

Annual Progress Report

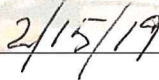
2018

Submitted to EPA on February 19, 2019

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.



Derwin Hagood



Date

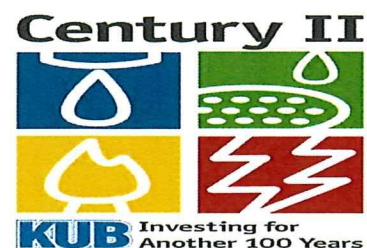


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Executive Summary

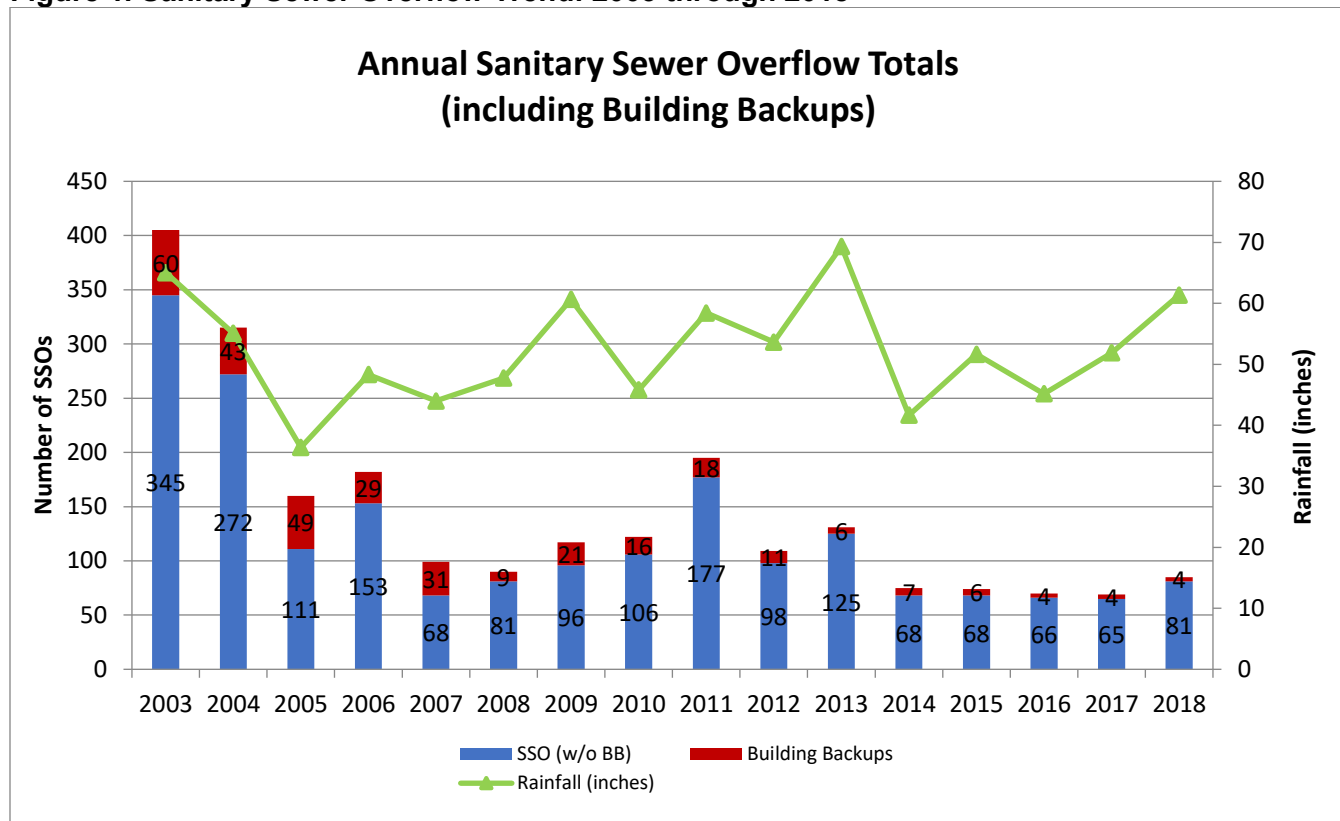
On February 11, 2005, the Knoxville Utilities Board (KUB) entered into a Consent Decree with the United States, the State of Tennessee, the Tennessee Clean Water Network, and the City of Knoxville. The Consent Decree and its First Amendment required KUB to achieve full Compliance with work required under Section VII *Performance of the Work* [except those obligations described in VIID.1.(a)(v)(Composite Correction Plan for WWTPs)] before December 31, 2016. KUB successfully completed all the required work described in Section VII *Performance of the Work* in addition to the work in Section VIII *Supplemental Environmental Project* ahead of the schedules outlined in the Consent Decree. This was communicated to the EPA on November 10, 2016. In this same communication, KUB requested a Non-Material Modification of the current reporting requirements, which is allowed under Section XIX.E and Section XXI, to report annually on the remaining Consent Decree work. After consultation with TDEC, the EPA agreed that less frequent reporting was now appropriate as a result of the narrower scope of remaining work to be performed. On December 13, 2016, EPA approved the revised Section XIX to the Consent Decree, authorizing the submittal of an Annual Progress Report incorporating all Section XIX reporting requirements into one annual report. Consent Decree revised Section XIX.B describes the required content of this report:

- B. *“Beginning on March 1, 2017, and every twelve (12) Months thereafter until termination of the Consent Decree, KUB shall submit to the Parties, and simultaneously place in the PDR, an Annual Progress Report. The Annual Progress Report shall cover the most recent Calendar Year. The Annual Progress Report shall not be subject to the Public Review Requirement of Section VI.A.2. However, KUB shall accept questions and comments from the public for KUB’s review for a period of twenty (20) Days following placement in the PDR. Each Annual Progress Report shall contain:*
- 1. A summary of compliance with and activities related to implementation of the CCP;*
 - 2. A summary of implementation of and compliance with the Process Controls Program;*
 - 3. A total amount of banked credits available by Sewerbasin for use in future development if capacity cannot be certified and any exceptions granted for connections for essential services under the Capacity Assurance Program.*
 - 4. Identification of any transfer of an ownership interest, operation, management, or other control of the Treatment Works, or any portion thereof.*
 - 5. 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.*
 - 6. A spreadsheet and summary of all SSOs, Bypasses, Diversions and effluent limit violations that occurred during the previous Calendar Year. 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 identification of the treatment plant Sewerbasin in which each SSO is located, the reason for each SSO, the total SSO volume, the volume returned to the WCTS, the volume not captured, and category of corrective action planned, underway or completed with regard to the SSO (e.g, short term project, long term sewer basin project, blockage abatement, etc.);*
 - 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.*
 - 7. The water quality monitoring data and other information required pursuant to Section VII.D.1.(e).(v).*

8. *Grease-Related Information.*
 - a. *A summary table identifying for the reporting period: (i) A listing of the number of grease related blockages causing or relating to SSOs; and (ii) corrective actions to address such grease related blockages causing or relating to SSOs.*
 - b. *A narrative summary of grease program activities for the reporting period.*
9. *A summary of MOM program implementation for the following Work:*
 - a. *A summary of Continuing Sewer System Assessment Program activities undertaken to assess the condition of the WCTS during the reporting period, including information on assessment of manholes, gravity mains, force mains, pump stations and laterals;*
 - b. *A summary of Infrastructure Rehabilitation Program projects, including a spreadsheet listing of projects for the reporting period and projects continuing from previous reporting periods but not yet completed;*
 - c. *An update on procedures, response times and public reporting information associated with SSOs that demonstrate continued effectiveness of the Sewer Overflow Response Plan; and*
 - d. *A summary table of Gravity Line Preventative Maintenance Program activities conducted during the reporting period including information regarding the cleaning and maintenance of the gravity collection system.*
10. *A representation that the Other MOM Programs continue to be implemented in substantially the same manner as represented in Appendix A and the documents identified therein.*
11. *A summary of Private Lateral Program activities undertaken during the reporting period including the number of Private Laterals repaired.”*

The following Annual Progress Report is submitted to fulfill the reporting requirements described in the revised Section XIX of the Consent Decree and demonstrate KUB's continued focus on MOM programs, Composite Correction Plan (CCP) plant upgrades, and system rehabilitation through its Century II program. As seen in Figure 1, system improvements have produced significant reductions in overflow frequencies and volumes since 2003. Significant rainfall in the KUB service area was the key contributing factor to the uptick in SSO events experienced during this reporting period. Our data reflects this was the third wettest year since 2003, with rainfall about 13" greater than average. During this reporting period, KUB experienced a total of 85* SSOs, four of which were building backups.

Figure 1. Sanitary Sewer Overflow Trend: 2003 through 2018



* One SSO also resulted in a BBU. This is noted on both the SSO and BBU appendices.

Section 1 Composite Correction Plan (CCP)

The CCP was submitted to the EPA on July 23, 2007. EPA rejected it on January 4, 2008. The Revised CCP was submitted to EPA on January 5, 2009, and subsequently approved on January 20, 2009. The CCP work is progressing and on schedule, meeting the implementation deadline of June 2018 at the Fourth Creek Wastewater Treatment Plant (WWTP) and on schedule to meet the June 2021 at the Kuwahee WWTP.

Fourth Creek WWTP Phase I

Work was completed prior to the December 30, 2013, deadline.

Fourth Creek WWTP Phase II

Work was completed prior to the June 30, 2018, deadline.

Kuwahee WWTP Phase I

Work was completed prior to the December 30, 2012, deadline.

Kuwahee WWTP Phase II

KUB's consultant completed design on the Biologically Enhanced High Rate Clarification (BEHRC) project in June 2018. Construction is currently on schedule to be complete by the June 30, 2021, deadline. Tasks included are construction of (2) biological contact tanks, pump station, BEHRC treatment trains, chemical and electrical control building, and associated yard piping.

Section 2 Process Controls Program (PCP)

KUB continues to follow its Process Controls Program (PCP) during wet-weather operating conditions. During this reporting period, the PCP was initiated 56 times. Three Diversion events occurred. Please refer to Table 2 under Section 6 to view information related to these Diversion events.

Section 3 Capacity Assurance Program

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 manages its CAP using an Information Management System (IMS) that tracks rehabilitation credits earned through its Century II and Management, Operations, and Maintenance (MOM) program activities.

Table 1 below lists a total amount of banked credits available by sewerbasin for use in future development if capacity cannot be certified. There were no exceptions granted or needed for connections for essential services during this reporting period.

Table 1. CAP Banked Credits

Basin	Flow Credits (MGD)	Equivalent Homes
First Creek	18.90	28,291
Second Creek	12.40	18,556
Third Creek	13.24	19,817
Fourth Creek	5.26	7,871
South Knoxville	5.40	8,084
Loves Creek	1.85	2,766
Williams Creek	2.29	3,428
Eastbridge	0.11	172
TOTAL	59.45	88,985

Section 4 Transfers of Ownership

There has been no transfer of ownership interest, operation, management, or other control of the Treatment Works, or any portion thereof, during this reporting period as defined by Section III, Part C of the Consent Decree.

Section 5 Compliance and Non-Compliance With the Consent Decree

5.1 Submission of Deliverables

To date, KUB has submitted all deliverables in accordance with the schedule set forth in the Consent Decree. After consultation with TDEC, the EPA agreed that less frequent reporting was now appropriate as a result of the narrower scope of remaining work to be performed. On December 13, 2016, EPA approved the revised Section XIX to the Consent Decree, authorizing the submittal of an Annual Progress Report incorporating all reporting requirements into one annual report. The following sections detail all activity related to deliverables that occurred during the past year.

5.1.1 Status of Deliverables

Below is a list of dates on which KUB submitted deliverables to EPA or received approval for deliverables in 2018. Each submittal was available for public comment in the Public Document Repository (PDR) for a period of twenty (20) days. No comments were received for any of the following deliverables.

February 27, 2018

- Submitted to EPA – Annual Progress Report 2017

5.2 Violations Subject to Stipulated Penalties

During this reporting period, KUB incurred 47 Unpermitted Discharges. Appendix A lists any SSO that occurred during 2018 that resulted in an unpermitted discharge along with its cause, volume, one- and three-day rainfall totals, and rainfall intensity. Unpermitted discharges that were impacted by factors that were difficult to control or events that had minimal impact on the environment due to their low volume are also indicated in Appendix A.

Section 6 SSOs, Bypasses, Diversions, and Effluent Limit Violations

6.1 SSOs

Appendix B lists the location, source, date, time, duration, pathway (if any), receiving water (if any), the identification of the treatment plant sewerbasin in which each SSO is located, the reason for each SSO, the total SSO volume, the volume returned to the WCTS, the volume not captured, and category of corrective action planned, underway or completed with regard to the SSO during this reporting period. During this period, there were 81 SSO events.

Of the 81 SSO events, 45 were in the 0 – 1,000 gallons volume range, 22 were in the 1,001 – 10,000 gallons volume range, 12 events totaled greater than 10,000 gallons, and the volume for two events were unknown. Durations for events during this period are as follows: 44 ranged from 0 – 2 hours, and 22 ranged from 2.1 – 5 hours, 13 were greater than five hours, and the duration of two events were unknown.

One site, 5619 E. Governor John Sevier Hwy, became chronic on February 7, 2018, after experiencing five SSO events in less than a 12 month period. This site accounted for 12 SSO events in 2018. A project is currently underway to install a new, larger force main under the Holston River, and upsize about 100' of gravity main above the John Sevier pump station. The project is currently scheduled to be completed in April 2019, and once complete, should prevent SSO events from occurring at this location going forward.

6.2 Building Backups

Appendix C lists the location, source, date, time, duration, the identification of the treatment plant sewerbasin in which each SSO is located, the reason for each SSO, the total SSO volume, the volume returned to the WCTS, the volume not captured, and category of corrective action planned, underway or completed with regard to the SSO during this reporting period. During this period, there were five Building Backups including one SSO event that also resulted in a BBU.

6.3 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 the location, date, time, duration, volume, and reason for each Bypass and Diversion event that occurred during the reporting period. For the year, there were three Diversion events: two at Kuwahee WWTP and one at Loves Creek WWTP. There were no Diversion events at Fourth Creek or Eastbridge WWTPs. No Bypasses occurred during this reporting period.

6.4 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 were 11 effluent limit violations at the Kuwahee WWTP, three at the Fourth Creek WWTP, one at Loves Creek WWTP, and four at Eastbridge WWTP.

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
Kuwahee	Yes	2/11/2018	0001			2/11/2018	23.97	49.320	39.97	56.47	High flow event due to excess rainfall
				2/12/2018	1600	2/12/2018	16.00	7.150			
Kuwahee	Yes	12/28/2018	0250			12/28/2018			15.70 ¹	25.440	High flow event due to excess rainfall
				12/28/2018	2340	12/28/2018					
Loves Creek	Yes	2/11/2018	1425			2/11/2018			1.5	0.497	High flow event due to excess rainfall
				2/11/2018	1555	2/11/2018					
Fourth Creek	No										
Eastbridge	No										

¹ Diversion valve was open twice in the same 24-hour period. Therefore, total flow and hours are additive of both events.

Table 3. Effluent Limit Violations

WWTP	Did an event occur?	Date	Parameter	Type	Limit	Value
Kuwahee	Yes	2/07/2018	Daily maximum	TSS	45 mg/l	49 mg/l
Kuwahee	Yes	2/10/2018	Daily Maximum	TSS	45 mg/l	67 mg/l
Kuwahee	Yes	2/11/2018	Daily Maximum	TSS	45 mg/l	140 mg/l
Kuwahee	Yes	2/11/2018	Daily Minimum	TSS, % Removal	40%	-40%
Kuwahee	Yes	2/11/2018	Daily Maximum	Settleable Solids	1.0 mL/l	10 mL/l
Kuwahee	Yes	2/11/2018	Washout	MLSS	30.00%	31.70%
Kuwahee	Yes	2/11/2018	Daily Minimum	CBOD, % removal	40%	36%
Kuwahee	Yes	2/12/2018	Daily Maximum	Settleable Solids	1.0 mL/l	4.5 mL/l
Kuwahee	Yes	2/12/2018	Daily Maximum	TSS	45 mg/l	47 mg/l
Kuwahee	Yes	Feb 2018	Monthly Average	TSS	11,009 lb/day	11,823 lb/day
Kuwahee	Yes	2/17/2018	Weekly Average	TSS (lbs/day)	14,678 lbs/day	28,995 lbs/day
Fourth Creek	Yes	2/11/2018	Daily Maximum	TSS	45 mg/l	92 mg/l
Fourth Creek	Yes	2/11/2018	Daily Minimum	TSS, % removal	40%	-130%
Fourth Creek	Yes	2/11/2018	Daily Minimum	BOD, % removal	40%	-9.4%
Loves Creek	Yes	6/26/2018	Daily Maximum	<i>E. coli</i>	487 MPN/100ml	650 MPN/100ml
Eastbridge	Yes	2/11/2018	Daily Maximum	TSS	30mg/l	73 mg/l
Eastbridge	Yes	2/12/2018	Daily Maximum	TSS	30mg/l	32 mg/l
Eastbridge	Yes	2/17/2018	Weekly Average	TSS (lbs/day)	290 lbs/day	319 lbs/day
Eastbridge	Yes	12/10/2018	Daily Maximum	<i>E. coli</i>	487 MPN/100ml	980 MPN/100ml
SS - Settleable Solids	mg/l - milligrams per liter			MPN – Most Probable Number		
TSS - Total Suspended Solids	cfu –Colony Forming Unit					
ml/l – milliliters per liter	lbs - Pounds					

Section 7 Water Quality Monitoring Data

7.1 Sampling Conducted and Results

Appendix D lists all sampling that was conducted during this reporting period and the results thereof. This includes results associated with routine and investigative monitoring or unpermitted discharges that occurred in dry weather conditions.

7.2 Projected Data Collection

During 2019, KUB will continue to monitor 24 routine sampling locations in the sewer basins of eight area creeks. KUB will collect samples from the following locations during 2019:

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	5.11
Third Creek	0.87	2.08E	4.80W
Fourth Creek	1.75	2.79	3.29
Baker Creek	0.36	1.45	2.00
Goose Creek	0.40	1.19E	1.80E
Loves Creek	0.85	1.89	3.45
Williams Creek	0.89	1.70	2.02

Section 8 Grease Control Program (GCP)

8.1 Food Service Facilities (FSFs) Compliance Activities

There are currently 935 permitted and active FSFs in KUB's service area that were inspected routinely in 2018 to assess compliance with KUB's Grease Control Program (GCP). KUB also inspected an additional 149 FSF locations at least once in 2018 that were inactive or closed to determine if food preparation had resumed or the facility had reopened under new ownership. During this reporting period, KUB conducted 2,000 inspections of all facilities combined to determine if their equipment was adequate and being maintained as required to prevent grease from entering the wastewater system. In addition, KUB required all newly constructed FSFs to submit a permit application to ensure their facilities would be equipped with appropriately sized grease control equipment (GCE) before opening.

KUB continues its emphasis on improving wastewater system performance and reducing grease related blockages by routinely inspecting FSFs and requiring them to replace aging and/or undersized GCE as needed. Traps and interceptors can develop cracks and corrosion over time, so their maintenance condition must be assessed during inspections. A total of 79 FSFs were required to submit a Corrective Action Plan (CAP) in 2018 demonstrating they would move forward with upgrading and/or installing GCE. There were 52 customers that actually installed GCE during the reporting period. A total of 40 grease interceptors and 12 grease traps were added to control grease as a result of program efforts and customer compliance. Zero FSF's were published this year in the local newspaper for noncompliance for failure to install the required grease control equipment. Zero new facilities were placed under an Administrative Order in 2018.

8.2 Grease-Related Overflow Response

When a grease-related overflow occurs, KUB initiates an investigation to identify any customer that could have contributed grease to the wastewater system and caused the blockage. Using an electronic mapping tool, Geographic Information System (GIS), KUB identifies all potential contributors upstream from the site of where a grease-related SSO occurred. KUB then inspects all commercial customers in the area to verify their compliance with the GCP, and educational program information is mailed to all residential customers contributing to the SSO. In 2018, KUB mailed grease letters, educational brochures, and grease can liners to 3,320 customers and conducted 130 inspections on commercial customers as a result of 16 grease-related SSO/BBU investigations. Appendix E lists the number of grease-related blockages causing SSOs and the corrective actions that were used to address such blockages.

Information about the GCP is also made available to our customers on KUB's website. There, customers can view material discussing the environmental risks associated with grease-related overflows and receive instruction on proper grease disposal methods. When feasible, KUB also provides GCP educational materials through customer newsletters, event promotions of the residential Can the Grease program in the local newspaper, and community events.

Section 9 MOM Program Update

9.1 Continuing Sewer System Assessment Program (CSSAP)

The CSSAP is a systematic evaluation of the entire wastewater collection and transmission system (WCTS) that also assesses capacity to support prioritization of the Infrastructure Rehabilitation Program (IRP). The CSSAP was approved on July 28, 2005 and system assessments began that same year. In February 2016, KUB completed its first assessment of the entire WCTS one year ahead of the required 12-year cycle period.

The following table shows the elements of the CSSAP assessment tools and performance goal periods associated with the second assessment which began in March 2016. A comprehensive pump station assessment was last conducted in 2017 as required by the two-year assessment schedule:

Table 4. CSSAP Elements

Program Elements	Assessment Tools	Completed in 2018	Total Completed*	One Complete Cycle Period
Manhole Condition Assessment	Manhole Inspections Smoke Testing	7.4 percent	25.7 percent	12 Years
Gravity Sewer Condition Assessment	Flow Monitoring Smoke Testing Dye Testing CCTV	4.8 percent	21.0 percent	12 Years
Private Lateral Condition Assessment	Flow Monitoring Smoke Testing Dye Testing CCTV	7.9 percent	26.7 percent	12 Years
Force Main Performance Assessment	Corrosion Defect Identification	100 percent	100 percent**	2 Years
Pump Station Performance Assessment	Pump Station Performance and Adequacy	0 percent	0 percent**	2 Years

*Percentage completed in second 12-year cycle.

**Comprehensive inspections alternate each year between the Force Main Performance Assessment and Pump Station Performance Assessment.

9.2 Infrastructure Rehabilitation Program (IRP)

In 2018, KUB's IRP rehabilitated or replaced more than 95,232 ft (18.0 miles) of sewer gravity mains and 498 manholes and 2,615 ft (0.5 miles) of force mains. Appendix F lists the IRP projects for the reporting period and projects continuing from previous reporting periods but not yet completed. All of these projects are in addition to the previously completed CAP/ER projects and are included in KUB's Century II Program.

9.3 Sewer Overflow Response Plan (SORP)

KUB continues to place a high priority on maintaining and executing a SORP to help protect our community and our environment. This progress report includes an update on implementation of SORP procedures, training, and other areas of interest related to the program.

KUB makes all reasonable efforts to respond to an SSO within 45 minutes, taking into consideration the safety of the responder and the public as the first priority. In 2018, we had 81 SSO events in which KUB's Underground Construction (UGC) department responded, and our average response time was 34 minutes. KUB's prompt response time to SSO events is an essential element to the success of our SORP. It enables responding personnel to quickly assess the cause and environmental impact of an SSO to establish the best containment and remediation procedures. Quick response times also enable KUB to classify the majority of SSOs as having a short duration with a minimal impact on the environment.

KUB continues to provide an initial notice to TDEC and make public the date, time, volume, and location of each SSO (excluding building backups) on an SSO log accessed through KUB's website within 24 hours of the event. The SSO log also contains a link to a permanent archive of SSOs by month. To access the SSO log, go to www.kub.org and type "SSO Log" in the search bar at the top of the webpage.

KUB uses a computerized SORP training tool that allows new employees, and those needing refresher training, to train at their own pace on a computer. Training is also given in a classroom setting with hands-on field training components when more appropriate. In addition, KUB relies on feedback from customers and other local organizations to help identify any instances when the quality of SSO response falters. Such feedback is directed to Engineering, who works with various departments to correct any concerns.

9.4 Gravity Line Preventative Maintenance Program (GLPMP)

The GLPMP is divided into the Comprehensive Hydraulic Cleaning Program (CHCP) and Blockage Abatement (BA). The CHCP is a systematic, planned cleaning of the system to reduce debris and grease buildup and root intrusion. The BA Program is also a preventative maintenance approach for addressing operational issues that uses event history and condition assessment information to implement activities that prevent or reduce system disruptions. Activities may include, but are not limited to, hydraulic flushing, mechanical and chemical root control, rodding, and televised inspections.

The following table documents program activities for the year.

Table 5. GLPMP Elements

Program Elements				
Comprehensive Hydraulic Cleaning Program (CHCP)	Cleaned and televised			
	380,960 ft (72.2 miles)			
Blockage Abatement (BA) Program	Sewer mains in BA	Sewer mains cleaned	Sewer mains televised	Sewer mains root cut
	1,564,000 ft (296 miles)	861,000 ft (163 miles)	209,250 ft (40 miles)	287,000 ft (54 miles)

Section 10 Other MOM Programs

KUB continues to implement and manage its Other MOM Programs as represented in Appendix A of the Consent Decree. There have been no substantial program changes made during this reporting period.

Section 11 Private Lateral Program (PLP)

KUB operates a Private Lateral Program (PLP), as required by the Consent Decree and KUB's Wastewater Rules and Regulations. The PLP helps protect our environment by ensuring that property owners repair their laterals and/or remove prohibited connections. Through the CSSAP, KUB has smoke tested and/or televised all laterals within the WCTS during one complete 12-year cycle period. In addition, KUB completed the Supplemental Environmental Project (SEP) and submitted the SEP Completion Report to the EPA on June 29, 2012. KUB continues to enforce on private sewer laterals through the PLP where defects are discovered in laterals when there is a problem on property (POP) reported and customers fail to correct the problem. The statistics below include enforcement actions undertaken in the program from January 1, 2018, to December 31, 2018.

Total Private Lateral Enforcements	0
Repair	0
Replace	0
Total with Tenants	0

Additionally, there were six properties that received reinstatements of water service after lateral work was completed. In these cases, the water service was terminated in previous years due to noncompliance with the PLP, but the required repairs were completed in 2018.

Total Repairs Completed	6
2018 Enforcements	0
Reinstatements	6
Terminations	0

Appendix A

Unpermitted Discharges

Appendix A										
Unpermitted Discharges in 2018										
	11	Overflow volume of 500 gallons or less			1-day rainfall greater than 3"					
	4	Overflow volume of 501 - 1000 gallons		1	3-day rainfall greater than 4"					
		Vandalism		2	Intensity > 0.84 in/hr					
	1	Electrical or mechanical failure								
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 2018	2/7/2018	5619 E. Governor John Sevier Hwy	Unpermitted Discharge	6,600	Holston River	Heavy Rainfall	0.97	0.98	0.28	
1st 2018	2/10/2018	3320 Johnson Rd	Unpermitted Discharge	1,100	Fourth Creek	Blockage - Debris	2.09	2.09	0.28	
1st 2018	2/11/2018	5619 E. Governor John Sevier Hwy	Unpermitted Discharge	116,500	Holston River	Heavy Rainfall	0.93	3.02	0.42	
1st 2018	2/11/2018	4605 Webb Ln	Unpermitted Discharge	1,500	Third Creek	Heavy Rainfall	0.93	3.02	0.42	
1st 2018	2/11/2018	2544 Fair Dr	Unpermitted Discharge	1,100	First Creek	Heavy Rainfall	0.93	3.02	0.42	
1st 2018	2/11/2018	600 N Gallaher View Rd	Unpermitted Discharge	824,000	Ten Mile Creek	Heavy Rainfall	0.93	3.02	0.42	
1st 2018	2/11/2018	701 Kentwood Rd	Unpermitted Discharge	10,000	Second Creek	Blockage - Grease and Debris	0.93	3.02	0.42	
1st 2018	2/11/2018	6103 Manchester Rd	Unpermitted Discharge	750	Pond	Blockage - Grease	0.93	3.02	0.42	
1st 2018	2/11/2018	4100 Central Ave Pike	Unpermitted Discharge	400	Second Creek	Heavy Rainfall	0.93	3.02	0.42	
1st 2018	2/11/2018	2004 Riverside Dr	Unpermitted Discharge	750	Williams Creek	Heavy Rainfall	0.93	3.02	0.42	
1st 2018	2/12/2018	4713 Old Broadway	Unpermitted Discharge	281,000	First Creek	Heavy Rainfall	0.05	3.07	0.42	
1st 2018	2/14/2018	1500 Hoitt Ave	Unpermitted Discharge	2,400	First Creek	Heavy Rainfall	0.38	0.44	0.15	
1st 2018	2/16/2018	1404 Adair Dr	Unpermitted Discharge	Unknown	First Creek	Heavy Rainfall	0.22***	0.61***	0.15***	
1st 2018	2/22/2018	4804 Western Ave	Unpermitted Discharge	400	Third Creek	Blockage - Roots and Grease	0.00	0.17	0.06	
1st 2018	2/25/2018	4744 S Middlebrook Pk	Unpermitted Discharge	1,100	Third Creek	Blockage - Debris	0.75	0.79	0.41	
1st 2018	3/1/2018	2535 Holbrook Dr	Unpermitted Discharge	5,800	First Creek	Blockage - Grease	1.25	1.87	0.17	
1st 2018	3/1/2018	5619 E. Governor John Sevier Hwy	Unpermitted Discharge	24,000	Holston River	Heavy Rainfall	1.25	1.87	0.17	
1st 2018	3/20/2018	5619 E. Governor John Sevier Hwy	Unpermitted Discharge	1,700	Holston River	Heavy Rainfall	0.03	0.36	0.53	
1st 2018	3/24/2018	241 Neals Landing Rd	Unpermitted Discharge	5,300	Shinning Creek East	Heavy Rainfall	0.97	0.97	0.29	
1st 2018	3/25/2018	5619 E. Governor John Sevier Hwy	Unpermitted Discharge	1,700	Holston River	Heavy Rainfall	0.32	1.29	0.30	
2nd 2018	5/15/2018	156 Keeble Ave	Unpermitted Discharge	1,600	Goose Creek	Blockage - Roots	0.04	0.04	0.40	
2nd 2018	6/25/2018	219 Drinnen Ave	Unpermitted Discharge	200	Goose Creek	Blockage - Debris	0.52	1.17	0.21	
2nd 2018	6/29/2018	5619 E. Governor John Sevier Hwy	Unpermitted Discharge	200	Holston River	Heavy Rainfall	0.00	1.97	0.55	
3rd 2018	7/6/2018	5619 E. Governor John Sevier Hwy	Unpermitted Discharge	5,300	Holston River	Heavy Rainfall	1.80	1.80	1.07	
3rd 2018	7/12/2018	1408 Adair Dr	Unpermitted Discharge	Unknown	First Creek	Heavy Rainfall	0.00***	0.00***	0.02***	
3rd 2018	7/18/2018	1409 Maryville Pike	Unpermitted Discharge	350	Goose Creek	Blockage - Grease	0.00	1.40	0.85	
3rd 2018	8/5/2018	404 Oak Park Dr	Unpermitted Discharge	600	First Creek	Construction Failure - Dig In	0.00	0.00	0.02	
3rd 2018	8/8/2018	2211 Piney Grove Church Rd	Unpermitted Discharge	12,200	Ten Mile Creek	Blockage - Grease	0.24	0.24	0.51	
3rd 2018	8/28/2018	1105 Bridge Ave	Unpermitted Discharge	150	Second Creek	Blockage - Grease	0.00	0.00	0.00	
3rd 2018	9/27/2018	5619 E. Governor John Sevier Hwy	Unpermitted Discharge	360	Holston River	Heavy Rainfall	2.10	4.61	0.76	
4th 2018	10/1/2018	4407 Tynemouth Dr	Unpermitted Discharge	4,250	Holston River	Blockage - Roots and Grease	0.00	0.00	0.13	
4th 2018	11/12/2018	5619 E. Governor John Sevier Hwy	Unpermitted Discharge	23,000	Holston River	Heavy Rainfall	1.23	1.23	0.27	
4th 2018	11/26/2018	4923 Ball Rd	Unpermitted Discharge	800,000	Grassy Creek	Pump Station Failure - Software Malfunction caused by Electrical Failure	0.04	0.44	0.20	
4th 2018	12/9/2018	5619 E. Governor John Sevier Hwy	Unpermitted Discharge	150	Holston River	Heavy Rainfall	0.87	1.43	0.16	
4th 2018	12/10/2018	3807 Middlebrook Pike	Unpermitted Discharge	150	Third Creek	Blockage - Grease	0.09	1.52	0.16	
4th 2018	12/21/2018	5619 E. Governor John Sevier Hwy	Unpermitted Discharge	4,100	Holston River	Heavy Rainfall	1.49	2.20	0.18	
4th 2018	12/22/2018	241 Neals Landing Rd	Unpermitted Discharge	4,500	Shinning Creek East	Heavy Rainfall	0.00	2.20	0.18	
4th 2018	12/26/2018	1000 State St	Unpermitted Discharge	180	First Creek	Blockage - Grease	0.00	0.00	0.00	
4th 2018	12/28/2018	5619 E. Governor John Sevier Hwy	Unpermitted Discharge	3,000	Holston River	Heavy Rainfall	1.66	2.61	0.39	
4th 2018	12/28/2018	1928 Wayland Rd	Unpermitted Discharge	50,000	Swanpond Creek	Heavy Rainfall	1.66	2.61	0.39	
4th 2018	12/28/2018	4100 Central Ave Pike	Unpermitted Discharge	65	Second Creek	Heavy Rainfall	1.66	2.61	0.39	
4th 2018	12/28/2018	4605 Webb Ln	Unpermitted Discharge	150	Third Creek	Heavy Rainfall	1.66	2.61	0.39	
4th 2018	12/28/2018	600 N Gallaher View Rd	Unpermitted Discharge	600,000	Ten Mile Creek	Heavy Rainfall	1.66	2.61	0.39	
4th 2018	12/28/2018	1221 Milam Cir	Unpermitted Discharge	750	Fourth Creek	Heavy Rainfall	1.66	2.61	0.39	
4th 2018	12/28/2018	4511 Plummer Rd	Unpermitted Discharge	1,500	Lynnhurst Creek	Heavy Rainfall	1.66	2.61	0.39	
4th 2018	12/28/2018	2004 Riverside Dr	Unpermitted Discharge	2,000	Williams Creek	Heavy Rainfall	1.66	2.61	0.39	
4th 2018	12/29/2018	1647 McCroskey Ave	Unpermitted Discharge	50	First Creek	Blockage - Debris	0.00	2.61	0.39	
*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 2 days prior										
***Evidence that these overflows occurred was found some time following the actual event. The rainfall shown for these events correlate to the amount received on the date the events were reported to KUB.										

Appendix B

SSOs

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	Corrective Action
1/15/2018	5:23pm	5600	Kentwood Rd	KUW	Second Creek	5	Manhole 8-26	Ground to Soil Saturation		Broken System Protruding Lateral The sewer main was flushed and the area was cleaned. The lateral is scheduled to be repaired.	1,800	0	1,800	2.5	No	System Repair Completed
1/21/2018	3:40pm	1010	S. Chilhowee Dr	LC	Loves Creek	26	Manhole 45-42	Pavement		Broken System - Broken Gravity Main. The sewer main was flushed and the area was cleaned. The main is scheduled to be repaired.	15	0	15	2	No	Future Construction Planned
2/7/2018	9:55am	5619	E. Governor John Sevier Hwy	LC	Loves Creek	61	Manhole 4	Wet Weather Conveyance to Holston River	Holston River	<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	6,600	0	6,600	6	Yes	Construction Project Underway
2/10/2018	10:54am	3320	Johnson Rd	FC	Fourth Creek	49	Manholes 12-1 and 12-2	Ground to Fourth Creek	Fourth Creek	Blockage - Debris. The sewer main was flushed to remove the blockage. The area was cleaned.	1,100	0	1,100	3	Yes	Routine Blockage Abatement
2/11/2018	1:13pm	2004	Riverside Dr	KUW	Williams Creek	25	Manhole 1-1	Ground to Williams Creek	Williams Creek	<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	750	0	750	2	Yes	System Assessment Underway
2/11/2018	1:41pm	2544	Fair Dr	KUW	First Creek	4	Manhole 77	Ground to Wet Weather Conveyance to First Creek	First Creek	<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	1,100	0	1,100	1	Yes	System Assessment Underway
2/11/2018	10:45am	600	N Gallaher View Rd	FC	Fourth Creek	32a	Manhole 77	Ground to Ten Mile Creek	Ten Mile Creek	<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	824,000	0	824,000	39	Yes	System Assessment Underway
2/11/2018	11:46am	4100	Central Ave Pike	KUW	Second Creek	10	Manhole 17-9	Pavement to Wet Weather Conveyance to Second Creek	Second Creek	<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	400	0	400	1	Yes	System Assessment Underway
2/11/2018	11:52am	6103	Manchester Rd	KUW	Knob Creek	41	Manhole 66-28	Ground to Pond	Pond	Blockage - Grease. The sewer main was flushed to clear the blockage. The area was cleaned.	750	0	750	2	Yes	Routine Blockage Abatement
2/11/2018	12:33pm	4605	Webb Ln	KUW	Third Creek	28	Manholes 1, 27-54, 27-56	Ground to Third Creek	Third Creek	<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	1,500	0	1,500	3	Yes	System Assessment Underway
2/11/2018	12:57pm	701	Kentwood Rd	KUW	Second Creek	5	Manholes 8-47, 8-46, and 7-33	Pavement to Storm Drain to Second Creek	Second Creek	Blockage - Grease and Debris. The sewer main was flushed to remove the blockage and the area was cleaned.	10,000	0	10,000	24	Yes	Routine Blockage Abatement
2/11/2018	2:12pm	5619	E. Governor John Sevier Hwy	LC	Loves Creek	61	Manhole 4	Wet Weather Conveyance to Holston River	Holston River	<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	116,500	0	116,500	22	Yes	Construction Project Underway
2/12/2018	1:36pm	4713	Old Broadway	KUW	First Creek	7	Manhole 2	Ground to Lynnhurst Creek to First Creek	First Creek	<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	281,000	0	281,000	24	Yes	System Assessment Underway
2/12/2018	9:55am	7128	Sir Arthur Way	FC	Fourth Creek	36	Manhole 3-656	Soil Saturation		Blockage - Roots. The sewer main was flushed to remove the blockage. The area was cleaned.	800	0	800	2	No	Routine Blockage Abatement
2/14/2018	3:13pm	1020	Cedarwood St	LC	Loves Creek	6	Manhole 29-135	Soil Saturation		Blockage - Grease and Debris. The sewer main was flushed to remove the blockage and the area was cleaned.	360	0	360	1	No	Routine Blockage Abatement
2/14/2018	4:40pm	1500	Hoitt Ave	KUW	First Creek	17	Manhole 38	Ground to Wet Weather Conveyance to First Creek	First Creek	<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	2,400	0	2,400	2	Yes	System Assessment Underway
2/15/2018	10:22am	1829	Wayland Rd	LC	Loves Creek	67	Manhole 40-2	Soil Saturation		<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	100	0	100	1	No	Future Construction Planned
2/16/2018	11:30am	1404	Adair Dr	KUW	First Creek	7	Manholes 73 & 4511 Plummer Rd - Manhole 31	Gound to Lynnhurst Creek to First Creek	First Creek	<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	Unknown	0	Unknown	Unknown	Yes	System Assessment Underway
2/17/2018	1:45pm	2729	Rushland Park Blvd	LC	Loves Creek	105	2729 & 2734 Lateral Cleanout	Ground to Catch Basin to Soil Saturation		Blockage - Debris. The sewer main was flushed to remove the blockage. The area was cleaned.	600	0	600	1	No	Routine Blockage Abatement
2/17/2018	9:58am	6173	McMillan Creek Dr	LC	Loves Creek	105	Lateral Cleanout	Soil Saturation		Blockage - Grease and Debris. The sewer main was flushed to remove the blockage and the area was cleaned.	15	0	15	1	No	Routine Blockage Abatement
2/22/2018	11:46am	4804	Western Ave	KUW	Third Creek	21	Manhole 33-3	Wet Weather Conveyance to Third Creek	Third Creek	Blockage - Roots. The sewer main was flushed to remove the blockage. The area was cleaned.	400	0	400	2	Yes	Routine Blockage Abatement
2/22/2018	2:34pm	727	Scenic Dr	KUW	Third Creek	38	Gravity Main	Ground to Soil Saturation		Construction Failure - Third Party - Pipe Bursting. The area was cleaned.	150	0	150	1	No	System Repair Completed
2/23/2018	10:50am	4524	Royalview Rd	KUW	Third Creek	11	Manhole 11-138	Soil Saturation		Blockage - Roots. The sewer main was flushed to remove the blockage. The area was cleaned.	65	0	65	1	No	Routine Blockage Abatement
2/25/2018	11:29pm	4744	S Middlebrook Pk	KUW	Third Creek	21	Manhole 10-15	Ground to Storm Drain to Third Creek	Third Creek	Blockage - Debris. The sewer main was flushed to remove the blockage. The area was cleaned.	1,100	0	1,100	3	Yes	Routine Blockage Abatement
3/1/2018	12:30pm	2535	Holbrook Dr	KUW	First Creek	4	Manhole 18-29	Pavement to Storm Drain to First Creek	First Creek	Blockage - Grease. The sewer main was flushed to clear the blockage. The area was cleaned.	5,800	0	5,800	2	Yes	Routine Blockage Abatement
3/1/2018	12:42pm	923	Wooddale Rd	LC	Loves Creek	61	Manhole 17	Soil Saturation		<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	100	0	100	4	No	Future Construction Planned
3/1/2018	8:29am	5619	E. Governor John Sevier Hwy	LC	Loves Creek	61	Manhole 4	Wet Weather Conveyance to Holston River	Holston River	<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	24,000	0	24,000	9	Yes	Construction Project Underway

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	Corrective Action
3/20/2018	12:35am	5619	E. Governor John Sevier Hwy	LC	Loves Creek	61	Manhole 4	Wet Weather Conveyance to Holston River	Holston River	<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	1,700	0	1,700	2.5	Yes	Construction Project Underway
3/24/2018	10:51am	241	Neals Landing Rd	LC	Loves Creek	61	Manhole 42	Ground to Shinning Creek East	Shinning Creek East	<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	5,300	0	5,300	2	Yes	Future Construction Planned
3/25/2018	7:52am	5619	E. Governor John Sevier Hwy	LC	Loves Creek	61	Manhole 4	Wet Weather Conveyance to Holston River	Holston River	<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	1,700	0	1,700	2	Yes	Construction Project Underway
3/27/2018	9:23am	1630	Henrietta Ave	KUW	First Creek	24	Manhole 6-33	Pavement to Soil Saturation		Blockage - Grease and Debris. The sewer main was flushed to remove the blockage and the area was cleaned.	100	0	100	2	No	Routine Blockage Abatement
3/30/2018	5:52pm	4429	Oakbank Ln	KUW	Third Creek	11	4429 Lateral cleanout and BBU	Soil Saturation		Blockage - Grease. The sewer main was flushed to clear the blockage. The area was cleaned.	15,200	100	15,200	4	No	Routine Blockage Abatement
4/2/2018	11:46am	1218	Cassel Dr	KUW	Third Creek	10	Manholes 14-167 and 14-168	Pavement to Soil Saturation		Blockage - Grease. The sewer main was flushed to clear the blockage. The area was cleaned.	270	20	250	1	No	Routine Blockage Abatement
4/11/2018	10:05pm	1712	Polkwright Ln	FC	Fourth Creek	37	Grinder Pump	Soil Saturation		Grinder Pump Failure. The pump was replaced, the area was cleaned.	11	9	2	1	No	System Repair Completed
4/11/2018	11:44am	600	Citico St	KUW	Third Creek	29	Manhole 60-4	Pavement to Ditch to Soil Saturation		Blockage - Grease. The sewer main was flushed to clear the blockage. The area was cleaned.	200	0	200	1	No	Routine Blockage Abatement
4/11/2018	2:16pm	2321	Vincinda Cir	LC	Loves Creek	105	Grinder Pump	Soil Saturation		Grinder Pump Failure. The pump was replaced, the area was cleaned.	15	10	5	1	No	System Repair Completed
4/30/2018	1:06pm	1500	Lyons Bend Rd	FC	Fourth Creek	37	Bypass Pipe	Soil Saturation		Construction Failure - Bypass Pumping. The pumps were turned off. The area was cleaned.	200	50	150	1	No	System Repair Completed
5/7/2018	8:13am	5516	Brown Atkin Dr	FC	Fourth Creek	37	Flushing Station	Soil Saturation		Construction Failure - Operation Failure. The valve was closed. The area was cleaned.	50	50	0	1	No	System Repair Completed
5/11/2018	12:47pm	204	Riggs Ave	KUW	South Knox	39	Cleanout	Soil Saturation		Blockage - Roots. The sewer main was flushed to remove the blockage. The area was cleaned.	500	0	500	4	No	Routine Blockage Abatement
5/15/2018	3:35pm	156	Keeble Ave	KUW	South Knox	39	Manhole 65	Wet Weather Conveyance to Goose Creek	Goose Creek	Blockage - Roots. The sewer main was flushed to remove the blockage. The area was cleaned.	1,600	0	1,600	2	Yes	Routine Blockage Abatement
5/16/2018	12:09pm	1829	Wayland Rd	LC	Loves Creek	67	Manhole 40-2	Soil Saturation		<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	2,000	0	2,000	2	No	Future Construction Planned
5/17/2018	10:26am	2641	Osprey Vista Way	KUW	South Knox	44	Manhole 23-20	Soil Saturation		Blockage - Debris. The sewer main was flushed to remove the blockage. The area was cleaned.	150	0	150	2	No	Routine Blockage Abatement
5/21/2018	6:00pm	609	E. Inskip Dr	KUW	First Creek	7	Manhole 29-205	Wet Weather Conveyance to Soil Saturation		Vandalism - Sticks and debris. The debris was removed. The area was cleaned.	3,100	0	3,100	3	No	System Repair Completed
6/5/2018	12:40pm	6310	Roberts Rd	EB	Eastbridge	111	Grinder Pump	Soil Saturation		Grinder Pump Failure. The pump was replaced and the power restored. The area was cleaned.	2	1	1	1	No	System Repair Completed
6/25/2018	12:17pm	219	Drinnen Ave	KUW	South Knox	39	Manhole 28-154	Storm Drain to Tributary to Goose Creek	Goose Creek	Blockage - Debris. The sewer main was flushed to remove the blockage. The area was cleaned.	200	0	200	1	Yes	Routine Blockage Abatement
6/29/2018	12:04pm	5619	E. Governor John Sevier Hwy	LC	Loves Creek	61	Manhole 4	Wet Weather Conveyance to Holston River	Holston River	<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	200	0	200	1	Yes	Construction Project Underway
7/6/2018	12:04pm	5619	E. Governor John Sevier Hwy	LC	Loves Creek	61	Manhole 4	Wet Weather Conveyance to Holston River	Holston River	<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	5,300	0	5,300	2	Yes	Construction Project Underway
7/12/2018	11:17am	1408	Adair Dr	KUW	First Creek	7	Manhole 72	Ground to Lynnhurst Creek to First Creek	First Creek	<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	Unknown	0	Unknown	Unknown	Yes	System Assessment Underway
7/18/2018	11:18am	1409	Maryville Pike	KUW	South Knox	39	Manhole 27-117 and Cleanout	Storm Drain to Wet Weather Conveyance to Goose Creek	Goose Creek	Blockage - Grease. The sewer main was flushed to clear the blockage. The area was cleaned.	350	0	350	2	Yes	Routine Blockage Abatement
7/30/2018	8:32am	2143	Keith Ave	KUW	Third Creek	22	2143 Keith Ave, Dig-in	Soil Saturation		Construction Failure - Dig-In (Boring). Contractor repaired the main. The area was cleaned.	20	0	20	1	No	System Repair Completed
8/5/2018	8:46pm	404	Oak Park Dr	KUW	First Creek	4	Sewer Main	Tributary to First Creek	First Creek	Construction Failure - Dig-In. The main was repaired and the area was cleaned.	600	0	600	9	Yes	System Repair Completed
8/8/2018	1:00am	2211	Piney Grove Church Rd	FC	Fourth Creek	32a	Manhole 63	Ground to Wet Weather Conveyance to Ten Mile Creek	Ten Mile Creek	Blockage - Grease. The sewer main was flushed to clear the blockage. The area was cleaned.	12,200	0	12,200	3	Yes	Routine Blockage Abatement
8/9/2018	9:19am	1521	Saylors Ford Rd	EB	Eastbridge	115	Ground	Ground to Soil Saturation		Construction Failure - Dig-In. The main was repaired by contractor. The area was cleaned.	600	0	600	3	No	System Repair Completed
8/19/2018	7:28pm	2501	Miss Ellie Dr	FC	Fourth Creek	32a	Manhole 71	Soil Saturation		Vandalism. The sewer main was flushed and the debris removed from the manhole. The area was cleaned.	54,000	0	54,000	2.5	No	System Repair Completed
8/22/2018	2:04pm	8225	Kingston Pike	FC	Fourth Creek	32b	Gravity Main	Soil Saturation		Broken System - Broken Gravity Main. The sewer main was repaired. The area was cleaned.	100	0	100	3	No	System Repair Completed
8/28/2018	1:56pm	1105	Bridge Ave	KUW	Second Creek	23	Manhole 10-31	Ground to Storm Drain to Second Creek	Second Creek	Blockage - Grease. The sewer main was flushed to clear the blockage. The area was cleaned.	150	0	150	2	Yes	Routine Blockage Abatement
9/10/2018	4:58pm	7218	Washington Pike	EB	Eastbridge	109	Grinder Pump	Soil Saturation		Grinder Pump Failure. The pump was replaced, the area was cleaned.	4	3	1	3.25	No	System Repair Completed
9/27/2018	9:48pm	5619	E. Governor John Sevier Hwy	LC	Loves Creek	61	Manhole 4	Wet Weather Conveyance to Holston River	Holston River	<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	360	0	360	1	Yes	Construction Project Underway
10/1/2018	4:49pm	4407	Tynemouth Dr	LC	Loves Creek	26	Manhole 80-45	Ground to Beaman Branch to Holston River	Holston River	Blockage - Roots and Grease. The sewer main was flushed to remove the blockage. The area was cleaned.	4,250	0	4,250	3	Yes	Routine Blockage Abatement
10/17/2018	1:42pm	6549	Creekhead Rd	FC	Fourth Creek	32a	Manhole 49-2	Ground to Wet Weather Conveyance to Soil Saturation		Blockage - Grease. The sewer main was flushed to clear the blockage. The area was cleaned.	31,750	3,000	28,750	6	No	Routine Blockage Abatement

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	Corrective Action
11/12/2018	5:38pm	5619	E. Governor John Sevier Hwy	LC	Loves Creek	61	Manhole 4	Wet Weather Conveyance to Holston River	Holston River	<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	23,000	0	23,000	16	Yes	Construction Project Underway
11/26/2018	9:08am	4923	Ball Rd	FC	Fourth Creek	49	Manholes 1-1 and 2	Ground to Grassy Creek	Grassy Creek	Pump Station Failure - Software Malfunction Caused By Electrical Failure. The pump station was repaired. The area was cleaned	800,000	0	800,000	48	Yes	System Repair Completed
12/9/2018	8:30am	5619	E. Governor John Sevier Hwy	LC	Loves Creek	61	Manhole 4	Wet Weather Conveyance to Holston River	Holston River	<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	150	0	150	2	Yes	Construction Project Underway
12/10/2018	9:35am	3807	Middlebrook Pike	KUW	Third Creek	28	Manhole 16-19	Ground to Storm Drain to Third Creek	Third Creek	Blockage - Grease. The sewer main was flushed to clear the blockage. The area was cleaned.	150	0	150	2	Yes	Routine Blockage Abatement
12/21/2018	2:10pm	5619	E. Governor John Sevier Hwy	LC	Loves Creek	61	Manhole 4	Wet Weather Conveyance to Holston River	Holston River	<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	4,100	0	4,100	4	Yes	Construction Project Underway
12/21/2018	3:02pm	1829	Wayland Rd	LC	Loves Creek	67	Manhole 40-2	Soil Saturation		<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	625	0	625	3	No	Future Construction Planned
12/22/2018	12:35pm	1521	Saylors Ford Road	EB	Eastbridge	105	Manhole serving building	Ground to Pavement to Soil Saturation		WWTP Failure Mechanical Failure. The cause of the failure was identified and repaired. The area was cleaned.	30	0	30	1	No	System Repair Completed
12/22/2018	9:15am	241	Neals Landing Rd	LC	Loves Creek	63	Manhole 42	Ground to Shinning Creek East	Shinning Creek East	<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	4,500	0	4,500	2	Yes	Future Construction Planned
12/26/2018	9:39am	1000	State St	KUW	First Creek	30	Manhole 3-65	Ground to Catch Basin to Storm Drain to First Creek	First Creek	Blockage - Grease. The sewer main was flushed to clear the blockage. The area was cleaned.	180	0	180	1	Yes	Routine Blockage Abatement
12/28/2018	10:00am	2004	Riverside Dr	KUW	Williams Creek	31	Manhole 1-1	Ground to Williams Creek	Williams Creek	<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	2,000	0	2,000	1	Yes	System Assessment Underway
12/28/2018	10:20pm	600	N Gallaher View Rd	FC	Fourth Creek	32a	Manhole 77	Ground to Ten Mile Creek	Ten Mile Creek	<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	600,000	0	600,000	24	Yes	System Assessment Underway
12/28/2018	10:24am	4100	Central Ave Pike	KUW	Second Creek	10	Manhole 17-9	Pavement to Wet Weather Conveyance to Second Creek	Second Creek	<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	65	0	65	2	Yes	System Assessment Underway
12/28/2018	11:50am	119	Caron Dr	KUW	Second Creek	5	Manhole 16-66	Ground to Soil Saturation		Blockage - Debris. The sewer main was flushed to remove the blockage. The area was cleaned.	750	0	750	2	No	Routine Blockage Abatement
12/28/2018	3:04pm	4511	Plummer Rd	KUW	First Creek	7	Manhole 31	Ground to Tributary to Lynnhurst Creek	Lynnhurst Creek	<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	1,500	0	1,500	4	Yes	System Assessment Underway
12/28/2018	3:18pm	1829	Wayland Rd	LC	Loves Creek	67	Manhole 40-2	Ground to Tributary to Swanpond Creek	Swanpond Creek	<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	50,000	0	50,000	9	Yes	Future Construction Planned
12/28/2018	4:34pm	5100	West Martin Mill Pike	KUW	South Knox	39	Manholes 8, 9, and 142	Soil Saturation		<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	900	0	900	5	No	System Assessment Underway
12/28/2018	5:04pm	1221	Milam Cir	FC	Fourth Creek	36	Manhole 12-173	Ground to Tributary to Fourth Creek	Fourth Creek	<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	750	0	750	4	Yes	System Assessment Underway
12/28/2018	9:05am	2739	Parkview Ave	KUW	Williams Creek	19	Manhole 5-15	Soil Saturation		<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	350	0	350	2	No	System Assessment Underway
12/28/2018	9:15am	5619	E. Governor John Sevier Hwy	LC	Loves Creek	61	Manhole 4	Wet Weather Conveyance to Holston River	Holston River	<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	3,000	0	3,000	8	Yes	Construction Project Underway
12/28/2018	9:42am	4605	Webb Ln	KUW	Third Creek	28	Manhole 27-54	Ground to Third Creek	Third Creek	<2 Year Rain Event. Rainfall in the area produced I & I and high flows in the sewer mains. The sewer main was checked until the high flows subsided. The area was cleaned.	150	0	150	4	Yes	System Assessment Underway
12/29/2018	4:00pm	1647	McCroskey Ave	KUW	First Creek	17	Lateral Cleanout	Ground to Storm Drain to First Creek	First Creek	Blockage - Debris. The sewer main was flushed to remove the blockage. The area was cleaned.	50	0	50	3	Yes	Routine Blockage Abatement

*KUB performs inspections, hydraulic cleaning, and/or root removal on a routine frequency for all locations under Blockage Abatement

Appendix C

Building Backups

BBUs

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)	Corrective Action
1/19/2018	3:22am	1505	Cumberland Ave	KUW	Second Creek	35a	1505 Cumberland Ave	Blockage - Debris - The main was flushed to remove the blockage. The building was cleaned by ServPro	90	90	0	3.5	Routine Blockage Abatement
2/10/2018	3:45pm	2335	Carbury Dr	KUW	Third Creek	11	2335 Carbury Dr	Blockage - Roots - The main was flushed to remove the blockage. The building was cleaned by DCR.	10	10	0	2	Routine Blockage Abatement
3/30/2018	5:52pm	4429	Oakbank Ln	KUW	Third Creek	11	4429 Oakbank Ln and Cleanout	Blockage - Grease - The sewer main was flushed to remove the blockage and the area was cleaned. The building was cleaned by customer contractor.	15,200	100	15,100	4	Routine Blockage Abatement
4/3/2018	2:30pm	1618	Cumberland Ave	KUW	Second Creek	35a	1618 Cumberland Ave	Construction Failure - Unconnected Lateral. The lateral was reinstated. The building was cleaned by ServPro	50	50	0	1	Repair Complete
10/26/2018	11:39am	121	W. Oak Hill Ave	KUW	Second Creek	15	121 W. Oak Hill Ave	Construction Failure - Unconnected Lateral. The lateral was reinstated. The building was cleaned by ServPro	10	10	0	2	Repair Complete

*KUB performs inspections, hydraulic cleaning, and/or root removal on a routine frequency for all locations under Blockage Abatement

Appendix D

Water Quality Monitoring Program Sampling Results



Water Quality Monitoring
Report

Routine Water Quality Monitoring Report

1/1/2018 Through 12/31/2018

Knoxville Utilities Board

Water Quality Laboratory
Kevin Keaton, Lab Supervisor
835 East Jackson Avenue
Knoxville, Tennessee 37915
(865) 594-8206 Fax: (865) 594-8245

Creek Mile #	Sample Date	Sample Time	pH	Sample Temp (C)	Dissolved Oxygen (mg/l)	Fecal Coliform (CFU/100 ml)	E. Coli (MPN)	Precipitation Event	Status*
First Creek									
1.74	1/16/2018	11:22	7.7	6	12	140	89	Wet	R
2.57	1/16/2018	11:09	7.8	6	12	36	120	Wet	R
6.33	1/16/2018	09:56	6.9	10	9.1	210	140	Wet	R
1.74	2/16/2018	10:10	7.9	15	9.1	200	180	Wet	R
2.57	2/16/2018	09:58	8.1	15	9.3	230	180	Wet	R
6.33	2/16/2018	09:40	7.7	15	8.4	240	170	Wet	R
1.74	3/15/2018	10:31	8.0	10	11	290	240	Wet	R
2.57	3/15/2018	10:48	8.1	9	11	340	160	Wet	R
6.33	3/15/2018	11:10	7.8	12	9.6	310	140	Wet	R
1.74	4/25/2018	11:31	7.9	15	9.3	2200	2000	Wet	I
2.57	4/25/2018	11:18	8.1	15	9.6	2900	2000	Wet	R
6.33	4/25/2018	10:13	7.6	15	8.0	5600	> 2400	Wet	R
1.74	5/14/2018	11:17	8.0	20	8.5	290	190	Dry	R
2.57	5/14/2018	11:36	8.3	21	8.9	560	370	Dry	R
6.33	5/14/2018	10:00	7.7	18	7.5	500	550	Dry	R
1.74	6/13/2018	08:42	7.9	21	7.5	5300	> 2400	Dry	I
2.57	6/13/2018	08:53	8.1	20	8.2	820	770	Dry	R
6.33	6/13/2018	11:07	7.7	20	7.2	1400	310	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.



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Creek Mile #	Sample Date	Sample Time	pH	Sample Temp (C)	Dissolved Oxygen (mg/l)	Fecal Coliform (CFU/100 ml)	E. Coli (MPN)	Precipitation Event	Status*
First Creek									
1.74	7/20/2018	08:53	8.0	21	6.9	300	440	Wet	R
2.57	7/20/2018	08:31	8.2	21	7.3	300	650	Wet	R
6.33	7/20/2018	08:12	7.8	20	6.6	1100	580	Wet	R
1.74	8/31/2018	08:48	7.8	23	6.9	17000	> 2400	Wet	R
2.57	8/31/2018	08:12	7.9	22	7.2	26000	> 2400	Wet	R
6.33	8/31/2018	07:53	7.6	20	6.2	4900	790	Wet	R
1.74	9/12/2018	11:21	7.9	21	7.9	640	770	Wet	R
2.57	9/12/2018	11:12	8.0	21	8.2	440	440	Wet	R
6.33	9/12/2018	09:20	7.7	20	6.7	3200	180	Wet	R
1.74	10/5/2018	10:36	7.9	20	7.8	1100	200	Dry	R
2.57	10/5/2018	10:20	8.1	20	8.2	120	120	Dry	R
6.33	10/5/2018	10:07	7.7	20	7.3	540	260	Dry	R
1.74	11/21/2018	09:03	8.4	12	9.6	1100	690	Dry	R
2.57	11/21/2018	09:17	8.3	10	11	140	140	Dry	R
6.33	11/21/2018	09:32	8.0	11	9.1	340	330	Dry	R
1.74	12/21/2018	09:43	7.8	10	9.9	4400	> 2400	Wet	R
2.57	12/21/2018	10:05	8.0	10	10	4600	> 2400	Wet	R
6.33	12/21/2018	10:27	7.8	10	9.8	5100	> 2400	Wet	R

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Creek Mile #	Sample Date	Sample Time	pH	Sample Temp (C)	Dissolved Oxygen (mg/l)	Fecal Coliform (CFU/100 ml)	E. Coli (MPN)	Precipitation Event	Status*
<u>Second Creek</u>									
0.30	1/16/2018	10:49	7.7	8	11	72	250	Wet	R
1.54	1/16/2018	10:29	7.9	9	11	36	79	Wet	R
5.11	1/16/2018	10:12	6.5	15	6.0	130	93	Wet	R
0.30	2/26/2018	11:02	7.8	13	9.8	4200	> 2400	Wet	R
1.54	2/26/2018	10:50	7.7	13	9.6	3400	> 2400	Wet	R
5.11	2/26/2018	10:35	7.2	14	6.2	3800	> 2400	Wet	R
0.30	3/9/2018	09:51	8.1	11	11	160	210	Wet	R
1.54	3/9/2018	09:36	8.0	11	11	140	180	Wet	R
5.11	3/9/2018	09:20	7.7	14	8.3	81	86	Wet	R
0.30	4/25/2018	10:56	8.0	15	9.3	520	220	Wet	R
1.54	4/25/2018	10:44	7.8	15	8.9	910	550	Wet	R
5.11	4/25/2018	10:26	7.4	16	6.7	640	580	Wet	R
0.30	5/14/2018	10:51	8.1	20	8.6	1000	490	Dry	R
1.54	5/14/2018	10:38	7.8	19	8.3	560	460	Dry	R
5.11	5/14/2018	10:18	7.4	18	6.1	170	120	Dry	R
0.30	6/13/2018	09:18	8.1	20	8.3	1000	920	Dry	R
1.54	6/13/2018	09:07	7.8	20	7.8	1600	2000	Dry	R
5.11	6/13/2018	10:49	7.6	18	6.1	910	490	Dry	R

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Creek Mile #	Sample Date	Sample Time	pH	Sample Temp (C)	Dissolved Oxygen (mg/l)	Fecal Coliform (CFU/100 ml)	E. Coli (MPN)	Precipitation Event	Status*
<u>Second Creek</u>									
0.30	7/26/2018	11:00	8.1	20	8.5	1600	1100	Dry	I
1.54	7/26/2018	10:47	7.9	20	7.9	1600	330	Dry	R
5.11	7/26/2018	10:27	7.2	17	5.3	370	120	Dry	R
0.30	8/10/2018	09:38	8.3	23	8.1	51000	> 2400	Wet	I
1.54	8/10/2018	10:48	7.9	23	6.9	> 60000	> 2400	Wet	R
5.11	8/10/2018	10:12	8.0	22	6.6	> 60000	> 2400	Wet	R
0.30	8/17/2018	10:08	8.1	22	8.1	4300	> 2400	Dry	I
1.54	8/17/2018	10:30	7.9	21	7.9	360	340	Dry	R
5.11	8/17/2018	10:51	7.6	19	6.0	640	730	Dry	R
0.30	9/12/2018	10:14	8.1	21	8.4	3100	> 2400	Wet	I
1.54	9/12/2018	09:52	7.8	20	7.6	730	460	Wet	R
5.11	9/12/2018	09:35	7.3	18	6.0	340	250	Wet	R
0.30	10/19/2018	10:52	8.2	15	9.7	1200	390	Wet	R
1.54	10/19/2018	10:36	7.9	15	9.2	540	260	Wet	R
5.11	10/19/2018	10:11	7.6	15	5.9	300	220	Wet	R
0.30	11/14/2018	08:42	8.4	14	9.5	5700	> 2400	Wet	R
1.54	11/14/2018	09:27	7.8	13	9.4	1100	330	Wet	R
5.11	11/14/2018	09:46	7.3	15	5.3	730	300	Wet	R

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Creek Mile #	Sample Date	Sample Time	pH	Sample Temp (C)	Dissolved Oxygen (mg/l)	Fecal Coliform (CFU/100 ml)	<i>E. Coli</i> (MPN)	Precipitation Event	Status*
<u>Second Creek</u>									
0.30	12/13/2018	10:35	8.1	12	10	150	140	Dry	R
1.54	12/13/2018	09:27	7.9	12	10	210	190	Dry	R
5.11	12/13/2018	09:10	7.3	13	6.7	72	62	Dry	R

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Creek Mile #	Sample Date	Sample Time	pH	Sample Temp (C)	Dissolved Oxygen (mg/l)	Fecal Coliform (CFU/100 ml)	E. Coli (MPN)	Precipitation Event	Status*
<u>Third Creek</u>									
0.87	1/24/2018	11:57	7.8	9	12	150	100	Dry	R
2.08E	1/24/2018	11:46	7.7	9	12	18	34	Dry	R
4.80W	1/24/2018	10:54	7.5	11	10	200	240	Dry	R
0.87	2/21/2018	10:31	7.9	15	9.0	400	520	Wet	R
2.08E	2/21/2018	10:16	7.9	15	8.8	450	1200	Wet	R
4.80W	2/21/2018	09:21	7.5	16	8.8	90	120	Wet	R
0.87	3/16/2018	09:10	7.9	12	9.6	220	370	Dry	R
2.08E	3/16/2018	09:21	7.8	12	9.8	72	69	Dry	R
4.80W	3/16/2018	09:42	7.6	13	9.7	63	55	Dry	R
0.87	4/26/2018	09:06	7.9	15	8.5	540	390	Wet	R
2.08E	4/26/2018	10:21	7.7	15	8.6	310	440	Wet	R
4.80W	4/26/2018	09:25	7.6	14	8.6	1200	220	Wet	R
0.87	5/4/2018	09:31	8.0	17	8.6	380	290	Dry	R
2.08E	5/4/2018	09:50	7.9	18	8.9	530	400	Dry	R
4.80W	5/4/2018	10:16	7.8	17	8.6	110	120	Dry	R
0.87	6/25/2018	11:11	8.1	20	8.0	950	210	Wet	R
2.08E	6/25/2018	11:01	7.9	23	9.0	1600	870	Wet	R
4.80W	6/25/2018	10:45	7.7	18	8.0	360	210	Wet	R

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Creek Mile #	Sample Date	Sample Time	pH	Sample Temp (C)	Dissolved Oxygen (mg/l)	Fecal Coliform (CFU/100 ml)	E. Coli (MPN)	Precipitation Event	Status*
<u>Third Creek</u>									
0.87	7/23/2018	09:06	8.1	19	8.2	4000	770	Wet	R
2.08E	7/23/2018	08:57	7.9	21	7.7	3300	550	Wet	R
4.80W	7/23/2018	08:40	7.6	18	8.2	3600	820	Wet	R
0.87	8/30/2018	09:21	8.0	22	7.1	770	240	Wet	R
2.08E	8/30/2018	09:11	8.2	21	7.4	500	330	Wet	R
4.80W	8/30/2018	08:18	7.7	18	7.9	320	170	Wet	R
0.87	9/14/2018	09:47	7.8	22	6.8	4600	340	Wet	R
2.08E	9/14/2018	10:01	7.9	23	6.3	3700	610	Wet	R
4.80W	9/14/2018	10:25	7.7	19	7.4	640	1100	Wet	R
0.87	10/18/2018	11:17	8.2	15	8.8	1400	460	Wet	R
2.08E	10/18/2018	11:06	8.0	15	8.8	2900	1400	Wet	R
4.80W	10/18/2018	10:21	7.8	14	8.5	230	120	Wet	R
0.87	11/27/2018	10:11	8.1	10	10	330	280	Wet	R
2.08E	11/27/2018	10:27	7.9	10	9.6	370	150	Wet	R
4.80W	11/27/2018	09:18	7.7	12	9.0	170	66	Wet	R
0.87	12/11/2018	11:36	8.0	11	10	140	98	Wet	R
2.08E	12/11/2018	11:25	7.6	11	10	300	260	Wet	R
4.80W	12/11/2018	09:37	7.6	11	9.5	170	130	Wet	R

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Creek Mile #	Sample Date	Sample Time	pH	Sample Temp (C)	Dissolved Oxygen (mg/l)	Fecal Coliform (CFU/100 ml)	E. Coli (MPN)	Precipitation Event	Status*
<u>Fourth Creek</u>									
1.75	1/24/2018	10:16	7.4	11	11	240	74	Dry	R
2.79	1/24/2018	10:27	7.5	11	11	18	15	Dry	R
3.29	1/24/2018	10:36	7.9	11	11	63	50	Dry	R
1.75	2/21/2018	09:59	7.8	16	9.0	290	210	Wet	R
2.79	2/21/2018	09:45	7.7	16	8.9	63	68	Wet	R
3.29	2/21/2018	09:35	7.8	16	9.3	130	88	Wet	R
1.75	3/16/2018	10:14	8.0	13	10	99	130	Dry	R
2.79	3/16/2018	10:03	7.8	13	9.5	99	110	Dry	R
3.29	3/16/2018	09:52	7.9	14	10	45	17	Dry	R
1.75	4/26/2018	10:04	7.9	15	9.3	270	170	Wet	R
2.79	4/26/2018	09:52	7.8	15	8.7	99	67	Wet	R
3.29	4/26/2018	09:39	7.9	15	9.2	90	82	Wet	R
1.75	5/30/2018	09:51	7.8	19	8.2	4200	820	Wet	R
2.79	5/30/2018	09:21	7.7	18	7.6	2100	520	Wet	R
3.29	5/30/2018	09:35	7.9	18	8.6	1000	370	Wet	R
1.75	6/15/2018	10:39	8.0	20	9.5	450	410	Dry	R
2.79	6/15/2018	10:20	7.9	19	8.6	430	330	Dry	R
3.29	6/15/2018	10:02	8.1	18	9.3	260	150	Dry	R

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Water Quality Monitoring
Report

Routine Water Quality Monitoring Report

1/1/2018 Through 12/31/2018

Knoxville Utilities Board

Water Quality Laboratory
Kevin Keaton, Lab Supervisor
835 East Jackson Avenue
Knoxville, Tennessee 37915
(865) 594-8206 Fax: (865) 594-8245

Creek Mile #	Sample Date	Sample Time	pH	Sample Temp (C)	Dissolved Oxygen (mg/l)	Fecal Coliform (CFU/100 ml)	E. Coli (MPN)	Precipitation Event	Status*
Fourth Creek									
1.75	7/26/2018	09:55	7.8	19	9.0	1500	210	Dry	R
2.79	7/26/2018	09:42	7.8	18	8.2	1700	76	Dry	R
3.29	7/26/2018	09:30	7.9	18	8.8	430	100	Dry	R
1.75	8/30/2018	08:53	8.1	19	8.3	470	290	Wet	R
2.79	8/30/2018	08:43	7.9	18	7.9	450	460	Wet	R
3.29	8/30/2018	08:30	8.1	18	8.8	230	210	Wet	R
1.75	9/28/2018	09:21	7.9	19	7.9	1900	690	Wet	R
2.79	9/28/2018	09:40	7.9	19	7.8	1300	580	Wet	R
3.29	9/28/2018	09:51	8.0	18	8.3	400	370	Wet	R
1.75	10/18/2018	09:45	8.0	15	9.5	1200	460	Wet	R
2.79	10/18/2018	09:56	7.8	15	8.3	360	440	Wet	R
3.29	10/18/2018	10:10	8.1	15	9.0	820	610	Wet	R
1.75	11/27/2018	09:54	8.0	11	10	270	150	Wet	R
2.79	11/27/2018	09:40	7.8	12	9.0	400	310	Wet	R
3.29	11/27/2018	09:29	8.0	12	9.7	180	89	Wet	R
1.75	12/11/2018	10:23	7.9	11	11	310	150	Wet	R
2.79	12/11/2018	10:10	7.7	11	9.8	320	190	Wet	R
3.29	12/11/2018	09:59	7.8	11	10	240	190	Wet	R

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Creek Mile #	Sample Date	Sample Time	pH	Sample Temp (C)	Dissolved Oxygen (mg/l)	Fecal Coliform (CFU/100 ml)	E. Coli (MPN)	Precipitation Event	Status*
<u>Baker Creek</u>									
0.36	1/26/2018	09:39	7.2	8	10	490	490	Dry	R
1.45	1/26/2018	10:00	7.4	8	11	180	140	Dry	R
2.00	1/26/2018	09:51	7.2	9	11	72	250	Dry	R
0.36	2/27/2018	10:23	7.9	12	9.9	350	410	Wet	R
1.45	2/27/2018	10:10	7.7	12	9.3	230	150	Wet	R
2.00	2/27/2018	10:00	8.0	11	9.9	320	100	Wet	R
0.36	3/23/2018	10:45	7.9	10	10	580	690	Dry	R
1.45	3/23/2018	10:32	7.7	13	9.3	240	390	Dry	R
2.00	3/23/2018	10:57	8.2	11	10	190	290	Dry	R
0.36	4/20/2018	10:29	7.9	12	9.7	350	260	Dry	R
1.45	4/20/2018	09:44	7.8	12	9.2	110	190	Dry	R
2.00	4/20/2018	10:11	8.1	12	9.7	120	130	Dry	R
0.36	5/22/2018	09:47	7.8	18	7.4	2000	1600	Wet	I
1.45	5/22/2018	10:12	7.7	17	8.0	2100	2000	Wet	I
2.00	5/22/2018	10:00	8.0	17	8.5	3000	1700	Wet	I
0.36	6/28/2018	10:21	7.7	20	7.5	37000	> 2400	Wet	I
1.45	6/28/2018	10:04	7.5	20	7.3	20000	> 2400	Wet	I
2.00	6/28/2018	10:40	7.7	19	7.7	16000	> 2400	Wet	I

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Creek Mile #	Sample Date	Sample Time	pH	Sample Temp (C)	Dissolved Oxygen (mg/l)	Fecal Coliform (CFU/100 ml)	E. Coli (MPN)	Precipitation Event	Status*
<u>Baker Creek</u>									
0.36	7/16/2018	10:02	7.7	21	7.2	1200	330	Dry	R
1.45	7/16/2018	10:15	7.9	19	7.6	730	500	Dry	R
2.00	7/16/2018	10:26	8.1	18	8.0	1600	580	Dry	R
0.36	8/16/2018	08:51	7.9	20	7.0	240	120	Dry	R
1.45	8/16/2018	10:11	7.8	19	7.9	2200	1300	Dry	I
2.00	8/16/2018	10:00	8.2	17	8.3	360	240	Dry	R
0.36	9/25/2018	10:01	7.6	20	6.5	5600	1700	Wet	R
1.45	9/25/2018	09:47	7.6	19	6.8	3700	2000	Wet	I
2.00	9/25/2018	09:36	7.8	19	7.5	4400	> 2400	Wet	R
0.36	10/3/2018	09:37	7.8	19	7.2	580	340	Dry	R
1.45	10/3/2018	09:53	7.8	18	7.6	1500	410	Dry	R
2.00	10/3/2018	09:25	8.1	17	8.3	1100	820	Dry	R
0.36	11/28/2018	09:30	7.7	8	10	340	300	Dry	R
1.45	11/28/2018	09:52	7.6	8	10	530	400	Dry	R
2.00	11/28/2018	09:14	8.1	9	10	640	1000	Dry	R
0.36	12/19/2018	09:03	7.7	11	9.4	290	200	Dry	R
1.45	12/19/2018	08:52	7.5	14	8.5	480	610	Dry	R
2.00	12/19/2018	09:15	8.0	10	10	510	580	Dry	R

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Creek Mile #	Sample Date	Sample Time	pH	Sample Temp (C)	Dissolved Oxygen (mg/l)	Fecal Coliform (CFU/100 ml)	E. Coli (MPN)	Precipitation Event	Status*
<u>Goose Creek</u>									
0.40	1/26/2018	10:31	7.4	6	11	1200	1200	Dry	R
1.19E	1/26/2018	10:19	7.4	8	11	160	190	Dry	R
1.80E	1/26/2018	10:12	7.5	7	11	27	86	Dry	R
0.40	2/27/2018	09:29	7.7	11	9.6	430	690	Wet	R
1.19E	2/27/2018	09:38	7.8	11	9.8	470	390	Wet	R
1.80E	2/27/2018	09:19	7.7	12	9.6	210	170	Wet	R
0.40	3/29/2018	09:56	7.8	15	8.5	260	390	Wet	R
1.19E	3/29/2018	10:11	7.9	14	9.5	1600	1200	Wet	R
1.80E	3/29/2018	10:31	7.9	15	9.3	81	67	Wet	R
0.40	4/6/2018	10:39	7.9	12	10	520	520	Wet	R
1.19E	4/6/2018	10:21	8.0	12	10	4400	> 2400	Wet	I
1.80E	4/6/2018	10:10	8.0	13	9.6	110	140	Wet	R
0.40	5/15/2018	10:46	7.7	18	7.0	19000	> 2400	Dry	I
1.19E	5/15/2018	09:56	7.7	18	7.5	38000	> 2400	Dry	I
1.80E	5/15/2018	10:34	7.9	17	8.0	420	240	Dry	R
0.40	6/28/2018	09:50	7.6	21	7.9	40000	> 2400	Wet	I
1.19E	6/28/2018	09:21	7.4	21	7.6	5000	> 2400	Wet	I
1.80E	6/28/2018	09:37	7.8	18	7.7	> 60000	> 2400	Wet	R

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Creek Mile #	Sample Date	Sample Time	pH	Sample Temp (C)	Dissolved Oxygen (mg/l)	Fecal Coliform (CFU/100 ml)	E. Coli (MPN)	Precipitation Event	Status*
<u>Goose Creek</u>									
0.40	7/6/2018	09:55	7.7	21	6.9	1500	2000	Wet	I
1.19E	7/6/2018	10:16	7.8	22	7.4	3000	1600	Wet	I
1.80E	7/6/2018	10:31	8.0	20	8.0	410	550	Wet	R
0.40	8/22/2018	08:46	7.6	20	6.3	3600	1400	Wet	I
1.19E	8/22/2018	08:40	7.8	21	7.2	3500	> 2400	Wet	I
1.80E	8/22/2018	08:30	7.9	19	7.8	2300	390	Wet	R
0.40	9/25/2018	09:14	7.8	21	6.0	9000	1700	Wet	I
1.19E	9/25/2018	09:28	7.9	21	6.4	36000	> 2400	Wet	I
1.80E	9/25/2018	09:00	7.9	19	7.6	4000	2400	Wet	R
0.40	10/3/2018	09:13	7.8	19	7.0	2300	1300	Dry	I
1.19E	10/3/2018	09:05	7.9	19	7.6	2600	2000	Dry	I
1.80E	10/3/2018	08:53	7.9	18	8.0	450	490	Dry	R
0.40	11/16/2018	10:32	7.8	12	9.1	1500	1100	Wet	I
1.19E	11/16/2018	10:17	7.8	11	9.6	730	870	Wet	R
1.80E	11/16/2018	09:58	7.8	13	9.3	340	360	Wet	R
0.40	12/19/2018	09:46	8.0	10	10	2100	> 2400	Dry	I
1.19E	12/19/2018	09:35	7.8	9	9.4	1200	1100	Dry	I
1.80E	12/19/2018	09:23	7.9	10	10	470	240	Dry	R

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Creek Mile #	Sample Date	Sample Time	pH	Sample Temp (C)	Dissolved Oxygen (mg/l)	Fecal Coliform (CFU/100 ml)	<i>E. Coli</i> (MPN)	Precipitation Event	Status*
<u>Loves Creek</u>									
0.85	1/22/2018	11:21	7.2	9	12	< 9	11	Dry	R
1.89	1/22/2018	10:30	6.9	10	10	260	180	Dry	R
3.45	1/22/2018	10:20	7.0	9	11	< 9	3	Dry	R
0.85	2/9/2018	10:07	7.5	8	11	110	120	Wet	R
1.89	2/9/2018	09:44	7.1	9	10	220	100	Wet	R
3.45	2/9/2018	09:34	7.3	8	11	2300	55	Wet	R
0.85	3/14/2018	10:03	7.8	10	10	54	56	Wet	R
1.89	3/14/2018	10:38	7.5	11	9.5	63	41	Wet	R
3.45	3/14/2018	11:01	7.8	9	11	36	46	Wet	R
0.85	4/11/2018	11:00	7.8	13	10	54	110	Dry	R
1.89	4/11/2018	11:09	7.4	13	9.8	54	110	Dry	R
3.45	4/11/2018	11:19	7.8	13	10	180	170	Dry	R
0.85	5/9/2018	09:18	7.7	16	8.2	140	74	Dry	R
1.89	5/9/2018	09:39	7.6	16	7.9	81	46	Dry	R
3.45	5/9/2018	09:02	7.6	18	7.5	54	44	Dry	R
0.85	6/19/2018	09:20	7.9	21	8.4	510	460	Dry	R
1.89	6/19/2018	09:31	7.6	20	7.9	1100	650	Dry	R
3.45	6/19/2018	09:43	7.9	22	8.0	230	150	Dry	R

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Creek Mile #	Sample Date	Sample Time	pH	Sample Temp (C)	Dissolved Oxygen (mg/l)	Fecal Coliform (CFU/100 ml)	<i>E. Coli</i> (MPN)	Precipitation Event	Status*
<u>Loves Creek</u>									
0.85	7/18/2018	09:41	7.9	21	7.4	1200	230	Wet	R
1.89	7/18/2018	09:28	7.4	20	6.5	410	270	Wet	R
3.45	7/18/2018	09:17	7.7	22	6.8	270	170	Wet	R
0.85	8/3/2018	10:19	7.8	20	7.6	1400	1200	Wet	R
1.89	8/3/2018	10:08	7.4	19	7.0	3300	230	Wet	R
3.45	8/3/2018	09:50	7.6	21	7.0	300	290	Wet	R
0.85	9/20/2018	10:10	8.0	20	7.3	520	330	Wet	R
1.89	9/20/2018	09:57	7.6	20	7.0	240	49	Wet	R
3.45	9/20/2018	09:45	7.8	21	7.0	500	380	Wet	R
0.85	10/1/2018	10:25	7.9	19	7.9	480	170	Dry	R
1.89	10/1/2018	10:11	7.3	19	7.1	270	96	Dry	R
3.45	10/1/2018	09:55	7.8	20	7.3	460	210	Dry	R
0.85	11/8/2018	10:10	7.9	14	8.4	130	200	Wet	R
1.89	11/8/2018	10:23	7.5	15	8.0	90	21	Wet	R
3.45	11/8/2018	10:35	7.8	14	8.5	36	50	Wet	R
0.85	12/18/2018	09:40	7.9	10	9.8	220	160	Wet	R
1.89	12/18/2018	09:29	7.5	11	8.8	18	33	Wet	R
3.45	12/18/2018	09:10	7.7	10	9.4	110	24	Wet	R

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Creek Mile #	Sample Date	Sample Time	pH	Sample Temp (C)	Dissolved Oxygen (mg/l)	Fecal Coliform (CFU/100 ml)	<i>E. Coli</i> (MPN)	Precipitation Event	Status*
<u>Williams Creek</u>									
0.89	1/22/2018	12:10	7.8	10	11	36	23	Dry	R
1.70	1/22/2018	11:56	7.2	13	8.8	150	210	Dry	R
2.02	1/22/2018	11:42	7.5	11	10	130	68	Dry	R
0.89	2/9/2018	10:26	7.8	9	11	200	160	Wet	R
1.70	2/9/2018	10:37	7.6	9	10	390	460	Wet	R
2.02	2/9/2018	10:46	7.8	11	10	45	93	Wet	R
0.89	3/14/2018	11:53	7.9	10	11	110	99	Wet	R
1.70	3/14/2018	11:29	7.8	11	9.7	200	190	Wet	R
2.02	3/14/2018	11:40	7.6	11	9.6	250	200	Wet	R
0.89	4/11/2018	11:33	8.0	14	10	200	410	Dry	R
1.70	4/11/2018	11:46	7.8	15	9.1	150	130	Dry	R
2.02	4/11/2018	11:57	7.9	13	9.5	170	260	Dry	R
0.89	5/9/2018	10:30	8.1	17	8.9	1500	690	Dry	R
1.70	5/9/2018	10:18	7.9	20	7.7	1500	270	Dry	R
2.02	5/9/2018	10:02	7.8	17	8.4	330	200	Dry	R
0.89	6/19/2018	10:30	8.1	20	9.0	390	520	Dry	R
1.70	6/19/2018	10:06	7.8	19	8.0	1800	1700	Dry	R
2.02	6/19/2018	10:15	7.9	21	8.7	2200	1100	Dry	R

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Creek Mile #	Sample Date	Sample Time	pH	Sample Temp (C)	Dissolved Oxygen (mg/l)	Fecal Coliform (CFU/100 ml)	E. Coli (MPN)	Precipitation Event	Status*
<u>Williams Creek</u>									
0.89	7/18/2018	10:50	8.1	22	8.0	1000	440	Wet	R
1.70	7/18/2018	10:17	7.7	21	7.0	1200	310	Wet	R
2.02	7/18/2018	10:30	7.9	22	7.7	2400	440	Wet	R
0.89	8/22/2018	09:39	8.0	21	7.8	2200	310	Wet	R
1.70	8/22/2018	09:28	7.5	21	6.2	5000	1400	Wet	R
2.02	8/22/2018	09:17	7.6	22	6.3	24000	1600	Wet	R
0.89	9/20/2018	10:50	8.1	20	7.8	450	160	Wet	R
1.70	9/20/2018	10:37	7.8	19	6.8	2300	410	Wet	R
2.02	9/20/2018	10:25	8.0	22	7.0	4100	390	Wet	R
0.89	10/1/2018	11:07	8.0	20	8.3	2500	730	Dry	R
1.70	10/1/2018	10:53	8.0	21	7.6	3500	730	Dry	R
2.02	10/1/2018	10:41	8.1	21	7.4	4600	310	Dry	R
0.89	11/8/2018	09:23	8.1	15	8.8	130	86	Wet	R
1.70	11/8/2018	09:41	7.7	15	7.6	510	240	Wet	R
2.02	11/8/2018	09:52	7.9	16	7.6	360	190	Wet	R
0.89	12/14/2018	10:21	8.0	12	10	72	38	Wet	R
1.70	12/14/2018	09:47	7.6	14	8.0	210	150	Wet	R
2.02	12/14/2018	10:03	7.8	14	8.3	120	96	Wet	R

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Water Quality Monitoring
Report

Spill Impact Sampling Results Water Quality Monitoring Program

Knoxville Utilities Board
Water Quality Laboratory
Kevin Keaton, Lab Supervisor
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Knoxville, Tennessee 37915
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Event Date 2/22/2018
Street Address 4804 Western Ave
Description Blockage - Roots and Grease

Wet Weather Conveyance to Third Creek

Estimated unrecovered volume 400 gallons

Sampling Notes: No Priority Pollutants were known to be present in any SIU discharge upstream of this SSO.

Precipitation (McGhee-Tyson Airport)	Date	Total - Day of Event	Total - Prior 4 Days
	2/22/2018	0	0.19

Sample Location	Sample Date	Sample Time	Dissolved Oxygen	Temperature (Celsius)	pH	Fecal Coliform	<i>E-Coli</i> (MPN)
Upstream of SSO Discharge	2/22/2018	13:40	8.9	18	7.4	36	81
Downstream of SSO Discharge	2/22/2018	14:00	9.1	18	7.6	270	580



Water Quality Monitoring
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Spill Impact Sampling Results
Water Quality Monitoring Program

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Event Date 5/15/2018
Street Address 156 Keeble Ave
Description Blockage - Roots

Wet Weather Conveyance to Goose Creek

Estimated unrecovered volume 1600 gallons

Sampling Notes: No Priority Pollutants were known to be present in any SIU discharge upstream of this SSO.

Precipitation (McGhee-Tyson Airport)	Date	Total - Day of Event	Total - Prior 4 Days
	5/15/2018	0.04	0.04

Sample Location	Sample Date	Sample Time	Dissolved Oxygen	Temperature (Celsius)	pH	Fecal Coliform	E-Coli (MPN)
Upstream of SSO Discharge	5/16/2018	08:35	7.9	18	7.8	2500	1400
Downstream of SSO Discharge	5/16/2018	08:47	7.6	18	7.8	11000	> 2400
Upstream of SSO Discharge	5/22/2018	09:17	7.9	19	7.8	2800	1100
Downstream of SSO Discharge	5/22/2018	09:27	7.9	18	7.9	3800	> 2400
Upstream of SSO Discharge	6/6/2018	09:21	8.4	17	7.9	1500	650
Downstream of SSO Discharge	6/6/2018	09:32	8.4	18	7.9	3800	> 2400
Upstream of SSO Discharge	7/16/2018	10:41	7.3	22	7.9	1700	1000
Downstream of SSO Discharge	7/16/2018	10:53	7.3	21	7.9	2000	1700



Water Quality Monitoring
Report

Spill Impact Sampling Results Water Quality Monitoring Program

Knoxville Utilities Board
Water Quality Laboratory
Kevin Keaton, Lab Supervisor
835 East Jackson Avenue
Knoxville, Tennessee 37915
(865) 594-8206 Fax: (865)594-8245

Event Date 8/5/2018
Street Address 404 Oak Park Drive
Description Construction Failure - Dig In

Tributary to First Creek

Estimated unrecovered volume 600 gallons

Sampling Notes: No Priority Pollutants were known to be present in any SIU discharge upstream of this SSO.

Precipitation (McGhee-Tyson Airport)	Date	Total - Day of Event	Total - Prior 4 Days
	8/5/2018	0	1.57

Sample Location	Sample Date	Sample Time	Dissolved Oxygen	Temperature (Celsius)	pH	Fecal Coliform	<i>E-Coli</i> (MPN)
Upstream of SSO Discharge	8/6/2018	08:45	7.7	18	7.7	1200	370
Downstream of SSO Discharge	8/6/2018	08:27	7.8	19	7.7	1500	520



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Event Date 8/28/2018
Street Address 1105 Bridge Ave
Description Blockage - Grease

Ground to Storm Drain to Second Creek

Estimated unrecovered volume 150 gallons

Sampling Notes: No Priority Pollutants were known to be present in any SIU discharge upstream of this SSO.

Precipitation (McGhee-Tyson Airport)	Date	Total - Day of Event	Total - Prior 4 Days
	8/28/2018	0	0

Sample Location	Sample Date	Sample Time	Dissolved Oxygen	Temperature (Celsius)	pH	Fecal Coliform	E-Coli (MPN)
Upstream of SSO Discharge	8/28/2018	16:00	7.9	30	7.8	1600	650
Downstream of SSO Discharge	8/28/2018	16:15	6.3	24	7.7	1600	200



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Event Date 10/1/2018
Street Address 4407 Tynemouth Drive
Description Blockage - Roots and Grease

Ground to Beaman Branch to Holston River

Estimated unrecovered volume 4250 gallons

Sampling Notes: No Priority Pollutants were known to be present in any SIU discharge upstream of this SSO.

Precipitation (McGhee-Tyson Airport)	Date	Total - Day of Event	Total - Prior 4 Days
	10/1/2018	0	0

Sample Location	Sample Date	Sample Time	Dissolved Oxygen	Temperature (Celsius)	pH	Fecal Coliform	<i>E-Coli</i> (MPN)
Upstream of SSO Discharge	10/2/2018	09:12	5.9	20	7.3	280	190
Downstream of SSO Discharge	10/2/2018	09:41	5.4	20	7.9	910	650



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Event Date 11/26/2018
Street Address 4923 Ball Road
Description Pump Station Failure - Software Malfunction Caused by Electrical Failure

Ground to Grassy Creek

Estimated unrecovered volume 800000 gallons

Sampling Notes: No Priority Pollutants were known to be present in any SIU discharge upstream of this SSO.

Precipitation (McGhee-Tyson Airport)	Date	Total - Day of Event	Total - Prior 4 Days
	11/26/2018	0.04	0.48

Sample Location	Sample Date	Sample Time	Dissolved Oxygen	Temperature (Celsius)	pH	Fecal Coliform	<i>E-Coli</i> (MPN)
Upstream of SSO Discharge	11/26/2018	10:33	9.1	10	7.6	340	170
Downstream of SSO Discharge	11/26/2018	10:20	8.7	10	7.9	12000	> 2400
Upstream of SSO Discharge	11/29/2018	08:59	11	5	7.9	360	330
Downstream of SSO Discharge	11/29/2018	08:47	10	6	7.8	640	290



Water Quality Monitoring
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Event Date 12/26/2018
Street Address 1000 State Street
Description Blockage - Grease

Ground to Catch Basin to Storm Drain to First Creek

Estimated unrecovered volume 180 gallons

Sampling Notes: No Priority Pollutants were known to be present in any SIU discharge upstream of this SSO.

Precipitation (McGhee-Tyson Airport)	Date	Total - Day of Event	Total - Prior 4 Days
	12/26/2018	0	0.04

Sample Location	Sample Date	Sample Time	Dissolved Oxygen	Temperature (Celsius)	pH	Fecal Coliform	<i>E-Coli</i> (MPN)
Upstream of SSO Discharge	12/26/2018	10:56	11	9	7.9	200	160
Downstream of SSO Discharge	12/26/2018	10:23	10	10	7.9	580	410

Knoxville Utilities Board

Water Quality Monitoring Program

Investigative Water Quality Monitoring Report 1/1/18 - 12/31/18

Table 1: Goose Creek Investigative Sampling

Location	Collection Date	Weather	Dissolved Oxygen	Water Temp	Water pH	Fecal Coliform	<i>E. coli</i>
			(mg/L)	(°C)	s.u.	(CFU/ 100mL)	(MPN)
Left fork above 1.19E	2/27/2018	Wet	9.6	14	7.6	330	610
	3/29/2018	Wet	9.3	16	7.8	350	440
	5/15/2018	Dry	6.4	18	7.7	> 60000	> 2400
Right fork above 1.19E	5/15/2018	Dry	8.0	18	7.9	2900	1000

Appendix E

Grease-Related SSO Summary Table

Grease-Related SSOs

	Date			Building	Grease	Grease	Grease	Grease, Roots	Grease &	Customers	Residential Letters	Cans, Bags, and	Commercial	# of Feet	Blockage Abatement*
	of SSO	Address	SSO	Backup	Only	& Roots	& Debris	& Debris	I & I	Contributing to SSO	Mailed	Spatulas Mailed	Inspections	Cleaned	Frequency
1	2/11/2018	701 Kentwood Rd Manholes 8-47, 8-46, and 7-33	Yes	-	-	-	-	-	Yes	227	216	216	11	500	6 Month
2	2/11/2018	6103 Manchester Rd Manhole 66-28	Yes	-	-	Yes	-	-		18	18	18	0	200	24 Month
3	2/14/2018	1020 Cedarwood St Manhole 29-135	Yes	-	-	-	Yes	-	-	105	94	94	11	433	24 Month
4	2/17/2018	6173 McMillan Creek Dr Lateral Cleanout	Yes	-	-	-	Yes	-	-	139	139	139	0	415	12 Month
5	3/1/2018	2535 Holbrook Dr Manhole 18-29	Yes	-	Yes	-	-	-	-	343	339	339	4	456	24 Month
6	3/27/2018	1630 Henrietta Ave Manhole 6-33	Yes	-	-	-	Yes	-	-	15	14	14	1	375	48 Month
7	3/30/2018	4429 Oakbank Ln 4429 Lateral cleanout and BBU	Yes	Yes	Yes	-	-	-	-	154	154	154	0	700	3 Month
8	4/2/2018	1218 Cassel Dr Manholes 14-167 and 14-168	Yes	-	Yes	-	-	-	-	209	209	209	0	200	24 Month
9	4/11/2018	600 Citico St Manhole 60-4	Yes	-	Yes	-	-	-	-	8	4	4	4	430	3 Month
10	7/18/2018	1409 Maryville Pike Manhole 27-117 and Cleanout	Yes	-	Yes	-	-	-	-	423	418	418	5	250	24 Month
11	8/8/2018	2211 Piney Grove Church Rd Manhole 63	Yes	-	Yes	-	-	-	-	574	572	572	2	530	24 Month
12	8/28/2018	1105 Bridge Ave Manhole 10-31	Yes	-	Yes	-	-	-	-	219	218	218	1	200	24 Month
13	10/1/2018	4407 Tynemouth Dr Manhole 80-45	Yes	-	-	Yes	-	-	-	73	73	73	0	675	6 Month
14	10/17/2018	6549 Creekhead Rd Manhole 49-2	Yes	-	Yes	-	-	-	-	633	633	633	0	700	12 Month
15	12/10/2018	3807 Middlebrook Pike Manhole 16-19	Yes	-	Yes	-	-	-	-	160	159	159	1	300	48 Month
16	12/26/2018	1000 State St Manhole 3-65	Yes	-	Yes	-	-	-	-	155	60	60	90	185	48 Month
										3455	3320	3320	130		

*KUB performs inspections, hydraulic cleaning, and/or root removal on a routine frequency for all locations under Blockage Abatement

Appendix F

Infrastructure Rehabilitation Projects

Project	Plant	Watershed	Basin	Description	Status
Papermill 18" Point Repair	Fourth Creek	Fourth Creek	33	Shortline Sewer Replacement Project consists of localized sewer replacement of higher priority sewer mains.	Construction Project Completed 01/25/18
Volunteer Blvd Shortline	Kuwahee	Second Creek	35a	Shortline Sewer Replacement Project consists of localized sewer replacement of higher priority sewer mains.	Construction Project Completed 02/02/18
Loves Creek - Eastwood Trunkline CN 1004	Loves Creek	Loves Creek	63	Trunkline Rehabilitation/Replacement.	Construction Project Completed 03/23/18
Minibasin 10D1	Kuwahee	Second Creek	10	Mini-Basin Sewer Replacement Project consists of comprehensive analysis of inspection data from the area to determine appropriate upgrades.	Construction Project Completed 03/29/18
Mini-Basin 16D1	Kuwahee	First Creek	16	Mini-Basin Sewer Replacement Project consists of comprehensive analysis of inspection data from the area to determine appropriate upgrades.	Construction Project Completed 04/01/18
Mini-Basin 32A2	Fourth Creek	Fourth Creek	32a	Mini-Basin Sewer Replacement Project consists of comprehensive analysis of inspection data from the area to determine appropriate upgrades.	Construction Project Completed 06/05/18
Sanders Ln, Shrewsbury, Grata Sewer Repl CN 586	Kuwahee, Loves Creek	Williams Creek, Third Creek, Loves Creek	19, 11, 67, 20	Shortline Sewer Replacement Project consists of localized sewer replacement of higher priority sewer mains.	Construction Project Completed 06/16/18
UGC - Walter Reed Lane Sewer Main Replacement	Kuwahee	South Knox	39	Shortline Sewer Replacement Project consists of localized sewer replacement of higher priority sewer mains.	Construction Project Completed 06/18/18
South Haven Phase 1 CN 929	Kuwahee	South Knox	40	Trunkline Rehabilitation/Replacement.	Construction Project Completed 06/19/18
Mini-basin 14B1	Kuwahee	Second Creek	14	Mini-Basin Sewer Replacement Project consists of comprehensive analysis of inspection data from the area to determine appropriate upgrades.	Construction Project Completed 06/26/18
Third Creek Mini-Basin 13A1 Ph 1 CIPP CN 1205	Kuwahee	Third Creek	13	Shortline Sewer Replacement Project consists of localized sewer replacement of higher priority sewer mains.	Construction Project Completed 07/13/18
Three Points PS Upgrades	Eastbridge	Eastbridge	114	Pump station and appropriate force main upgrade.	Construction Project Completed 07/26/18
Loves Creek - Holston Hills Trunkline CN 965	Loves Creek	Loves Creek	26	Trunkline Rehabilitation/Replacement.	Construction Project Completed 09/21/18
Schaad Rd PS CN 1015	Kuwahee	Third Creek	50	Pump station and appropriate force main upgrade.	Construction Project Completed 10/18/18
Mini-Basin 16C1	Kuwahee	First Creek	16	Mini-Basin Sewer Replacement Project consists of comprehensive analysis of inspection data from the area to determine appropriate upgrades.	Construction Project Completed 11/09/18
Isabella Towers WW Shortline & Waterline inclds Beck Place & East Bridge CN 1198	Kuwahee, Eastbridge	Williams Creek, Eastbridge, First Creek, South Knox	31, 105, 2, 40	Shortline Sewer Replacement Project consists of localized sewer replacement of higher priority sewer mains.	Construction Project Completed 11/21/18
National Drive Pump Station CN 1189 (lump Sum)	Kuwahee	Williams Creek	60	Pump station and appropriate force main upgrade.	Construction Project Completed 12/06/18
Jackson Ave Ramps Utilities Relocation CN 1276	Kuwahee	First Creek	30	Rehab/Replace in project area.	Construction Project Completed 01/02/19
Magnolia Ave Water & Wwater - Phase 1 CN 1215	Kuwahee	First Creek	24	Rehab/Replace in project area.	Construction Project Underway - Estimated Completion 02/20/19
Papermill Plaza Shortline CN 1402	Fourth Creek	Fourth Creek	33	Shortline Sewer Replacement Project consists of localized sewer replacement of higher priority sewer mains.	Construction Project Underway - Estimated Completion 03/19/19
Mini-basin 38B5	Kuwahee	Third Creek	38	Mini-Basin Sewer Replacement Project consists of comprehensive analysis of inspection data from the area to determine appropriate upgrades.	Construction Project Underway - Estimated Completion 03/31/19
John Sevier Force Main CN 1147	Loves Creek	Loves Creek	61	Pump station and appropriate force main upgrade.	Construction Project Underway - Estimated Completion 04/05/19
Magnolia Ave Water & Wwater - Phase 2 CN 1321	Kuwahee	First Creek	24	Rehab/Replace in project area.	Construction Project Underway - Estimated Completion 04/22/19
South Haven Sewer Trunkline Phase 2 CN 1377	Kuwahee	South Knox	40	Trunkline Rehabilitation/Replacement.	Construction Project Underway - Estimated Completion 05/01/19
Mini-Basin 05A3	Kuwahee	Second Creek	5	Mini-Basin Sewer Replacement Project consists of comprehensive analysis of inspection data from the area to determine appropriate upgrades.	Construction Project Underway - Estimated Completion 05/29/19
First, Williams, & Third Creek Sewer Shortline Rehabilitation	Kuwahee	First Creek, Williams Creek	24, 19, 25	Shortline Sewer Replacement Project consists of localized sewer replacement of higher priority sewer mains.	Construction Project Underway - Estimated Completion 07/10/19
Scottish Pump Station Repl CN 1014	Kuwahee	South Knox	39	Pump station and appropriate force main upgrade.	Construction Project Underway - Estimated Completion 07/28/19
Pelham Pump Station CN 546	Kuwahee	Williams Creek	19	Pump station and appropriate force main upgrade.	Construction Project Underway - Estimated Completion 08/26/19