

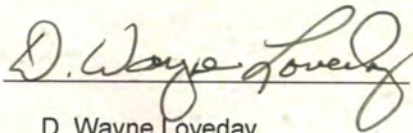
Quarterly Progress Report

Volume 20

First Quarter Report
January 1, 2010 through March 31, 2010

Submitted to EPA on April 28, 2010

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

4.28.10

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 first quarter of 2010 from January 1 through March 31. This is the twentieth quarterly report required of KUB under this Consent Decree.

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 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 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.

January 28, 2010

- Submitted to EPA – Quarterly Progress Report 4th quarter 2009
- Submitted to EPA – SEP Periodic Report 2nd period 2009

February 26, 2010

- Submitted to EPA – Annual MOM Progress Report 2009
- Submitted to EPA – Documentation for SEP Payment #8

March 22, 2010

- Approved by EPA – Phase II Corrective Action Plan/Engineering Report

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 was submitted to EPA on September 9, 2009 and approved on March 22, 2010.

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)** – revised completion date was FY 08/09 and was completed on schedule.
- **1-20 Vine Middle School Rehabilitation Project** – revised completion date was FY 07/08 and was completed as scheduled.
- **2-4 Dutch Valley Collector Rehabilitation (Sewershed 10B1)** – revised completion date was September 2007 and was completed as scheduled.
- **2-5 Rickard and Wilson Collector Rehabilitation (Sewershed 10C1)** – revised completion date was September 2007 and was completed as scheduled.
- **S-1 Ginnbrook Pump Station Rehabilitation** – revised completion date was 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** – revised completion date was FY 08/09 and was completed as scheduled.
- **2-1 Lower Second Creek Replacement/Rehabilitation at I40/I275 Junction** – revised completion date is FY 09/10.
- **2-2 Lower Second Creek Replacement/Rehabilitation at Woodland** – revised completion date is FY 09/10.
- **3-6 Interstate 40 and Middlebrook Pike Trunk Replacement Project** – revised completion date of June 30, 2012.
- **4-2 Gleason Drive Collector Rehabilitation Project** – revised completion date of June 30, 2010.
- **4-3 Middlebrook Pike Rehabilitation (Sub-basin 27C3)** – revised completion date of June 30, 2010.

- **4-4 Northshore Drive Trunk Replacement Project** – revised completion date of June 20, 2011.
- **4-6 Shadyland Drive Rehabilitation (Sub-basin 36A2) Project** – revised completion date of June 30, 2010.

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. Construction is underway.
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. Construction is underway.

Second Creek

1. **2-1 Lower Second Creek Replacement/Rehabilitation at I40/I275 Junction** –Project scope has been redefined in lieu of storage placement upstream of the Second Creek trunk sewer running from Dameron south to Interstate 40. Revised project scope will only include line work beginning at MH 19-133 and continuing to MH 19-107. Design is complete and construction on trunk rehabilitation will begin in summer 2010. Construction of CCP storage at Bernard Avenue is scheduled to be complete in October 2010.
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 complete for the northern section, and railroad permits are being acquired. Construction has been completed for the southern portion of this project.
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 is underway.
4. **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. Design is complete and construction is underway.
5. **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. Design is complete and construction is underway.
6. **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 underway.

7. **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. Design is complete and construction is underway.
8. **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 underway.
9. **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. Design is complete and construction is underway.

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 at 90% engineering design 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** – Phase 1 project is at 90% engineering design.

Fourth Creek

1. **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 2nd quarter 2010. Design is 95% complete and easement acquisition is underway. EPA approved extension to 2011.

South Knox

1. **S-11 Ford Valley Pump Station Upgrade Project** –. Design is complete. Construction has begun and is expected to be complete in June 2010.
2. **S-15 Trunk Replacement in Sub-basin 40A2 Project** – Design is complete and construction is projected to begin in the Spring of 2010.
3. **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.
13. **2-12 Camelia Road Rehabilitation Project** - Find and fix work identified and addressed the cause of the overflow in the vicinity of Camelia Road and Merchant Drive and 412 Merchant Drive.
14. **2-13 Cedar Heights Road Rehabilitation Project** - Find and fix work identified and addressed the cause of the overflow in the vicinity of 5511 Cedar Heights Road and 5605 Pinecrest Road.
15. **2-14 Central Avenue Pike Rehabilitation Project** - Find and fix work to identified and addressed the cause of overflow in the vicinity of 5500 Central Avenue Pike.
16. **2-18 Nicholas Road - Clinton Highway Rehabilitation Project** - Find and fix work identified and addressed the cause of the overflow in the vicinity of 4500 Nicholas Road and 4200 Clinton Highway.

17. **2-22 Dale Avenue Rehabilitation Project** - Find and fix work identified and addressed the cause of the overflow in the vicinity of 345 Dale Avenue.

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.
10. **3-12 Clinch and 21st Street Collector Rehabilitation Project (Sub-basin 35B3)** – Replaced approximately 3,400 lf of existing sewer, rehabilitated 1,900 lf and replaced/rehabbed 25 manholes.

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.
6. **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.
7. **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.
8. **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.

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 10,000 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 addressed historical overflows.
11. **S-6 Sevier Avenue and Jones Street Collector Project** – Rehabilitated approximately 3,100 ft of existing sewer and rerouted approximately 352 ft of 8-inch sewer.

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.

Phase II CAP/ER

The Phase II CAP/ER was submitted to EPA on September 9, 2009 and subsequently approved on March 22, 2010.

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 submitted to the EPA on July 23, 2007. EPA disapproved it on January 4, 2008. The Revised CCP was submitted to EPA on January 5, 2009 and subsequently approved on January 20, 2009.

Chemically Enhanced Primary Treatment (CEPT) continues to be studied. Benchtop testing of various polymers as well as iron salts has been completed. Recommendation is to remain with a single-source polymer with no iron salts needed. Full-scale trials continue to reflect the results of the benchtop testing.

The Kruger Actiflow process was on site and operating at Kuwahee from late January to early March. The pilot plant has been testing both scenarios of High Rate Clarification and Biologically Enhanced High Rate Clarification. The pilot time at Kuwahee WWTP is complete and data is being evaluated. The pilot plant will be at Fourth Creek WWTP from April to May.

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 54 times during this reporting period resulting in four Diversion events (two at Fourth Creek WWTP and two at Kuwahee WWTP).

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 Fourth 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 January 28, 2010, KUB submitted to EPA and placed in the PDR the Quarterly Progress Report for the fourth quarter 2009. This deliverable was not subject to the Public Review Requirement of Section VI.A.2, but was available for public comment from January 28, 2010, until February 17, 2010. No comments were received during that period.

6.1.2 SEP Periodic Report Second Period 2009

Consent Decree language, page 61: *“While the SEP is being planned and implemented, KUB shall submit semiannual reports to the Parties describing the progress of the SEP up to and during the most recent Calendar Quarter within one (1) Month after the end of the second and fourth Calendar Quarters following the Date of Entry.”*

On January 28, 2010, KUB submitted the SEP Periodic Report for the second period 2009 to EPA. This deliverable was not subject to public review but was posted in the PDR at the time of submission.

6.1.3 Annual MOM Progress Report 2009

Consent Decree language, page 84: *“Beginning on March 1, 2006, and every twelve (12) Months thereafter until termination of this Consent Decree, KUB shall submit to the Parties, and simultaneously place in the PDR, an Annual MOM Progress Report.”*

On February 26, 2010, KUB submitted to EPA and placed in the PDR the Annual MOM Progress Report for 2009. This deliverable was not subject to the Public Review Requirement of Section VI.A.2, but was available for public comment from

February 26, 2010, until March 18, 2010. No comments were received during that period.

6.2 Violations Subject to Stipulated Penalties

During this reporting period, KUB incurred 20 Unpermitted Discharges. Table 1 below lists all violations subject to stipulated penalties as outlined in the Consent Decree. Appendix E lists any SSO that occurred during the first quarter 2010 that resulted in an unpermitted discharge along with its cause, volume, one- and three-day rainfall totals, and rainfall intensity.

Table 1. Violations Subject to Stipulated Penalties

Violation	Date	Address	Cause
Unpermitted discharge	1/24/10	5760 Sandis Lane	Electrical failure
Unpermitted discharge	1/24/10	1500 Lyons Bend Road	Heavy rainfall
Unpermitted discharge	1/25/10	7100 Rotherwood Drive	Heavy rainfall
Unpermitted discharge	1/25/10	1210 Moody Avenue	Heavy rainfall
Unpermitted discharge	1/25/10	608 Walker Springs Road	Heavy rainfall
Unpermitted discharge	1/25/10	2004 Ed Shouse Road	Heavy rainfall
Unpermitted discharge	1/25/10	1411 Davanna Street	Heavy rainfall
Unpermitted discharge	1/25/10	3741 Eakers Street	Heavy rainfall
Unpermitted discharge	1/26/10	4713 Old Broadway	Heavy rainfall
Unpermitted discharge	2/2/10	2706 Mynderse Avenue	Heavy rainfall
Unpermitted discharge	2/5/10	2706 Mynderse Avenue	Heavy rainfall
Unpermitted discharge	2/5/10	7104 Rotherwood Drive	Heavy rainfall
Unpermitted discharge	2/5/10	2621 Bragg Street	Blockage
Unpermitted discharge	2/5/10	2430 Highland Drive	Blockage
Unpermitted discharge	2/10/10	800 Bennett Place	Broken pipe
Unpermitted discharge	2/15/10	100 Thirteenth Street	Broken pipe
Unpermitted discharge	2/19/10	6410 South Northshore Drive	Heavy rainfall
Unpermitted discharge	3/10/10	6024 Brookvale Lane	Heavy rainfall
Unpermitted discharge	3/19/10	6549 Creekhead Drive	Blockage
Unpermitted discharge	3/23/10	2004 Neyland Drive	Electrical failure

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 43 SSO events. Of that number, 17 were due to heavy rainfall; 13 were due to blockages by either grease, debris, roots, or a combination thereof; six were due to broken pipe; three were due to electrical failure; three were due to mechanical failure; and one was due to vandalism. Of the 43 SSO events, 23 were in the 0 – 1000 gallons volume range, eight were in the 1001 – 10,000 range, 11 events totaled greater than 10,000 gallons, and the volume was unknown for one event. Durations for events during this period are as follows: 25 ranged from 0 – 2 hours, four ranged from 2.1 - 5 hours, nine were greater than 5 hours, and the duration was unknown for five events. If an event is found after the overflow has stopped it is sometimes difficult to estimate volume and duration. In those instances, unknown is entered for volume and duration.

7.2 Building Backups

Appendix C lists all Building Backups that occurred during this reporting period. During this period, there were five Building Backups. three were due to blockage, and two 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 2 Diversions at Kuwahee, 2 Diversions at Fourth Creek, and zero Diversions at Loves Creek, and Eastbridge WWTPs.

7.5 Effluent Limit Violations

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

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
Fourth Creek	Yes	Diversion	1/24/10	15:42			1/24/10	8.28	8.03	37.85	19.68	High flow event due to excess rainfall
							1/25/10	24.00	10.3			
					1/26/10	05:33	1/26/10	5.57	1.35			
Fourth Creek	Yes	Diversion	2/05/10	06:47			2/05/10	17.20	6.29	45.98	12.81	High flow event due to excess rainfall
							2/06/10	24.00	5.89			
					2/07/10	04:47	2/07/10	4.78	0.63			
Kuwahhee	Yes	Diversion	01/24/10	17:28			1/24/10	6.53	13.58	25.55	28.61	High flow event due to excess rainfall
					1/25/10	19:01	1/25/09	19.02	15.03			
Kuwahhee	Yes	Diversion	2/5/10	14:30			2/05/10	9.50	7.13	14.73	9.18	High flow event due to excess rainfall
					2/06/10	05:14	2/06/10	5.23	2.05			
Loves Creek	No											
Eastbridge	No											

Table 3: Effluent Limit Violations

WWTP	Did an event occur?	Date	Parameter	Type	Limit	Value
Kuwahhee	No	-	-	-	-	-
Fourth Creek	Yes	2/05/10	SS	Daily Max	1.0 ml/l	7.6 ml/l
Fourth Creek	Yes	2/05/10	e. coli	Daily Max	487 cfu/100 ml	1200 cfu/100 ml
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 investigative sampling on Baker Creek, First Creek, Third Creek and Second Creek. Also, KUB continued to utilize RT-PCR *Bacteroides* analysis on selected routine samples to investigate high *E. coli* counts when necessary.

First Creek

KUB submitted two samples from First Creek routine sampling for *Bacteroides* testing because of elevated *E. coli* counts during the previous quarter. Samples from the December routine collection at sites 1.74 and 2.57 were analyzed to determine if there was evidence of human content because of their higher *E. coli* counts. Neither sample exhibited strong evidence of human content (Table 1). There was no further investigation, as all routine monitoring on this stream this quarter met the water quality standard of 941 cfu/100ml for *E. coli* bacteria.

KUB also responded to a SSO on Valley View Drive on March 7th. The SSO ultimately did not reach First Creek. However, water quality samples were collected and analyzed, as a precaution at the time. Bacterial counts of the above and below samples confirm that the SSO did not reach the creek.

Fourth Creek

KUB submitted samples from the routine collection of Fourth Creek from December for *Bacteroides* analysis (Table 2). Although each sample exhibited elevated fecal coliform and *E. coli* counts, *Bacteroides* analysis did not indicate a human source.

Baker Creek

KUB submitted one routine monitoring sample from Baker Creek for *Bacteroides* analysis this quarter. During January, fecal coliform levels for site 0.36 were unusually elevated. *Bacteroides* analysis of that sample indicated significant human content in the sample. However, samples collected at the same site in the following months did not have similar *E. coli* and fecal coliform elevations, even during wet weather. This suggests the previous elevation (human or nonhuman) did not originate from a consistent source (leaking sewer main). In fact, the small tributary directly upstream from routine site 0.36 did not illustrate similar elevations either, which was also sampled each month in an effort to locate the source (Table 3). A small, inconsistent source directly in or around routine site 0.36 is suspect. In addition to monitoring Baker Creek on a routine basis, KUB will continue to investigate this area of concern further especially with warmer weather conditions in the late spring and summer.

Second Creek

KUB continued to investigate the area around routine site 5.76 on Second Creek by sampling a point several hundred yards above the routine site monthly (Table 4). KUB did not submit samples from Second Creek for further testing because of low bacterial counts.

KUB will continue to monitor Second Creek on a monthly basis and submit samples for *Bacteroides* testing as needed.

Third Creek

In January, two routine sites on Third Creek, which exhibited elevations in *E. coli* counts were submitted for *Bacteroides* source testing. Both samples from routine sites 0.87 and 2.08E showed evidence of human content. However, subsequent sampling during the following months did not exhibit similar elevations in fecal coliform or *E. coli* counts. KUB will continue to investigate areas of Third Creek when *E. coli* counts indicate the need for further inquiry.

On February 2nd, KUB Water Quality Personnel responded an SSO on Mynderse Avenue, which was caused by high flows due to rainfall. This SSO was reported after the overflow had stopped and rain was no longer occurring, but sampling was initiated as a precautionary since the cause of the SSO was unknown at the time. Even though it was determined to be caused by heavy rainfall, follow-up sampling was conducted.

8.2 Projected Data Collection

During the second quarter of 2010, 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 second quarter of 2010:

Sample Locations by Creek Mile or Site Number

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

In the second quarter of 2010, KUB will conduct Wet Weather investigations on Goose Creek and Fourth Creek as weather permits. KUB will also conduct a dry weather walking survey of Second Creek as well as dry and wet weather investigations.

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	McCampbell 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
88	Jersey Ave sewer rehabilitation (SubBasin 23)	Find & Fix Gravity Main	1st Creek	Kuwahee	419	Project Complete

Capital Projects and Rehabilitation Credits

	Project Name	Credit Type	Basin	WWTP	Credits Banked (gpd)	Status
89	East Magnolia sewer rehabilitation (SubBasin 24)	Find & Fix Gravity Main	1st Creek	Kuwahee	846	Project Complete
90	Walker Blvd Sewer Rehabilitation (SubBasin 16)	Find & Fix Gravity Main	1st Creek	Kuwahee	1086	Project Complete
91	Kingston Court Sewer Rehabilitation (SubBasin 29)	Find & Fix Gravity Main	3rd Creek	Kuwahee	3727	Project Complete
92	Clinch Ave Sewer Rehabilitation (SubBasin 30)	Find & Fix Gravity Main	1st Creek	Kuwahee	442	Project Complete
93	Badgett Drive Sewer Rehabilitation (SubBasin 22)	Find & Fix Gravity Main	3rd Creek	Kuwahee	214	Project Complete
94	Dickson Street Sewer Rehabilitation (SubBasin 20)	Find & Fix Gravity Main	Loves Creek	Loves Creek	417	Project Complete
95	W New Street Sewer Rehabilitation (SubBasin 24)	Find & Fix Gravity Main	1st Creek	Kuwahee	2844	Project Complete
96	Rennoc Rd Sewer Rehabilitation (SubBasin 4)	Find & Fix Gravity Main	1st Creek	Kuwahee	2853	Project Complete
97	Spicewood Lane Sewer Rehabilitation (SubBasin 13)	Find & Fix Gravity Main	3rd Creek	Kuwahee	216	Project Complete
98	Chapman Highway Sewer Rehabilitation (SubBasin 39)	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	212	Project Complete
99	McCroskey Ave Sewer Rehabilitation (SubBasin 17)	Find & Fix Gravity Main	1st Creek	Kuwahee	1,076	Project Complete
100	East 5th Ave Sewer Rehabilitation (SubBasin 24)	Find & Fix Gravity Main	1st Creek	Kuwahee	447	Project Complete
101	Simms Rd Sewer Rehabilitation (SubBasin 39)	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	2,955	Project Complete
102	Maynard Ave Sewer Rehabilitation (SubBasin 16)	Find & Fix Gravity Main	1st Creek	Kuwahee	423	Project Complete
103	Minibasin 10B1 & 10C1 find & fix	Find & Fix Gravity Main	2nd Creek	Kuwahee	15,689	Project Complete
104	Third Creek Trunkline Replacement	Find & Fix Gravity Main	3rd Creek	Kuwahee	483,793	Project Complete
105	Disconnected Stormwater 15' discharge pipe Island Home blvd	Disconnect Storm Sewer	South Knox / Knob Creek	Kuwahee	1,720,000	Project Complete
106	Paved Manhole Rehabilitation 40A2	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	20,140	Project Complete
107	Paved Manhole Rehabilitation 40F2	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	6,515	Project Complete
108	Paved Manhole Rehabilitation 40G1	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	13,571	Project Complete
109	Paved Manhole Rehabilitation 39E1	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	2,576	Project Complete
110	Paved Manhole Rehabilitation 03C1	Find & Fix Gravity Main	1st Creek	Kuwahee	3,615	Project Complete
111	Paved Manhole Rehabilitation 02A1	Find & Fix Gravity Main	1st Creek	Kuwahee	6,491	Project Complete
112	Paved Manhole Rehabilitation SB 38	Find & Fix Gravity Main	3rd Creek	Kuwahee	5,797	Project Complete
113	Paved Manhole Rehabilitation 18A1	Find & Fix Gravity Main	1st Creek	Kuwahee	4,540	Project Complete
114	Paved Manhole Rehabilitation 39E1	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	34,671	Project Complete
115	Paved Manhole Rehabilitation 39D1	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	8,000	Project Complete
116	Paved Manhole Rehabilitation 39A2	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	13,335	Project Complete
117	Paved Manhole Rehabilitation 39C3	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	26,670	Project Complete
118	Broken Manhole Lid Replacement (67)	Find & Fix Gravity Main	Loves Creek	Loves Creek	26,666	Project Complete
119	Manhole Replacement (61)	Find & Fix Gravity Main	Loves Creek	Loves Creek	2,304	Project Complete
120	Woodbine Awer 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	Chambliss 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
136	Shortline-Ave B	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	7,332	Project Complete
137	Second Creek SSO Abatement	Find & Fix Gravity Main	2nd Creek	Kuwahee	163,471	Project Complete
138	Shortline- Maplehurst	Find & Fix Gravity Main	1st Creek	Kuwahee	6,062	Project Complete
139	Shortline- Parkhill	Find & Fix Gravity Main	4th Creek	Fourth Creek	1,755	Project Complete
140	Shortline- Essary	Find & Fix Gravity Main	1st Creek	Kuwahee	215	Project Complete
141	Shortline- Ridgcrest	Find & Fix Gravity Main	1st Creek	Kuwahee	3,058	Project Complete
142	4th Creek SSO Abatement Project	Find & Fix Gravity Main	4th Creek	Fourth Creek	266,200	Project Complete
143	Ashville Highway Trunkline Replacement (20A3)	Find & Fix Gravity Main	Loves Creek	Kuwahee	372,780	Project Complete
144	Minibasin 06A2 & 06A3 Comprehensive Rehabilitation	Comprehensive Rehabilitation	Loves Creek	Loves Creek	275,630	Project Complete
145	Sevier Ave & Jones Ave Find & Fix Rehabilitation (40C1)	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	50,537	Project Complete
146	Manhole Rehabilitation - National Drive (60)	Find & Fix Gravity Main	Riverdale	Kuwahee	4,608	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
1/6/2010	3:45 PM	905	KERMIT DRIVE	KUW	Second Creek	5	MH 4-36	Pavement to Ditch to Soil Saturation		The sewer main was flushed to remove the blockage caused by grease.	1,080	0	1,080	1.5	No
1/18/2010	3:45 PM	1712	POLKRIGHT LANE	FC	Fourth Creek	37	Residential Grinder Pump	Wet Well to Soil Saturation		There was an electrical failure of the residential grinder pump.	5	0	5	1	No
1/18/2010	8:26 PM	229	LYNNWOOD DRIVE	KUW	First Creek	3	MH 2-98	Pavement to Ditch to Soil Saturation		The sewer main was flushed to remove the blockage caused by grease and roots.	130	0	130	0.5	No
1/24/2010	10:11 AM	5760	SANDIS LANE	LC	Loves Creek	20	Influent Structure	Holston River	Holston River	There was a temporary electrical power failure at the WWTP during a high rainfall event.	190,000	0	190,000	0.75	Yes
1/24/2010	12:09 PM	304	SEVENTH AVENUE	KUW	First Creek	18	MH 15	Soil Saturation		Rainfall in the area produced I & I and high flows in sewer mains.	90	0	90	3	No
1/24/2010	5:32 PM	1109	BIDDLE STREET	KUW	Williams Creek	25	Lateral Cleanout & BBU	Soil Saturation and BBU		The sewer main was flushed to remove the blockage caused by roots and influenced by heavy rainfall.	1,000	0	1,000	1	No
1/24/2010	6:40 PM	1500	LYONS BEND ROAD	FC	Fourth Creek	37	Influent Structure & MLSS Wetwell	Conveyance to Fourth Creek Embayment and Wetwell to Ground to Storm Drain to Tennessee River	Tennessee River	Rainfall in the area produced I & I and high flows in sewer mains.	74,000	0	74,000	1.62	Yes
1/24/2010	6:46 PM	2536	CECIL AVENUE	KUW	First Creek	18	MH 30-11	Pavement to Storm Drain to Ditch at Railroad Tracks and Soil Saturation		Rainfall in the area produced I & I and high flows in sewer mains.	138,060	0	138,060	8	No
1/24/2010	7:33 PM	2414	BERNHURST DRIVE	KUW	First Creek	4	MH 18-58, 18-54 & 18-53	Pavement to Storm Drain to Soil Saturation		The sewer main was flushed to remove the unknown blockage and influenced by heavy rainfall.	5,550	0	5,550	10	No
1/25/2010	8:08 AM	7100	ROTHERWOOD DRIVE	FC	Fourth Creek	36	MH 32, 33, 34 & 36	Ditch to Unnamed Tributary to Fourth Creek	Fourth Creek	Rainfall in the area produced I & I and high flows in sewer mains.	41,575	0	41,575	36	Yes
1/25/2010	8:33 AM	6621	CLINTON HIGHWAY	KUW	Third Creek	50	Air Release Valve	Soil Saturation		The air release valve malfunctioned resulting in an SSO.	190	0	190	2	No
1/25/2010	8:40 AM	1210	MOODY AVENUE	KUW	South Knoxville	40	MH 39	Soil Saturation and Swale to Baker Creek	Baker Creek	Rainfall in the area produced I & I and high flows in sewer mains.	0	0	Unknown	Unknown	Yes
1/25/2010	9:05 AM	608	WALKER SPRINGS ROAD	FC	Fourth Creek	32A	MH 77	Soil Saturation and Swale to Ten Mile Creek	Ten Mile Creek	Rainfall in the area produced I & I and high flows in sewer mains.	95,580	0	95,580	9	Yes
1/25/2010	9:10 AM	2004	ED SHOUSE ROAD	KUW	Third Creek	13	Diversion Structure	Ground to Soil Saturation and Third Creek	Third Creek	Rainfall in the area produced I & I and high flows in sewer mains.	21,600	0	21,600	4	Yes
1/25/2010	9:45 AM	1411	DAVANNA STREET	KUW	Second Creek	15	MH 8	Pavement to Ditch to Storm Drain to Second Creek and Soil Saturation	Second Creek	Rainfall in the area produced I & I and high flows in sewer mains.	200	200	Unknown	Unknown	Yes
1/25/2010	10:11 AM	3741	EAKERS STREET	KUW	South Knoxville	40	MH 47	Soil Saturation and Swale to Baker Creek	Baker Creek	Rainfall in the area produced I & I and high flows in sewer mains.	0	0	Unknown	Unknown	Yes
1/25/2010	2:15 PM	5546	WILKERSON ROAD	KUW	Third Creek	9	Lateral Cleanout	Soil Saturation		Rainfall in the area produced I & I and high flows in sewer mains.	5	0	5	1	No
1/26/2010	12:38 PM	4713	OLD BROADWAY	KUW	First Creek	8	MH 2	Soil Saturation and Swale to First Creek	First Creek	Rainfall in the area produced I & I and high flows in sewer mains.	3,400	0	3,400	12	Yes
1/27/2010	10:16 AM	4600	UPCHURCH ROAD	KUW	First Creek	7	MH 45	Soil Saturation		Rainfall in the area produced I & I and high flows in sewer mains.	105	0	105	1	No
1/27/2010	9:57 PM	4611	KINGSTON PIKE	KUW	Third Creek	34	Broken Sewer Main	Soil Saturation		There was a collapsed portion of the sewer main.	1,000	500	500	1	No
1/28/2010	5:31 PM	702	EAST INSKIP DRIVE	KUW	First Creek	7	MH 29-63	Soil Saturation		The sewer main was flushed to remove the blockage caused by debris.	410	0	410	1	No
2/2/2010	4:28 PM	2706	MYNDERSE AVENUE	KUW	Third Creek	22	MH 18-3	Pavement to Swale to Third Creek and Soil Saturation	Third Creek	Rainfall in the area produced I & I and high flows in sewer mains.	1,000	0	1,000	1	Yes
2/4/2010	6:25 PM	4025	THORNWOOD ROAD	KUW	Third Creek	13	MH 17-92	Soil Saturation		The sewer main was flushed to remove the blockage caused by grease and roots.	250	0	250	2	No
2/5/2010	7:32 AM	2706	MYNDERSE AVENUE	KUW	Third Creek	22	MH 18-3	Pavement to Swale to Third Creek and Soil Saturation	Third Creek	Rainfall in the area produced I & I and high flows in sewer mains.	11,500	0	11,500	8	Yes
2/5/2010	10:45 AM	7104	ROTHERWOOD DRIVE	FC	Fourth Creek	36	MH 34	Ditch to Unnamed Tributary to Fourth Creek	Fourth Creek	Rainfall in the area produced I & I and high flows in sewer mains.	51,015	0	51,015	71	Yes
2/5/2010	11:46 AM	2621	BRAGG STREET	KUW	Third Creek	22	MH 21-123	Pavement to Storm Drain to East Fork	East Fork	The sewer main was flushed to remove the blockage caused by debris and influenced by heavy rainfall.	60	0	60	1.5	Yes
2/5/2010	5:15 PM	2430	HIGHLAND DRIVE	KUW	First Creek	4	Lateral Cleanout	Ground to Soil Saturation and First Creek	First Creek	The sewer main was flushed to remove the blockage caused by debris and influenced by heavy rainfall.	2,290	0	2,290	1.5	Yes
2/10/2010	6:25 PM	800	BENNETT PLACE	FC	Fourth Creek	32B	Broken Pipe	Ditch to Ten Mile Creek	Ten Mile Creek	There was a collapsed portion of the sewer main.	45,900	0	45,900	72	Yes
2/12/2010	9:00 AM	8560	WESTLAND DRIVE	FC	Fourth Creek	42	Air Release Valve	Ground to Pavement to Storm Drain to Soil Saturation and Recovery		The air release valve malfunctioned resulting in an SSO.	4,155	25	4,130	1.5	No
2/14/2010	9:05 PM	302	LINGBURTON AVENUE	LC	Loves Creek	20	Lateral Cleanout	Lateral Cleanout to Soil Saturation		There was a mechanical failure of the residential grinder pump.	5	0	5	5	No
2/15/2010	5:35 PM	100	THIRTEENTH STREET	KUW	Second Creek	23	Broken Sewer	Sidewalk to Swale to Storm Drain to Second Creek and Sidewalk to Pavement to Storm Drain to Second Creek	Second Creek	There was a collapsed portion of the sewer main.	100	0	100	1	Yes
2/19/2010	2:55 PM	6410	SOUTH NORTHSORE DRIVE	FC	Fourth Creek	37	MH 8	Ground to Fourth Creek	Fourth Creek	Rainfall in the area produced I & I and high flows in sewer mains.	0	0	Unknown	Unknown	Yes
2/21/2010	2:50 PM	5713	MILLERTOWN PIKE	LC	Loves Creek	6	Broken Sewer	Soil Saturation		There was an SSO caused by a leaking low pressure sewer pipe.	5	0	5	1.5	No
3/7/2010	12:45 PM	3403	VALLEY VIEW DRIVE	KUW	First Creek	8	MH 9-86	Pavement to Soil Saturation		There was an SSO caused by a defective cured-in-place sewer pipe.	1,590	0	1,590	1.5	No
3/8/2010	7:30 PM	1904	SANDERSON ROAD	KUW	Third Creek	28	MH 16-27	Soil Saturation		The sewer main was flushed to remove the blockage caused by debris and the protruding lateral was trimmed.	50	0	50	1	No
3/10/2010	8:45 AM	955	KNOXVILLE COLLEGE DRIVE	KUW	Third Creek	22	MH 6-78	Ditch to Soil Saturation		The sewer main was flushed to remove the blockage caused by vandalism.	1,250	0	1,250	1	No
3/10/2010	2:15 PM	6024	BROOKVALE LANE	FC	Fourth Creek	33	MH 15	Ground to Fourth Creek and Soil Saturation	Fourth Creek	Rainfall in the area produced I & I and high flows in sewer mains.	Unknown	0	Unknown	Unknown	Yes
3/12/2010	6:57 PM	4804	BAY STREET	KUW	Third Creek	13	MH 34-31	Soil Saturation		The sewer main was flushed to remove the blockage caused by debris.	230	0	230	1	No
3/17/2010	10:00 AM	2217	MARTIN LUTHER KING JR DRIVE	KUW	First Creek	24	MH 6-152 & Privately Owned	Privately Owned Manhole to Soil Saturation and Manhole to Pavement to Storm Drain to Soil Saturation		The sewer main was flushed to remove the blockage caused by debris.	530	0	530	0.5	No
3/18/2010	12:23 PM	5732	TENNYSON DRIVE	FC	Fourth Creek	32A	MH 49-182	Manhole to Retention Basin to Ditch to Soil Saturation and Recovery		The sewer main was flushed to remove the blockage caused by debris.	20,825	2,000	18,825	168 Intermittently	No
3/19/2010	10:05 AM	5218	BENT RIVER BOULEVARD	FC	Fourth Creek	43	Residential Grinder Pump	Wetwell to Soil Saturation		There was a mechanical failure of the residential grinder pump.	22	2	20	3	No
3/19/2010	9:21 PM	6549	CREEKHEAD DRIVE	FC	Fourth Creek	32A	MH 49-2	Manhole to Ditch to Ten Mile Creek	Ten Mile Creek	The sewer main was flushed to remove the blockage caused by debris.	2,030	1,000	1,030	0.5	Yes
3/23/2010	8:18 AM	2004	NEYLAND DRIVE	KUW	Second Creek	35A	MH 1	Tennessee River	Tennessee River	There was an SSO caused by temporary electrical power failure.	50,000	0	50,000	0.05	Yes

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)
2/3/2010	12:09 PM	5401	GREENCREST ROAD	KUW	First Creek	1	BBU	The sewer main was flushed to remove the blockage caused by roots.	15	15	0	1
2/26/2010	10:30 AM	4337	FOUNTAIN DRIVE	KUW	Third Creek	13	BBU	The BBU caused by sewer main cleaning.	0.25	0.25	0	0.02
2/26/2010	2:16 PM	1127	MAGNET PLACE	KUW	Willams Creek	31	BBU	The sewer main was flushed to remove the blockage caused by roots and grease.	33	33	0	2
3/29/2010	2:47 PM	319	ECHODALE LANE	KUW	South Knoxville	41	BBU	The sewer main was flushed to remove the blockage caused by roots.	5	5	0	0.5
3/30/2010	11:50 AM	2924	SUTHERLAND AVENUE	KUW	Third Creek	28	BBU	The BBU caused by sewer main flushing to remove a blockage in the sewer main.	15	15	0	0.05

Appendix D

Water Quality Monitoring Program Sampling Results



Water Quality Monitoring
Report

Routine Water Quality Monitoring Report

1/1/2010 Through 3/31/2010

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)	Total Bacteroides (mg/L)	Human Bacteroides (mg/L)	Precipitation Event	Status
<u>First Creek</u>											
1.74	1/20/2010	10:14	8.2	11	10	160	180	N/A	N/A	Wet	R
2.57	1/20/2010	10:05	8.3	12	10	72	110	N/A	N/A	Wet	R
6.33	1/20/2010	09:50	7.8	14	8.7	290	330	N/A	N/A	Wet	R
1.74	2/12/2010	09:56	8.3	7	12	360	260	N/A	N/A	Wet	R
2.57	2/12/2010	09:40	7.4	8	11	150	180	N/A	N/A	Wet	R
6.33	2/12/2010	09:25	8.1	10	9.4	170	260	N/A	N/A	Wet	R
1.74	3/8/2010	09:56	8.0	10	12	340	340	N/A	N/A	Dry	R
2.57	3/8/2010	09:45	8.3	10	12	480	460	N/A	N/A	Dry	R
6.33	3/8/2010	09:24	7.8	13	9.5	54	54	N/A	N/A	Dry	R
<u>Second Creek</u>											
0.30	1/27/2010	10:52	8.3	10	10	45	67	N/A	N/A	Wet	R
1.54	1/27/2010	09:35	7.8	10	10	90	100	N/A	N/A	Wet	R
5.76	1/27/2010	09:16	7.4	14	7.8	27	50	N/A	N/A	Wet	R
0.30	2/24/2010	10:58	8.6	10	11	9	130	N/A	N/A	Wet	R
1.54	2/24/2010	10:45	8.6	11	12	110	280	N/A	N/A	Wet	R
5.76	2/24/2010	10:27	7.8	14	7.3	99	20	N/A	N/A	Wet	R
0.30	3/29/2010	12:27	8.2	12	11	210	520	N/A	N/A	Wet	R
1.54	3/29/2010	12:17	8.1	13	10	490	820	N/A	N/A	Wet	R
5.76	3/29/2010	11:58	7.4	15	6.6	36	150	N/A	N/A	Wet	R

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

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



Routine Water Quality Monitoring Report

1/1/2010 Through 3/31/2010

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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)	Total Bacteroides (mg/L)	Human Bacteroides (mg/L)	Precipitation Event	Status
<u>Third Creek</u>											
0.87	1/21/2010	08:23	8.0	12	9.3	4800	> 2400	40.9	14.3	Wet	R
2.08E	1/21/2010	08:35	8.2	11	9.4	4700	980	32.0	11.7	Wet	R
4.80W	1/21/2010	08:50	8.1	12	9.1	490	140	N/A	N/A	Wet	R
0.87	2/17/2010	09:45	8.4	8	11	170	120	N/A	N/A	Wet	R
2.08E	2/17/2010	09:26	8.4	7	11	45	26	N/A	N/A	Wet	R
4.80W	2/17/2010	08:35	8.0	11	9.4	27	46	N/A	N/A	Wet	R
0.87	3/12/2010	09:35	8.1	12	10	94	180	N/A	N/A	Dry	R
2.08E	3/12/2010	08:54	8.1	13	9.5	150	280	N/A	N/A	Dry	R
4.80W	3/12/2010	09:10	7.8	13	9.8	36	67	N/A	N/A	Dry	R
<u>Fourth Creek</u>											
1.75	1/14/2010	12:21	8.8	10	11	18	16	N/A	N/A	Dry	R
2.79	1/14/2010	12:47	8.4	11	11	99	84	N/A	N/A	Dry	R
3.29	1/14/2010	12:32	8.3	10	12	220	120	N/A	N/A	Dry	R
1.75	2/22/2010	12:17	8.1	11	9.3	560	440	N/A	N/A	Dry	R
2.79	2/22/2010	12:05	8.0	12	9.3	300	360	N/A	N/A	Dry	R
3.29	2/22/2010	11:53	8.0	12	9.4	270	200	N/A	N/A	Dry	R
1.75	3/17/2010	10:05	8.0	13	9.3	50	110	N/A	N/A	Wet	R
2.79	3/17/2010	09:45	7.9	14	9.0	90	13	N/A	N/A	Wet	R
3.29	3/17/2010	09:53	8.0	13	9.7	63	64	N/A	N/A	Wet	R

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

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



Water Quality Monitoring Report

Routine Water Quality Monitoring Report

1/1/2010 Through 3/31/2010

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)	Total Bacteroides (mg/L)	Human Bacteroides (mg/L)	Precipitation Event	Status
<u>Baker Creek</u>											
0.36	1/26/2010	10:16	7.9	9	10	9000	> 2400	46.5	41.0	Wet	R
0.53	1/26/2010	10:01	7.9	10	10	500	550	N/A	N/A	Wet	R
1.45	1/26/2010	09:51	7.9	10	9.5	350	520	N/A	N/A	Wet	R
0.36	2/24/2010	07:27	8.5	10	10	460	690	N/A	N/A	Wet	R
0.53	2/24/2010	07:38	8.6	10	10	470	550	N/A	N/A	Wet	R
1.45	2/24/2010	07:15	8.4	10	10	820	> 2400	N/A	N/A	Wet	R
0.36	3/18/2010	11:15	8.1	12	11	460	410	N/A	N/A	Dry	R
0.53	3/18/2010	11:25	8.2	12	11	440	490	N/A	N/A	Dry	R
1.45	3/18/2010	11:00	8.0	12	10	580	920	N/A	N/A	Dry	R
<u>Goose Creek</u>											
0.40	1/11/2010	10:00	8.3	5	11	9	1	N/A	N/A	Wet	R
1.19E	1/11/2010	10:20	7.4	6	8.5	< 10	< 1	N/A	N/A	Wet	R
1.80E	1/11/2010	10:31	7.6	7	10	190	360	N/A	N/A	Wet	R
0.40	2/4/2010	09:36	8.0	9	9.8	< 10	2	N/A	N/A	Wet	R
1.19E	2/4/2010	09:26	7.8	11	10	9	< 1	N/A	N/A	Wet	R
1.80E	2/4/2010	09:15	8.0	11	9.4	110	96	N/A	N/A	Wet	R
0.40	3/9/2010	10:40	7.6	11	10	< 10	2	N/A	N/A	Dry	R
1.19E	3/9/2010	10:05	7.6	11	10	< 10	< 1	N/A	N/A	Dry	R
1.80E	3/9/2010	10:17	8.0	11	10	270	360	N/A	N/A	Dry	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

1/1/2010 Through 3/31/2010

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)	Total Bacteroides (mg/L)	Human Bacteroides (mg/L)	Precipitation Event	Status
<u>Loves Creek</u>											
0.85	1/12/2010	10:12	8.3	7	11	180	140	N/A	N/A	Dry	R
1.89	1/12/2010	09:56	8.0	9	9.4	45	96	N/A	N/A	Dry	R
3.45	1/12/2010	09:42	8.5	7	11	170	110	N/A	N/A	Dry	R
0.85	2/11/2010	11:21	8.1	9	10	72	74	N/A	N/A	Wet	R
1.89	2/11/2010	11:07	7.9	10	8.8	18	29	N/A	N/A	Wet	R
3.45	2/11/2010	10:55	8.2	6	11	< 10	23	N/A	N/A	Wet	R
0.85	3/15/2010	11:27	7.9	11	10	68	120	N/A	N/A	Wet	R
1.89	3/15/2010	11:16	7.6	11	9.8	72	57	N/A	N/A	Wet	R
3.45	3/15/2010	11:05	7.8	11	11	54	81	N/A	N/A	Wet	R
<u>Williams Creek</u>											
0.89	1/11/2010	09:38	8.6	6	12	100	130	N/A	N/A	Wet	R
1.70	1/11/2010	09:21	8.7	7	10	45	110	N/A	N/A	Wet	R
2.02	1/11/2010	09:31	8.3	8	10	54	50	N/A	N/A	Wet	R
0.89	2/4/2010	09:55	8.0	10	10	160	150	N/A	N/A	Wet	R
1.70	2/4/2010	10:09	7.8	10	11	410	360	N/A	N/A	Wet	R
2.02	2/4/2010	10:25	8.1	10	11	150	140	N/A	N/A	Wet	R
0.89	3/22/2010	09:57	7.9	11	8.4	340	260	N/A	N/A	Wet	R
1.70	3/22/2010	09:48	7.9	14	8.4	600	520	N/A	N/A	Wet	R
2.02	3/22/2010	09:37	7.7	14	8.7	1000	980	N/A	N/A	Wet	R

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

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

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Water Quality Monitoring Program

Investigative Water Quality Monitoring Report

01/01/2010 Through 03/31/2010

Table 1: First Creek Routine and Investigative Sampling

Sample Location	Collection Date	Collection Time	Dissolved Oxygen	Water Temp	Water pH	Fecal Coliform	E. coli	Total Fecal	Human Fecal
			(mg/L)	(°C)		(CFU/ 100mL)	(MPN)	(mg/L)	(mg/L)
Routine Site 1.74	12/10/2009	10:26	10	9	7.5	1800	1400	52.2	5.3
Routine Site 2.57	12/10/2009	9:47	11	9	7.7	1500	2000	41.0	< 5
3404 Valley View Drive Above	3/7/2010	14:20	16	12	8.4	36	52	N/A	N/A
3404 Valley View Drive Below	3/7/2010	14:27	14	12	8.5	36	37	N/A	N/A

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Water Quality Monitoring Program

Investigative Water Quality Monitoring Report
01/01/2010 Through 03/31/2010

Table 2: Fourth Creek Routine Sampling

	Collection Date	Collection Time	Dissolved Oxygen (mg/L)	Water Temp (°C)	Water pH	Fecal Coliform (CFU/ 100mL)	E. coli (MPN)	Total Fecal (mg/L)	Human Fecal (mg/L)
Routine Site 1.75	12/2/2009	9:50	9.9	10	7.8	5300	> 2400	27.5	< 5
Routine Site 2.79	12/2/2009	9:36	9.9	10	7.8	4100	> 2400	40.5	< 5
Routine Site 3.29	12/2/2009	9:20	9.7	10	8.7	9000	> 2400	31.8	< 5

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Table 3: Baker Creek Routine and Investigative Sampling

	Collection Date	Collection Time	Dissolved Oxygen	Water Temp	Water pH	Fecal Coliform	E. coli	Total Fecal	Human Fecal
			(mg/L)	(°C)		(CFU/ 100mL)	(MPN)	(mg/L)	(mg/L)
Left Bank Tributary, upstream from 0.36	1/26/2010	10:08	10	8	7.8	220	290	N/A	N/A
	2/24/2010	7:45	11	7	8.6	640	980	N/A	N/A
	3/18/2010	11:36	10	10	8.2	670	690	N/A	N/A

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Table 4: Second Creek Routine and Investigative Sampling

	Collection Date	Collection Time	Dissolved Oxygen	Water Temp	Water pH	Fecal Coliform	E. coli	Total Fecal	Human Fecal
			(mg/L)	(°C)		(CFU/ 100mL)	(MPN)	(mg/L)	(mg/L)
~300 yards Upstream from Routine Site 5.76 (behind IHOP)	1/27/2010	9:10	8.5	12	8.3	36	47	N/A	N/A
	2/24/2010	10:16	9.1	12	8.0	45	23	N/A	N/A
	3/29/2010	11:50	7.9	14	7.5	54	64	N/A	N/A

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Table 5: Third Creek Investigative Sampling

	Collection Date	Collection Time	Dissolved Oxygen (mg/L)	Water Temp (°C)	Water pH	Fecal Coliform (CFU/ 100mL)	E. coli (MPN)	Total Fecal (mg/L)	Human Fecal (mg/L)
2706 Mynderse Ave. Above	2/5/2010	17:55	9.1	9	7.9	2500	2000	N/A	N/A
2706 Mynderse Ave. Below	2/5/2010	18:05	10	8	8.0	15000	> 2400	N/A	N/A
2706 Mynderse Ave. Above	2/8/2010	12:55	9.7	10	8.0	46000	> 2400	N/A	N/A
2706 Mynderse Ave. Below	2/8/2010	13:10	9.5	10	8.0	59000	> 2400	N/A	N/A
2706 Mynderse Ave. Above	3/4/2010	12:05	11	11	8.2	40	110	N/A	N/A
2706 Mynderse Ave. Below	3/4/2010	12:15	12	10	8.3	90	100	N/A	N/A



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

Event Date 2/10/2010
Street Address 800 Bennett Place
Description The SSO was caused by a broken sewer main. The SSO traveled from a ditch to Ten Mile Creek.

Estimated unrecovered volume 45,900 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
	2/10/2010	0	0.19

Sample Location	Sample Date	Sample Time	Dissolved Oxygen	Temperature (Celsius)	pH	Fecal Coliform	E-Coli (MPN)
Upstream of SSO Discharge	2/10/2010	21:10	6.1	11	7.6	72	110
Downstream of SSO Discharge	2/10/2010	20:47	7.0	12	7.4	4300	1000
Upstream of SSO Discharge	2/17/2010	09:12	7.8	9	7.5	36	64
Downstream of SSO Discharge	2/17/2010	08:51	7.9	12	7.7	110	140



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Event Date 2/15/2010
Street Address 100 Thirteenth Street
Description The SSO was caused by a collapse in a portion of sewer main. The SSO traveled from sidewalk to swale and pavement to storm drain to Second Creek.

Estimated unrecovered volume 100 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
	2/15/2010	0.26	0

Sample Location	Sample Date	Sample Time	Dissolved Oxygen	Temperature (Celsius)	pH	Fecal Coliform	E-Coli (MPN)
Upstream of SSO Discharge	2/16/2010	09:43	11	8	8.2	130	200
Downstream of SSO Discharge	2/16/2010	09:53	11	8	8.3	110	280



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Event Date 3/10/2010
Street Address 6024 Brookvale Lane
Description The SSO was caused when heavy rainfall in the area produced I and I and high flows in the sewer mains. The SSO traveled to Fourth Creek and soil saturation.

Estimated unrecovered volume Unknown 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
	3/10/2010	0	0

Sample Location	Sample Date	Sample Time	Dissolved Oxygen	Temperature (Celsius)	pH	Fecal Coliform	E-Coli (MPN)
Upstream of SSO Discharge	3/10/2010	15:47	12	16	8.2	90	200
Downstream of SSO Discharge	3/10/2010	15:55	11	15	8.2	27	68



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Event Date 3/19/2010
Street Address 6549 Creekhead Drive
Description The SSO was caused by a partial blockage of debris in the sewer main. The SSO traveled from a ditch to Ten Mile Creek.

Estimated unrecovered volume 1030 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
	3/19/2010	0	0

Sample Location	Sample Date	Sample Time	Dissolved Oxygen	Temperature (Celsius)	pH	Fecal Coliform	E-Coli (MPN)
Upstream of SSO Discharge	3/19/2010	23:17	9.8	12	8.2	110	110
Downstream of SSO Discharge	3/19/2010	23:25	9.1	11	8.1	40000	1200
Upstream of SSO Discharge	3/31/2010	10:40	12	10	8.1	160	130
Downstream of SSO Discharge	3/31/2010	10:47	12	9	8.2	140	180



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Event Date 3/23/2010
Street Address 2004 Neyland Drive
Description The SSO was caused by a temporary power failure at the Kuwahee WWTP. The SSO travel to the Tennessee River.

Estimated unrecovered volume 50,000 gallons

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

Precipitation (McGhee-Tyson Airport)	Date	Total - Day of Event	Total - Prior 4 Days
	3/23/2010	0	0.29

Sample Location	Sample Date	Sample Time	Dissolved Oxygen	Temperature (Celsius)	pH	Fecal Coliform	E-Coli (MPN)
Upstream of SSO Discharge	3/23/2010	10:25	12	9	8.7	190	250
Downstream of SSO Discharge	3/23/2010	10:10	13	11	8.6	190	85

Appendix E

Unpermitted Discharges Subject to Stipulated Penalties

First Quarter 2010 Unpermitted Discharge Data and Analysis

Appendix E lists any SSO that occurred during the first quarter 2010 that resulted in an unpermitted discharge along with its cause, volume, one- and three-day rainfall totals, and rainfall intensity.

Thirteen of the 20 unpermitted discharges were caused by heavy rainfall. During the reporting period there were two significant rainfall events, one of which produced rainfall rates of 0.55 inches per hour. Ten of those events occurred after three days of heavy rain.

Two discharges were caused by electrical failures during storm events. One event occurred when lightening knocked out one electrical feed to the Loves Creek WWTP. The automatic switch that transfers to the alternate feed malfunctioned. The other event was due to a lightening strike at a substation. Improvements to backup power sources continue to minimize storm related problems due to wind and lightening. Most KUB facilities currently have sufficient backup power and an additional backup source is being designed for the WWTPs as part of the Composite Correction Plan.

Volumes were unknown for five events because the SSOs were found after the flow had subsided and only evidence of the event was found. Two events had volumes that were 100 gallons or less and one event that was 1000 gallons.

The table below summarizes events impacted by factors that were difficult to control or events that had minimal impact on the environment due to their low volume.

Category	Count
Mech/Elec. Failure	2
Vandalism	0
3-day rain > 4 in.	0
1-day > 3 in.	0
501 gal <Vol <1000 gal	1
Vol < 500 gal.	2

