Quarterly Progress Report

Volume 25

Second Quarter Report
April 1 through June 30, 2011

Submitted to EPA on July 29, 2011

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

July 29, 2011

D. Wayne Loveday

Date

KUB

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A 10-year Program to Improve Our Waterways

Table of Contents

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 2011 from April 1 through June 30. This is the twenty-fifth 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.

<u>April 29, 2011</u>

- Submitted to EPA – Quarterly Progress Report 1st quarter 2011
- Submitted to EPA – 2003-2010 Sanitary Sewer Overflow Evaluation Report

<u>May 9, 2011</u>

- Posted in the PDR – 4th Revised Sewer Overflow Response Plan

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.

Requested Project Extensions and Changes

- **1-19 Edgewood Drive Rehabilitation Project** –Project is under construction. Scope of work was expanded after investigations showed that additional sewer lines and manholes needed to be rehabilitated. This project was combined with 1-23 Oglewood Avenue Rehabilitation Project due to the proximity of the SSO locations to be addressed by both projects. Because Edgewood covers a large area and Oglewood is fairly small and located within two blocks of Edgewood, KUB chose to take advantage of the economy of scale for construction and design work by combining the two projects into one. Expected completion is September 2011.
- **3-7 Neyland Drive Trunk Replacement (Lower Third Creek Trunk Replacement) –** Original scope has changed from replacement work along Neyland Drive to work on the existing trunk south of Tyson Park extending northwest along Third Creek. Construction has begun at the Third Creek siphon and will continue up to Tyson Park. Project is in bid phase. Constructability issues, property acquisitions, and permitting for this large diameter project required that KUB request to extend the project completion date until FY 12/13.
- **4-28 Queensridge (Queensbury) Pump Station Upgrade Project** – The terminal manhole for the Queensbury force main has been replaced and the piping configuration for this manhole was also adjusted to lessen pressure restrictions allowing access to the force main for cleaning. Due to the additional work on this manhole, this project requires an extension to FY 11/12 to complete the pump station upgrade.

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 was FY 09/10 and was completed as scheduled.
- **2-2 Lower Second Creek Replacement/Rehabilitation at Woodland** – revised completion date is FY 10/11. An additional extension to FY 11/12 was requested and approved.
- **3-6 Interstate 40 and Middlebrook Pike Trunk Replacement Project** – revised completion date is June 30, 2012. An additional extension to FY 12/13 was requested and approved.
- **4-2 Gleason Drive Collector Rehabilitation Project** – revised completion date was June 30, 2010 and was completed as scheduled.
- **4-3 Middlebrook Pike Rehabilitation (Sub-basin 27C3)** – revised completion date was June 30, 2010 and was completed as scheduled.
- **4-4 Northshore Drive Trunk Replacement Project** – revised completion date is June 20, 2011. An additional extension to FY 11/12 was requested and approved.
- **4-6 Shadyland Drive Rehabilitation (Sub-basin 36A2) Project** – revised completion date was June 30, 2010 and was completed as scheduled.

Current Capital Improvement Plan for FY 04/05 - FY 10/11

The following is a list of facility improvement projects included in the Capital Improvement Plan for fiscal years 04/05 to 10/11. 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.

Phase I CAP/ER Ongoing Projects

First Creek

1. **1-19 Edgewood Drive Rehabilitation Project** – Project is under construction. Scope of work was expanded after investigations showed that additional sewer lines and manholes needed to be rehabilitated. This project was combined with 1-23 Oglewood

Avenue Rehabilitation Project due to the proximity of the SSO locations to be addressed by both projects. Because Edgewood covers a large area and Oglewood is fairly small and located within two blocks of Edgewood, KUB chose to take advantage of the economy of scale for construction and design work by combining the two projects into one. Expected completion is October 2011.

2. **1-21 College Park Rehabilitation Project** –Project is in design. The expected completion date for construction is June 2012.
3. **1-22 E. Jackson Avenue Rehabilitation Project** – Project is in preliminary engineering. The expected completion date for construction is June 2013.
4. **1-23 Oglewood Avenue Rehabilitation Project** –Project is under construction. The expected completion date for construction is October 2011.

Second Creek

1. **2-2 Lower Second Creek Replacement/Rehabilitation at Woodland** – Construction has been completed on the lower trunk sewer work. The design of the upper portion is now complete. This portion of the work has required permitting from two different railroad owners. The permitting process has been slowed by redesign required by the railroad operators. Initial applications to the railroad were made in November 2009. Revisions have been made, and final plans were submitted in March 2010. Due to the dependency on railroad approval, KUB extended the project into FY11/12. The project is under construction and the anticipated completion is the end of FY 11/12.

Third Creek

1. **3-6 Interstate 40 and Middlebrook Pike Trunk Replacement Project (East Fork of Third Creek Trunk Replacement)** – Constructability issues, property acquisitions, and permitting for this large diameter project required that the project completion date be extended until FY 12/13. The project conditions are along commercial, industrial, and transportation (roadway and railroad) corridors with challenging topography. Project will require coordination with future TDOT road improvement projects, extensive railroad permitting, environmental permitting, and property acquisition. The project has been broken into two phases to provide more effective delivery. Phase I design is complete and consists of the replacement of 3,200 ft of 30” pipe with 36” pipe. Construction will commence in August 2011 with a projected completion of August 2012. Phase II design is underway and consists of the replacement of 5,100 ft of 18-30” pipe with 36” diameter pipe. The projected start date is January 2012 and this phase has a 12-month duration.
2. **3-7 Neyland Drive Trunk Replacement (Lower Third Creek Trunk Replacement) –** Design is complete. Constructability issues, property acquisitions, and permitting for this large diameter project required that the project completion date be extended until FY 12/13. Original scope has changed from replacement work along Neyland Drive to work on the existing trunk south of Tyson Park extending northwest along Third Creek. Construction has begun at the Third Creek siphon and will continue up to Tyson Park. Project is in bid phase.
3. **3-16 Painter Avenue Trunk Replacement Project** - The original scope of this project called for replacement of 2,200 ft of existing 42” sewer with 48” and 54” sewer to correct slight surcharging during a two-year rain event (no overflows currently occur and none are predicted). Subsequent modeling and analysis showed that rehabilitation of the collector sewer upstream will be more effective in reducing peak flows to this trunk sewer. This approach will prevent digging and replacing the trunk sewer along Third Creek that extends under a four-lane road and through a wetland area. KUB requested changing the scope of the project to rehabilitation (find and fix) of collection system in mini-basins 28B1. The project will be completed in the same time frame as approved for

the original Painter Avenue trunk project but will now be referred to as 3-16 Painter Avenue Rehabilitation Project. Project is under construction.

4. **3-20 Citico Street Rehabilitation Project** – Construction is expected to begin July 2011 and be complete June 2012.
5. **3-21 Deerfield Road Rehabilitation Project** – Construction is expected to begin in FY 11/12.
6. **3-23 Hillvale Circle Rehabilitation Project** – Construction is expected to begin July 2011 and be complete June 2012.
7. **3-24 Montgomery Avenue Rehabilitation Project** – Construction is expected to begin July 2011 and be complete June 2012.
8. **3-27 Montgomery Avenue Rehabilitation Project** - Construction is expected to begin July 2011 and be complete June 2012.
9. **3-29 Highland Hills Road Rehabilitation Project** – Construction is expected to begin July 2011 and be complete June 2012.

Fourth Creek

1. **4-4 Northshore Drive Trunk Sewer Replacement** – Project involves installation of approximately 4,000 lf of 36" trunk sewer in a major commercial district and through a major road intersection at Northshore and Kingston Pike. Project also involves a railroad crossing. Commercial property acquisitions required condemnation proceedings to obtain possession of easements on several properties along the route. Construction is expected to be complete January 2012.
2. **4-28 Queensridge (Queensbury) Pump Station Upgrade Project** – The terminal manhole for the Queensbury force main has been replaced and the piping configuration for this manhole was also adjusted to lessen pressure restrictions allowing access to the force main for cleaning. Due to the additional work on this manhole, this project requires an extension to FY 11/12 to complete the pump station upgrade.

South Knox

1. **S-21 Alpine Avenue Rehabilitation Project** - Project is in preliminary engineering and should begin construction in September 2011.

Loves Creek and Eastbridge

1. **L-7 Magnolia Avenue Rehabilitation** – Project is in design. The expected completion date for this project is June 2013.
2. **L-8 McDonald Drive Rehabilitation** – Project is under construction. The expected completion date for construction is December 2011.
3. **EB-2 Strawberry Plains Pike Rehabilitation Project** – Project is in design. The expected completion date is June 2012.

Williams Creek

1. **W-5 Groner Avenue Rehabilitation Project** - Project is in preliminary engineering. The expected completion date is June 2013.

Phase I CAP/ER Completed Projects

First Creek

1. **1-17 Fountain Road Trunkline Sewer Improvement Project -** Upsized 3,700 ft of gravity sewer using open cut and pipe bursting methods. Replaced manholes and services.
2. **1-13 Fair Drive Phase II -** Rehabilitated 3691 ft and replaced 2,458 ft of existing 8-12" gravity sewer along Fair Drive.
3. **1-18 Greenfield Drive Rehabilitation Project -** Replaced approximately 3,300 ft of existing sewer with 8" and 12" PVC and ductile iron pipe.
4. **Whites Creek Phase III -** Replaced 300 ft of 12", 300 ft of 16", 2,700 ft of 24", and 5,000 ft of 36" sewer.
5. **1-25 First Creek Sub-basins 3 and 4 Rehabilitation Project –** Rehabilitated 26,500 ft of line and replaced 10,500 ft. Project included CCTV, smoke testing, and manhole inspections.
6. **1-3 First Creek Storage Tanks -** Designed and built 9 MG wet-weather storage tank to control sewer overflows near Old Broadway during rain events. Designed and built 5 million gallon (MG) wet-weather storage tank to control sewer overflows near North Hoitt Avenue during rain events.
7. **1-15 Replace trunk sewer upstream of lower storage unit** – Replaced 1,600 feet of existing 42 inch and 130 feet of 24 inch pipe.
8. **1-5 Upper Fountain City Trunkline Replacement Project** - Replaced and upgraded approximately 6,000 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. **1-2 Lower First Creek Collector Project (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. **1-6 Sub-basin 08A1 Rehabilitation Project -** 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 MH rehab; 69 private laterals reinstated.
13. **1-27 Fair Drive Rehabilitation Project** – Preliminary engineering work discovered that 567 ft of 8" gravity main and 3 manholes were rehabilitated after the SSO occurred. No additional work is necessary to address the overflow at this location.
14. **1-4 Lower Fountain City Pipe Replacement Project** – Replaced 20 manholes. Replaced approximately 2,715 ft of sewer mains and rehabilitated 142 ft of sewer.
15. **1-11 Fountain City Trunkline Replacement Phase IV Project** – Replaced approximately 2,991 ft of sewer.
16. **1-12 Cedar Lane Area Sanitary Sewer Rehabilitation Project** – Rehabilitated approximately 8,500 ft of sewer.
17. **1-14 Wilderness Road Area Gravity Sewer Replacement Project** – Replaced approximately 5,440 ft of sewer.
18. **1-16 Clearview Street Sewer Project** – Replaced approximately 4,468 ft of sewer.
19. **1-24 Fulton Short Line Project** – Replaced approximately 520 lf of Completed find and fix work to identify cause of overflow in the vicinity of 214 Bertrand Street.
20. **1-26 Cherry Street Rehabilitation Project** – Upsized approximately 1,150 ft of sewer trunklines and replaced two manholes and rehabilitated two manholes.

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 ft of existing trunkline with 30" sewer.
7. **Second Creek Trunk Sewer Improvements Phase II -** Replaced approximately 3,700 ft of existing trunkline with 30" sewer and replaced approximately 1,400 ft of existing trunkline with 36" sewer.
8. **2-12 Camelia Road Rehabilitation Project** – Replaced 430 ft of 8" pipe and 2 manholes. 220 ft of 8" pipe was rehabbed using CIPP.
9. **2-13 Cedar Heights Road Rehabilitation Project** – Replaced 123 ft of 8" pipe and rehabbed 263 ft of 8" pipe with CIPP.
10. **2-14 Central Avenue Pike Rehabilitation Project** – Replaced 102 ft of 10" pipe, 25 ft of 18" pipe, 2 manholes. CIPP was used to rehab 659 ft of 8" pipe.
11. **2-18 Nicholas Road - Clinton Highway Rehabilitation Project** – Replaced 405 ft of 8" pipe and one manhole.
12. **2-22 Dale Avenue Rehabilitation Project** – The 8" main was replaced in 2003 with a 12" ductile iron main in Dale Avenue. No additional overflows have occurred.
13. **2-17 Shasta Drive Rehabilitation Project** – Replaced 714 ft of 8" pipe and 6 manholes. CIPP was used to rehab 2,149 ft of 8" pipe.
14. **2-20 Sierra Road Rehabilitation Project** – CIPP was used to rehab 969 ft of 8" pipe.
15. **2-1 Lower Second Creek Replacement/Rehabilitation at I40/I275 Junction** – Replaced 280 ft and 3 MHs, pipe burst 1959 ft; CIPP was used to rehab 2313 ft, 29 manholes were rehabbed, and 50 laterals were reinstated.
16. **2-11 Burnside Rehabilitation Project** – Replaced 517 ft of 8" sewer and 1651 ft of 12" sewer using pipe bursting. Six manholes were replaced and 3 were rehabbed.
17. **2-15 1000 Block Elm Street Rehabilitation Project** – Replaced 632 ft of 8" sewer and nine manholes. Rehabbed 1400 ft of 8" sewer using CIPP and rehabbed 3 manholes. One lateral was reinstated.
18. **2-19 Cumberland Avenue Rehabilitation Project** – Replaced 1448 ft of 8" sewer and 10 manholes. Rehabbed 525 ft of 8" sewer using CIPP and reinstated 12 laterals.
19. **2-21 Morelia Avenue Rehabilitation Project** – Replaced 382 ft of 8" sewer and two manholes. Rehabbed three manholes, 2375 ft of 8" sewer using CIPP, and reinstated 74 laterals.
20. **2-16 1600 Block Elm Street Rehabilitation Project** – Pipe burst 285 ft of existing 8" sewer and replaced two manholes.

Third Creek

1. **Mynderse, Western, and Canna -** Replaced approximately 1,700 ft of 8” sewer and pipe-burst approximately 3400 ft of 8” up to 10” and 12” 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” and 15” 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 3,100 ft of 24” and 30” 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 2,000 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 2,563 ft of existing sewer, rehabilitated 3,094 ft and replaced/rehabbed 25 manholes.
11. **3-8 Third Creek Bike Trail Trunk Replacement –** Improvements to improve the sewer hydraulics were made at the connection of the 12” main to a 36” trunk sewer running south of Sutherland Avenue along Third Creek bike trail. Improvements included approximately 50 feet of 12” line and a new manhole. Additionally, rehabilitation in SB 28B1 has reduced the peaks to the 12” line.
12. **3-22 Fountain Drive Rehabilitation Project** – Replaced approximately 750 ft of existing sewer, rehabilitated 800 ft and replaced/rehabbed 9 manholes.
13. **3-25 Rolling Ridge Interconnection Project** - Pump station was decommissioned and 1,950 ft of new gravity sewer was installed to divert flow from the station into existing gravity sewer.
14. **3-14 McKamey Road Interconnection Project** - Analysis that occurred during preliminary engineering for this project determined that it had been adequately addressed by previous construction work.
15. **3-15 Ball Camp Pike Improvement Project** - Analysis that occurred during preliminary engineering for this project determined that it had been adequately addressed by previous construction work.

Fourth Creek

1. **Pinebrook Drive Sewer Replacement** – Replaced 330 ft of 8” 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 4,000 ft of 15”, 18”, and 2,100 ft of 36” 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 –** Replaced 980 ft of 8” pipe and 12 manholes. CIPP was used to rehab 640 ft of 8” pipe and 480 ft of 12” pipe.
7. **4-3 Middlebrook Pike Rehabilitation –** Replaced 190 ft of 8” pipe and two manholes. CIPP was used to rehab 2,000 ft of 8” pipe. Two manholes were rehabbed as well.
8. **4-6 Shadyland Drive Rehabilitation –** Replaced 1,700 ft of 10” pipe and 9 manholes. CIPP was used to rehab 1,000 ft.
9. **4-19 Northshore Drive Rehabilitation Project** – Raised manholes 6, 7, and 8 to create additional storage in the trunkline upstream of the Fourth Creek WWTP.
10. **4-23 5205 Bent River Blvd Project** – Replaced air release valves, flushed the low pressure force main, and replaced the grinder pump at 5205 Bent River Blvd.
11. **4-27 Southfork Project** – Project was completed in conjunction with 4-1 Chukar Road Rehabilitation Project. Replaced 88 feet of 8 inch pipe and two manholes. Rehabilitated 140 feet of 8 inch pipe using CIPP.
12. **4-21 Black Bear Road Project** – Replaced approximately 261 ft of existing 8” sewer and rehabilitated one manhole. Project included CCTV, manhole inspections, and smoke testing.
13. **4-24 Kerri Way Project** – Replaced approximately 439 ft of existing 8” sewer and five manholes. Approximately 92 ft of existing 8” sewer was rehabilitated. Project included CCTV, manhole inspections, and smoke testing.
14. **4-25 Lonas Drive Project** – Replaced approximately 326 ft of existing 8” sewer and five manholes. Approximately 4,688 ft of existing 8” sewer and nine manholes were rehabilitated. Project included CCTV, manhole inspections, and smoke testing.
15. **4-26 Midpark Drive Project** – Replaced two manholes. Approximately 440 ft of existing 8” sewer and three manholes were rehabilitated. Project included CCTV, manhole inspections, and smoke testing.
16. **4-31 Kingston Pike @ Gallaher View Project** – Replaced one manhole. Approximately 1,068 ft of existing 8” sewer and six manholes were rehabilitated. Project included CCTV, manhole inspections, and smoke testing.

South Knox

1. **Maryville Pike** – Designed and replaced 800–1,200 ft of 24” sewer located in Witherspoon Superfund site. Design rerouted sewer around site.
2. **South Haven Phase I and Phase II** – Relocated, rehabilitated, and upsized approximately 4,700 ft of existing collector sewers to increase conveyance capacity and reduce inflow and infiltration (I/I).

3. **Island Home Rehabilitation** – Rehabilitated 9,400 ft and replaced 1,200 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” 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” sewer.
12. **S-9 Ellis Road Rehabilitation Project** – Rehabilitated 2,250 ft of gravity sewer and replaced 6 MHs.
13. **S-11 Ford Valley Pump Station Rehabilitation Project** – Replaced pump station and added additional pump and generator to convey two-year storm within CAP requirements.
14. **S-20 Avenue A Rehabilitation Project** – CIPP was used to rehabilitate 1,585 ft of sewer. Seven manholes were rehabilitated, and 25 service lines were replaced.
15. **S-26 Trunk Sewer Replacement Project in Sub-basin 40F1** – This project was constructed as part of the South Haven Phase III work. Replaced 704 ft of 8” sewer and six manholes. Five laterals were reinstated.
16. **S-15 Trunk Replacement in Sub-basin 40A2 Project** – 3411 ft of gravity sewer was replaced, 16 manholes were rehabbed and 13 laterals were reinstated as part of this completed project.

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.
3. **L-1 Asheville Highway west of I-40 Trunk Replacement** – Upgraded 4,688 ft of existing pipe and replaced 20 manholes. Project was completed in FY 09/10, two years ahead of schedule.

4. **L-3 River View Rehabilitation** – Rehabilitated 4,627 ft of gravity sewer along with 8 manholes and 1 manhole was replaced. This work addressed the SSO located on Riverview Drive. Project was completed on FY 09/10, two years ahead of schedule.
5. **L-5 Brentwood Shortline Repair** – Rehabilitated 440 ft of gravity sewer. This work addressed the SSO located on Brentwood Road. Project was completed on FY 09/10, three years ahead of schedule.
6. **L-10 Washington Court Rehabilitation** – Rehabilitated 872 ft of gravity sewer. This work addressed the SSO located on Washington Court. Project was completed on FY 09/10, three years ahead of schedule.
7. **L-2 Boyds Bridge Pike and Holston Hills Trunk Replacement** – Replaced 4,456 feet of trunkline and 31 manholes.
8. **L-4 Asheville Highway Rehabilitation** – Rehabilitated 1,560 ft of sewer mains and 12 manholes.
9. **L-6 Holston Hills Road Rehabilitation** – Rehabilitated 1,356 ft of sewer mains.

Williams Creek

1. **Delrose Force Main Replacement** – Designed and replaced approximately 5,000 ft of 16" 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" sewer to correct structural problems.
3. **Williams Creek Sub-basin 19 Rehabilitation** – Performed rehabilitation in sub-basin 19A1, 19B1, and19A2/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.
8. **W-7 Sunset Avenue Rehabilitation Project** – Replaced 102 ft with 8" PVC.

Phase II CAP/ER

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

Phase II CAP/ER Ongoing Projects

First Creek

1. **FCR-1 1235 Watercress Drive** – Find and fix project to address overflow in vicinity of 1235 Watercress drive in mini-basin 07A2. This project is currently in design. The expected completion date is June 2014.
2. **FCR-2 4600 Upchurch Road** - Find and fix project to address overflow in vicinity of 4600 Upchurch Road in mini-basin 07A3. This project is currently in design. The expected completion date is June 2014.

Second Creek

1. **SCR-1 4105 Central Avenue Pike** – Find and find work to identify and address overflow in vicinity of 4105 Central Avenue Pike. CCTV, smoke testing and manhole inspection are currently underway for this project.

Fourth Creek

1. **4TH-2 Ten Mile Pump Station Removal** – Removal of Ten Mile pump station. This project is currently in design.

South Knox

1. **STH-1 820 Goldfinch Drive** – Find and fix work to identify and address overflow in vicinity of 820 Goldfinch Drive. This project is currently in the design.

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.

Phase II CAP/ER Completed Projects

Fourth Creek

1. **4TH-1 6540 Creekhead Drive** – Sewer rehabilitation completed in mini-basin 32A4.

Loves Creek and Eastbridge

1. **LVS-1 1815 Wayland Road** – Replaced 18,433 ft of force main. New pump station to be built in the FY 12/13.
2. **EBR-1 7612 Bud Hawkins Road** – Replaced the pump station and force main with a 21-inch gravity sewer.

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.

Construction of the Kuwahee WWTP CCP Phase I Improvements will be managed to allow for sequencing of work and coordination of new construction, demolition of existing facilities, and maintenance of plant operations. Construction of the emergency stand-by generator building is complete. Kuwahee WWTP CCP Phase 1 Contract 1 is underway and construction has begun. Kuwahee WWTP CCP Phase 1 Contract 2 Improvements have been bid and awarded. Fourth Creek WWTP design continues. Schedule is being tracked so all milestones are accomplished. CDM and KUB continue to work together to derive engineering solutions for the requirements of the CCP.

The wastewater storage facilities required in the CCP are operational. Substantial completion of both facilities was achieved on June 16, 2011. The Lower Third Creek facility at the Kuwahee WWTP has a capacity of 6.5 million gallons, and the Second Creek facility on Bernard Avenue has a capacity of 5.5 million gallons.

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 19 times during this reporting period resulting in seven Diversion events (four at Kuwahee WWTP, and three at Fourth Creek 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 First Quarter 2011

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, 2011, KUB submitted to EPA and placed in the PDR the Quarterly Progress Report for the first quarter 2011. This deliverable was not subject to the Public Review Requirement of Section VI.A.2, but was available for public comment from April 29, 2011, until May 19, 2011. No comments were received during that period.

6.1.2 2003-2010 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, 2011, KUB submitted to EPA and placed in the PDR the 2003-2010 Sanitary Sewer Overflow Evaluation Report Annual Update. This Review Level 1 Deliverable was available for public comment from April 29, 2011 until May 19, 2011.

6.2 Violations Subject to Stipulated Penalties

During this reporting period, KUB incurred 23 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 second quarter 2011 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	4/16/2011	2004 Riverside Drive	Heavy Rainfall
Unpermitted Discharge	4/16/2011	6410 S Northshore Drive	Heavy Rainfall
Unpermitted Discharge	4/16/2011	1500 Lyons Bend Road	Heavy Rainfall
Unpermitted Discharge	4/16/2011	2536 Cecil Avenue	Heavy Rainfall
Unpermitted Discharge	4/16/2011	1411 Davanna Street	Heavy Rainfall
Unpermitted Discharge	4/16/2011	4719 Old Broadway	Heavy Rainfall
Unpermitted Discharge	4/16/2011	3741 Eakers Street	Heavy Rainfall
Unpermitted Discharge	4/16/2011	2004 Neyland Drive	Heavy Rainfall
Unpermitted Discharge	4/16/2011	600 North Gallaher View Road	Heavy Rainfall
Unpermitted Discharge	4/16/2011	2544 Fair Drive	Heavy Rainfall
Unpermitted Discharge	4/18/2011	304 Seventh Avenue	Heavy Rainfall
Unpermitted Discharge	4/21/2011	4505 Middlebrook Pike	Heavy Rainfall
Unpermitted Discharge	4/28/2011	6410 S Northshore Drive	Heavy Rainfall
Unpermitted Discharge	4/28/2011	3741 Eakers Street	Heavy Rainfall
Unpermitted Discharge	4/28/2011	1500 Lyons Bend Road	Heavy Rainfall
Unpermitted Discharge	4/28/2011	600 North Gallaher View Road	Heavy Rainfall
Unpermitted Discharge	4/29/2011	6928 Westland Drive	Broken Pipe
Unpermitted Discharge	5/9/2011	2639 Louise Avenue	Blockage
Unpermitted Discharge	6/6/2011	1140Tillery Drive	Broken Pipe
Unpermitted Discharge	6/7/2011	814 W Fourth Avenue	Blockage
Unpermitted Discharge	6/24/2011	1411 Davanna Street	Heavy Rainfall
Unpermitted Discharge	6/24/2011	1216 Watercress Drive	Heavy Rainfall
Unpermitted Discharge	6/29/2011	4014 Holston Hills Road	Heavy Rainfall

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

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

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

7.1 SSOs

Appendix B lists all SSOs that occurred during this reporting period. During this period, there were 53 SSO events. Of that number, 32 were due to heavy rainfall, 9 were due to blockage, six were due to grinder pump failure, four were due to broken pipe, one was due to construction failure, and one was due to electrical failure at a pump station.

Of the 53 SSO events, 33 were in the 0 – 1,000 gallons volume range, eight were in the 1,001 – 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: 35 ranged from 0 – 2 hours, 12 ranged from 2.1 - 5 hours, five were greater than 5 hours, and the duration was unknown for one event. 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 four Building Backups. All four events were due to heavy rainfall.

7.3 Bypasses

All Bypasses that occurred during this reporting period were in compliance with the Process Controls Program. For purposes of this Report, any Bypass in compliance with the Process Controls Program shall be referred to as a "Diversion" (see below). All Bypasses not in compliance with the Process Controls Program shall be referred to as a "Bypass."

Table 2 contains all Diversion event information that occurred during this reporting period. During this reporting period, there were four Diversions at Kuwahee and three at Fourth Creek. No Bypasses occurred during this reporting period.

7.4 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 was one Effluent Limit Violation at Fourth Creek and none at Kuwahee, Loves Creek, or Eastbridge WWTPs.

Table 2: Diversions

WWTP	Did a Diversion occur?	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	4/5/2011	00:57	4/5/2011	14:11	4/5/2011	13.23	2.93	13.23	2.93	High flow event due to excess rainfall
Fourth Creek	Yes	4/16/2011	00:50			4/16/2011	23.17	14.45	33.5	17.11	High flow event due to excess rainfall
				4/17/2011	10:20	4/17/2011	10.33	2.9.266			
Fourth Creek	Yes	4/28/2011	00:00			4/28/2011	4.0	9.2	31.2	10.22	High flow event due to excess rainfall
				4/29/2011	07:12	4/29/2011	7.2	1.02			
Kuwahee	Yes	4/5/2011	02:00	4/5/2011	14:00	4/5/2011	12.0	14.88	12.0	14.88	High flow event due to excess rainfall
Kuwahee	Yes	4/16/2011	02:30			4/16/2011	21.5	35.71	23.55	35.98	High flow event due to excess rainfall
				4/17/2011	02:03	4/17/2011	2.05	0.27			
Kuwahee	Yes	4/27/2011	23:01			4/27/2011	4.98	2.03	17.98	23.75	High flow event due to excess rainfall
				4/28/2011	17:00	4/28/2011	17.0	21.72			
Kuwahee	Yes	6/24/2011	05:00	6/24/2011	16:32	6/24/2011	11.53	10.82	11.53	10.82	High flow event due to excess rainfall
Loves Creek	No										
Eastbridge	No										

Table 3: Effluent Limit Violations

WWTP	Did an event occur?	Date	Parameter	Type	Limit	Value
Kuwahee	No	-	-	-	-	-
Fourth Creek	Yes	4/28/2011	TSS	Daily	45 mg/l	63 mg/l
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 this 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 in Baker, Second, and Williams Creeks. KUB continues to utilize RT-PCR Bacteroides analysis on selected samples to investigate the source of any high *E. coli* counts when applicable.

First Creek

In addition to routine monitoring, a dry weather investigative walk all along this stream was performed (Routine and Investigative Water Quality Monitoring Report – Appendix D – Table 1). Results for both routine and investigative monitoring revealed counts of 1000 cfu/100 ml on average for fecal coliform and E. coli bacteria, but do not indicate sewer leaks along the stream. A few locations, which tended to be slightly higher during the dry weather walk, were re-sampled. One location near a storm water pipe (associated with #14 and #15) is currently under investigation, since high counts were obtained during re-sampling.

Second Creek

The bacteriological results associated with the routine monitoring during last quarter indicated the need for some additional investigation at various locations, but counts did not continue to be high consistently over the last three months. KUB continues to exam some of the sites that were suspect during a dry weather walk of the stream last year (Routine and Investigative Water Quality Monitoring Report – Appendix D). Three areas near stream miles 1.0, 3.8 and 5.5 were resampled again this quarter during warmer temperatures (Tables 2a and 2b) and results did not reveal any apparent sewer problems. Additionally, the storm pipe from near the Foundry (near mile 1.0) has been checked periodically for flow during dry weather, but no discharge has been evident. In May it was determined that another storm pipe above stream mile 5.5 was contributing run-off from a dumpster pad behind a restaurant and impacting the area stream. KUB communicated this issue to City of Knoxville (COK) Stormwater inspectors who eliminated the storm water discharge. Results in this area look very low, but additional monitoring is being conducted during the third quarter at all these locations as follow up.

Third Creek

Bacteriological counts increased abnormally in June at all three routine monitoring locations for this stream (Routine Water Quality Monitoring Report – Appendix D), but a storm event dropped over 1.2 inches of rain the day before samples were collected and just after an extended dry period. Runoff brings potential contamination from other sources to the stream and likely produced the high counts observed at all three locations.

COK Stormwater Inspectors also reported concerns along the east fork of the creek at the end of June. KUB investigated the area, found a defective private sewer lateral leaking into the stream from a Knox County School property and required Knox County School Maintenance to repair their lateral.

Fourth Creek

There were no *E. coli* results above the water quality standard for any monitoring done on Fourth Creek during this quarter (Routine Water Quality Monitoring Report – Appendix D). Fecal counts were also low. Bacteriological counts have continued to be low over the last several months. One additional sample was collected in June due to a problem completing one of the E.coli analyses on 6/28.

Loves Creek

One sample had *E. coli* results above the water quality standard of 941cfu/100 ml during this quarter (Routine Water Quality Monitoring Report – Appendix D). The sample collected on 4/12/11 had *E. coli* results of 1400 during wet weather conditions. All other monitoring for the quarter was below the water quality standard and counts have continued to be low over the last several months.

Baker Creek

Although inconsistent, bacteriological counts in this stream continued to be elevated at times over the last six months near Routine Sites 0.36 and 0.54. This was also observed for the tributary that enters Baker Creek just above the routine Site 0.36 (Table 4), but so far no indication of human source along this tributary is evident. Additional samples from this quarter have been submitted for source testing. Since the elevations are inconsistent and this is largely a residential area, a leaking septic system or private lateral is suspect. KUB continues to investigate this area of the stream.

Goose Creek

One sample had *E. coli* results above the water quality standard of 941cfu/100 ml during this quarter (Routine Water Quality Monitoring Report – Appendix D). The sample collected on 6/14/11 had *E. coli* results of 1200 during dry weather conditions and has been submitted for source testing. All other monitoring for the quarter was below the water quality standard and counts have continued to be low over the last several months. KUB will continue to look at any high counts at Site 1.19E during dry weather, since there was a slight indication of human source in a sample collected in December 2010. No other source testing or investigation was conducted on this stream this quarter.

Williams Creek

There were no *E. coli* results above the water quality standard for any monitoring done on Williams Creek during last quarter and this continued through April of this quarter. In early May a blockage related SSO impacted the stream near Site 2.02 (Spill Impact Monitoring Report – Appendix D) and some counts in that area continue to be elevated (Routine Water Quality Monitoring Report – Appendix D). After the unpermitted discharge, additional monitoring was continued and stream continued to be posted until bacteriological counts had dropped below the water quality standard.

Water quality personnel have submitted routine and investigative samples for bacteroides testing due to some elevations in bacteriological counts around Site 2.02. This included sampling of the two tributaries just above this location. Although inconsistent, evidence of human source has been seen during wet weather conditions in this area. (Table 3) Previously, it was thought that a suspect lateral was only affecting the left fork or tributary. Source testing results implicate both tributaries. Additional monitoring and source testing is still underway to identify the source. As the routine monitoring from the last six months

illustrates the problem is transient and inconsistent, but investigation in this area is continuing.

Other Investigative Samples

KUB also followed up on two SSOs that occurred during dry weather to confirm there was no impact to a nearby waterway. These results are included in Investigative Water Quality Monitoring Report – Appendix D – Table 5, and no apparent impacts were indicated. The volume of both SSOs were low and well contained.

8.2 Projected Data Collection

During the third quarter of 2011, 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 2011:

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

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 Rehabiliation (19A1)	Comprehensive Rehabilitation	Williams Creek	Kuwahee	313,938	Project Complete
75	Comprehensive Rehabiliation (19B1)	Comprehensive Rehabilitation	Williams Creek	Kuwahee	328,300	Project Complete
76	Comprehensive Rehabiliation (10B1)	Comprehensive Rehabilitation	2nd Creek	Kuwahee	191,698	Project Complete
77	Comprehensive Rehabiliation (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	Broookvale Point Repairs (02A3)	Find & Fix Gravity Main	1st Creek	Kuwahee	52,079	Project Complete
83	Park Pump Point Repairs (45)	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	11,522	Project Complete
84	Wayland Road Storage Tank (67)	Storage Tank	Loves Creek	Loves Creek	20,000	Project Complete
85	Comprehensive Rehab (19A3)	Comprehensive Rehabilitation	Williams Creek	Kuwahee	325,090	Project Complete
86	Comprehensive Rehab (41A2)	Comprehensive Rehabilitation	South Knox / Knob Creek	Kuwahee	39,330	Project Complete
87	Comprehensive Rehab (41A5)	Comprehensive Rehabilitation	South Knox / Knob Creek	Kuwahee	119,327	Project Complete
88	Jersey Ave sewer rehabilitation (SubBasin 23)	Find & Fix Gravity Main	1st Creek	Kuwahee	419	Project Complete
89	East Magnolia sewer rehabilitation (SubBasin 24)	Find & Fix Gravity Main	1st Creek	Kuwahee	846	Project Complete
90	Walker Blvd Sewer Rehabilitation (SubBasin 16)	Find & Fix Gravity Main	1st Creek	Kuwahee	1086	Project Complete

91	Kingston Court Sewer Rehabilitation (SubBasin 29)	Find & Fix Gravity Main	3rd Creek	Kuwahee	3727	Project Complete
92	Clinch Ave Sewer Rehabilitation (SubBasin 30)	Find & Fix Gravity Main	1st Creek	Kuwahee	442	Project Complete
93	Badgett Drive Sewer Rehabilitation (SubBasin 22)	Find & Fix Gravity Main	3rd Creek	Kuwahee	214	Project Complete
94	Dickson Street Sewer Rehabilitation (SubBasin 20)	Find & Fix Gravity Main	Loves Creek	Loves Creek	417	Project Complete
95	W New Street Sewer Rehabilitation (SubBasin 24)	Find & Fix Gravity Main	1st Creek	Kuwahee	2844	Project Complete
96	Rennoc Rd Sewer Rehabilitation (SubBasin 4)	Find & Fix Gravity Main	1st Creek	Kuwahee	2853	Project Complete
97	Spicewood Lane Sewer Rehabilitation (SubBasin 13)	Find & Fix Gravity Main	3rd Creek	Kuwahee	216	Project Complete
98	Chapman Highway Sewer Rehabilitation (SubBasin 39)	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	212	Project Complete
99	McCroskey Ave Sewer Rehabilitation (SubBasin 17)	Find & Fix Gravity Main	1st Creek	Kuwahee	1,076	Project Complete
100	East 5th Ave Sewer Rehabilitation (SubBasin 24)	Find & Fix Gravity Main	1st Creek	Kuwahee	447	Project Complete
101	Simms Rd Sewer Rehabilitation (SubBasin 39)	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	2,955	Project Complete
102	Maynard Ave Sewer Rehabilitation (SubBasin 16)	Find & Fix Gravity Main	1st Creek	Kuwahee	423	Project Complete
103	Minibasin 10B1 & 10C1 find & fix	Find & Fix Gravity Main	2nd Creek	Kuwahee	15,689	Project Complete
104	Third Creek Trunkline Replacement	Find & Fix Gravity Main	3rd Creek	Kuwahee	483,793	Project Complete
105	Disconnected Stormwater 15" discharge pipe Island Home blvd	Disconnect Storm Sewer	South Knox / Knob Creek	Kuwahee	1,720,000	Project Complete
106	Paved Manhole Rehabilitation 40A2	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	20,140	Project Complete
107	Paved Manhole Rehabilitation 40F2	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	6,515	Project Complete
108	Paved Manhole Rehabilitation 40G1	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	13,571	Project Complete
109	Paved Manhole Rehabilitation 39E1	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	2,576	Project Complete
110	Paved Manhole Rehabilitation 03C1	Find & Fix Gravity Main	1st Creek	Kuwahee	3,615	Project Complete
111	Paved Manhole Rehabilitation 02A1	Find & Fix Gravity Main	1st Creek	Kuwahee	6,491	Project Complete
112	Paved Manhole Rehabilitation SB 38	Find & Fix Gravity Main	3rd Creek	Kuwahee	5,797	Project Complete
113	Paved Manhole Rehabilitation 18A1	Find & Fix Gravity Main	1st Creek	Kuwahee	4,540	Project Complete
114	Paved Manhole Rehabilitation 39E1	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	34,671	Project Complete
115	Paved Manhole Rehabilitation 39D1	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	8,000	Project Complete
116	Paved Manhole Rehabilitation 39A2	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	13,335	Project Complete
117	Paved Manhole Rehabilitation 39C3	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	26,670	Project Complete
118	Broken Manhole Lid Replacement (67)	Find & Fix Gravity Main	Loves Creek	Loves Creek	26,666	Project Complete
119	Manhole Replacement (61	Find & Fix Gravity Main	Loves Creek	Loves Creek	2,304	Project Complete
120	Woodbine Aver Sewer Rehab Phase II (19A2)	Find & Fix Gravity Main	Williams Creek	Kuwahee	855	Project Complete
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 Rehabiliation (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	Cheyanne 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- Ridgecrest	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
147	Washington Ave Sewer Replacement (24B1)	Find & Fix Gravity Main	1st Creek	Kuwahee	14,643	Project Complete
148	Second Creek SSO Abatement phase II	Find & Fix Gravity Main	2nd Creek	Kuwahee	40,973	Project Complete
149	Highland Hills (37A3)	Find & Fix Gravity Main	4th Creek	Fourth Creek	13,017	Project Complete
150	Moses Ave (29D1)	Find & Fix Gravity Main	3rd Creek	Kuwahee	1,761	Project Complete
151	Dance Ave (28A1)	Find & Fix Gravity Main	3rd Creek	Kuwahee	1,889	Project Complete
152	Texas Ave (SB 15)	Find & Fix Gravity Main	2nd Creek	Kuwahee	85,030	Project Complete
153	Ellis Road find & fix (41A3)	Find & Fix Gravity Main	Knob Creek	Kuwahee	61,614	Project Complete
154	Ford Valley Pump Station & gravity sewer	Find & Fix Gravity Main	Knob Creek	Kuwahee	14,520	Project Complete
155	Crestwood Pump Station & Gravity Sewer	Find & Fix Gravity Main	Loves Creek	Loves Creek	3,950	Project Complete
156	Washington Pike Manhole Rehab MH IPID 20414153	Find & Fix Gravity Main	Eastbridge	Eastbridge	576	Project Complete
157	Wassman & 8th Ave	Find & Fix Gravity Main	1st Creek	Kuwahee	8,750	Project Complete
158	Lebanon Street Sewer Improvements	Find & Fix Gravity Main	3rd Creek	Kuwahee	13,145	Project Complete
159	Minibasin 35B2 UT sewer improvements	Find & Fix Gravity Main	3rd Creek	Kuwahee	39,952	Project Complete
160	Minibasin 35B3 UT sewer improvements	Find & Fix Gravity Main	3rd Creek	Kuwahee	27,132	Project Complete
161	Boyds Bridge Trunkline Replacement	Find & Fix Gravity Main	Loves Creek	Loves Creek	137,695	Project Complete
162	Minibasin 17B1 & 01A1	Find & Fix Gravity Main	1st Creek	Kuwahee	69,883	Project Complete
163	Lake Forest Sewer Improvements 41A6	Find & Fix Gravity Main	Knob Creek	Kuwahee	35,202	Project Complete
164	Bennett Place Sewer Improvements 32B	Find & Fix Gravity Main	4th Creek	Fourth Creek	25,112	Project Complete
165	40A2 Phase I Trunkline Replacement	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	195,583	Project Complete
166	Jersey Ave, Ball Camp & Hiawassee Sewer Improvments	Find & Fix Gravity Main	3rd Creek	Kuwahee	13,059	Project Complete
167	W Glenwood, Nathaniel & Boyd St Shortline project 22B1, 17A1, 01A1	Find & Fix Gravity Main	1st Creek	Kuwahee	13,059	Project Complete
168	Minibasin 23D1/F1	Comprehensive Rehabilitation	2nd Creek	Kuwahee	50,577	Project Complete
169	Minibasin 18B1 find & fix	Find & Fix Gravity Main	1st Creek	Kuwahee	4,929	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
4/4/2011	5:36 PM	2641	MARYVILLE PIKE	FC	Knob Creek	45	Residential Grinder Pump	Wetwell to Soil Saturation		Grinder Pump Failure	10	0	10	1	No
4/5/2011	2:10 PM	4228	CROSBY DRIVE	KUW	Third Creek	28	MH 27-3	Ground to Soil Saturation		Blockage - roots.	75	0	75	1	No
4/6/2011	7:37 PM	8105	WEST CLIFF DRIVE	FC	Fourth Creek	32A	MH 36-18	Ground to Soil Saturation		Blockage - roots.	400	0	400	2.5	No
4/7/2011	3:15 PM	3526	BUFFAT MILL ROAD	LC	First Creek	18	MH 65-19	Ground to Soil Saturation		Blockage - roots.	300	200	100	4	No
4/14/2011	12:45 PM	4418	KINGSTON PIKE	KUW	Third Creek	34	Lateral Cleanout	Lateral Cleanout to Pavement to Soil Saturation		Pipe/Manhole Failure - collapsed gravity main	10	0	10	2	No
4/16/2011	4:15 AM	4100	CENTRAL AVENUE PIKE	LC	Second Creek	10	MH 17-9	Pavement to Soil Saturation		Rainfall in the area produced I & I and high flows in sewer mains.	800	0	800	4	No
4/16/2011	4:15 AM	4421	ROYALVIEW ROAD	LC	Third Creek	11	MH 11-157	Pavement to Soil Saturation		Rainfall in the area produced I & I and high flows in sewer mains.	750	0	750	1	No
4/16/2011	5:52 AM	2004	RIVERSIDE DRIVE	KUW	Williams Creek	31	MH 1-1	Pavement to Soil Saturation to Williams Creek	Williams Creek	Rainfall in the area produced I & I and high flows in sewer mains.	2,000	0	2,000	1	Yes
4/16/2011	7:14 AM	6410	S NORTHSHORE 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.	19,000	0	19,000	5	Yes
4/16/2011	9:11 AM	1500	LYONS BEND ROAD	FC	Fourth Creek	37	MH 1	Fourth Creek	Fourth Creek	Rainfall in the area produced I & I and high flows in sewer mains.	350,000	0	350,000	2.82	Yes
4/16/2011	9:32 AM	3412	BORIGHT DRIVE	KUW	First Creek	8	MH 43 & 44	Pavement to Ditch to Soil Saturation		Rainfall in the area produced I & I and high flows in sewer mains.	2,250	0	2,250	4	No
4/16/2011	9:36 AM	2536	CECIL AVENUE	KUW	First Creek	18	MH 30-11	Pavement to Ditch at Railroad Tracks to Unnamed Tributary to First Creek and Soil Saturation	First Creek	Rainfall in the area produced I & I and high flows in sewer mains.	24,000	0	24,000	5	Yes
4/16/2011	9:47 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.	2,700	1,350	1,350	1	Yes
4/16/2011	10:15 AM	4719	OLD BROADWAY	KUW	First Creek	4	MH 2 & 63	Ground to Unnamed Tributary to First Creek and Soil Saturation	First Creek	Rainfall in the area produced I & I and high flows in sewer mains.	24,500	0	24,500	3	Yes
4/16/2011	11:57 AM	3741	EAKERS ST	KUW	South Knox	40	MH 47 & 47-103	Soil Saturation and Swale to Baker Creek	Baker Creek	Rainfall in the area produced I & I and high flows in sewer mains.	1,900	0	1,900	1	Yes
4/16/2011	3:53 PM	2004	NEYLAND DRIVE	KUW	Second Creek	35A	MH 1	Tennessee River	Tennessee River	Rainfall in the area produced I & I and high flows in sewer mains.	20,000	0	20,000	0.18	Yes
4/16/2011	9:00 PM	600	NORTH GALLAHER VIEW ROAD	FC	Fourth Creek	32A	MH 77	Ground to Ten Mile Creek	Ten Mile Creek	Rainfall in the area produced I & I and high flows in sewer mains.	264,000	0	264,000	22	Yes
4/16/2011	10:45 PM	2544	FAIR DRIVE	KUW	First Creek	4	MH 77	Ground to Soil Saturation and First Creek	First Creek	Rainfall in the area produced I & I and high flows in sewer mains.	100	0	100	1	Yes
4/17/2011	12:30 PM	3814	WOODLAKE DRIVE	KUW	First Creek	1	Lateral Cleanout	Ground to Soil Saturation		Rainfall in the area produced I & I and high flows in sewer mains.	20	0	20	1	No
4/18/2011	9:58 AM	304	SEVENTH AVENUE	KUW	First Creek	18	MH 15	Ground to Soil Saturation and First Creek	First Creek	Rainfall in the area produced I & I and high flows in sewer mains.	200	0	200	1	Yes
4/18/2011	12:22 PM	5546	WILKERSON ROAD	KUW	Third Creek	9	Lateral Cleanout	Ground to Soil Saturation		Rainfall in the area produced I & I and high flows in sewer mains.	50	0	50	1	No
4/21/2011	2:25 PM	4505	MIDDLEBROOK PIKE	KUW	Third Creek	21	MH 16-48 & 2 Unnamed Manholes	Ground to Soil Saturation and Third Creek	Third Creek	Rainfall in the area produced I & I and high flows in sewer mains.	72,000	0	72,000	6	Yes
4/24/2011	2:55 PM	3901	BONNIE VIEW AVENUE	LC	Loves Creek	20	MH 74-8	Pavement to Soil Saturation		Blockage - roots and grease.	50	0	50	2	No
4/28/2011	2:02 AM	6410	S NORTHSHORE DRIVE	FC	Fourth Creek	37	MH 8	Soil Saturation to Fourth Creek	Fourth Creek	Rainfall in the area produced I & I and high flows in sewer mains.	8,700	0	8,700	1	Yes
4/28/2011	8:36 AM	3741	EAKERS STREET	KUW	South Knox	40	MH 47 & 47-103	Soil Saturation and Swale to Baker Creek	Baker Creek	Rainfall in the area produced I & I and high flows in sewer mains.	100	0	100	1	Yes
4/28/2011	8:52 AM	1500	LYONS BEND ROAD	FC	Fourth Creek	37	MH 1	Fourth Creek	Fourth Creek	Rainfall in the area produced I & I and high flows in sewer mains.	680,000	0	680,000	5.82	Yes
4/28/2011	12:34 PM	600	NORTH GALLAHER VIEW ROAD	FC	Fourth Creek	32A	MH 77	Ground to Ten Mile Creek	Ten Mile Creek	Rainfall in the area produced I & I and high flows in sewer mains.	36,000	0	36,000	3	Yes
4/28/2011	2:55 PM	304	SEVENTH AVENUE	KUW	First Creek	18	MH 15	Ground to Soil Saturation		Rainfall in the area produced I & I and high flows in sewer mains.	5	0	5	1	No
4/28/2011	7:15 PM	5546	WILKERSON ROAD	KUW	Third Creek	9	Lateral Cleanout	Ground to Soil Saturation		Rainfall in the area produced I & I and high flows in sewer mains.	100	0	100	1	No
4/28/2011	11:58 PM	237	WEST SCOTT AVENUE	KUW	Second Creek	15	MH 9	Pavement to Soil Saturation		Rainfall in the area produced I & I and high flows in sewer mains.	1,000	0	1,000	1	No
4/29/2011	9:45 AM	6928	WESTLAND DRIVE	FC	Fourth Creek	36	Broken Gravity Main	Soil Saturation to Fourth Creek	Fourth Creek	A section of broken sewer main was repaired.	57,000	0	57,000	2	Yes
4/29/2011	8:15 PM	1704	POLKWRIGHT LANE	FC	Fourth Creek	37	Grinder Pump	Wetwell to Soil Saturation		Grinder Pump Failure	5	0	5	0.25	No
5/2/2011	9:45 AM	3604	HILLVALE CIRCLE	KUW	Third Creek	38	MH 1-115	Ground to Soil Saturation		Rainfall in the area produced I & I and high flows in sewer mains.	100	0	100	6	No
5/9/2011	3:02 PM	1728	POLKWRIGHT LANE	FC	Fourth Creek	37	Grinder Pump	Wetwell to Soil Saturation		Grinder Pump Failure	5	2.5	2.5	1	No
5/9/2011	9:27 PM	2639	LOUISE AVENUE	KUW	Williams Creek	19	MH 5-1	Ground to Williams Creek and Recovery	Williams Creek	Blockage - Grease and Debris	540,000	270,000	270,000	24	Yes
5/10/2011	9:00 PM	2524	JACOB DRIVE	KUW	Third Creek	35B	MH 4-9	Pavement to Ground to Soil Saturation		Construction Failure - Bypass Pump Failure	2,000	0	2,000	2	No
5/11/2011	9:38 PM	5356	BENT RIVER BOULEVARD	FC	Fourth Creek	43	Grinder Pump	Wetwell to Soil Saturation		Grinder Pump Failure	5	4	1	1	No
5/15/2011	3:38 PM	5715	ELDRIDGE ROAD	KUW	First Creek	3	Lateral Cleanout	Lateral Cleanout to Ground to Soil Saturation		Blockage - Roots	125	0	125	2	No
5/25/2011	5:22 PM	1917	CHEROKEE BOULEVARD	KUW	Third Creek	38	MH 25	Ground to Soil Saturation		Rainfall in the area produced I & I and high flows in sewer mains.	Unknown	0	Unknown	Unknown	No
6/2/2011	4:56 PM	1216	GLENOAKS DRIVE	KUW	First Creek	7	Lateral Cleanout	Lateral Cleanout to Soil Saturation		Blockage - Roots, Grease, Debris	30	0	30	1	No
6/6/2011	9:45 AM	2305	CLINCH AVENUE	KUW	Third Creek	35B	MH 39	Pavement to Soil Saturation		Blockage - Debris	750	0	750	1	No
6/6/2011	4:24 PM	114	TILLERY DRIVE	KUW	Second Creek	10	MH 16-1	Ground to Second Creek and Recovery	Second Creek	Pipe/Manhole Failure - Sag	15,000	7,500	7,500	5	Yes
6/7/2011	8:15 AM	814	W FOURTH AVENUE	KUW	Second Creek	23	MH 19-189	Pavement to Storm Drain to Second Creek and Recovery	Second Creek	Blockage - Debris	5,550	150	5,400	1.5	Yes
6/11/2011	8:51 PM	4304	ROBERTS ROAD	EB	Eastbridge	113	Grinder Pump	Wetwell to Soil Saturation		Grinder Pump Failure	6	1	5	1	No
6/14/2011	11:00 AM	2010	E FIFTH AVENUE	KUW	First Creek	24	Broken Gravity Main	Broken Pipe to Subsurface to Storm Drain to Ditch to Recovery and Soil Saturation		Broken System - Broken Pipe	7,800	7,400	400	2.5	No
6/17/2011	10:26 AM	961	E FORD VALLEY ROAD	KUW	Knob Creek	41	Pump Station	Facility Wetwell to Pavement to Soil Saturation		Pump Station Failure - Electrical Failure	200	0	200	0.16	No
6/24/2011	10:12 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.	100	0	100	1	Yes
6/24/2011	2:15 PM	3621	BORIGHT DRIVE	KUW	First Creek	8	MH 45	Pavement to Ditch to Soil Saturation		Rainfall in the area produced I & I and high flows in sewer mains.	400	0	400	3	No
6/24/2011	2:16 PM	1216	WATERCRESS DRIVE	KUW	First Creek	7	MH 29-9	Pavement to Ground to Unnamed Tributary to First Creek and Soil Saturation	First Creek	Rainfall in the area produced I & I and high flows in sewer mains.	60	0	60	1	Yes
6/24/2011	4:05 PM	1722	POLKWRIGHT LANE	FC	Fourth Creek	37	Grinder Pump	Wetwell to Soil Saturation		Grinder Pump Failure	5	0	5	0.08	No
6/25/2011	11:32 AM	304	SEVENTH AVENUE	KUW	First Creek	18	MH 15	Soil Saturation		Rainfall in the area produced I & I and high flows in sewer mains.	200	0	200	1	No
6/29/2011	9:10 AM	5014	JACKSBORO PIKE	KUW	First Creek	4	MH 13-101	Ground to Soil Saturation		Rainfall in the area produced I & I and high flows in sewer mains.	200	0	200	1	No
6/29/2011	2:30 PM	4014	HOLSTON HILLS ROAD	LC	Loves Creek	26	MH 72	Ground to Loves Creek and Soil Saturation	Loves Creek	Rainfall in the area produced I & I and high flows in sewer mains.	200	0	200	1	Yes

Appendix C

Building Backups

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)
4/30/2011	1:00 PM	445	BLOUNT AVENUE	KUW	South Knox	39	BBU	Rainfall in the area produced I & I and high flows in sewer mains.	10	10	0	0.5
6/24/2011	7:08 AM	2111	EDGEWOOD AVENUE	KUW	First Creek	16	BBU	Rainfall in the area produced I & I and high flows in sewer mains.	200	200	0	1
6/24/2011	10:41 AM	2300	GREENFIELD LANE	KUW	First Creek	18	BBU	Rainfall in the area produced I & I and high flows in sewer mains.	50	50	0	1
6/24/2011	7:00 PM	3619	ESSARY DRIVE	KUW	First Creek	1	BBU	Rainfall in the area produced I & I and high flows in sewer mains.	1550	50	1500	1.5

Appendix D

Water Quality Monitoring Program
Sampling Results

Knoxville Utilities Board
Water Quality Monitoring Program

Investigative Water Quality Monitoring Report
04/01/2011 Through 06/30/2011

Table 1: First Creek Dry Weather Walk

Initial Collection Date	Initial Collection Time	Sample ID #	Sample Location	Approximate Stream Mile	DO	pH	Water Temperature	Fecal Coliform	E. coli Test
6/1/2011	6:56	# 1	Downstream of sewer crossing mouth of First Creek at River.	0.09	8.3	8.1	21	1100	N/A
6/1/2011	7:40	# 2	above and below sewer crossing.	0.64	8.2	8.1	21	1100	N/A
6/1/2011	7:56	# 3	Left Pipe above sample #2	0.66	N/A	N/A	N/A	180	N/A
6/1/2011	8:05	# 4	Above left pipe	0.7	8.3	8.1	21	1200	N/A
6/1/2011	8:25	# 5	Before creek goes under Magnolia. Walking downstream due to access t	1.57	8	8	21	1400	N/A
6/1/2011	8:40	# 6	under Bridge at CO OP walking downstream.	1.3	8.2	7.7	23	1100	N/A
6/1/2011	8:47	# 7	Right Bank pipe at Austin Homes	1.15	N/A	N/A	N/A	450	N/A
6/1/2011	8:52	# 8	Downstream Of RB storm pipe at C&S Laundry	1.1	8.4	8	21	820	N/A
6/1/2011	10:40	# 9	Downstream of Sewer Crossing and LB Pipe concrete channel	1.65	8.9	8.1	22	1500	N/A
6/1/2011	10:45	# 10	Left Bank pipe at bridge at Jessamine.	1.69	N/A	N/A	N/A	2100	N/A
6/1/2011	11:02	# 11	Sampled routine site 1.74	1.82	8.3	8.1	21	1200	N/A
6/1/2011	11:14	# 12	Right Bank Trib upstream of site 1.74. first box culvert.	1.85	8.6	8.1	20	1000	N/A
6/1/2011	11:21	# 13	Sampled between box culvert 1 and box culvert 2 mainstream.	1.9	8.5	8.1	21	1300	N/A
6/1/2011	11:35	# 14	Right Bank Trib box culvert # 2	1.91	8.5	8	20	2300	N/A
6/1/2011	11:44	# 15	Right Bank Pipe at Standard Mill.	2.05	N/A	N/A	N/A	1700	N/A
6/1/2011	12:15	# 16	mainstream at Standard Mill.	2.08	8.9	8.1	21	2000	N/A
6/1/2011	13:02	# 17	Sample taken under Bridge.	2.27	8.2	8.1	22	360	N/A
6/1/2011	13:12	# 18	foot bridge Greenway at Sixth Ave.	2.61	8.6	8.2	23	820	N/A
6/1/2011	13:25	# 19	Above and Below sewer crossing Greenway foot bridge.	2.84	8.9	8.4	24	1100	N/A
6/1/2011	7:35	# 20	Before creek reaches Broadway.	3.04	8.9	8.4	24	360	N/A
6/2/2011	7:47	# 21	N/A	3.15	8.1	8.1	21	1100	N/A
6/2/2011	8:10	# 22	Mainstream at Broadway shopping center.	3.24	7.9	8.2	21	1200	N/A
6/2/2011	8:36	# 23	sampled at Fulton High School foot bridge.	3.5	7.9	8.2	21	1500	N/A
6/2/2011	9:00	# 24	Behind Church parking lot Broadway.	3.76	7.5	8.2	22	1600	N/A
6/2/2011	9:16	# 25	Bridge on Atlantic Ave. Mainstream	3.99	7.6	8.1	21	2100	N/A
6/2/2011	9:30	# 26	Behind Nursing Home 3300 Broadway.	4.33	8.1	7.7	21	730	N/A
6/2/2011	9:45	# 27	Sampled above and below sewer crossing Fairmont Blvd.	4.48	7.5	8	21	1200	N/A
6/2/2011	9:57	# 28	Frankies Gym on Broadway Mainstream.	4.66	7.4	8.1	22	640	N/A
6/2/2011	10:09	# 29	Bridge Walker Blvd.	4.94	7.4	8.1	21	540	N/A
6/2/2011	11:29	# 30	Mineral Springs at Walker Blvd.	5.7	8.2	8.2	20	1500	N/A
6/2/2011	11:56	# 31	640 North Building Parking Lot.	6.07	8.2	7.4	22	2800	N/A
6/2/2011	12:02	# 32	Remax Parking Lot 4707 Old Broadway mainstream	6.25	7.4	7.9	21	730	N/A
6/2/2011	12:13	# 33	Left Bank Trib Upstream Of Remax.	6.28	5.2	7.8	20	240	N/A
6/2/2011	12:25	# 34	Routine site 6.33 First Creek	6.35	7.9	7.9	20	540	N/A
6/2/2011	12:41	# 35	Sampled Mainstream at Woodrow.	6.78	8.4	8	21	1500	N/A
6/2/2011	12:50	# 36	Right Bank trib at Mcdonalds and pinnacle building on Broadway.	6.97	5.2	7.5	19	1300	N/A
6/2/2011	13:05	# 37	Sample mainstream at maple Dr. and Knox Rd. Skate Park.	7.11	7.9	7.8	22	640	N/A
6/2/2011	13:21	# 38	Below Fountain City Duck Pond.	7.35	9.9	7.6	23	2000	N/A
6/2/2011	13:36	# 39	Mainstream above Duck Pond at Colonial Circle.	7.7	11	8.9	27	1400	N/A
6/9/2011	13:25	# 4	Above left pipe start of concrete walls. Follow up.	N/A	10	9.2	24	1300	980
6/9/2011	13:25	# 10	Left Bank Pipe at Jessamine. Follow up.	N/A	N/A	N/A	N/A	150	160
6/9/2011	12:39	# 14	Right Bank Trib Box culvert above 1.74 routine second box culvert above	N/A	7.3	9	22	51000	> 2400
6/9/2011	12:52	# 15	RB pipe at Standard Mill foot bridge follow up	N/A	N/A	N/A	N/A	6000	> 2400
6/9/2011	12:59	# 16	At Standard Mill follow up	N/A	9	8.8	22	1300	770
6/9/2011	9:37	# 24	below sewer crossing Church parking lot Broadway. Follow Up	N/A	7.9	9.1	21	1500	1400
6/9/2011	9:25	# 25	Bridge on Atlantic Ave. Follow up	N/A	7.7	9	21	1300	1700
6/9/2011	9:12	# 31	640 North Building parking lot.	N/A	7.6	8.8	20	1100	980
6/9/2011	8:55	# 38	Below Fountain City Duck Pond main stream.	N/A	9.7	8.5	20	120	180

Knoxville Utilities Board
Water Quality Monitoring Program

Investigative Water Quality Monitoring Report
04/01/2010 Through 06/30/2011

Table 2a: Second Creek Dry Weather Walk

Initial Collection Date	Initial Collection Time	Sample ID #	Sample Location	Approximate Stream Mile	DO	pH	Water Temp	Fecal Coliform	Fecal Coliform Retest 4/15/10	E. coli Test 4/15/10	Total Bacteroides mg/L on 4/6/10 & 4/15/10	Human Bacteroides mg/L on 4/6/10 & 4/15/10	Fecal Coliform Retest 5/19/11	E. coli Retest 5/19/11	Comments
4/6/2010	7:41	1	Above sewer crossing @ Neyland Dr., Mouth of 2nd Ck	0.14	9.0	8.0	17	99							
4/6/2010	7:56	2	foot bridge @ World's Fair Park, below sewer crossing @ Cumberland	0.32	9.3	8.0	16	27							upstream creek goes underground
4/6/2010	8:20	3	Foot Bridge @ Foundry	0.82	8.7	8.0	16	2100	490	770	27.4	< 5.0			homeless camps upstream
4/6/2010	8:35	4	right bank storm drain	0.85	N/A	N/A	N/A	2400			28.1	30.5			storm pipe coming from Foundry
4/6/2010	8:51	5	McGHee St. foot bridge, abve/below sewer crossing	1.12	8.4	8.0	16	4500	550	550	31.5	5.4	490	440	sewer crossings and homeless camps
4/6/2010	8:58	6	Rright bank storm pipe above McGhee St.	1.13	N/A	N/A	N/A	< 10							storm pipe
4/6/2010	9:14	7	downstream of tributary, above/below sewer crossing	1.41	8.6	8.0	16	3900	410	460	32.9 & 21.4	9.5 & < 5.0			homeless area
4/6/2010	9:19	8	Right bank tributary	1.43	8.5	7.6	13	9	4400	>2400					little discoloration in stream bed
4/6/2010	9:40	9	Bernard St. Bridge, above/below tributary and sewer crossing	1.58	9.5	8.0	16	2700	310	490	22.9	< 5.0			
4/6/2010	9:59	10	downstream of Baxter Ave., above/below sewer crossing	1.8	9.1	8.0	16	2200	160	280	26.4	< 5.0			homeless camp, 2 12" temp sewer lines laying in creek bed
4/6/2010	10:13	11	under Woodland Ave. bridge, above/below sewer crossings	2.24	10.0	8.2	16	910							homeless area
4/6/2010	10:45	12	right bank tributary below Sysco	2.79	7.2	7.3	14	< 10							tributary to deep pool, lots of minnows in main stream
4/6/2010	10:50	13	above tributary below Sysco	2.79	8.5	7.7	15	1500	360	520	18.2	< 5.0	330	210	deep pool, a lot of minnows
4/6/2010	13:12	14	interstate	3.47	9.9	8.3	17	1200			17.2	< 5.0	910	1400	mainstream
4/6/2010	13:27	15	emmergence from under interstate	3.85	9.9	8.2	16	27000	>60000	>2400	54.2 & 307	32.3 & 250	380	300	
4/6/2010	14:00	16	Clinton Highway, stream under interstate	4.45	11.0	8.3	18	45	32	23			460	390	deep pool, a lot of minnows
4/7/2010	8:30	17	below Kubota, above/below sewer crossings	4.91	8.0	7.7	16	99					290	440	took fluoride sample of water running adjacent to creek
4/7/2010	8:40	18	Inskip, left bank pipe at sewer manhole	5.11	5.6	7.3	15	9							lb pipe had a lot of flow
4/7/2010	8:56	19	Inskip Ball Park, above sewer crossing and tributary	5.12	7.4	7.8	16	260							creek getting smaller, more vegetation
4/7/2010	9:10	20	Merchants Rd, behind Outback and Ball Park, left bank tributary	5.32	5.0	7.5	15	380							little flow
4/7/2010	9:17	21	Merchants Rd. above left bank tributary, below sewer crossing	5.41	6.7	7.3	16	81							a lot of vegetation
4/7/2010	9:29	22	IHOP	5.48	6.6	7.4	15	< 10							left pipe looking upstream
4/7/2010	9:36	23	Merchants Rd., center pipe, at IHOP	5.48	8.4	7.7	15	90							center pipe at 5.76
4/7/2010	9:46	24	Merchants Rd., left bank tributary at IHOP	5.48	6.9	7.6	17	1900			24	13.4			a lot of vegetation, LB walking upstream
4/7/2010	9:50	25	Merchants Rd., right bank tributary at IHOP	5.48	6.6	7.5	16	< 10							RB walking upstream, very little flow
4/7/2010	10:02	26	IHOP	5.54	N/A	N/A	N/A	< 10							

Knoxville Utilities Board
Water Quality Monitoring Program

Investigative Water Quality Monitoring Report
07/01/2010 Through 6/30/2011

Table 2b: Second Creek Investigative Sampling

	Collection Date	Dissolved Oxygen	Water Temp	Water pH	Fecal Coliform	E. coli	Total Bacteriodes	Human Bacteriodes
		(mg/L)	(°C)	s.u.	(CFU/ 100mL)	(MPN)	(mg/L)	(mg/L)
~300 yards Upstream from Routine Site 5.76 (behind IHOP)	7/29/2010	8.4	25	7.2	53000	> 2400	23.3	< 5
	8/30/2010	4.0	17	7.0	170	71	N/A	N/A
	9/28/2010	4.5	16	7.1	1100	77	N/A	N/A
	10/28/2010	6.0	16	6.9	300	490	N/A	N/A
	11/17/2010	5.9	14	7.4	99	86	N/A	N/A
	12/21/2010	8.0	10	7.5	9	44	N/A	N/A
	3/29/2011	7.3	14	7.3	9	35	N/A	N/A
	4/27/2011	7.7	16	7.4	280	170	N/A	N/A
	5/17/2011	5.6	15	7.4	140	110	N/A	N/A
	6/29/2011	7.0	18	7.2	210	190	N/A	N/A
Left pipe looking downstream at Routine Site 5.76 (in front of IHOP)	7/29/2010	6.9	17	7.6	16000	2400	23.7	9
	8/30/2010	8.8	18	8.0	910	300	N/A	N/A
	9/28/2010	7.8	16	7.5	1500	520	N/A	N/A
	10/28/2010	8.0	16	7.4	820	550	N/A	N/A
	11/17/2010	7.7	14	7.3	310	310	N/A	N/A
	3/29/2011	7.7	14	7.3	32	24	N/A	N/A
	4/27/2011	7.9	16	7.5	380	340	N/A	N/A
	5/17/2011	6.9	15	7.4	180	130	N/A	N/A
	6/29/2011	7.7	17	7.4	140	170	N/A	N/A
PVC Pipe Above 5.76 at IHOP	5/17/2011	N/A	N/A	N/A	3600	220	N/A	N/A
Dry Weather Walk #15 - Emmergence from under interstate at approximate stream mile 4.0	7/29/2010	9.0	20	8.0	3800	180	N/A	N/A
	8/30/2010	9.1	18	8.2	72	54	N/A	N/A
	9/28/2010	9.2	17	8.0	730	650	N/A	N/A
	10/28/2010	9.6	17	7.8	260	550	N/A	N/A
	11/17/2010	9.5	14	8.2	430	440	N/A	N/A
	3/29/2011	9.4	14	7.9	3000	>2400	N/A	N/A
	4/27/2011	9.3	16	7.9	540	870	N/A	N/A
	5/17/2011	9.4	15	7.9	180	150	N/A	N/A
Foundry right bank storm pipe - approximate stream mile 0.9	11/17/2010	N/A	N/A	N/A	>1600	> 2400	N/A	N/A
	3/30/2011	N/A	N/A	N/A	950	820	N/A	N/A

Knoxville Utilities Board
Water Quality Monitoring Program

Investigative Water Quality Monitoring Report
10/01/2010 Through 6/30/2011

Table 3: Williams Creek Investigative Sampling

	Collection Date	Weather Condition	Dissolved Oxygen	Water Temp	Water pH	Fecal Coliform	E. coli	Total Bacteriodes	Human Bacteriodes
			(mg/L)	(^{o}C)	s. u.	(cfu/100 ml)	(MPN)	(mg/L)	(mg/L)
Left Fork Above 2.02 - Sample 1	11/16/2010	Wet	7.9	16	7.7	3200	>2400	19.7	9.2
Left Fork Above 2.02 - Sample 2	11/16/2010	Wet	7.9	16	7.7	2200	>2400	16.7	15.2
Right Fork Above 2.02 - Sample 1	11/16/2010	Wet	7.8	15	7.6	9000	>2400	129	137
Right Fork Above 2.02 - Sample 2	11/16/2010	Wet	8.0	16	7.8	3400	>2400	10	<5
Left Fork Above 2.02 - Sample 1	11/18/2010	Wet	8.3	16	7.9	1400	2000	15.5	9.9
Left Fork Above 2.02 - Sample 2	11/18/2010	Wet	8.6	17	8.0	1400	1700	23.9	16.2
Right Fork Above 2.02 - Sample 1	11/18/2010	Wet	7.9	13	8.0	>1600	>2400	1442	700
Right Fork Above 2.02 - Sample 2	11/18/2010	Wet	9.4	15	7.9	4600	920	15.2	5.2
Left Fork Above 2.02 - Sample 1	4/25/2011	Wet	8.9	19.0	7.9	140	86	NA	NA
Left Fork Above 2.02 - Sample 2	4/25/2011	Wet	8.8	17.0	8.4	9	55	NA	NA
Right Fork Above 2.02 - Sample 1	4/25/2011	Wet	9.1	19.0	7.9	1100	920	NA	NA
Right Fork Above 2.02 - Sample 2	4/25/2011	Wet	9.7	19.0	7.8	1500	770	NA	NA
S.Chestnut at Biddle - Williams Creek, Downstream of SSO	5/10/2011	Dry	5	19.0	7.4	25000	> 2400	NA	NA
Brooks Rd.- Williams Creek, Downstream of SSO	5/10/2011	Dry	6.9	20.0	7.6	1600	490	NA	NA
Wee Course - Williams Creek, Downstream of SSO	5/10/2011	Dry	7.9	19.0	7.8	550	220	NA	NA
S.Chestnut Williams Creek	5/11/2011	Dry	5.7	18	7.4	3200	1700	NA	NA
Brooks Rd. Williams Creek	5/11/2011	Dry	7.6	19	7.7	1300	440	NA	NA
Wee Course Williams Creek	5/11/2011	Dry	8.4	19	7.8	180	290	NA	NA
S. Chestnut Williams Creek	5/16/2011	Wet	7	17	7.8	910	650	NA	NA
Brooks Rd. Williams Creek	5/16/2011	Wet	8.3	16	7.9	430	360	NA	NA
Left Fork Above 2.02 - Sample 1	5/18/2011	Dry	8.4	16.0	7.9	180	180	NA	NA
Left Fork Above 2.02 - Sample 2	5/18/2011	Dry	8.6	16.0	8.0	130	83	NA	NA
Right Fork Above 2.02 - Sample 1	5/18/2011	Dry	8.2	14.0	8.0	5700	> 2400	NA	NA
Right Fork Above 2.02 - Sample 2	5/18/2011	Dry	7.9	16.0	7.8	2800	1700	NA	NA
Left Fork Above 2.02 - Sample 1	6/8/2011	Dry	7.9	19.0	7.8	2700	2000	NA	NA
Left Fork Above 2.02 - Sample 2	6/8/2011	Dry	8.0	20.0	7.9	530	520	NA	NA
Right Fork Above 2.02 - Sample 1	6/8/2011	Dry	6.5	22.0	7.9	4900	1300	NA	NA
Right Fork Above 2.02 - Sample 2	6/8/2011	Dry	12.2	23.0	8.0	9000	1400	NA	NA
Right Fork Above 2.02 - Sample 3	6/8/2011	Dry	3.4	21.0	7.2	580	550	NA	NA

Knoxville Utilities Board
Water Quality Monitoring Program

Investigative Water Quality Monitoring Report
10/01/2010 Through 6/30/2011

Table 4: Baker Creek Investigative Sampling

	Collection Date	Weather	Dissolved Oxygen	Water Temp	Water pH	Fecal Coliform	E. coli	Total Bacteriodes	Human Bacteriodes
			(mg/L)	(°C)	S.U.	(CFU/ 100mL)	(MPN)	(mg/L)	(mg/L)
Left Bank Tributary Above SM 0.36	10/20/2010	Wet	7.6	14	7.8	5500	1400	< 5	< 5
Left Bank Tributary Above SM 0.36	11/9/2010	Dry	9.7	8	8.2	730	1700	N/A	N/A
Left Bank Tributary Above SM 0.36	12/20/2010	Dry	11.5	3	8.0	810	1300	N/A	N/A
Left Bank Tributary Above SM 0.36	1/27/2011	Wet	11.7	5	7.0	22000	1300	< 5	< 5
Left Bank Tributary Above SM 0.36	2/28/2011	Wet	8.8	13	7.9	5300	> 2400	N/A	N/A
Left Bank Tributary Above SM 0.36	3/24/2011	Wet	9.8	12	8.2	2300	1000	N/A	N/A
Left Bank Tributary Above SM 0.36 near Gilbert Lane	3/24/2011	Wet	9.1	12	7.7	730	580	N/A	N/A
Left Bank Tributary Above SM 0.36 near Mayfair Dr.	3/24/2011	Wet	9.7	12	8.2	540	650	N/A	N/A
Left Bank Tributary Above SM 0.36	4/21/2011	Wet	9.2	15	7.8	1300	1100	N/A	N/A
Left Bank Tributary Above SM 0.36	5/25/2011	Dry	8.5	18	8.0	13000	> 2400	N/A	N/A
Left Bank Tributary Above SM 0.36	6/28/2011	Wet	7.7	20	8.5	8000	> 2400	N/A	N/A

Knoxville Utilities Board
Water Quality Monitoring Program

Investigative Water Quality Monitoring Report
04/01/2011 Through 6/30/2011

Table 5: SSO Investigative Sampling

	Collection Date	Weather	Dissolved Oxygen	Water Temp	Water pH	Fecal Coliform	E. coli
			(mg/L)	(°C)	S.U.	(CFU/ 100mL)	(MPN)
Tennessee River - Upstream of SSO at 2408 Neyland Drive	5/11/2011	Dry	10.2	18	7.7	110	910
Tennessee River - Downstream of SSO at 2408 Neyland Drive	5/11/2011	Dry	10.0	18	8.3	91	1200
Tennessee River - Upstream of SSO at 2408 Neyland Drive	5/16/2011	Dry	8.7	18	8.0	120	48
Tennessee River - Downstream of SSO at 2408 Neyland Drive	5/16/2011	Dry	8.2	18	7.9	72	66
Third Creek - Upstream of SS0 - 2305 Clinch Avenue	6/6/2011	Dry	9.2	20	8.3	910	1700
Third Creek - Downstream of SS0 - 2305 Clinch Avenue	6/6/2011	Dry	9.0	20	8.2	950	1600

Water Quality Monitoring Report

Routine Water Quality Monitoring Report

4/1/2011 Through 6/30/2011

Knoxville Utilities Board
Water Quality Laboratory
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Creek Mile #	Sample Date	Sample Time	pH	Sample Temp (C)	Dissolved Oxygen (mg/l)	Fecal Coliform (CFU/100 ml)	E. Coli (MPN)	Total Bacteroides (mg/L)	Human Bacteroides (mg/L)	Precipitation Event	Status
First Creek											
1.74	4/6/2011	10:17	7.1	11	10.1	1100	870	N/A	N/A	Wet	R
2.57	4/6/2011	10:05	7.7	11	10.1	1300	2400	N/A	N/A	Wet	R
6.33	4/6/2011	09:45	7.3	13	9.0	1700	1200	N/A	N/A	Wet	R
1.74	5/23/2011	09:56	8.0	18	8.6	1100	980	N/A	N/A	Dry	R
2.57	5/23/2011	09:43	8.0	19	8.8	450	580	N/A	N/A	Dry	R
6.33	5/23/2011	09:30	7.8	17	7.9	860	770	N/A	N/A	Dry	R
1.74	6/27/2011	08:56	8.3	19	8.2	500	490	N/A	N/A	Wet	R
2.57	6/27/2011	08:42	7.7	19	8.2	910	440	N/A	N/A	Wet	R
6.33	6/27/2011	08:38	8.5	18	7.9	1200	920	N/A	N/A	Wet	R
Second Creek											
0.30	4/27/2011	10:50	8.3	18	9.0	14000	> 2400	N/A	N/A	Wet	R
1.54	4/27/2011	11:01	8.1	16	9.2	3000	1300	N/A	N/A	Wet	I
5.76	4/27/2011	10:01	7.4	16	6.0	270	270	N/A	N/A	Wet	R
0.30	5/17/2011	11:35	8.5	14	9.7	540	690	N/A	N/A	Dry	R
1.54	5/17/2011	10:52	8.2	14	9.2	280	280	N/A	N/A	Dry	R
5.76	5/17/2011	09:56	7.2	15	4.5	130	70	N/A	N/A	Dry	R
0.30	6/29/2011	10:57	8.1	20	8.5	390	580	N/A	N/A	Wet	R
1.54	6/29/2011	10:18	7.9	19	8.2	11000	1600	N/A	N/A	Wet	I
5.76	6/29/2011	10:00	7.3	17	6.2	120	120	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.

004873

Water Quality Monitoring Report

Routine Water Quality Monitoring Report

4/1/2011 Through 6/30/2011

Knoxville Utilities Board
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Creek Mile #	Sample Date	Sample Time	pH	Sample Temp (C)	Dissolved Oxygen (mg/l)	Fecal Coliform (CFU/100 ml)	E. Coli (MPN)	Total Bacteroides (mg/L)	Human Bacteroides (mg/L)	Precipitation Event	Status
Third Creek											
0.87	4/11/2011	12:09	8.1	17	9.8	140	140	N/A	N/A	Wet	R
2.08E	4/11/2011	11:27	7.8	18	9.7	420	360	N/A	N/A	Wet	R
4.80W	4/11/2011	11:13	7.4	16	9.2	140	120	N/A	N/A	Wet	R
0.87	5/24/2011	09:00	8.1	18	8.4	340	550	N/A	N/A	Dry	R
2.08E	5/24/2011	08:41	8.1	19	8.0	1600	1700	N/A	N/A	Dry	I
4.80W	5/24/2011	08:29	7.7	16	8.3	310	310	N/A	N/A	Dry	R
0.87	6/16/2011	10:53	8.5	19	8.3	1100	> 2400	N/A	N/A	Wet	R
2.08E	6/16/2011	10:40	8.5	20	7.7	2200	> 2400	N/A	N/A	Wet	I
4.80W	6/16/2011	10:23	7.0	18	8.1	1100	> 2400	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

4/1/2011 Through 6/30/2011

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Creek Mile #	Sample Date	Sample Time	pH	Sample Temp (C)	Dissolved Oxygen (mg/l)	Fecal Coliform (CFU/100 ml)	E. Coli (MPN)	Total Bacteroides (mg/L)	Human Bacteroides (mg/L)	Precipitation Event	Status
Fourth Creek											
1.75	4/14/2011	11:36	7.9	16	10.4	330	220	N/A	N/A	Wet	R
2.79	4/14/2011	11:47	7.8	15	9.8	120	120	N/A	N/A	Wet	R
3.29	4/14/2011	12:01	7.7	16	10.2	90	74	N/A	N/A	Wet	R
1.75	5/12/2011	10:11	8.1	18	9.5	190	220	N/A	N/A	Dry	R
2.79	5/12/2011	10:21	7.9	17	9.0	280	360	N/A	N/A	Dry	R
3.29	5/12/2011	10:36	8.1	17	9.3	45	91	N/A	N/A	Dry	R
1.75	6/28/2011	08:41	8.0	19	8.5	490		N/A	N/A	Wet	R
2.79	6/28/2011	08:56	8.2	18	8.5	380	360	N/A	N/A	Wet	R
3.29	6/28/2011	09:05	8.3	17	9.2	270	170	N/A	N/A	Wet	R
1.75	6/29/2011	10:37	7.9	19	9.0	540	240	N/A	N/A	Wet	R

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Water Quality Monitoring Report

Routine Water Quality Monitoring Report

4/1/2011 Through 6/30/2011

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Creek Mile #	Sample Date	Sample Time	pH	Sample Temp (C)	Dissolved Oxygen (mg/l)	Fecal Coliform (CFU/100 ml)	E. Coli (MPN)	Total Bacteroides (mg/L)	Human Bacteroides (mg/L)	Precipitation Event	Status
Baker Creek											
0.36	4/21/2011	12:32	7.6	15	8.7	1300	1600	N/A	N/A	Wet	I
0.53	4/21/2011	12:57	7.8	16	9.5	730	980	N/A	N/A	Wet	I
1.45	4/21/2011	12:17	7.6	16	8.5	1400	1000	N/A	N/A	Wet	I
0.36	5/25/2011	08:10	7.8	17	7.8	11000	> 2400	N/A	N/A	Dry	I
0.53	5/25/2011	08:39	8.0	17	8.6	5600	> 2400	N/A	N/A	Dry	I
1.45	5/25/2011	08:50	7.8	17	8.6	360	390	N/A	N/A	Dry	R
0.36	6/28/2011	10:24	8.6	19	7.3	2600	2400	N/A	N/A	Wet	I
0.53	6/28/2011	10:48	8.3	19	8.1	1900	1300	N/A	N/A	Wet	I
1.45	6/28/2011	09:29	8.4	19	7.8	820	980	N/A	N/A	Wet	I
Goose Creek											
0.40	4/7/2011	10:11	7.1	12	9.4	540	650	N/A	N/A	Wet	R
1.19E	4/7/2011	09:37	7.4	13	9.4	540	870	N/A	N/A	Wet	R
1.80E	4/7/2011	09:50	7.2	13	9.6	460	690	N/A	N/A	Wet	R
0.40	5/20/2011	08:42	7.2	16	7.8	680	770	N/A	N/A	Dry	R
1.19E	5/20/2011	08:31	7.8	16	8.4	550	870	N/A	N/A	Dry	R
1.80E	5/20/2011	08:20	7.7	15	8.3	63	56	N/A	N/A	Dry	R
0.40	6/14/2011	09:54	8.9	18	7.2	1400	870	N/A	N/A	Dry	R
1.19E	6/14/2011	09:38	8.3	18	8.2	1200	1200	N/A	N/A	Dry	R
1.80E	6/14/2011	09:25	7.9	17	8.6	99	140	N/A	N/A	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

4/1/2011 Through 6/30/2011

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Creek Mile #	Sample Date	Sample Time	pH	Sample Temp (C)	Dissolved Oxygen (mg/l)	Fecal Coliform (CFU/100 ml)	E. Coli (MPN)	Total Bacteroides (mg/L)	Human Bacteroides (mg/L)	Precipitation Event	Status
Loves Creek											
0.85	4/12/2011	09:56	7.5	16	8.3	1500	1400	N/A	N/A	Wet	R
1.89	4/12/2011	09:45	7.2	16	7.8	730	580	N/A	N/A	Wet	R
3.45	4/12/2011	09:32	7.6	16	8.2	1900	870	N/A	N/A	Wet	R
0.85	5/16/2011	09:10	7.9	15	8.4	330	250	N/A	N/A	Dry	R
1.89	5/16/2011	08:57	7.5	15	6.9	130	130	N/A	N/A	Dry	R
3.45	5/16/2011	08:45	7.7	16	7.8	130	99	N/A	N/A	Dry	R
0.85	6/27/2011	09:59	8.7	19	7.9	540	520	N/A	N/A	Wet	R
1.89	6/27/2011	09:50	8.3	18	7.0	390	250	N/A	N/A	Wet	R
3.45	6/27/2011	09:36	8.5	20	7.2	140	120	N/A	N/A	Wet	R
Williams Creek											
0.89	4/25/2011	12:07	7.8	18	9.1	99	140	N/A	N/A	Wet	R
1.70	4/25/2011	12:16	7.6	19	8.0	310	220	N/A	N/A	Wet	R
2.02	4/25/2011	12:30	7.8	18	8.9	250	290	N/A	N/A	Wet	R
0.89	5/18/2011	11:01	7.7	14	9.3	240	180	N/A	N/A	Dry	R
1.70	5/18/2011	10:50	7.6	15	7.2	450	240	N/A	N/A	Dry	R
2.02	5/18/2011	10:39	8.0	15	8.1	2700	2400	N/A	N/A	Dry	I
0.89	6/8/2011	09:12	7.9	18	8.3	490	610	N/A	N/A	Dry	R
1.70	6/8/2011	09:20	7.6	18	7.0	1400	1600	N/A	N/A	Dry	R
2.02	6/8/2011	09:35	7.9	20	7.6	3900	> 2400	N/A	N/A	Dry	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.

004877

Water Quality Monitoring Report

Spill Impact Sampling Results
Water Quality Monitoring Program

Knoxville Utilities Board
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Event Date 4/29/2011
Street Address: 6928 Westland Dr.
Description: Broken Gravity Main

Overflowed to wet weather conveyance 0.7 miles from tributary to Fourth Creek. Initial samples from conveyance. Followup sample from tributary.

Estimated unrecovered volume 57,000 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**
	4/29/2011	0	3.59

Sample Location	Sample Date	Sample Time	Dissolved Oxygen	Temperature (Celsius)	pH	Fecal Coliform	E-Coli (MPN)
Upstream of SSO Discharge	4/29/2011	11:15	9.7	17	8.1	230	520
Downstream of SSO Discharge	4/29/2011	11:28	9.2	16	7.6	4600	> 2400
Downstream of SSO Discharge	5/12/2011	09:56	8.4	18	7.9	270	180

Water Quality Monitoring Report

Spill Impact Sampling Results
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Event Date 5/9/2011
Street Address: 2639 Louise Ave
Description: Partial blockage in sewer main caused by grease and debris.

Crews cleaned the portion of the stream impacted by overflow. Signs were posted all along the stream until bacteriological counts decreased to normal levels.

Estimated unrecovered volume 270,000 gallons

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

	Date	Total - Day of Event	Total - Prior 4 Days
Precipitation (McGhee-Tyson Airport)	5/9/2011	0	0

Sample Location	Sample Date	Sample Time	Dissolved Oxygen	Temperature (Celsius)	pH	Fecal Coliform	E-Coli (MPN)
Upstream of SSO Discharge	5/9/2011	23:11	6.0	18	8.1	38000	1100
Downstream of SSO Discharge	5/9/2011	23:02	5.2	18	7.8	> 60000	> 2400
Upstream of SSO Discharge	5/11/2011	11:12	8.1	18	7.7	3100	2400
Downstream of SSO Discharge	5/11/2011	11:01	7.7	18	7.8	1500	1200
Upstream of SSO Discharge	5/16/2011	09:30	8.1	16	7.8	270	250
Downstream of SSO Discharge	5/16/2011	09:21	7.8	16	8.0	1000	770
Upstream of SSO Discharge	5/24/2011	07:37	8.2	17	7.7	400	410
Downstream of SSO Discharge	5/24/2011	07:48	7.7	18	7.8	640	690

Water Quality Monitoring Report

Spill Impact Sampling Results
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Event Date 6/6/2011
Street Address: 114 Tillery Rd.
Description: Sag in main which caused blockage from debris.

Ground to Second Creek.

Estimated unrecovered volume 7,500 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**
	6/6/2011	0	0

Sample Location	Sample Date	Sample Time	Dissolved Oxygen	Temperature (Celsius)	pH	Fecal Coliform	E-Coli (MPN)
Upstream of SSO Discharge	6/6/2011	17:05	7.2	20	7.6	430	610
Downstream of SSO Discharge	6/6/2011	16:50	7.8	22	8.0	1000	2000
Upstream of SSO Discharge	6/13/2011	11:17	8.5	18	7.1	820	1000
Downstream of SSO Discharge	6/13/2011	11:03	8.4	19	9.0	300	460

Water Quality Monitoring Report

Spill Impact Sampling Results
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Event Date 6/7/2011
Street Address: 814 W Fourth Ave.
Description: Blockage/ Debris

Pavement to storm drain to Second Creek

Estimated unrecovered volume 5,400 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**
	6/7/2011	0	0

Sample Location	Sample Date	Sample Time	Dissolved Oxygen	Temperature (Celsius)	pH	Fecal Coliform	E-Coli (MPN)
Upstream of SSO Discharge	6/7/2011	11:31	8.5	22	8.2	770	550
Downstream of SSO Discharge	6/7/2011	11:47	7.6	22	8.1	13000	> 2400
Upstream of SSO Discharge	6/13/2011	13:30	7.8	22	8.4	21000	> 2400
Downstream of SSO Discharge	6/13/2011	13:43	7.5	22	8.4	2200	> 2400
Upstream of SSO Discharge	6/15/2011	11:49	8.7	19	8.7	480	580
Downstream of SSO Discharge	6/15/2011	12:03	8.2	19	8.9	190	290

Appendix E

Unpermitted Discharges Subject to Stipulated Penalties

Second Quarter 2011 Unpermitted Discharge Data and Analysis

Appendix E lists any SSO that occurred during the second quarter 2011 that resulted in an unpermitted discharge along with its cause, volume, one- and three-day rainfall totals, and rainfall intensity.

Of the 23 unpermitted discharges that occurred during the second quarter 2011, 19 were caused by heavy rainfall, two were due to blockages, and two were due to a broken pipe.

The Knoxville area experienced significant rainfall in the month of April. A total of over nine inches of rainfall was received. There were two significant events that accounted for more than half of the month's total accumulation, April 15th and 16th and April 27th and 28th. On April 15th and 16th, the Knoxville area received an average of 2.54 inches of rainfall in approximately 10.5 hours with a peak intensity of 0.74 in/hr. This resulted in 12 events classified as unpermitted discharges. On April 27th and 28th, the Knoxville area received an average of 2.89 inches of rainfall in approximately 11.5 hours with a peak intensity of 1.32 in/hour. This event resulted in four events classified as unpermitted discharges.

Category	Count
Mech/Elec. Failure	0
Vandalism	0
3-day rain > 4 in.	0
1-day > 3 in.	0
Vol 501 - 1000 gal	0
Vol < 500 gal.	6
Intensity > 0.84 in/hr	4

Appendix E

Unpermitted Discharges in 2011

Overflow volume of 500 gallons or less

Overflow volume of 501 - 1000 gallons

Vandalism

Electrical or mechanical failure

1-day rainfall greater than 3"

3-day rainfall greater than 4"

Intensity > 0.84 in/hr

Reporting Period	Date	Location	Event	Unrecovered Volume (Gal.)	Receiving Stream	Cause	Rainfall Totals 1-Day*	Rainfall Totals 3-Day**	Peak Rainfall Intensity (in/hr)	Force Majeure event
1st 2011	1/1/2011	1411 Davanna Street	Unpermitted Discharge	5,600	Second Creek	Heavy Rainfall	2.4	2.52		
1st 2011	1/1/2011	5011 Kingston Pike	Unpermitted Discharge	600	Fourth Creek	Heavy Rainfall	2.4	2.52		
1st 2011	1/1/2011	1500 Lyons Bend Road	Unpermitted Discharge	380,000	Fourth Creek / Tennessee River	Heavy Rainfall	2.4	2.52		
1st 2011	1/7/2011	5915 Neubert Sprigs Road	Unpermitted Discharge	224,000	Knob Creek	Heavy Rainfall		0.25		
1st 2011	2/16/2011	512 Flennwood Way	Unpermitted Discharge	400	Goose Creek	Blockage				
1st 2011	2/16/2011	604 Ben Hur Avenue	Unpermitted Discharge	400	Williams Creek	Blockage				
1st 2011	2/28/2011	1500 Lyons Bend Road	Unpermitted Discharge	590,000	Fourth Creek	Heavy Rainfall	2.84	2.84	1.83	Yes
1st 2011	2/28/2011	2500 Cedar Lane	Unpermitted Discharge	500	First Creek	Heavy Rainfall	2.84	2.84	1.83	Yes
1st 2011	2/28/2011	2008 Riverside Drive	Unpermitted Discharge	720,000	Williams Creek	Heavy Rainfall	2.84	2.84	1.83	Yes
1st 2011	2/28/2011	2004 Neyland Drive	Unpermitted Discharge	360,000	Tennessee River	Heavy Rainfall	2.84	2.84	1.83	Yes
1st 2011	2/28/2011	815 South Central Street	Unpermitted Discharge	100	First Creek	Heavy Rainfall	2.84	2.84	1.83	Yes
1st 2011	2/28/2011	1411 Davanna Street	Unpermitted Discharge	5,800,000	Second Creek	Heavy Rainfall	2.84	2.84	1.83	Yes
1st 2011	2/28/2011	2536 Cecil Avenue	Unpermitted Discharge	410,000	First Creek	Heavy Rainfall	2.84	2.84	1.83	Yes
1st 2011	2/28/2011	2640 Morgan Circle	Unpermitted Discharge	1,500	Tennessee River	Heavy Rainfall	2.84	2.84	1.83	Yes
1st 2011	2/28/2011	2102 Washington Avenue	Unpermitted Discharge	190,000	First Creek	Heavy Rainfall	2.84	2.84	1.83	Yes
1st 2011	2/28/2011	4014 Holston Hills Road	Unpermitted Discharge	295,000	Loves Creek	Heavy Rainfall	2.84	2.84	1.83	Yes
1st 2011	3/1/2011	600 North Gallaher View Road	Unpermitted Discharge	24,000	Ten Mile Creek	Heavy Rainfall	***	2.84	1.83	Yes
1st 2011	3/1/2011	1521 Fairmont Boulevard	Unpermitted Discharge	30	First Creek	Heavy Rainfall	***	2.84	1.83	Yes
1st 2011	3/1/2011	3741 Eakers Street	Unpermitted Discharge	67,500	Baker Creek	Heavy Rainfall	***	2.84	1.83	Yes
1st 2011	3/1/2011	411 West Baxter Avenue	Unpermitted Discharge	800,000	Second Creek	Heavy Rainfall	***	2.84	1.83	Yes
1st 2011	3/3/2011	1216 Watercress Drive	Unpermitted Discharge	50	First Creek	Heavy Rainfall	***			Yes
1st 2011	3/7/2011	6540 Creekhead Drive	Unpermitted Discharge	12,200	Ten Mile Creek	Blockage		1.62	0.29	
1st 2011	3/7/2011	243 Gilbert Lane	Unpermitted Discharge	5,000	Baker Creek	Blockage		1.62	0.29	
1st 2011	3/9/2011	1500 Lyons Bend Road	Unpermitted Discharge	160,000	Fourth Creek	Heavy Rainfall	2.58	3.68	0.34	
1st 2011	3/9/2011	2536 Cecil Avenue	Unpermitted Discharge	98,000	First Creek	Heavy Rainfall	2.58	3.68	0.34	
1st 2011	3/10/2011	600 North Gallaher View Road	Unpermitted Discharge	468,000	Ten Mile Creek	Heavy Rainfall	0.18	3.86	0.34	
1st 2011	3/10/2011	2377 Neyland Drive	Unpermitted Discharge	Unknown	Third Creek	Heavy Rainfall	0.18***	3.86	0.34	Yes
1st 2011	3/17/2011	6410 South Northshore Drive	Unpermitted Discharge	Unknown	Fourth Creek	Heavy Rainfall	***	0.44		Yes
1st 2011	3/22/2011	4719 Old Broadway	Unpermitted Discharge	Unknown	First Creek	Heavy Rainfall				
1st 2011	3/29/2011	702 Redwine Street	Unpermitted Discharge	100	Goose Creek	Construction Failure	0.08	0.72		
2nd 2011	4/16/2011	2004 Riverside Drive	Unpermitted Discharge	2,000	Williams Creek	Heavy Rainfall	1.33	2.54	0.74	
2nd 2011	4/16/2011	6410 S Northshore Drive	Unpermitted Discharge	19,000	Fourth Creek	Heavy Rainfall	1.33	2.54	0.74	
2nd 2011	4/16/2011	1500 Lyons Bend Road	Unpermitted Discharge	350,000	Fourth Creek	Heavy Rainfall	1.33	2.54	0.74	
2nd 2011	4/16/2011	2536 Cecil Avenue	Unpermitted Discharge	24,000	First Creek	Heavy Rainfall	1.33	2.54	0.74	
2nd 2011	4/16/2011	1411 Davanna Street	Unpermitted Discharge	1,350	Second Creek	Heavy Rainfall	1.33	2.54	0.74	
2nd 2011	4/16/2011	4719 Old Broadway	Unpermitted Discharge	24,500	First Creek	Heavy Rainfall	1.33	2.54	0.74	
2nd 2011	4/16/2011	3741 Eakers Street	Unpermitted Discharge	1,900	Baker Creek	Heavy Rainfall	1.33	2.54	0.74	
2nd 2011	4/16/2011	2004 Neyland Drive	Unpermitted Discharge	20,000	Tennessee River	Heavy Rainfall	1.33	2.54	0.74	
2nd 2011	4/16/2011	600 N Gallaher View Road	Unpermitted Discharge	264,000	Ten Mile Creek	Heavy Rainfall	1.33	2.54	0.74	
2nd 2011	4/16/2011	2544 Fair Drive	Unpermitted Discharge	100	First Creek	Heavy Rainfall	1.33	2.54	0.74	
2nd 2011	4/18/2011	304 Seventh Avenue	Unpermitted Discharge	200	First Creek	Heavy Rainfall	0	1.33	0.74	
2nd 2011	4/21/2011	4505 Middlebrook Pike	Unpermitted Discharge	72,000	Third Creek	Heavy Rainfall	0	0.26	0.15	
2nd 2011	4/28/2011	6410 S Northshore Drive	Unpermitted Discharge	8,700	Fourth Creek	Heavy Rainfall	0.28	2.894	1.32	
2nd 2011	4/28/2011	3741 Eakers Street	Unpermitted Discharge	100	Baker Creek	Heavy Rainfall	0.28	2.894	1.32	

Reporting Period	Date	Location	Event	Unrecovered Volume (Gal.)	Receiving Stream	Cause	Rainfall Totals 1-Day*	Rainfall Totals 3-Day**	Peak Rainfall Intensity (in/hr)	Force Majeure event
2nd 2011	4/28/2011	1500 Lyons Bend Road	Unpermitted Discharge	680,000	Fourth Creek	Heavy Rainfall	0.28	2.894	1.32	
2nd 2011	4/28/2011	600 N Gallaher View Road	Unpermitted Discharge	36,000	Ten Mile Creek	Heavy Rainfall	0.28	2.894	1.32	
2nd 2011	4/29/2011	6928 Westland Drive	Unpermitted Discharge	57,000	Fourth Creek	Broken Sewer Main	0	2.894	1.32	
2nd 2011	5/9/2011	2639 Louise Avenue	Unpermitted Discharge	270,000	Williams Creek	Blockage	0	0	0	
2nd 2011	6/6/2011	114 Tillery Drive	Unpermitted Discharge	7,500	Second Creek	Broken System - Sag	0	0	0	
2nd 2011	6/7/2011	814 W Fourth Avenue	Unpermitted Discharge	5,400	Second Creek	Blockage	0	0	0	
2nd 2011	6/24/2011	1411 Davanna Street	Unpermitted Discharge	100	Second Creek	Heavy Rainfall	2.09	2.93	1.37	
2nd 2011	6/24/2011	1216 Watercress Drive	Unpermitted Discharge	60	First Creek	Heavy Rainfall	2.09	2.93	1.37	
2nd 2011	6/29/2011	4014 Holston Hills Road	Unpermitted Discharge	200	Loves Creek	Heavy Rainfall	0	0	0	

*1-Day Rainfall Total is the rain that occurred on the day of the SSO

**3-Day Rainfall Total is the total amount of rain that occurred on the day of the SSO and the the 2 days prior

***This overflow is believed to be the result of the significant rainfall event that occurred on 2/28/2011. Evidence that the overflow occurred was found some time following the actual event. The rainfall shown for this event correlates to the amount received on the date the event was reported to KUB.