blockage caused by grease during a rainfall event.	280	0	280	1	Yes
10/29/2008	5:49 PM	4801	WILKSHIRE DRIVE	KUW	Third Creek	12	Cleanout	Soil Saturation		The sewer main was repaired and flushed to remove the blockage caused by a broken pipe.	1,500	0	1,500	3	No
11/4/2008	10:31 AM	3413	PILKAY ROAD	KUW	Third Creek	28	MH 8-1	Soil Saturation and Third Creek	Third Creek	The sewer main was flushed to remove the blockage caused by grease and debris.	5,320	1,000	4,320	1	Yes
11/5/2008	4:05 PM	1036	E EMERALD AVENUE	KUW	First Creek	17	MH 4-71	Swale to Storm Sewer to First Creek	First Creek	The sewer main was flushed to remove the blockage caused by roots and debris.	120	0	120	1	Yes
11/9/2008	1:05 PM	1036	E EMERALD AVENUE	KUW	First Creek	17	MH 4-71	Swale to Storm Sewer to First Creek	First Creek	The sewer main was flushed and root cut to remove the blockage caused by roots and debris.	120	0	120	1	Yes
11/9/2008	2:13 PM	120	MORRELL ROAD	FC	Fourth Creek	33	MH 53-8	Parking Lot to Storm Sewer to Soil Saturation		The sewer main was flushed to remove the blockage caused by grease.	240	0	240	1	No
11/19/2008	11:23 AM	3600	KENILWORTH LANE	LC	Loves Creek	6	BBU and Service Lateral	Soil Saturation		A private contractor installing a gas main bored through the service lateral.	19	5	14	1	No
11/22/2008	11:34 AM	3706	ROBERTS ROAD	EB	Eastbridge	113	Leaking LP Lateral	Soil Saturation		An exposed section of service lateral burst upon freezing and was repaired.	7	3	4	0.017	No
11/27/2008	8:15 PM	8111	WASHINGTON PIKE	EB	Eastbridge	111	Leaking LP Lateral	Soil Saturation		There was a leak on the low-pressure service lateral.	90	0	90	5	No
12/3/2008	3:36 PM	1708	NUMBER TWO DRIVE	EB	Eastbridge	115	Leaking ARV	Soil Saturation		There was a leak from a air release valve on a force main.	423	282	141	4	No
12/3/2008	3:45 PM	3413	KINGSTON PIKE	KUW	Third Creek	29	Broken Pipe	Soil Saturation		There was a collapsed pipe on an undesignated sewer main.	200	0	200	10	No
12/7/2008	4:37 PM	4209	LAMOUR DRIVE	KUW	Third Creek	28	MH 16-161	Soil Saturation		The sewer main was flushed to remove the blockage caused by roots.	30	0	30	2	No
12/8/2008	5:03 PM	1902	HIGHLAND DRIVE	KUW	First Creek	7	MH 17-32	Ditch to Soil Saturation		The sewer main was flushed to remove the blockage caused by roots.	1,025	0	1,025	10	No
12/9/2008	7:14 PM	2007	RIDGECREST DRIVE	KUW	First Creek	4	MH 18-126	Soil Saturation		The sewer main was flushed to remove the blockage caused by roots.	561	0	561	5	No
12/10/2008	1:00 PM	615	SEVIER AVENUE	KUW	South Knoxville	40	MH 1-43 & BBU	Catch Basin to Tennessee River	Tennessee River	The sewer main was flushed to remove the blockage caused by debris during heavy rainfall.	615	15	600	3	Yes
12/10/2008	7:26 AM	1210	E. MOODY AVENUE	KUW	South Knoxville	40	MH 39	Swale to Baker Creek	Baker Creek	Heavy rainfall in the area resulted in high flows in the collection system.	1,100	0	1,100	4	Yes
12/11/2008	4:42 PM	1216	WATERCRESS DRIVE	KUW	First Creek	7	MH 29-9	Swale to Unnamed Tributary of First Creek	First Creek	Heavy rainfall in the area resulted in high flows in the collection system.	65	0	65	1	Yes
12/11/2008	12:58 PM	4144	OAKLAND DRIVE	KUW	First Creek	2	MH 39-4	Pavement to Ditch to Unnamed Tributary to Whites Creek	Whites Creek	Heavy rainfall in the area resulted in high flows in the collection system.	150	0	150	2	Yes
12/11/2008	7:30 PM	7112	SHADYLAND DRIVE	FC	Fourth Creek	36	MH 36	Unnamed Tributary to Fourth Creek	Fourth Creek	Heavy rainfall in the area resulted in high flows in the collection system.	62	0	62	1	Yes
12/13/2008	1:22 PM	8112	AINSWORTH DRIVE	FC	Fourth Creek	32B	MH 4-46	Ditch to Soil Saturation		The sewer main was flushed to remove the blockage caused by roots and debris.	2,160	0	2,160	12	No
12/21/2008	2:30 PM	6902	S. NORTHSHORE DRIVE	FC	Fourth Creek	36	MH 12-62	Soil Saturation		The sewer main was flushed to remove the blockage caused by debris.	360	0	360	1	No

Appendix C

Building Backups

BBUs

1	2	3	4	5	6	7	8	9	10	11	12	13
Date	Time	Street #	Street	Plant	Watershed	Basin	Overflow Location	Cause of SSO/KUB Response	Total Volume (Gallons)	Recovered Volume (Gallons)	Non-Recovered Volume (Gallons)	Duration (Hours)
10/8/2008	4:06 PM	2800	FAIRVIEW STREET	KUW	First Creek	16	BBU	The sewer main was flushed to remove the blockage caused by grease and roots.	200	200	0	1
11/1/2008	7:15 PM	4707	SEMINOLE ROAD	KUW	First Creek	7	BBU	The sewer main was flushed to remove the blockage caused by grease and roots.	50	45	5	1.5
11/15/2008	12:00 PM	3321	GODFREY STREET	KUW	First Creek	16	BBU	The sewer main was flushed to remove the blockage caused by roots.	100	100	0	5.25
12/22/2008	11:47 AM	105	SOUTH GAY STREET	KUW	First Creek	30	BBU	The sewer main was flushed to remove the blockage caused by debris.	10	40	10	0.5
12/10/2008	9:34 AM	5816	HOLSTON HILLS ROAD	LC	Loves Creek	26	BBU	There was a power failure at a pump station.	50	50	0	1

Appendix D

Water Quality Monitoring Program Sampling Results



Water Quality Monitoring
Report

Routine Water Quality Monitoring Report

10/1/2008 Through 12/31/2008

Knoxville Utilities Board
Water Quality Laboratory
Debbie Ailey, Lab Supervisor
835 East Jackson Avenue
Knoxville, Tennessee 37915
(865) 594-8286 Fax: (865)594-8245

Creek Mile #	Sample Date	Sample Time	pH	Sample Temp (C)	Dissolved Oxygen (mg/l)	Fecal Coliform (CFU/100 ml)	E. Coli (MPN)	Precipitation Event	Status
<u>First Creek</u>									
0.45	10/24/2008	09:50	7.4	13	9.3	560	520	Dry	R
2.57	10/24/2008	08:41	7.4	12	8.0	130	96	Dry	R
6.33	10/24/2008	08:25	7.4	14	6.9	1500	440	Dry	R
0.45	11/18/2008	12:12	7.8	8	11	280	490	Wet	R
2.57	11/18/2008	11:55	7.9	8	10	170	150	Wet	R
6.33	11/18/2008	11:05	7.7	9	10	310	280	Wet	R
0.45	12/23/2008	09:21	8.6	6	11	450	730	Wet	R
2.57	12/23/2008	09:00	8.0	7	11	630	870	Wet	R
6.33	12/23/2008	08:30	7.9	11	9.1	250	210	Wet	R
<u>Second Creek</u>									
0.30	10/28/2008	09:53	8.0	12	9.5	200	38	Wet	R
1.54	10/28/2008	09:42	7.2	10	9.6	72	82	Wet	R
5.76	10/28/2008	09:17	7.2	15	5.0	9	170	Wet	R
0.30	11/21/2008	09:50	7.8	8	11	< 10	2	Dry	R
1.54	11/21/2008	09:30	7.9	6	10	81	196	Dry	R
5.76	11/21/2008	09:16	7.0	6	3.8	2000	46	Dry	R
0.30	12/22/2008	09:37	7.9	7	12	250	190	Wet	R
1.54	12/22/2008	09:21	7.7	7	11	320	180	Wet	R
5.76	12/22/2008	08:57	7.4	13	7.5	170	170	Wet	R

*Status: I = Site Under Investigation, R = Reportable for monitoring purposes

Precipitation event = "Wet" if the total amount of rainfall for four days prior to the sample was greater than 0.1 inches.



Water Quality Monitoring
Report

Routine Water Quality Monitoring Report

10/1/2008 Through 12/31/2008

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Creek Mile #	Sample Date	Sample Time	pH	Sample Temp (C)	Dissolved Oxygen (mg/l)	Fecal Coliform (CFU/100 ml)	E. Coli (MPN)	Precipitation Event	Status
<u>Third Creek</u>									
0.87	10/23/2008	08:52	8.1	11	8.7	400	260	Dry	R
2.08E	10/23/2008	08:42	7.3	10	7.4	49	50	Dry	R
4.80W	10/23/2008	08:30	7.3	12	8.7	360	310	Dry	R
0.87	11/14/2008	09:19	7.8	13	8.2	2800	1200	Wet	R
2.08E	11/14/2008	09:11	7.7	13	7.6	520	1200	Wet	R
4.80W	11/14/2008	09:00	7.3	13	7.7	400	580	Wet	R
0.87	12/17/2008	08:37	7.7	11	9.6	2100	610	Wet	R
2.08E	12/17/2008	08:25	7.5	11	9.7	320	490	Wet	R
4.80W	12/17/2008	08:10	7.7	12	9.2	1900	1100	Wet	R
<u>Fourth Creek</u>									
0.55	10/7/2008	09:35	7.7	16	8.0	410	310	Dry	R
1.33	10/7/2008	09:44	7.7	16	8.0	720	1000	Dry	I
1.78	10/7/2008	09:56	7.9	15	9.3	120	190	Dry	R
0.55	11/13/2008	10:06	7.5	12	9.0	5200	2000	Dry	R
1.33	11/13/2008	09:45	7.4	13	8.9	4800	2000	Dry	I
1.78	11/13/2008	09:55	7.6	12	9.2	2700	2400	Dry	R
0.55	12/19/2008	08:56	7.6	15	8.5	350	440	Wet	R
1.33	12/19/2008	09:10	7.6	15	8.7	200	240	Wet	R
1.78	12/19/2008	09:18	7.7	15	9.0	390	240	Wet	R

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Precipitation event = "Wet" if the total amount of rainfall for four days prior to the sample was greater than 0.1 inches.



Water Quality Monitoring
Report

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835 East Jackson Avenue
Knoxville, Tennessee 37915
(865) 594-8286 Fax: (865)594-8245

Creek Mile #	Sample Date	Sample Time	pH	Sample Temp (C)	Dissolved Oxygen (mg/l)	Fecal Coliform (CFU/100 ml)	E. Coli (MPN)	Precipitation Event	Status
<u>Baker Creek</u>									
0.36	10/16/2008	08:56	7.5	17	7.0	1200	1700	Dry	I
0.53	10/16/2008	08:43	7.8	18	7.4	1100	1600	Dry	R
1.45	10/16/2008	08:35	7.8	17	7.4	2700	> 2400	Dry	I
0.36	11/20/2008	10:13	7.6	10	9.1	540	1400	Dry	I
0.53	11/20/2008	09:59	7.8	9	9.4	590	920	Dry	R
1.45	11/20/2008	09:51	7.8	7	10	3900	> 2400	Dry	I
0.36	12/3/2008	12:15	7.7	10	9.5	210	260	Wet	R
0.53	12/3/2008	12:27	7.8	10	8.8	460	440	Wet	R
1.45	12/3/2008	12:37	7.7	9	10	1300	1400	Wet	I
<u>Goose Creek</u>									
0.35	10/15/2008	08:10	7.3	17	4.5	5100	> 2400	Dry	I
0.90E	10/15/2008	08:21	7.6	17	6.9	900	610	Dry	R
1.50E	10/15/2008	08:31	7.4	15	8.3	400	820	Dry	R
0.35	11/12/2008	08:05	7.4	10	4.3	510	220	Dry	R
0.90E	11/12/2008	08:24	7.9	10	8.0	1700	1700	Dry	I
1.50E	11/12/2008	08:15	8.0	11	8.4	81	88	Dry	R
0.35	12/1/2008	10:05	7.5	8	9.2	1600	1300	Wet	I
0.90E	12/1/2008	10:29	7.9	9	8.7	900	1200	Wet	I
1.50E	12/1/2008	10:20	7.8	9	9.1	2100	2400	Wet	R

*Status: I = Site Under Investigation, R = Reportable for monitoring purposes

Precipitation event = "Wet" if the total amount of rainfall for four days prior to the sample was greater than 0.1 inches.



Water Quality Monitoring
Report

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Knoxville, Tennessee 37915
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Creek Mile #	Sample Date	Sample Time	pH	Sample Temp (C)	Dissolved Oxygen (mg/l)	Fecal Coliform (CFU/100 ml)	E. Coli (MPN)	Precipitation Event	Status
<u>Loves Creek</u>									
0.85	10/6/2008	08:45	7.8	16	7.6	450	870	Dry	R
1.89	10/6/2008	08:55	7.2	15	6.8	240	360	Dry	R
3.45	10/6/2008	09:07	7.6	15	7.4	370	330	Dry	R
0.85	11/11/2008	10:11	7.9	9	8.9	720	770	Wet	R
1.89	11/11/2008	09:57	7.3	10	8.3	27	44	Wet	R
3.45	11/11/2008	09:46	7.6	9	9.2	260	330	Wet	R
0.85	12/15/2008	12:47	7.6	13	9.4	76	96	Wet	R
1.89	12/15/2008	12:30	7.2	14	8.1	54	45	Wet	R
3.45	12/15/2008	11:30	7.6	11	9.3	260	120	Wet	R
<u>Williams Creek</u>									
0.89	10/27/2008	09:35	8.0	12	9.0	160	160	Wet	R
1.70	10/27/2008	09:22	7.6	13	7.3	440	440	Wet	R
2.02	10/27/2008	09:13	7.6	14	7.1	480	650	Wet	R
0.89	11/19/2008	12:29	7.8	11	8.2	32	52	Wet	R
1.70	11/19/2008	11:39	7.6	11	8.6	300	310	Wet	R
2.02	11/19/2008	11:27	8.0	13	8.5	240	220	Wet	R
0.89	12/22/2008	12:59	7.6	9	11	580	440	Wet	R
1.70	12/22/2008	12:45	7.5	10	10	1400	920	Wet	R
2.02	12/22/2008	12:35	7.7	10	10	330	260	Wet	R

*Status: I = Site Under Investigation, R = Reportable for monitoring purposes

Precipitation event = "Wet" if the total amount of rainfall for four days prior to the sample was greater than 0.1 inches.



Water Quality Monitoring
Report

Investigative Water Quality Monitoring Report

10/1/2008 Through 12/31/2008

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Debbie Ailey, Lab Supervisor
835 East Jackson Avenue
Knoxville, Tennessee 37915
(865) 594-8286 Fax: (865)594-8245

Goose Creek

<u>Sample Location</u>	<u>Date</u>	<u>Time</u>	<u>Dissolved Oxygen (mg/l)</u>	<u>Fecal Coliform (CFU/100 ml)</u>	<u>E-Coli (MPN)</u>	<u>pH</u>	<u>Silt level</u>	<u>Water Temperature (C)</u>
Tributary to Goose Creek at Daylily Drive	10/14/2008	9:10 AM	4.8	340	920	7.5	N/A	16



Water Quality Monitoring
Report

**Spill Impact Sampling Results
Water Quality Monitoring Program**

Knoxville Utilities Board
Water Quality Laboratory
Debbie Ailey, Lab Supervisor
835 East Jackson Avenue
Knoxville, Tennessee 37915
(865) 594-8286 Fax: (865)594-8245

Event Date 10/22/2008
Street Address 438 Maryville Pike
Description The SSO was caused by a vandalized bypass pump that was subsequently damaged. The SSO flowed to a swale to an unnamed tributary of Goose Creek.

Estimated unrecovered volume 100,000 gallons

Sampling Notes: There was no industry upstream of the SSO, therefore no Priority Pollutant samples were collected.

Precipitation (McGhee-Tyson Airport)	Date	Total - Day of Event	Total - Prior 4 Days
	10/22/2008	0	0

Sample Location	Sample Date	Sample Time	Dissolved Oxygen	Temperature (Celsius)	pH	Fecal Coliform	E-Coli (MPN)
Upstream of SSO Discharge	10/22/2008	09:30	8.2	11	7.8	1200	1300
Downstream of SSO Discharge	10/22/2008	09:40	5.6	13	7.7	460000	> 2400
Upstream of SSO Discharge	10/27/2008	08:29	8.1	12	7.9	480	980
Downstream of SSO Discharge	10/27/2008	08:19	8.0	12	7.7	490	820



Water Quality Monitoring
Report

**Spill Impact Sampling Results
Water Quality Monitoring Program**

Knoxville Utilities Board
Water Quality Laboratory
Debbie Ailey, Lab Supervisor
835 East Jackson Avenue
Knoxville, Tennessee 37915
(865) 594-8286 Fax: (865)594-8245

Event Date 11/4/2008
Street Address 3413 Pilkay Road
Description The SSO was caused by a partial blockage in the sewer main caused by grease and debris. The SSO flowed into soil saturation and Third Creek.

Estimated unrecovered volume 4,320 gallons

Sampling Notes: There was no industry upstream of the SSO, therefore no Priority Pollutant samples were collected.

Precipitation (McGhee-Tyson Airport)	Date	Total - Day of Event	Total - Prior 4 Days
	11/4/2008	0	0

Sample Location	Sample Date	Sample Time	Dissolved Oxygen	Temperature (Celsius)	pH	Fecal Coliform	E-Coli (MPN)
Upstream of SSO Discharge	11/4/2008	12:53	8.9	13	7.8	4800	310
Downstream of SSO Discharge	11/4/2008	13:03	8.7	13	7.8	55000	2400
Upstream of SSO Discharge	11/10/2008	09:55	9.1	11	7.8	370	410
Downstream of SSO Discharge	11/10/2008	10:10	9.3	10	7.6	340	280



Water Quality Monitoring
Report

**Spill Impact Sampling Results
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Debbie Ailey, Lab Supervisor
835 East Jackson Avenue
Knoxville, Tennessee 37915
(865) 594-8286 Fax: (865)594-8245

Event Date 11/5/2008
Street Address 1036 East Emerald Ave.
Description The SSO was caused by a partial blockage in the main due to roots and debris. The SSO flowed from a swale to a storm sewer to First Creek.

Estimated unrecovered volume 120 gallons

Sampling Notes: Industry was noted to be upstream of the spill. However, priority pollutant samples were not taken.

Precipitation (McGhee-Tyson Airport)	Date	Total - Day of Event	Total - Prior 4 Days
	11/5/2008	0	0

Sample Location	Sample Date	Sample Time	Dissolved Oxygen	Temperature (Celsius)	pH	Fecal Coliform	E-Coli (MPN)
Upstream of SSO Discharge	11/5/2008	19:11	8.9	14	7.5	81	100
Downstream of SSO Discharge	11/5/2008	18:50	8.8	14	7.4	110	99

Knoxville Utilities Board
 Water Quality Monitoring Program

Investigative Water Quality Monitoring Report
 10/01/2008 Through 12/31/2008

Table 1: Fourth Creek Routine Sampling

	Collection Date	Collection Time	Dissolved Oxygen (mg/L)	Water Temperature (°C)	Water pH	Fecal Coliform (CFU/ 100mL)	E. coli (MPN)	Total Bacteroides Concentration (mg/L) (mean±SD)	Human Bacteroides Concentration (mg/L) (mean±SD)
Routine Site 0.55	11/13/2008	10:06	9.0	12	7.5	5200	2000	21.4 (± 0.4)	< 5.0
Routine Site 1.33	11/13/2008	9:45	8.9	13	7.4	4800	2000	24.0 (± 4.7)	< 5.0
Routine Site 1.78	11/13/2008	9:55	9.2	12	7.6	2700	2400	23.9 (± 5.1)	< 5.0

Knoxville Utilities Board

Water Quality Monitoring Program

Investigative Water Quality Monitoring Report

10/01/2008 Through 12/31/2008

Table 2: Goose Creek Routine Sampling

	Collection Date	Collection Time	Dissolved Oxygen (mg/L)	Water Temperature (°C)	Water pH	Fecal Coliform (CFU/ 100mL)	E. coli (MPN)	Total Bacteroides Concentration (mg/L) (mean±SD)	Human Bacteroides Concentration (mg/L) (mean±SD)
Routine Site 0.35	12/1/2008	10:05	9.2	8	7.5	1600	1300	17.4 (± 3.1)	< 5.0
Routine Site 0.90E	12/1/2008	10:29	8.7	9	7.9	900	1200	19.4 (± 4.3)	< 5.0
Routine Site 1.50E	12/1/2008	10:20	9.1	9	7.8	2100	2400	15.9 (± 4.3)	< 5.0

Knoxville Utilities Board
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Table 3: Williams Creek: Dry Weather Investigative Sampling

	Collection Date	Collection Time	Dissolved Oxygen (mg/L)	Water Temperature (°C)	Water pH	Fecal Coliform (CFU/ 100mL)	E. coli (MPN)	Total Bacteroides Concentration (mg/L) (mean±SD)	Human Bacteroides Concentration (mg/L) (mean±SD)
Routine Site 2.02	9/24/2008	8:32	6.7	18	7.6	8100	> 2400	24.9 (± 1.6)	< 5.0
Routine Site 1.70	9/24/2008	8:48	7.3	16	7.1	630	920	6.7 (± 4.0)	< 5.0
Tributary downstream from site 1.70	9/24/2008	8:40	6.5	18	7.5	510	650	122.4 (± 19.1)	< 5.0
Downstream of stream mile 1.33	9/24/2008	9:00	8.5	16	7.8	470	980	8.8 (± 3.7)	< 5.0
Williams Creek site 0.89	9/24/2008	9:23	8.8	16	7.7	230	360	4.3 (± 1.5)	< 5.0

Knoxville Utilities Board
Water Quality Monitoring Program

Investigative Water Quality Monitoring Report
10/01/2008 Through 12/31/2008

Table 4: Baker Creek: Routine and Investigative Sampling

Sample Location	Collection Date	Collection Time	Dissolved Oxygen (mg/L)	Water Temperature (°C)	Water pH	Fecal Coliform (CFU/ 100mL)	E. coli (MPN)	Total Bacteroides Concentration (mg/L) (mean±SD)	Human Bacteroides Concentration (mg/L) (mean±SD)
Routine Sampling									
Routine Site 0.36	11/20/2008	10:13	9.1	10	7.6	540	1400	8.9 (± 1.6)	< 5.0
Routine Site 0.53	11/20/2008	9:59	9.4	9	7.8	590	920	8.3 (± 1.1)	< 5.0
Routine Site 1.45	11/20/2008	9:51	10	7	7.8	3900	> 2400	11.5 (± 5.0)	< 5.0
Dry Weather Investigation									
Routine Site 0.36	12/3/2008	12:15	9.5	10	7.7	210	260	6.0 (± 1.6)	< 5.0
Routine Site 0.53	12/3/2008	12:27	8.8	10	7.8	460	440	6.8 (± 3.6)	< 5.0
Upstream of routine site 1.45	12/3/2008	12:50	8.9	10	7.8	3900	> 2400	12.2 (± 1.8)	< 5.0
Routine Site 1.45	12/3/2008	12:37	10	9	7.7	1300	1400	7.5 (± 0.8)	< 5.0
Taylor Rd. and Cruze (stream mile 2.08)	12/3/2008	12:59	9.7	10	7.8	1300	1000	4.9 (± 1.4)	< 5.0

Knoxville Utilities Board
Water Quality Monitoring Program

Investigative Water Quality Monitoring Report
10/01/2008 Through 12/31/2008

Table 5: Baker Creek: Wet Weather Investigation

Sample Set #	Location	Collection Date	Collection Time (mg/L)	Dissolved Oxygen (°C)	Water Temperature	Water pH	Fecal Coliform (CFU/ 100mL)	E. coli (MPN)	Total Bacteroides Concentration (mg/L) (mean±SD)	Human Bacteroides Concentration (mg/L) (mean±SD)
1	0.36	12/9/2008	13:45	9.6	12	7.6	210	200	12.1 (± 2.9)	< 5.0
2		12/10/2008	8:53	9.5	11	7.1	14000	2400	111.3 (± 72.9)	48.3 (± 22.2)
3		12/10/2008	12:45	8.6	12	7.3	17000	1300	76.1 (± 8.8)	18.9 (± 17.4)
4		12/15/2008	8:40	8.3	12	7.6	810	610	18.4 (± 14.8)	< 5.0
1	0.53	12/9/2008	13:57	9.4	11	7.7	260	310	9.8 (± 1.5)	< 5.0
2		12/10/2008	9:30	9.5	10	7.2	20000	> 2400	69.6 (± 9.8)	11.3 (± 4.2)
3		12/10/2008	13:05	8.8	12	7.3	9100	1100	122.0 (± 25.6)	35.4 (± 21.5)
4		12/15/2008	9:00	9.0	12	7.9	430	520	6.8 (± 2.8)	< 5.0
1	1.45	12/9/2008	14:08	9.3	11	7.8	990	1200	10.8 (± 3.2)	< 5.0
2		12/10/2008	9:47	9.4	11	7.2	15000	2400	93.9 (± 5.1)	27.5 (± 15.2)
3		12/10/2008	13:21	8.4	12	7.3	15000	> 2400	73.8 (± 30.9)	14.1 (± 6.0)
4		12/15/2008	9:09	8.8	11	7.8	1100	1000	17.9 (± 4.4)	< 5.0
1	Taylor Road at Cruze	12/9/2008	14:19	8.9	12	7.8	1800	> 2400	13.7 (± 1.8)	< 5.0
2		12/10/2008	10:05	9.0	11	7.3	12000	1700	61.2 (± 4.8)	15.1 (± 13.8)
3		12/10/2008	13:40	8.5	11	7.5	22000	2000	79.3 (± 46.0)	5.7 (± 3.2)
4		12/15/2008	9:24	9.1	12	8.0	1900	2000	9.0 (± 1.2)	< 5.0

Knoxville Utilities Board
 Water Quality Monitoring Program

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Table 6: Real Time PCR Results from SSO located at 3413 Pilkay Road

	Collection Date	Collection Time	Dissolved Oxygen (mg/L)	Water Temperature (°C)	Water pH	Fecal Coliform (CFU/ 100mL)	E. coli (MPN)	Total Fecal Concentration (mg/L) (mean±SD)	Human Fecal Concentration (mg/L) (mean±SD)
Upstream from SSO	11/4/2008	12:53	8.9	13	7.8	4800	310	24.4 (± 6.7)	< 5.0
Downstream from SSO	11/4/2008	13:03	8.7	13	7.8	55000	2400	881.4 (± 172.4)	464.7 (± 89.1)
Upstream from SSO	11/10/2008	9:55	9.1	11	7.8	370	410	11.9 (± 3.5)	< 5.0
Downstream from SSO	11/10/2008	10:10	9.3	10	7.6	340	280	15.1 (± 8.3)	< 5.0