

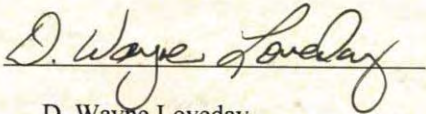
# Quarterly Progress Report

Volume 17

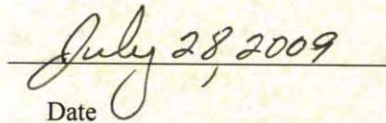
Second Quarter Report  
April 1 through June 30, 2009

Submitted to EPA on July 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



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 second quarter of 2009 from April 1 through June 30. This is the sixteenth 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.

#### April 29, 2009

- Submitted to EPA – Quarterly Progress Report 1st quarter 2009
- Submitted to EPA – Sanitary Sewer Overflow Evaluation Report 2001-2008

## 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
<b>2-2 Lower Second Creek Replacement/Rehabilitation at Woodland</b> – Construction has been completed of the lower trunkline work. Upper portion is currently in design and will require permitting from two different railroad owners. End date was initially extended to FY 08/09. New alignment for trunk sewer construction required easement acquisition and railroad permitting and requires an additional extension.	FY 08/09	FY 10/11
<b>3-6 Interstate 40 and Middlebrook Pike Trunk Replacement Project</b> – Constructability issues and permitting require that the project completion date be extended until FY 11/12. Project will require coordination with future TDOT road improvement project and extensive railroad permitting, environmental permitting, and property acquisition.	FY 09/10	FY 11/12
<b>4-2 Gleason Drive Collector Rehabilitation Project</b> – See justification below	FY 08/09	FY 09/10
<b>4-3 Middlebrook Pike Rehabilitation (Sub-basin 27C3) Project</b> – See justification below	FY 08/09	FY 09/10
<b>4-4 Northshore Drive Trunk Replacement Project</b> – See justification below	FY 08/09	FY 10/11
<b>4-6 Shadyland Drive Rehabilitation (Sub-basin 36A2) Project</b> – See justification below	FY 08/09	FY 09/10

Preliminary design of these projects were shifted from FY 07/08 to FY 08/09 to allow resources to focus on other projects in First Creek, Second Creek, Loves Creek, and Williams Creek that were determined to be higher risk areas for overflows. The shift in starts has led to a need for

extension in completion of one year. In the case of the Northshore trunk, a two-year extension is requested due to difficult construction on a major street. All projects are well underway and should complete in the requested time frame.

### **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 was completed 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 and 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. Approximately half of the project is complete. Delays due to railroad permitting on the remaining half. Requesting additional extension to FY 09/10.

### **Current Capital Improvement Plan for FY 04/05 - FY 09/10**

The following is a list of facility improvement projects included in the Capital Improvement Plan for fiscal years 04/05 to 09/10. 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. **1-19 Edgewood Drive Rehabilitation Project** – Find and fix work to identify and address cause of overflow in the vicinity of 1620 Edgewood Drive. Project is in preliminary engineering. The expected completion date for construction is June 2010.

2. **1-23 Oglewood Avenue Rehabilitation Project** – Find and fix work to identify and address cause of overflow in the vicinity of 1307 Oglewood Avenue. Project is in preliminary engineering. The expected completion date for construction is June 2013.

### **Second Creek**

1. **2-1 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 Interstate 40. 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. Schedule may be adjusted for new project definition. Revised project scope will only include line work beginning at MH 19-133 and continuing to MH 19-107. Construction of CCP storage at Bernard Avenue is underway.
2. **2-2 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 for the northern section, and railroad permits will be required prior to beginning construction. Construction has been completed for the southern portion of this project. Delay in obtaining railroad right of way has led to an additional extension request.
3. **2-11 Burnside Rehabilitation Project** – Find and fix work to identify and address cause of overflow in the vicinity of 2523 Burnside Street. Construction work has been contracted and will begin shortly.
4. **2-12 Camelia Road Rehabilitation Project** - Find and fix work to identify and address cause of overflow in the vicinity of Camelia Road and Merchant Drive and 412 Merchant Drive. Construction work has been contracted and will begin shortly.
5. **2-13 Cedar Heights Road Rehabilitation Project** - Find and fix work to identify and address cause of overflow in the vicinity of 5511 Cedar Heights Road and 5605 Pinecrest Road. Construction work has been contracted and will begin shortly.
6. **2-14 Central Avenue Pike Rehabilitation Project** - Find and fix work to identify and address cause of overflow in the vicinity of 5500 Central Avenue Pike. This project is currently in the design phase.
7. **2-15 1000 Block Elm Street Rehabilitation Project** - Find and fix work to identify and address cause of overflow in the vicinity of 1025 Elm Street. This project is currently in the design phase.
8. **2-16 1600 Block Elm Street Rehabilitation Project** - Find and fix work to identify and address cause of overflow in the vicinity of 1611 Elm Street and 801 West Oldham Avenue. This project is currently in the design phase.
9. **2-17 Shasta Drive Rehabilitation Project** - Find and fix work to identify and address cause of overflow in the vicinity of 5108 Fennel Road and 805 Shasta Drive. Construction work has been contracted and will begin shortly.
10. **2-18 Nicholas Road - Clinton Highway Rehabilitation Project** - Find and fix work to identify and address cause of overflow in the vicinity of 4500 Nicholas Road and 4200 Clinton Highway. Construction work has been contracted and should begin shortly.
11. **2-19 Cumberland Avenue Rehabilitation Project** - Find and fix work to identify and address cause of overflow in the vicinity of 1000 Phillip Fulmer Way, 1509 Cumberland Avenue, and Seventeenth Street and White Avenue. This project is currently in the design phase.

12. **2-20 Sierra Road Rehabilitation Project** - Find and fix work to identify and address cause of overflow in the vicinity of 5609 Sierra Road. Construction work has been contracted and will begin shortly.
13. **2-21 Morelia Avenue Rehabilitation Project** - Find and fix work to identify and address cause of overflow in the vicinity of 120 E. Morelia Avenue. This project is currently in the design phase.
14. **2-22 Dale Avenue Rehabilitation Project** - Find and fix work to identify and address cause of overflow in the vicinity of 345 Dale Avenue. This project is currently in the design phase.

#### **Third Creek**

1. **3-6 Interstate 40 and Middlebrook Pike Trunk Sewer Replacement** – Design 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. Original scope has changed from replacement work along Neyland Drive to work on the existing trunk south of Tyson Park.
3. **3-8 Third Creek Bike Trail Trunk Replacement** – Project is in preliminary engineering.
4. **3-12 Clinch and 21<sup>st</sup> Street Collector Rehabilitation Project (Sub-basin 35B3)** – Replace approximately 3,400 lf of existing sewer, rehabilitate 1,900 lf and replace/rehab 25 manholes. Project is substantially complete.

#### **Fourth Creek**

1. **4-2 Gleason Road Rehabilitation** – The Notice to Proceed was issued on May 14, 2009. This project is included in the Fourth Creek SSO project. Substantial completion date will be in October 2009. Requesting extension to FY 09/10.
2. **4-3 Middlebrook Pike Rehabilitation** – The Notice to Proceed was issued on May 14, 2009. This project is included in the Fourth Creek SSO project. Substantial completion date will be in October 2009. Requesting extension to FY 09/10.
3. **4-4 Northshore Drive Trunk Sewer Replacement** – Replace approximately 3600 ft of existing 24-inch trunk sewer with 36 inch. Construction should commence in the 4th 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. Requesting extension to FY 10/11.
4. **4-6 Shadyland Drive Rehabilitation** – The Notice to Proceed was issued on May 14, 2009. This project is included in the Fourth Creek SSO project. Substantial completion date will be in October 2009. Requesting extension to 09/10.

#### **South Knox**

1. **S-6 Sevier Avenue and Jones Street Collector Project** – Rehabilitate approximately 3,100 ft of existing sewer and reroute approximately 352 ft of 8-inch sewer. This project will be completed in 3<sup>rd</sup> quarter 2009.
2. **S-11 Ford Valley Pump Station Upgrade Project** – This project is under design and construction is projected to begin in 3<sup>rd</sup> quarter 2009. Other downstream pump station improvements may require a change in schedule.
3. **S-15 Trunk Replacement in Sub-basin 40A2 Project** – Design is underway and is projected to be completed in 1<sup>st</sup> quarter 2010.
4. **S-9 Ellis Road Rehabilitation Project** – Rehabilitate approximately 3,940 ft of sewer in the vicinity of 6555 Chapman Highway, 6516 Jackie Lane, 212 Ellis Road, and 6528 Jackie Lane. Project is currently in design.



## Loves Creek and Eastbridge

1. **L-1 Asheville Highway west of I-40 Trunk Replacement** – Upgrade 4,786 LF of existing 18-inch pipe into 24-inch and 30-inch pipe. Project is under construction. The expected completion date is June 2010, two years ahead of schedule.
2. **L-2 Boyds Bridge Pike and Holston Hills Trunk Replacement** – Replace approximately 4,190 LF of existing 10-inch, 500 LF of 12-inch, and 330 LF of 15-inch pipe. Project is under design. The expected completion date for construction is June 2011, one year ahead of schedule.
3. **L-3 River View Rehabilitation** – Find and fix work to identify and address cause of overflow in the vicinity of 4102, 4200, 3722, 3716, and 4014 Holston Hills Road. Project is in preliminary engineering.
4. **L-4 Asheville Highway Rehabilitation** – Find and fix work to identify and address cause of overflow in the vicinity of 5411 Asheville Highway. Project is in preliminary engineering.
5. **L-5 Brentwood Shortline Repair** – Find and fix work to identify and address cause of overflow in the vicinity of Brentwood Road. Project is in preliminary engineering.
6. **L-6 Holston Hills Road Rehabilitation** – Find and fix work to identify and address cause of overflow in the vicinity of 4716 Holston Hills Road. Project is in preliminary engineering.
7. **L-7 Magnolia Avenue Rehabilitation** – Find and fix work to identify and address cause of overflow in the vicinity of 3301 Magnolia Avenue. Project is in preliminary engineering.
8. **L-8 McDonald Drive Rehabilitation** – Find and fix work to identify and address cause of overflow in the vicinity of 3415 McDonald Drive. Project is in preliminary engineering.
9. **L-10 Washington Court Rehabilitation** – Find and fix work to identify and address cause of overflow in the vicinity of 4436 Washington Court. Project is in preliminary engineering.

## 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.
12. **1-1 Upper First Creek Collector Project (Mini-basin 1A1, 2A2, and 3D1)** – Estimated total quantities: 10,235 ft gravity sewer replaced/rehabbed; 32 new MHs installed; 175 ft MH rehab; 69 private laterals reinstated.

### 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.
6. **Second Creek Trunk Sewer Improvements Phase I** - Replaced approximately 4,100 feet of existing trunkline with 30-inch sewer.
7. **Second Creek Trunk Sewer Improvements Phase II** - Replaced approximately 3,700 feet of existing trunkline with 30-inch sewer and replaced approximately 1,400 feet of existing trunkline with 36-inch sewer.

### 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.
9. **3-11 Sutherland Avenue Collector Rehabilitation Project (Sub-basin 28B1)** – Replaced 303 ft of existing sewer and rehabilitated 3,332 ft of existing sewer collectors in mini-basin 28B1. 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.
5. **4-1 Chukar Road Rehabilitation** – Replaced 1,600 ft of pipe and nine manholes; rehabbed 900 ft of pipe and nine manholes.

#### 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.

9. **Mini-basin 41A6 Rehabilitation Project** – Rehabilitated approximately 21,000 ft of sewer in sub-basin 41A6.
10. **Blount Avenue Trunkline and Goose Creek Siphon Upgrade** – The trunkline upgrades between the siphon inlet structure and manhole 63-2 are complete. This work was included in phases I and II of the Blount Avenue Trunkline Replacement/Rehabilitation Project. This construction successfully addresses historical overflows.

#### **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.
3. **Williams Creek Sub-basin 19 Rehabilitation** – Performed rehabilitation in sub-basin 19A1, 19B1, and 19A2/A3 to reduce R-value to 2%. Investigative work was performed on the approximately 105,000 ft in the entire sub-basin 19 area. Completed rehabilitation projects in 19A1, 19B1, and 19A2/A3. 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 coincided with water quality monitoring program work in Williams Creek.
4. **W-4 E. Fifth Avenue Sewer Replacement Project** – Replaced 956 ft with 8" PVC and four manholes.
5. **W-6 Selma Avenue – Harrison Street Rehabilitation Project** – Replaced 650 ft with 8" PVC and four manholes, and rehabbed 600 ft of 8" concrete.
6. **W-8 South Elmwood Street Rehabilitation Project** – Replaced 200 ft with 8" PVC and three manholes, and rehabbed 400 ft of 8" concrete.
7. **W-9 Williams Creek Trunk Line Replacement (Sub-basin 19A1)** – In lieu of replacement of 360 ft of 12" concrete with 15" sewer, problem was addressed by comprehensive rehab of mini-basin 19A1. Project included replacement with 8,900 ft of 8" PVC, 97 ft with 10" PVC, 179 ft with 12" PVC, and 76 manholes. Also rehabbed 21,200 ft of 8" concrete and 180 ft of 12" concrete.

#### **Loves Creek and Eastbridge**

1. **L-9 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.
2. **EB-1 Maloneyville Road Rehabilitation** – Mechanical grinder was installed at Knox County Detention Facility to remove paper debris prior to discharge. Paper debris clogging the pumps was the cause of previous SSOs at Maloney Road pump station.

## **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. 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.

The Revised CCP was submitted to EPA on January 5, 2009 and subsequently approved on January 20, 2009.

## 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 initiated 34 times during this reporting period, but resulted in no Diversion events.

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 First Quarter 2009

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 April 29, 2009, KUB submitted to EPA and placed in the PDR the Quarterly Progress Report for the first quarter 2009. This deliverable was not subject to the Public Review Requirement of Section VI.A.2, but was available for public comment from April 29, 2009, until May 18, 2009. No comments were received during that period.

#### 6.1.2 2001-2008 Sanitary Sewer Overflow Evaluation Report Annual Update

Consent Decree language, page 21: *“Beginning on April 30, 2005, and on an annual basis thereafter, until termination of this Consent Decree, KUB shall submit an update to the SSOER to address those conditions that caused the SSOs that occurred during the previous Calendar Year, in accordance with subparagraphs (b) through (e) below (“Annual SSOER Update”).”*

On April 29, 2009, KUB submitted to EPA and placed in the PDR the 2001-2008 Sanitary Sewer Overflow Evaluation Report Annual Update. This Review Level 1 Deliverable was available for public comment from April 29, 2009 until May 18, 2009.

### 6.2 Violations Subject to Stipulated Penalties

During this reporting period, KUB incurred seven 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**

<b>Violation</b>	<b>Date</b>	<b>Address</b>	<b>Cause</b>
Unpermitted Discharge	5/7/2009	4419 McCambell Lane	Blockage
Unpermitted Discharge	5/8/2009	2305 Clinch Avenue	Broken Pipe
Unpermitted Discharge	5/8/2009	1210 E. Moody Avenue	Heavy Rainfall
Unpermitted Discharge	5/10/2009	3560 Talahi Drive	Blockage
Unpermitted Discharge	6/5/2009	1411 Davanna Street	Heavy Rainfall
Unpermitted Discharge	6/17/2009	1210 E. Moody Avenue	Heavy Rainfall
Unpermitted Discharge	6/18/2009	2303 Clinch Avenue	Blockage

## 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 22 SSO events. Of that number, 12 were due to blockages by either grease, debris, roots, or a combination thereof; three were due to heavy rainfall; three were due to grinder pump failure; two were due to broken pipe; and two were due to construction failure. Of the 22 SSO events, 18 were in the 0 – 1000 gallons volume range, three 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: 15 ranged from 0 – 2 hours, six ranged from 2.1 - 5 hours, and one was greater than 5 hours.

### 7.2 Building Backups

Appendix C lists all Building Backups that occurred during this reporting period. During this period, there were seven Building Backups. Four were due to blockage and three were due to construction 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 were no Diversion events.

### 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.

**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	No											
Fourth Creek	No											
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 Williams Creek, Goose Creek, First Creek, Third Creek, Fourth Creek and Second Creek. Much of this investigative sampling included the use of Real Time Polymerase Chain Reaction (RT-PCR) source testing to identify potential sewer impacts. KUB Water Quality Personnel also conducted a Dry Weather Walking Survey of Fourth Creek.

#### Fourth Creek

On April 27th and 28th, Water Quality Personnel walked the entire length of Fourth Creek to perform a Dry Weather Walking Survey of the creek. Fecal coliform samples as well as basic water chemistry measurements were collected upstream and downstream at every sewer crossing and active storm drain. Samples and measurements were also collected at tributaries and springs that entered the main stream. Table 1 summarizes the fecal coliform and water chemistry results from the walking survey. As illustrated in the results, there was only one area in the creek located at a right side tributary to the main stream that had fecal coliform counts higher than 1000cfu/mL. Water Quality Personnel will conduct follow-up testing in that area in the next quarter when dryer conditions prevail to determine if further investigation and location of source testing is warranted. Also, based on the new stream miles generated during the walking survey, KUB has updated the stream miles for the Fourth Creek routine sites, starting with the May routine sampling.

#### Williams Creek

In April, Water Quality Personnel conducted a dry weather and wet weather investigation on the upper most region of Williams Creek, (upstream from Routine site 2.02, where there is a fork of the main stream). Samples were collected during a rain event, and followed up with samples collected after five days of dry weather. The fecal coliform and E. coli counts during the wet weather event were elevated, as expected. Routine sampling was conducted the day prior to the wet weather sampling event and did not show elevations of fecal coliform or E. coli. Dry weather samples collected after the wet weather event also did not show elevations of fecal coliform or E. coli, as illustrated in Table 2. Samples from the wet weather sampling event were submitted for Bacteroides RT-PCR analysis. The sample collected on the right fork of the stream during wet weather showed an elevation in human fecal Bacteroides content. The other areas tested during wet weather did not show this elevation. Routine monitoring of the creek during May and June did show similar wet weather elevations of fecal coliform and E. coli, but no evidence of any human Bacteroides source. KUB will continue to investigate this area of the creek for human source content, as well as sample above the area on the right fork of the creek.

#### Goose Creek

KUB submitted three samples from routine monitoring for Bacteroides RT-PCR analysis that had elevations in fecal coliform and E. coli counts. One sample collected from the routine site located at stream mile 1.19E showed an elevation in human Bacteroides content, as reported in Table 3. Samples from that routine site had previously been analyzed for human Bacteroides content, and an elevation was noted in the February

routine sampling. Similarly, there was an elevation at the 1.19E site during May, which was classified as wet weather. Routine sampling from the 1.19E as well as the 0.40 site showed elevations of fecal coliform and E. coli during June sampling. However, there were no elevations of human Bacteroides content in those samples. The evidence of human Bacteroides tends to be centered around the 1.19E routine site, but is not necessarily weather related. KUB will continue to investigate via Bacteroides analysis the area around the 1.19E routine monitoring site. KUB will also attempt two wet weather sampling events in the next quarter, and focus around the 1.19E site in addition to other sampling areas.

#### First Creek

KUB submitted several samples from First Creek routine sampling for Bacteroides RT-PCR analysis. Routine sample site 1.74 had elevated fecal coliform and E. coli counts through the quarter, however, April and May sampling is considered wet weather sampling, so elevations in fecal coliform and E. coli are expected. Although the three samples taken from routine 1.74 showed elevations in fecal coliform and E. coli, there was not an elevation of human Bacteroides content, as reported in Table 4. In fact, all the samples submitted for Bacteroides analysis did not have an elevation of human Bacteroides content, suggesting the elevations in E. coli were caused by nonhuman sources.

#### Third Creek

KUB submitted one sample for Bacteroides RT-PCR analysis in May from routine site 2.08E on Third Creek that had elevated fecal coliform and E. coli counts. There was no human Bacteroides content in the sample, as reported in Table 5.

#### Second Creek

KUB continued to investigate the area around Routine site 5.76 on Second Creek this quarter. In previous quarters, we had seen high elevations of fecal coliform counts, while the E. coli counts remained low. Field personnel have observed stagnant water in the area of Routine site 5.76. KUB submitted samples from the April routine collection at site 5.76 (Table 6) for Bacteroides RT-PCR analysis. Although routine site 5.76 showed an elevation in fecal coliform, there was no marked elevation in E. coli or human Bacteroides content. Water Quality personnel returned to the 5.76 routine site and collected a second sample. This sample also exhibited the high fecal coliform, low E. coli counts. The sample collected on April 24th also showed evidence of human Bacteroides content. Several days later, Water Quality personnel investigated the area again. Fecal coliform counts were elevated once again, but to a lesser degree, however there was no human Bacteroides contribution. KUB returned to the area in June and sampled at the 5.76 routine site, as well as a second site in the area. Data from this sampling showed no elevation in fecal coliform counts similar to previous samples, but there was a slight elevation in E. coli counts (this sample will be submitted for Bacteroides analysis and reported in the next quarter). Routine sampling from May and June did not show the same pattern of high fecal coliform, low E. coli at routine site 5.76. KUB will continue to investigate the area around the routine site in the next quarter.

#### Spill Impact Response

KUB responded to a sanitary sewer overflow on Lake Avenue that ultimately did not require sampling, however KUB Spill Response samplers did collect samples in this area as a precaution. Low E. coli counts from the samples provided further evidence that the overflow did not reach or impact the local waterway.

On May 8th, Spill Response samplers responded to a wet weather related SSO on West Clinch Avenue. The relatively small SSO, 180 gallons, flowed from a storm drain to Third Creek, near a local park. Spill responders chose to sample, even though it had been raining considerably that day, because of the close proximity of the creek to the park. The Spill Response sampler noted a marked elevation in the creek's depth as well as high turbidity in the water due to the amount of rain. Fecal coliform and E. coli counts did show elevations in both the samples upstream from the storm drain and downstream from the storm drain. KUB Water Quality personnel believe that the elevations of the bacterial counts are due to the insurgent rain and subsequent run-off rather than the relatively small sanitary sewer overflow. A similar type of situation occurred on June 18th, where the SSO flowed from the same storm drain into Third Creek. Spill Response samplers collected in the same upstream and downstream locations on Third Creek. Initial samples showed an increase in both fecal coliform and E. coli concentrations, but follow-up samples did not show the elevations of E. coli. Although spill impact monitoring was not required in these cases, responders assessed the area and posted signs to warn the public of contamination.

## 8.2 Projected Data Collection

During the third 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 third quarter of 2009:

### ***Sample Locations by Creek Mile or Site Number***

<b><i>Creek Name</i></b>	<b><i>Creek Mile #</i></b>	<b><i>Creek Mile #</i></b>	<b><i>Creek Mile #</i></b>
<b>First Creek</b>	1.74	2.57	6.33
<b>Second Creek</b>	0.30	1.54	5.76
<b>Third Creek</b>	0.87	2.08E	4.80W
<b>Fourth Creek</b>	1.75	2.79	3.29
<b>Baker Creek</b>	0.36	0.53	1.45
<b>Goose Creek</b>	0.40	1.19E	1.80E
<b>Loves Creek</b>	0.85	1.89	3.45
<b>Williams Creek</b>	0.89	1.70	2.02

In the third Quarter of 2009, KUB will conduct Dry and Wet Weather investigations on Goose Creek. KUB will also continue to investigate regions of Williams Creek and upper regions of Second Creek.

# **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
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

Capital Projects and Rehabilitation Credits

	Project Name	Credit Type	Basin	WWTP	Credits Banked (gpd)	Status
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 26)	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
121	Comprehensive Sewer Rehab (41A6)	Comprehensive Rehabilitation	South Knox / Knob Creek	Kuwahee	951,328	Project Complete
122	Comprehensive Sewer Rehab (41C1)	Comprehensive Rehabilitation	South Knox / Knob Creek	Kuwahee	161,680	Project Complete
123	Comprehensive Sewer Rehab (41C2)	Comprehensive Rehabilitation	South Knox / Knob Creek	Kuwahee	94,332	Project Complete
124	Davenport Trunkline Replacement (15A1)	Find & Fix Gravity Main	2nd Creek	Kuwahee	86,423	Project Complete
125	Forks of the River Trunkline Replacement (60)	Find & Fix Gravity Main	Riverdale	Kuwahee	62,037	Project Complete
126	Brooks & Ester Sewer Rehabilitation (25A2)	Find & Fix Gravity Main	Williams Creek	Kuwahee	14,186	Project Complete
127	Grand Ave Sewer Rehabilitation (23B1)	Find & Fix Gravity Main	2nd Creek	Kuwahee	885	Project Complete
128	Clinch Ave & 21st Rehabilitation (35B3)	Find & Fix Gravity Main	3rd Creek	Kuwahee	15,453	Project Complete
129	Blount Ave Trunkline phase II (39A2)	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	124,150	Project Complete
130	Trunkline at Woodland Ave	Trunkline Replacement	2nd Creek	Kuwahee	106,558	Project Complete
131	Keowee Ave, Sandusky Rd, and Sutherland Ave	Find & Fix Gravity Main	3rd Creek	Kuwahee	6,367	Project Complete
132	Antietam Rd	Find & Fix Gravity Main	1st Creek	Kuwahee	1,760	Project Complete
133	Cheyenne Dr	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	1,760	Project Complete
134	Chambless Ave	Find & Fix Gravity Main	3rd Creek	Kuwahee	2,642	Project Complete
135	Godfrey St	Find & Fix Gravity Main	1st Creek	Kuwahee	218	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
4/13/2009	5:15 PM	1848	FRATERNITY PARK DRIVE	KUW	Third Creek	35B	Patio and BBU	Recovery and Soil Saturation		The capacity of the sewer main was exceeded when a swimming pool was drained.	650	630	20	2.25	No
4/15/2009	7:45 AM	811	EDWARDS DRIVE	KUW	Knob Creek	41	MH 107	Pavement to Soil Saturation		The sewer main was flushed to remove the blockage caused by grease.	60	0	60	1	No
4/16/2009	10:18 AM	5032	LYONS VIEW PIKE	KUW	Third Creek	34	Residential Grinder Pump	Soil Saturation		There was an electrical failure of the commercial grinder pump.	510	0	510	6.5	No
4/29/2009	11:40 AM	1801	LAKE AVENUE	KUW	Third Creek	35B	Lateral Cleanout	Ditch to Catch Basin to Recovery and Soil Saturation		The broken sewer main was repaired and the partial blockage was flushed.	710	350	360	2.25	No
5/5/2009	8:20 AM	4710	MURPHY ROAD	KUW	First Creek	2	Wetwell	Recovery and Soil Saturation		There was a mechanical failure of the commercial grinder pump.	100	30	70	2.5	No
5/7/2009	6:54 PM	4419	MCCAMPBELL LANE	KUW	First Creek	2	MH 43-64	Swale to Wet-Weather Conveyance to Whites Creek	Whites Creek	The sewer main was flushed to remove the blockage caused by construction debris.	270	0	270	1.5	Yes
5/8/2009	2:30 PM	2305	CLINCH AVENUE	KUW	Third Creek	35B	MH 23-27	Ditch to Catch Basin to Stormwater Pipe to Soil Saturation and Third Creek	Third Creek	The broken sewer main was repaired and the partial blockage was flushed.	180	0	180	1	Yes
5/8/2009	9:45 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.	540	0	540	1.5	Yes
5/10/2009	3:00 PM	3560	TALAHY DRIVE	KUW	Third Creek	38	Lateral Cleanout	Swale to Catch Basin to Stormwater Pipe to the Tennessee River	Tennessee River	The sewer main was flushed to remove the blockage caused by debris.	140	0	140	1	Yes
5/15/2009	12:40 PM	1233	MARYVILLE PIKE	KUW	South Knoxville	39	MH 27-115	Pavement to Soil Saturation		The sewer main was flushed to remove the blockage caused by construction debris.	22	0	22	1	No
5/25/2009	2:30 PM	1800	MIDDLEBROOK PIKE	KUW	Third Creek	29	MH 38	Pavement to Catch Basin to Soil Saturation		The sewer main was flushed to remove the blockage caused by grease.	162	0	162	1	No
6/5/2009	8:58 AM	1411	DAVANNA STREET	KUW	Second Creek	15	MH 8	Pavement to Ditch to Storm Drain to Second Creek, Recovery and Soil Saturation	Second Creek	Heavy rainfall in the area resulted in high flows in the collection system.	3,990	1,990	2,000	4	Yes
6/6/2009	10:41 AM	2501	FERNBANK ROAD	LC	Loves Creek	105	Lateral Cleanout	Lateral Cleanout to Soil Saturation		The sewer main was flushed to remove the blockage caused by grease.	44	0	44	4	No
6/12/2009	8:44 AM	4300	ROBERTS ROAD	EB	Eastbridge	113	Residential Grinder Pump	Soil Saturation		There was an electrical failure of the commercial grinder pump.	30	0	30	1	No
6/13/2009	4:53 PM	835	FARRAGUT AVENUE	KUW	First Creek	16	MH 24-45	Pavement to Soil Saturation		The sewer main was flushed to remove the blockage caused by debris.	54	0	54	0.5	No
6/15/2009	5:19 PM	900	GERTRUDE AVENUE	KUW	South Knoxville	40	MH 3-70	Pavement to Soil Saturation		The sewer main was flushed to remove the blockage caused by roots and debris.	60	0	60	0.5	No
6/17/2009	8:35 PM	1210	E. MOODY AVENUE	KUW	South Knoxville	40	MH 39	Ground to Baker Creek and Soil Saturation	Baker Creek	Heavy rainfall in the area resulted in high flows in the collection system.	51,771	0	51,771	3	Yes
6/18/2009	12:38 PM	2303	CLINCH AVENUE	KUW	Third Creek	35B	MH 23-5	Subsurface to Storm Drain to Third Creek and Soil Saturation	Third Creek	The sewer main was flushed to remove the blockage caused by construction debris.	5,491	0	16,380	1	Yes
6/22/2009	12:22 PM	125	TILLERY DRIVE	KUW	Second Creek	10	Lateral Cleanout	Lateral Cleanout to Soil Saturation		The sewer main was flushed to remove the blockage caused by grease.	150	0	150	1	No
6/24/2009	7:42 AM	2052	DANDRIDGE AVENUE	KUW	Williams Creek	25	MH 4-103	Pavement to Soil Saturation		The sewer main was flushed to remove the blockage caused by grease.	344	0	344	1	No
6/26/2009	12:46 PM	2305	CLINCH AVENUE	KUW	Third Creek	35B	MH 39	Ditch to Swale to Soil Saturation		There was a process failure of a construction bypass pump.	2,328	0	2,328	0.0166	No
6/26/2009	7:19 PM	4900	LANDBROOK DRIVE	KUW	Third Creek	21	MH 27-6	Manhole to Soil Saturation		The sewer main was flushed to remove the blockage caused by roots, grease and debris.	153	0	153	1.5	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)
4/21/2009	5:30 PM	4213	WALROCK LANE	KUW	Third Creek	12	BBU	The sewer main was flushed to remove the blockage caused by roots.	10	10	0	0.17
5/14/2009	3:11 PM	200	E. JACKSON AVE	KUW	First Creek	30	BBU	The service lateral was not reconnected to the sewer main during construction.	900	900	0	ant over sever
5/20/2009	8:45 PM	5508	LAKESHORE DRIVE	KUW	Knob Creek	41	BBU	Building backup due to sewer main flushing.	1	1	0	0.017
5/24/2009	11:00 PM	4304	GLASGOW ROAD	KUW	First Creek	7	BBU	The sewer main was flushed to remove the blockage caused by roots and grease.	100	100	0	2.25
5/27/2009	10:28 AM	8714	STRAWBERRY PLAINS PIKE	EB	Eastbridge	72	BBU	Building backup due to sewer main flushing.	2	2	0	0.017
5/28/2009	8:15 PM	2536	NICHOLS AVENUE	KUW	Williams Creek	19	BBU	The sewer main was flushed to remove the blockage caused by debris.	15	15	0	0.33
6/10/2009	2:29 PM	4016	WAYNE DRIVE	LC	Loves Creek	6	BBU	The sewer main was flushed to remove an unknown blockage.	3	3	0	0.33

## **Appendix D**

### **Water Quality Monitoring Program Sampling Results**



**Routine Water Quality Monitoring Report**

**4/1/2009 Through 6/30/2009**

**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
<b><u>First Creek</u></b>									
1.74	4/14/2009	14:18	8.3	15	10	1400	1700	Wet	I
2.57	4/14/2009	13:59	8.1	15	10	180	170	Wet	R
6.33	4/14/2009	13:47	7.9	16	8.9	500	490	Wet	R
1.74	5/27/2009	13:06	7.7	20	7.8	4000	> 2400	Wet	I
2.57	5/27/2009	12:53	7.7	20	7.8	2400	2000	Wet	I
6.33	5/27/2009	12:31	7.5	20	7.7	590	650	Wet	R
1.74	6/4/2009	08:35	7.7	19	7.4	10000	> 2400	Dry	I
2.57	6/4/2009	08:25	7.7	19	7.6	11000	> 2400	Dry	I
6.33	6/4/2009	08:10	7.5	18	6.4	8000	2000	Dry	R
<b><u>Second Creek</u></b>									
0.30	4/22/2009	09:56	8.2	13	9.9	120	220	Wet	R
1.54	4/22/2009	09:40	8.0	13	10	530	690	Wet	R
5.76	4/22/2009	09:15	7.2	15	5.6	> 60000	110	Wet	R
0.30	5/19/2009	09:45	7.1	15	5.1	2000	310	Wet	R
1.54	5/19/2009	09:29	8.0	14	8.8	3800	490	Wet	R
5.76	5/19/2009	09:05	8.0	14	9.4	370	50	Wet	R
0.30	6/10/2009	11:17	8.0	20	8.5	500	730	Dry	R
1.54	6/10/2009	11:00	8.1	19	8.0	530	520	Dry	R
5.76	6/10/2009	10:35	7.2	17	5.5	140	140	Dry	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

4/1/2009 Through 6/30/2009

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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
<b><u>Third Creek</u></b>									
0.87	4/24/2009	09:07	8.0	15	9.2	180	340	Dry	R
2.08E	4/24/2009	08:50	8.2	15	8.5	500	390	Dry	R
4.80W	4/24/2009	08:12	7.8	14	8.7	72	86	Dry	R
0.87	5/18/2009	09:35	8.0	14	9.2	430	610	Wet	R
2.08E	5/18/2009	09:23	8.1	13	8.9	1100	1100	Wet	R
4.80W	5/18/2009	09:08	7.6	13	8.7	240	260	Wet	R
0.87	6/25/2009	09:32	8.0	19	8.0	470	980	Wet	R
2.08E	6/25/2009	09:17	8.0	19	8.0	480	410	Wet	R
4.80W	6/25/2009	09:00	7.6	17	7.9	310	490	Wet	R
<b><u>Fourth Creek</u></b>									
0.55	4/7/2009	10:14	7.9	12	10	210	290	Wet	R
1.33	4/7/2009	10:05	7.7	13	9.6	90	88	Wet	R
1.78	4/7/2009	09:53	7.9	13	10	36	46	Wet	R
1.75	5/12/2009	08:58	7.8	15	8.9	330	330	Wet	R
2.79	5/12/2009	09:10	7.8	15	8.8	300	360	Wet	R
3.29	5/12/2009	09:22	7.9	15	9.1	150	130	Wet	R
1.75	6/22/2009	08:55	7.7	19	7.7	1000	820	Wet	R
2.79	6/22/2009	08:43	7.7	18	7.7	640	490	Wet	R
3.29	6/22/2009	08:37	8.0	18	8.0	480	550	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

### Routine Water Quality Monitoring Report

4/1/2009 Through 6/30/2009

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Water Quality Laboratory  
Debbie Ailey, Lab Supervisor  
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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
<b><u>Baker Creek</u></b>									
0.36	4/29/2009	10:54	7.7	18	8.1	2300	1700	Dry	I
0.53	4/29/2009	11:03	7.9	16	8.6	730	1300	Dry	R
1.45	4/29/2009	11:17	7.8	17	9.1	2900	> 2400	Dry	I
0.36	5/13/2009	10:03	7.9	16	7.9	3700	> 2400	Wet	I
0.53	5/13/2009	10:12	8.0	16	8.5	500	360	Wet	R
1.45	5/13/2009	10:28	8.3	16	7.5	2800	> 2400	Wet	I
0.36	6/9/2009	09:58	7.7	19	7.3	1300	2000	Dry	I
0.53	6/9/2009	09:46	7.8	18	7.9	1700	1200	Dry	R
1.45	6/9/2009	09:25	7.7	17	8.1	1400	1700	Dry	I
<b><u>Goose Creek</u></b>									
0.40	4/21/2009	13:59	7.9	15	9.3	480	580	Wet	R
1.19E	4/21/2009	13:38	8.0	16	9.3	440	460	Wet	R
1.80E	4/21/2009	13:29	8.0	16	9.0	240	330	Wet	R
0.40	5/11/2009	08:23	7.8	16	7.9	450	580	Wet	R
1.19E	5/11/2009	08:37	7.8	15	7.8	3100	1600	Wet	I
1.80E	5/11/2009	08:50	7.7	14	8.4	210	240	Wet	R
0.40	6/3/2009	08:27	7.7	17	7.5	1400	1100	Dry	R
1.19E	6/3/2009	08:38	7.9	18	8.3	2300	2400	Dry	I
1.80E	6/3/2009	08:15	7.8	16	8.0	640	920	Dry	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.



**Routine Water Quality Monitoring Report**

**4/1/2009 Through 6/30/2009**

**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
<b><u>Loves Creek</u></b>									
0.85	4/9/2009	13:07	8.0	15	12	18	43	Wet	R
1.89	4/9/2009	13:18	7.5	15	9.3	9	28	Wet	R
3.45	4/9/2009	13:31	8.0	16	9.7	18	31	Wet	R
0.85	5/20/2009	10:55	7.9	16	8.7	230	140	Wet	R
1.89	5/20/2009	11:11	7.5	16	8.1	110	86	Wet	R
3.45	5/20/2009	11:22	7.8	17	8.2	380	240	Wet	R
0.85	6/16/2009	13:36	7.9	20	7.8	260	280	Dry	R
1.89	6/16/2009	13:21	7.4	20	7.0	200	180	Dry	R
3.45	6/16/2009	13:10	7.7	23	6.8	90	76	Dry	R
<b><u>Williams Creek</u></b>									
0.89	4/13/2009	08:59	7.8	14	9.5	180	210	Wet	R
1.70	4/13/2009	08:32	7.8	15	8.3	160	150	Wet	R
2.02	4/13/2009	08:46	7.9	14	8.7	170	120	Wet	R
0.89	5/26/2009	10:30	7.6	20	8.4	3100	1700	Wet	I
1.70	5/26/2009	10:20	7.0	20	7.6	1800	1100	Wet	I
2.02	5/26/2009	10:11	7.7	19	7.5	4000	1100	Wet	I
0.89	6/19/2009	08:41	7.7	20	7.6	2000	> 2400	Wet	I
1.70	6/19/2009	08:50	7.5	20	7.1	7000	> 2400	Wet	I
2.02	6/19/2009	08:59	7.5	20	7.4	2900	2400	Wet	I

\*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

**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** 4/29/2009  
**Street Address** 1801 Lake Avenue  
**Description** The SSO was caused by a partial blockage in the sewer main due to broken pipe and influenced by grease. The SSO flowed from a ditch to a catch basin to a stormwater pipe to recovery and soil saturation.

**Estimated unrecovered volume** 360 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
	4/29/2009	0.01	0

Sample Location	Sample Date	Sample Time	Dissolved Oxygen	Temperature (Celsius)	pH	Fecal Coliform	E-Coli (MPN)
Upstream of SSO Discharge	4/29/2009	15:12	9.6	19	8.2	270	220
Downstream of SSO Discharge	4/29/2009	15:08	9.6	19	8.2	240	310



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** 5/7/2009  
**Street Address** 4419 McCampbell Lane  
**Description** The SSO was caused by a partial blockage in the sewer main caused by gravel from an improperly installed pipe connection to a manhole. The SSO flowed from a swale to a wet-weather conveyance to Whites Creek.

**Estimated unrecovered volume** 270 gallons

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

<b>Precipitation (McGhee-Tyson Airport)</b>	<b>Date</b>	<b>Total - Day of Event</b>	<b>Total - Prior 4 Days</b>
	5/7/2009	0.06	2.19

Sample Location	Sample Date	Sample Time	Dissolved Oxygen	Temperature (Celsius)	pH	Fecal Coliform	E-Coli (MPN)
Upstream of SSO Discharge	5/7/2009	20:50	4.9	19	8.6	5700	> 2400
Downstream of SSO Discharge	5/7/2009	20:58	3.8	18	7.1	48000	> 2400
Upstream of SSO Discharge	5/11/2009	09:56	5.4	16	6.8	900	1600
Downstream of SSO Discharge	5/11/2009	10:05	4.3	15	7.1	1100	1600
Upstream of SSO Discharge	5/19/2009	13:21	5.0	15	6.8	820	1300
Downstream of SSO Discharge	5/19/2009	13:10	5.4	15	7.0	400	730



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**Event Date** 5/8/2009  
**Street Address** 2305 W Clinch Avenue  
**Description** The SSO was caused by a partial blockage in the sewer main from debris from a broken pipe. The SSO flowed from a ditch to a catch basin to a storm water pipe to Third Creek and soil saturation.

**Estimated unrecovered volume** 180 gallons

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

<b>Precipitation (McGhee-Tyson Airport)</b>	<b>Date</b>	<b>Total - Day of Event</b>	<b>Total - Prior 4 Days</b>
	5/8/2009	1.02	1.58

Sample Location	Sample Date	Sample Time	Dissolved Oxygen	Temperature (Celsius)	pH	Fecal Coliform	E-Coli (MPN)
Upstream of SSO Discharge	5/8/2009	16:20	7.93	19	7.59	31000	> 2400
Downstream of SSO Discharge	5/8/2009	16:27	8.04	19	7.65	26000	> 2400



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**Event Date** 5/10/2009  
**Street Address** 3560 Talahi Drive  
**Description** The SSO was caused by a partial blockage in the sewer main due to debris. The SSO flowed from a swale to a catch basin to a stormwater pipe to the Tennessee River.

**Estimated unrecovered volume** 140 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
	5/10/2009	0	1.63

Sample Location	Sample Date	Sample Time	Dissolved Oxygen	Temperature (Celsius)	pH	Fecal Coliform	E-Coli (MPN)
Upstream of SSO Discharge	5/10/2009	19:33	7.5	20	7.6	500	440
Downstream of SSO Discharge	5/10/2009	19:40	7.1	20	7.6	270	290



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Knoxville, Tennessee 37915  
(865) 594-8286 Fax: (865)594-8245

**Event Date** 6/18/2009  
**Street Address** 2303 Clinch Avenue  
**Description** The SSO was caused by a partial blockage in the sewer main due to construction debris. The SSO flowed subsurface to a storm drain to Third Creek and soil saturation.

**Estimated unrecovered volume** 16380 gallons

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

<b>Precipitation (McGhee-Tyson Airport)</b>	<b>Date</b>	<b>Total - Day of Event</b>	<b>Total - Prior 4 Days</b>
	6/18/2009	0.42	0.75

Sample Location	Sample Date	Sample Time	Dissolved Oxygen	Temperature (Celsius)	pH	Fecal Coliform	E-Coli (MPN)
Upstream of SSO Discharge	6/18/2009	13:40	7.8	21	7.9	37000	> 2400
Downstream of SSO Discharge	6/18/2009	13:35	7.7	22	7.8	22000	> 2400
Upstream of SSO Discharge	6/24/2009	09:32	8.1	18.2	8.1	910	550
Downstream of SSO Discharge	6/24/2009	09:27	8.1	18.8	8.1	1100	490



# Knoxville Utilities Board

## Water Quality Monitoring Program

### Investigative Water Quality Monitoring Report

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**Table 1: Fourth Creek Dry Weather Walking Survey**

Sample Location	Comments	Collection Date	Collection Time	Dissolved Oxygen	Water Temperature	Water pH	Fecal Coliform (CFU/100mL)
SM 0.91		4/27/2009	8:30	7.1	15	7.6	580
SM 0.90	Spring on left	4/27/2009	8:36	6.2	16	7.1	< 10
SM 1.31	Right tributary	4/27/2009	9:14	9.2	16	8.2	190
SM 1.30		4/27/2009	9:21	9.4	16	8.1	240
SM 1.34		4/27/2009	9:28	9.3	16	8.2	280
SM 1.58		4/27/2009	9:53	9.6	17	8.1	520
SM 1.68		4/27/2009	10:22	9.8	17	8.1	54
SM 1.85		4/27/2009	10:56	9.3	17	8.0	140
SM 1.92		4/27/2009	11:05	9.4	17	8.1	220
SM 1.97	Right tributary	4/27/2009	11:14	8.2	18	7.8	1500
SM 1.99		4/27/2009	11:20	9.5	17	8.0	320
SM 2.04	Left tributary	4/27/2009	11:28	8.5	17	7.6	< 10
SM 2.08		4/27/2009	11:35	9.4	17	8.0	150
SM 2.29		4/27/2009	13:07	9.8	19	8.0	54
SM 2.58		4/27/2009	13:41	9.8	17	8.0	81
SM 2.60	Right tributary	4/27/2009	13:57	10	20	8.1	18
SM 2.61		4/27/2009	14:05	9.5	18	8.1	90
SM 2.80		4/27/2009	14:16	9.4	18	8.0	270
SM 2.91	Left tributary	4/27/2009	14:27	7.9	19	7.5	380
SM 2.93		4/27/2009	14:32	9.4	18	8.1	81
SM 3.11		4/28/2009	8:34	9.1	15	7.9	190
SM 3.18	Spring on right	4/28/2009	8:54	4.6	16	7.0	< 10
SM 3.20		4/28/2009	9:03	9.6	15	8.1	120
SM 3.24	Spring on right	4/28/2009	9:13	4.6	15	6.9	< 10
SM 3.34		4/28/2009	9:31	9.6	15	8.1	330
SM 3.44		4/28/2009	10:38	9.5	15	7.9	81
SM 3.47	Spring on left	4/28/2009	10:45	7.9	15	7.3	< 10
SM 3.53		4/28/2009	11:00	9.5	16	8.0	150
SM 3.70	Right tributary	4/28/2009	11:21	7.5	16	8.0	63
SM 3.74		4/28/2009	11:30	8.9	16	7.8	290
SM 3.78	Left tributary	4/28/2009	11:40	8.9	16	7.6	150
SM 3.88	Left tributary	4/28/2009	11:54	12	18	8.3	450
SM 3.94		4/28/2009	12:11	8.1	17	7.6	300

**Knoxville Utilities Board**  
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**Table 2: Williams Creek Routine and Investigative Sampling**

	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)	Human Fecal Concentration (mg/L)
Routine Site 2.02	4/14/2009	9:53	8.5	14	7.6	11000	> 2400	25.0	< 5
	4/23/2009	11:46	8.0	17	7.9	290	280		
Left Fork, Upstream from Routine Site 2.02	4/14/2009	9:47	9.0	14	7.6	24000	> 2400	6.2	< 5
	4/23/2009	11:56	8.4	16	7.9	27	44		
Right Fork, Upstream from Routine Site 2.02	4/14/2009	9:40	7.9	15	7.6	40000	> 2400	41.8	13.4
	4/23/2009	11:24	10.0	16	7.9	420	920		
***4/14/09 sampling was conducted during wet weather									
Routine Site 0.89	5/26/2009	10:30	8.4	20	7.6	3100	1700	18.1	< 5
Routine Site 1.70	5/26/2009	10:20	7.6	20	7.0	1800	1100	23.4	< 5
Routine Site 2.02	5/26/2009	10:11	7.5	19	7.7	4000	1100	6.8	< 5
Routine Site 0.89	6/19/2009	8:41	7.6	20	7.7	2000	> 2400	4.9	< 5
Routine Site 1.70	6/19/2009	8:50	7.1	20	7.5	7000	> 2400	9.2	< 5
Routine Site 2.02	6/19/2009	8:59	7.4	20	7.5	2900	> 2400	5.3	< 5

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**Table 3: 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 Fecal Concentration (mg/L)	Human Fecal Concentration (mg/L)
Routine Site 0.40	6/3/2009	8:27	7.5	17	7.7	1400	1100	5.8	< 5
Routine Site 1.19E	5/11/2009	8:37	7.8	15	7.8	3100	1600	15.7	6.3
Routine Site 1.19E	6/3/2009	8:38	8.3	18	7.9	2300	2400	2.8	< 5

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## Investigative Water Quality Monitoring Report

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**Table 4: First Creek Routine Sampling**

	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)	Human Fecal Concentration (mg/L)
Routine Site 1.74	4/14/2009	14:18	10	15	8.3	1400	1700	6.5	< 5
Routine Site 1.74	5/27/2009	13:06	7.8	20	7.7	4000	> 2400	6.7	< 5
Routine Site 1.74	6/4/2009	8:35	7.4	19	7.7	10000	> 2400	7.7	< 5
Routine Site 2.57	5/27/2009	12:53	7.8	20.0	7.7	2400	2000	5.3	< 5
Routine Site 2.57	6/4/2009	8:25	7.6	19.0	7.7	11000	> 2400	6.9	< 5
Routine Site 6.33	6/4/2009	8:10	6.4	18	7.5	8000	2000	7.2	< 5

## Knoxville Utilities Board

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4/1/2009 Through 6/30/2009

**Table 5: Third Creek Routine Sampling**

	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)	Human Fecal Concentration (mg/L)
Routine Site 2.08E	5/18/2009	9:23	8.9	13	8.1	1100	1100	3.7	< 5

# Knoxville Utilities Board

Water Quality Monitoring Program

## Investigative Water Quality Monitoring Report

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**Table 6: Second Creek Routine and Investigative Sampling**

	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)	Human Fecal Concentration (mg/L)
Routine Site 0.3	4/22/2009	9:56	9.9	13	8.2	120	220		
Routine Site 1.54	4/22/2009	9:40	10	13	8.0	530	690		
Routine Site 5.76	4/22/2009	9:15	5.6	15	7.2	> 60000	110	63	< 5
Routine Site 5.76	4/24/2009	11:03	4.2	17	7.2	> 60000	690	128	13.6
Site 5.76 Second Creek	4/30/2009	8:47	4.5	16	7.2	6100	93	84.2	< 5
Left Pipe next to Routine Site 5.76	4/30/2009	8:52	7.5	15	7.5	1400	21	6	< 5
Routine Site 5.76	6/26/2009	9:31	5.9	17	7.2	640	1000		
~300 yards Upstream from Routine Site 5.76	6/26/2009	9:22	6.1	18	7.2	330	550		