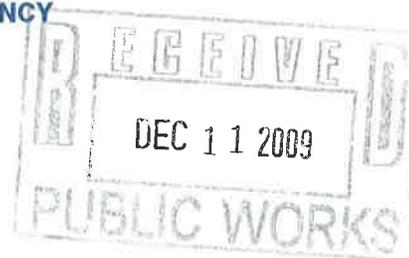




UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4  
ATLANTA FEDERAL CENTER  
61 FORSYTH STREET  
ATLANTA, GEORGIA 30303-8960

DEC 08 2009



CERTIFIED MAIL 70091680000146900650  
RETURN RECEIPT REQUESTED

Mr. Gary Cinder, P.E.  
Director, Oak Ridge Public Works Department  
P.O. Box 1  
Oak Ridge, Tennessee 37831-0001

Re: Compliance Inspection Report for the October 27 - October 28, 2009 Inspection  
NPDES Permit Nos. TN0024155

Dear Mr. Cinder:

The U.S. Environmental Protection Agency (EPA), Region 4 and the Tennessee Department of Environment and Conservation conducted a Compliance Evaluation Inspection (CEI) of the City of Oak Ridge's Sewage Collection and Transmission System on October 27 and 28, 2009. The objective of the CEI was to assess the City's compliance with the Clean Water Act and to evaluate reported Sanitary Sewer Overflows. Additionally, EPA examined the City's Management, Operation, and Maintenance Programs. The inspection results have been summarized in the enclosed Compliance Inspection Report.

If you have specific questions about the inspection report, please contact Mr. Dennis Sayre at (404) 562-9756.

Sincerely,

César Zapata, Chief  
West NPDES Enforcement Section  
Water Protection Division

Enclosure

cc: John West, Manager  
Tennessee Department of Environment and Conservation - Knoxville



United States Environmental Protection Agency  
Washington, D.C. 20460

# Water Compliance Inspection Report

## Section A: National Data System Coding (i.e., PCS)

<b>Transaction Code</b> N 5	<b>NPDES</b> TN0024255	<b>yr/mo/day</b> 10/27/2009	<b>Inspection Type</b> &	<b>Inspector</b> J	<b>Facility Type</b> 1
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Remarks

<b>Inspection Work Days</b> 2.0	<b>Facility Self Monitoring Evaluation Rating</b> 2	<b>B1</b> N	<b>QA</b> N	<b>Reserved</b>
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## Section B: Facility Data

<b>Name and Location of Facility Inspected (For industrial users discharging to POTW, also include POTW name and NPDES permit number)</b> City of Oak Ridge Sewage Collection and Transmission System	<b>Entry Time/Date</b> 10/27/09 4:45 p.m.	<b>Permit Effective Date</b> 10/1/2008
	<b>Exit Time/Date</b> 10/28/09, 13:25 p.m.	<b>Permit Expiration Date</b> 08/31/2013

**Names of On-Site Representative(s)/Title(s)/Phone and Fax No's**  
 Scott Jackson, Public Works Operations Manager, 865-425-1870  
 Ken Glass, Public Works, Env & Regulatory Compliance Coord, 865-425-1610  
 Robert Currier, Public Works, Wastewater Plant Ops Supervisor, 865-425-1642

**Other Facility Data (e.g., SIC NAICS, and other descriptive information)**

**Name, Address of Responsible Official/Title/Phone and Fax No's**

Gary Cinder, P.E., Director of Public Works  
 200 Monterey Road/P.O. Box 1  
 Oak Ridge, Tennessee

**Contacted**  
 Yes  No

## Section C: Areas Evaluated During Inspection (Check only those areas evaluated)

<input type="checkbox"/>	Permit	<input type="checkbox"/>	Self-Monitoring Program	<input type="checkbox"/>	Pretreatment	<input type="checkbox"/>	MS4
<input type="checkbox"/>	Records/Reports	<input type="checkbox"/>	Compliance Schedules	<input type="checkbox"/>	Pollution Prevention	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	Facility Site Review	<input type="checkbox"/>	Laboratory	<input type="checkbox"/>	Storm Water	<input type="checkbox"/>	
<input type="checkbox"/>	Effluent/Receiving Waters	<input checked="" type="checkbox"/>	Operations & Maintenance	<input type="checkbox"/>	Combined Sewer Overflow	<input type="checkbox"/>	
<input type="checkbox"/>	Flow Measurement	<input type="checkbox"/>	Sludge Handling/Disposal	<input checked="" type="checkbox"/>	Sanitary Sewer Overflow	<input type="checkbox"/>	

## Section D: Summary of Findings/Comments

(Attach additional sheets of narrative and checklists, including Single Event Violation codes, as necessary)

SEV Codes	SEV Description
A0020	WW SSO - Discharge to Waters
A0026	WW SSO - Overflow to Dry Land or Building Backup

<b>Name(s) and Signature(s) of Inspector(s)</b> Dennis Sayre	<b>Agency/Office/Phone and Fax Numbers</b> West NPDES Enf Section/CWEB/WPD/EPA 404-562-9756	<b>Date</b> 12/3/2009
<b>Signature of Management QA Reviewer</b> Cesar Zapata, Chief	<b>Agency/Office/Phone and Fax Numbers</b> West NPDES Enf Section/CWEB/WPD/EPA 404-562-9744	<b>Date</b> 12/3/09

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**  
**Region 4**  
**Water Protection Division**  
**Clean Water Enforcement Branch**



**RECONNAISSANCE INSPECTION REPORT**

**Oak Ridge Public Works Department**  
Oak Ridge, Tennessee  
NPDES Permit No. TN0024155

**Facility Address:**  
200 Monterey Road  
Oak Ridge, Tennessee 37831

**Inspection Dates:**  
October 27 - 28, 2009

**Inspectors:**  
Dennis Sayre, Enforcement Officer, EPA Region 4  
Laurie Jones, Enforcement Officer, EPA Region 4  
John West, Manager, TDEC-Knoxville  
Michael Atchley, Environmental Specialist, TDEC-Knoxville  
Larry Bonds, Environmental Specialist, TDEC-Knoxville

**Inspection Report Prepared by:**  
Dennis Sayre

December 3, 2009

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## ABBREVIATIONS AND ACRONYMS

CTS	Collection and Transmission System
CWA	Clean Water Act
EPA	United States Environmental Protection Agency
TDEC	Tennessee Department of Environment and Conservation
GIS	Geographic Information System
GPM	Gallons per Minute
I/I	Infiltration and Inflow
IS	Information System
LIFT Station	Lift Station
NPDES	National Pollutant Discharge Elimination System
MGD	Million Gallons per Day
OM&M	Operation, Management, and Maintenance
Value Study	Value Study
WTP	Wastewater Treatment Plant

# COMPLIANCE INSPECTION REPORT

Oak Ridge Public Works Department, Collection and Transmission System, October 27-28, 2009

## I. OVERVIEW

Oak Ridge Public Works Department (Public Works) provides sanitary sewer and drinking water services for residential, commercial and industrial entities within the City of Oak Ridge (the City), Tennessee. Regarding the sanitary sewer services, the City's Public Works Department is responsible for the operation and maintenance of two (2) wastewater treatment facilities, approximately 210 miles of sewer lines, thirty three (33) pump stations, approximately 5,700 manholes and other sewer related appurtenances serving approximately 12,500 customer accounts.

On November 20, 2008, the Environmental Protection Agency (EPA) sent a Information Request Letter pursuant to Section 308 of the CWA (308 Letter) to the City requesting information related to Sanitary Sewer Overflows (SSO) from the sewer system. EPA received the City's response, dated December 15, 2008, to EPA's 308 Letter on December 22, 2008.

EPA conducted a Compliance Evaluation Inspection (CEI) of the City's sewer system on October 27 and 28, 2009. The purpose of this CEI was to evaluate compliance with the CWA as it relates to SSOs from the sewer system and to assess the City's Management, Operations and Maintenance (MOM) programs. Additionally, the purpose of this compliance inspection was to examine the causes and potential corrective actions for SSOs from the sewer system and related pump stations.

During the inspection, EPA requested written documentation of the City's MOM programs, including inspection and maintenance records, interviewed management personnel and visited various sites in the wastewater collection and transmission system (CTS) including: the East Plant Lift Station (LS), the Emory Heights LS, constructed bypasses located at 100 Dresden Road and the Christian Outreach Academy at 535 Oak Ridge Turnpike, and several manholes. This report describes EPA's findings, and provides an initial analysis of SSOs from the sewer system. In this report, EPA also identifies areas that need to be addressed and presents preliminary recommendations.

## II. OBJECTIVES

The specific objectives of the inspection were to assess the City's compliance with the CWA, evaluate reported SSOs, and assess the MOM programs. Additionally, EPA examined the causes of SSOs in the City's sewer system.

## III. INVESTIGATION METHODS

The investigation included:

- Review of the Integrated Compliance Information System - National Pollutant Discharge Elimination System (ICIS-NPDES) federal database, state documents and

# COMPLIANCE INSPECTION REPORT

Oak Ridge Public Works Department, Collection and Transmission System, October 27-28, 2009

the NPDES Permit;

- Review of the City's December 15, 2008 response to EPA's 308 Letter;
- Interviews with the City's Public Works personnel;
- Review of the City's records/documents; and,
- Visual inspection.

## IV. REGULATORY SUMMARY

The Tennessee Department of Environment and Conservation (TDEC) is authorized under the Clean Water Act (CWA) to implement the National Pollutant Discharge Elimination System (NPDES) program in Tennessee. The City owns and operates two wastewater treatment plants (WWTPs) and their associated wastewater CTS. The Oak Ridge Sewage Treatment Plant (STP), which is locally named the Turtle Creek WWTP, but it is permitted under the name of Oak Ridge STP, is classified as a major treatment plant (30 MGD capacity) and is covered under Tennessee's NPDES Permit No. TN0024155 (the Permit). The Permit allows discharge from its wastewater treatment plant into the East Fork Poplar Creek, the Clinch River in the Lower Clinch Watershed. The Clinch River WWTP is classified as a minor treatment plant (0.01 MGD capacity) and is covered under Tennessee's NPDES Permit No. TN0024171, which allows discharge from its wastewater treatment plant into the Clinch River; also in the Lower Clinch Watershed. The East Fork Poplar Creek is listed as impaired for *E. Coli* and siltation and is currently under a state approved Total Maximum Daily Load (TMDL) limit. The Clinch River is currently impaired for Mercury, pesticides (Chlordane), and Polychlorinated Bi-phenols (PCBs). Waterways that are directly affected by the City's sewer shed are Ernie's Creek, listed as impaired for *E. Coli*, four unnamed tributaries leading to the Milton Hill Reservoir on the northeast boundary of the City and several unnamed tributaries of Poplar Creek. *E. Coli* (*Escherichia coli*) indicates the presence of fecal bacteria and may be a strong indication of the presence of human waste in the waterway.

## V. INSPECTION SUMMARY AND FINDINGS

EPA conducted a CEI of the City's sewer system on October 27 and 28, 2009 to evaluate compliance with the CWA. Particular attention was given to the City's SSO assessment and reports to evaluate any MOM programs used by the City.

### A. Analysis of SSOs

Discharges to waters of the United States from municipal sewer systems are prohibited unless authorized by an NPDES permit. In addition, overflows from the sewer system that do not reach waters of the United States can be indicative of a failure to comply with the proper operation and maintenance provisions of Part 2, Section 2.1.4 of the NPDES permit.

The City submitted to EPA information related to sanitary sewer overflows (SSOs) that

## COMPLIANCE INSPECTION REPORT

Oak Ridge Public Works Department, Collection and Transmission System, October 27-28, 2009

occurred from January 2004 through December 2008. EPA analyzed the information and compiled results based on total number of overflows, total and average volume of overflows per year per 100 miles and the average volume per SSO. EPA also categorized the SSOs by cause which included six categories: Blockage, Rain, Electrical (power failure at the pump station), Mechanical, Damaged Pipe, and Unknown.

The average annual SSO volume from the sewer system and pump stations reported from January 2004 through October 2008 was approximately 650,000 gallons per year of sewage over the five year period. The table below shows the annual volume summary from 1/2004 to 10/2008.

Annual Volume Summary	
Year	Gallons
2004	569,005
2005	70,224
2006	1,971,590
2007	540,471
2008	105,695
<b>Total</b>	<b>3,256,985</b>

Of the volumes reported to EPA in the 308 Letter response, approximately 2.2 million gallons, or 67% of the total volume reported, was attributed to wet weather. Blockage is typically attributed to the presence of roots and grease, however on two separate overflow records the cause was listed as debris in the pipe. The table below is a summary of causes.

Causation summary			
Cause	No. of SSOs	Volume Reported (gal)	Percent of Volume (%)
Blockage (primarily grease/roots)	74	25,987	>1%
Rain	40	2,170,773	67%
Electrical (pump station)	3	94,800	3%
Mechanical	3	900,000	28%
Damaged Pipe	4	64,300	2%
Unknown	2	1,125	>0.1%
<b>Total</b>	<b>126</b>	<b>3,256,985</b>	<b>100%</b>

The City uses a document called "Sanitary Sewer Bypass Report" to document and report SSOs. Completed copies of these documents were submitted to EPA by the City to satisfy requested information regarding SSOs. Document categories included: Date of Report; Location Data; Flow Data; Cause of Bypass; Remedial Measures; Comments; and Official Use Only (Supervisor Review). None of the reports submitted to EPA were signed by supervisors indicating supervisory review and none of the reports indicated that

## COMPLIANCE INSPECTION REPORT

Oak Ridge Public Works Department, Collection and Transmission System, October 27-28, 2009

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the NPDES Permit;

- Review of the City's December 15, 2008 response to EPA's 308 Letter;
- Interviews with the City's Public Works personnel;
- Review of the City's records/documents; and,
- Visual inspection.

### IV. REGULATORY SUMMARY

The Tennessee Department of Environment and Conservation (TDEC) is authorized under the Clean Water Act (CWA) to implement the National Pollutant Discharge Elimination System (NPDES) program in Tennessee. The City owns and operates two wastewater treatment plants (WWTPs) and their associated wastewater CTS. The Oak Ridge Sewage Treatment Plant (STP), which is locally named the Turtle Creek WWTP, but it is permitted under the name of Oak Ridge STP, is classified as a major treatment plant (30 MGD capacity) and is covered under Tennessee's NPDES Permit No. TN0024155 (the Permit). The Permit allows discharge from its wastewater treatment plant into the East Fork Poplar Creek, a tributary of the Clinch River in the Lower Clinch Watershed. The Clinch River Industrial Park WWTP is classified as a minor treatment plant (0.01 MGD capacity) and is covered under Tennessee's NPDES Permit No. TN0024171, which allows discharge from its wastewater treatment plant into the Clinch River; also in the Lower Clinch Watershed. The East Fork Poplar Creek is listed as impaired for *E. Coli* and siltation and is currently under a state approved Total Maximum Daily Load (TMDL) limit. The Clinch River is currently listed as impaired for Mercury, pesticides (Chlordane), and Polychlorinated Bi-phenols (PCBs). Other waterways that are directly affected by the City's sewer system are Ernie's Creek, listed as impaired for *E. Coli*, four unnamed tributaries leading to the Milton Hill Reservoir on the Clinch River on the northeast boundary of the City and several unnamed tributaries of the East Fork Poplar Creek. *E. Coli* (*Escherichia coli*) indicates the presence of fecal bacteria and may be a strong indication of the presence of human waste in the waterway.

### V. INSPECTION SUMMARY AND FINDINGS

EPA conducted a CEI of the City's sewer system on October 27 and 28, 2009 to evaluate compliance of the CWA. Particular attention was given to the City's SSO assessment and reporting and to evaluate any MOM programs used by the City.

#### A. Analysis of SSOs

Discharges to waters of the United States from municipal sewer systems are prohibited unless authorized by an NPDES permit. In addition, overflows from the sewer system that do not reach waters of the United States can be indicative of a failure to comply with the proper operation and maintenance provisions of Part 2, Section 2.1.4 of the NPDES permit.

The City submitted to EPA information related to sanitary sewer overflows (SSOs) that

## COMPLIANCE INSPECTION REPORT

Oak Ridge Public Works Department, Collection and Transmission System, October 27-28, 2009

an oral or written report was made to TDEC for the recorded overflow. Recording the destination of an overflow is not a required field for this form; only 10 of the 126 Sanitary Sewer Bypass Reports recorded sewage entering waters. Consequently, this report may not be a reliable source in determining whether pollution from these overflows entered waters of the United States.

Copies of Monthly Bypass/Overflow Reports made to TDEC by the City were supplied to EPA by TDEC for the period covering January 1, 2007 to October 30, 2009. This document is what TDEC uses to maintain SSO report records from permitted publically owned treatment works (POTWs). Report comparisons were made for the period covering January 1, 2007 to October 31, 2008 between SSO/Bypass reports made to TDEC by the City and SSOs reported to EPA as a result of the 308 Letter information request. The following observations were made when comparing records supplied to EPA by the City to those supplied to EPA by TDEC:

Summary of SSOs with no regulatory report record					
Date	Address	Volume	Comments	Cause Category	Location Information
SSO/Bypass not reported to TDEC					
4/19/2007	131 Marquette Rd	36,000	rain	rain	W5 MH Mini System
SSO/Bypass not reported to EPA in the City's 308 Letter response					
4/3/2007	120 Badger Road	60	debris in line	blockage	MH 353-1
5/3/2007	111 E. Madison Road	22	pipe damage	damaged pipe	MH D431
5/9/2007	WWTP	83,340	valve controller quit working	mechanical	Aeration Influent Channel
6/10/2007	190 California Avenue	30	debris in line	blockage	MH C-21-3
8/4/2007	WWTP	75	debris in line	blockage	Return sludge well
8/5/2007	242 Jefferson Avenue	45	grease	blockage	MH D-9-15
8/23/2007	WWTP	12,155	grease clogged the screens	blockage	Screening bldg
12/2/2007	136 Balboa Circle	30	roots	blockage	MH K-22-9
12/4/2007	East Sewer Plant	45	roots	blockage	MH G22-18
9/30/2008	93 E. Pasadena Road	30	roots	blockage	MH DAN-4
Total Volume:		131,832		blockage	

### Findings and Recommendations:

EPA could not accurately assess SSO history largely due to the inconsistencies discovered in reporting history. Some of these inconsistencies include; 1) Lack of evidence that the City's management reviewed any of the City's Sanitary Sewer Bypass Reports; 2) Inconsistencies found in SSO/Bypass reporting to TDEC and to EPA; and 3) Visual inspection findings.

EPA recommends that the City evaluate and amend their SSO discovery, recording, and reporting process. All SSOs should be recorded and reported for future reference. Record data should include date, location, cause (grease, roots, blockage), estimated volume, ultimate destination (river, storm gutter, ditch), and corrective actions taken to stop the SSO. Thorough SSO record keeping leaves no doubt as to when and how a spill is reported and evaluating this information on a periodic basis can be a valuable tool in identifying maintenance trends, discovering weaknesses in the system, and planning and

## COMPLIANCE INSPECTION REPORT

Oak Ridge Public Works Department, Collection and Transmission System, October 27-28, 2009

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performing preventive maintenance.

### B. Management Interview

EPA met with the City management and TDEC, Knoxville Environmental Field Office personnel at 8:00 a.m., October 28, 2009. Prior to arrival, EPA requested the City to provide documentation related to the following MOM programs: Grease Control, Root Control, Capacity Assurance, Preventive Maintenance and Inspections, Emergency Response, and Pump Station Back-up Power. The City does not hold any formal written MOM programs. EPA also requested copies of the City ordinances relating to Fats, Oil, and Grease (FOG) Control and Sewer Use Ordinances. No City ordinance documents were produced relating to FOG control although grease trap code enforcement is mentioned in the City's Sewer Use Ordinance, according to City personnel.

EPA's SSO analysis and findings were discussed in detail with the City management. EPA inquired about each program listed above to determine whether a formal or non-formal (not in writing) program existed for use to manage various maintenance and operations needs of the CTS. The City personnel indicated that no formal written program existed for the management team but the City Engineering Department plans all maintenance requirements. No Engineering Department personnel were present during the interview. The City personnel stated that the Engineering Department determines when and where to work in the collection system.

Initial information provided by the City revealed the existence of ten (10) constructed bypasses within the CTS. The City management personnel stated that none of the constructed bypasses have experienced an overflow within the past couple of years.

City field technicians use an "Overflow Log" to record site inspections of some of the constructed overflows and points within the system that are known to experience overflows. The City personnel stated that these overflow inspection points are visited daily or every other day.

### C. Site Inspection

EPA performed a site inspection on two pump stations; the East Plant Lift LS located on Cairo Road and the Emory Heights LS located on Coe Road; two constructed bypasses located at 100 Dresden Road and at the Christian Outreach Academy located at 535 Oak Ridge Turnpike. EPA and State inspectors and City personnel also visited two separate gravity pipe interceptor locations; one section is located behind the Big Lots at 250 S. Illinois Avenue and one section located between the Van Hicks Housing Complex and Robertsville Middle School. Both sections of gravity pipe are running in close proximity to East Fork Poplar Creek or a direct tributary.

The East Plant LS is a 4 MGD pump station. A permanent emergency generator is

## COMPLIANCE INSPECTION REPORT

Oak Ridge Public Works Department, Collection and Transmission System, October 27-28, 2009

located on-site, appears to be in good condition and is tested regularly, according to City personnel. The lift station appeared to be well maintained, secure from public access, and kept clean. The manhole located directly before the pump intake of the lift station showed obvious signs of overflowing which was attributed to a recent pump failure at the lift station, according to the City personnel at the site. The flow observed at the lift station was between  $\frac{1}{2}$  and  $\frac{3}{4}$  of the capacity of the gravity pipe which was observed at approximately 11:45 a.m. Figure 1 of Enclosure 1 shows the exterior of the pump station. Figure 2 of Enclosure 1 shows sewage debris and recently applied fill dirt around the manhole at the East Plant LS as a result of soil erosion around the crown of the manhole. The alarm was tested on-site and was operating properly.

Figures 3 and 4 of Enclosure 1 show the Emory Heights LS at Coe Road. The Emory Heights LS is a 180 GPM (0.26 MGD) lift station that serves the Emory Heights residential subdivision. This lift station uses two wet well fluid level depth indicators. The primary system uses an inductance system to engage the pumps and alert the treatment plant of a malfunction (high fluid levels); the secondary system uses traditional float switches. The alarm was tested on-site. An alarm at the treatment plant was activated as a result of high fluid levels in the wet well caused by the City's technician to test the alarm. The telemetry alarm system connected to the operator's panel at the Turtle Creek WWTP appeared to be operating properly for the primary float level system; however, the visual alarm at the pump station was inoperative for both the primary and back-up fluid level indicators. The float switch alarm appeared to be inoperative. The technician on-site inspected the control panel and wiring and discovered that the float system was not connected to the alarm relay on the control panel. The cause of the primary visual alarm malfunction was not determined during the course of the inspection.

Enclosure 2 displays manholes and gravity sewer pipe sections that were inspected in Oak Ridge. Manhole #1 through #3 are located behind the Big Lots located on S. Illinois Avenue; these numbers are used for the purposes of this report and are not numbers used by the City. On October 27, 2009, at approximately 5:00 p.m., EPA inspectors independently inspected various manhole lids in the W18A mini-sewer system; Figure 6 of Enclosure 2 displays a portion of the City's sewershed indicating section W18A. Approximately 15 manhole lids were inspected on the evening of October 27, 2009. Medium to light rain had been occurring in the City before EPA's arrival and during the evening of October 27th. Figure 4 of Enclosure 2 shows sewage debris caught between the manhole lid and the crown seal of Manhole #3 discovered on the evening of the 27<sup>th</sup>, indicating the occurrence of a recent SSO strong enough to lift the lid off of the manhole crown. Figure 5 of Enclosure 2 shows the same manhole on the following day. The interior section of the manhole shows debris lodged on the upper access ladder handle. On October 28<sup>th</sup>, EPA and TDEC inspectors, accompanied by City personnel, inspected the manholes (#1 through #3) located behind Big Lots and one manhole located between the Van Hicks housing area and Richardsville Middle School, located in the W18D area of the chart in Figure 6, Enclosure 2. Each of the manholes inspected appeared to be in good condition and had been lined/sealed with a poly fiber lining in the recent past. Of

## COMPLIANCE INSPECTION REPORT

Oak Ridge Public Works Department, Collection and Transmission System, October 27-28, 2009

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note, the debris lodged in the manhole crown of Manhole #3 was removed prior to EPA/TDEC arrival on the morning of October 28<sup>th</sup>. Also noted was the absence of any reporting records of the SSO from Manhole #3 when reviewing records obtained from TDEC.

Enclosure 3 shows two unpermitted outfalls (constructed bypasses) that are located within the City's sewershed. The City reported to have 10 constructed bypasses at the time of the 308 Letter information request. One constructed bypass has reportedly been eliminated. Figures 1 and 2 of Enclosure 3 shows the unpermitted outfall located at 100 Dresden Road. Figure 3 is the constructed bypass located at the Christian Outreach Academy. The pipe end shown in Figure 2 outfalls into a roadside ditch that leads to a larger ditch or small stream that retains water and is tributary to the Clinch River. Figures 1 and 3 of Enclosure 3 display the outfall pipe openings under the bypass access lids; note the sewage debris located in the pipe. Both of these outfall's intakes are located within one foot of the surcharge level of the sewer gravity pipe. These observations were made between 11:30 a.m. and 12:30 p.m. in the absence of rain. The City management personnel contend that all the constructed outfalls have been inactive (dry) for the past several years.

### Findings and recommendations:

The City personnel that assisted with the physical/visual inspection of the CTS were very helpful, courteous and displayed a good working knowledge of the system. Deficiencies noted include:

- 1) Failure of the visual alarm system at the Emory Heights LS indicates that not all aspects of pump station operations are inspected routinely and is indicative of a lack of an official pump station preventive maintenance plan;
- 2) The SSO that had reportedly occurred at the East Plant LS due to a pump failure may also be indicative of the absence of an official, written pump station preventive maintenance plan;
- 3) Sewage debris lodged between the crown and lid of Manhole #3 indicates either a capacity problem or blockage in the interceptor located along East Fork Poplar Creek; it may also be an indication of the presence of excessive inflow and infiltration (I/I) from wet weather;
- 4) The lack of evidence of a report from the City to TDEC for the SSO identified above (from Manhole #3) indicates that the City is not adequately identifying, recording and reporting SSOs, and;
- 5) Despite the City's claims that the constructed bypasses have been dry (has not overflowed) for an extended period of time, sewage debris in the pipe, as shown in Figures 1 and 3 of Enclosure 3, indicate that at least some of them are actively discharging untreated sewage into waters and in areas that may create a public health hazard. All of the constructed bypasses are unpermitted outfalls.

The development and implementation of MOM Programs will aid City personnel to

## COMPLIANCE INSPECTION REPORT

Oak Ridge Public Works Department, Collection and Transmission System, October 27-28, 2009

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avoid, recognize, identify and preemptively correct maintenance problems such as those noted above and enhance their ability to avoid SSOs. The City is strongly encouraged to develop and implement MOM Programs to improve collection system maintenance practices.

Part 2.1.4.a (Proper Operation and Maintenance) of the City's Permit stipulates, "The permittee shall at all times properly operate and maintain all facilities and systems (and related appurtenances) for collection and treatment which are installed or used by the permittee to achieve compliance with the terms and conditions of this permit." The existence of unpermitted outfalls in the form of constructed bypasses within the collection system counteracts the City's ability to achieve compliance with the Permit when untreated sewage is allowed to be released from the collection system, as a function of design, prior to treatment at the WWTP. Observed indications of overflows at the constructed bypasses and SSOs in the system may indicate an I/I problem or a lack of adequate capacity in the collection system, or both. EPA requests the elimination of all unpermitted outfalls/constructed bypasses within the CTS. EPA recommends performing a full system Sanitary Sewer Evaluation Study (SSES) in order to identify and correct I/I sources and to conduct a hydraulic analysis of the system using proven computer modeling programs and sound engineering techniques, including flow measurements and rainfall data to determine the systems ability to operate properly in the absence of constructed bypasses.

### **D. Management, Operation, and Maintenance Programs**

The City does not have a formal MOM Program as outlined in EPA's *Management, Operation and Maintenance, Comprehensive List of Programs for Sewer and Treatment Systems*, (July 2000). Comments provided for programs listed below are based on the interview with the City's Public Works management personnel.

#### **1. Mapping Program**

The City is currently not using advanced automated mapping programs capable of utilizing integrated management planning tools. The Engineering Department maintains the CTS map on traditional drawings using AutoCad. There is no formal written mapping program utilized by the City to ensure map updates and accuracy.

#### **Recommendation:**

Formal Mapping Program documentation should be developed to ensure consistency of map protocol and to provide official guidance for map review and maintenance.

#### **2. Grease Control Program**

The City has no formal, written Grease Control Program outside of any guidance that may be included in the City's ordinances. No documentation for grease control was provided

## COMPLIANCE INSPECTION REPORT

Oak Ridge Public Works Department, Collection and Transmission System, October 27-28, 2009

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that gives specific guidance to City personnel to manage grease build-up in the collection system. The City personnel stated that the City's Sewer Use Ordinance provides for code enforcement relating to grease traps.

### **Recommendation:**

EPA recommends that the City develop documents that outline procedures and provide guidance on how to manage and reduce grease build-up in the system. A valid grease program includes; defining annual goals; providing documentation guidelines (permitting, inspection, enforcement, compliance tracking, and budgeting); establishing inspection priorities; public education guidance; and establishing performance goals.

### **3. Root Control Program**

Root control is performed on an "as needed" basis by the City maintenance personnel. No documentation was provided that outlined specific requirements to manage root penetration in the collection system.

### **Recommendation:**

EPA recommends the development and implementation of a grease, roots and mechanical cleaning program. This program should include; a) guidance for scheduling hydraulic cleaning, root clearing, and mechanical cleaning activities; b) personnel responsible for the activity; c) equipment available; d) scheduling guidance for preventive maintenance and routine inspections; e) the use of standard forms, reporting procedures, and tag out/lock out procedures; and f) procedures for records keeping.

### **4. Capacity Assurance Program**

The City has no formal, written capacity assurance program and produced no documents during the course of the inspection that indicated that City ordinances address capacity issues when building, adding, or modifying the sewer system.

### **Recommendation:**

The City should develop a capacity assurance program that includes; a) specific criteria for approval of additions to the system; b) performance measures used to approve or deny an extension of the collection system; and c) procedures used to calculate capacity in the collection system and at the treatment plant.

### **5. Preventive Maintenance and Inspection Programs**

No formal written documents were provided that outlined specific guidance for preventive maintenance and inspection programs. The City personnel stated that the Engineering Department plans corrective maintenance as needed to repair any reported deficiencies. No formal preventive maintenance programs are known to be utilized by the City. No written inspection program was presented to the inspectors for review; however,

## COMPLIANCE INSPECTION REPORT

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some inspection and/or preventive maintenance activity was observed and is being utilized for pump stations and known overflow points.

### **Recommendation:**

EPA recommends that the City develop MOM Programs with an aggressive Preventive Maintenance and Inspection Program. Preventive Maintenance and Inspection Programs can have a significant positive impact on the future condition of the collection system. A properly implemented Preventive Maintenance and Inspection Program can prevent a massive outlay of expenses needed to repair or replace parts of the system that City personnel 'did not see' failing due to the lack of prevention. Relatively small preventive maintenance expenses now can save the City larger repair expenses in the future. Formal guidance can also be used to educate City Council members concerning program funding requirements and assist managers in funding programs that are essential to proper operation and maintenance.

### **6. Emergency Response**

The City did not present formal written documents meant to provide guidance for emergency response to SSOs or pump station failure.

### **Recommendation:**

EPA recommends that the City develop *Emergency Response Plans* (including a *Pump Station Emergency Response Plan* and a *Sewer Overflow Response Plan*, separately or as a combined document) that provides an outline for emergency response, mitigation and clean up in the event of pump station failure and sewer overflows. The *Emergency Response Plans* should include, at a minimum; a) emergency contact information; b) location(s) of auxiliary power including portable generators; c) location(s) of portable pumping equipment; d) guidance for initiating auxiliary power with fixed or portable generators in the event that fixed generators do not start; e) guidance for installing portable pumps during high flow; f) mitigation and clean-up procedures; g) public notification guidelines; and, h) applicable Contingency Plans.

### **7. Municipal Ordinances**

No City ordinances were presented for EPA's review.

### **Recommendation:**

The City should have in place ordinances that include; 1) Sewer Use; 2) Fats, Oils and Grease (FOG), and 3) Sewer Capacity Assurance. These ordinances should provide guidance to the general public and to Public Works in regards to operating and using the collection system and provide City personnel the administrative tools necessary to interact with local contractors, businesses and residence in a manner that will properly manage impacts to the system. These City ordinances should include compliance inspection and enforcement authority guidelines.

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### VI. ATTACHMENTS

- A. Enclosures 1, 2, and 3. (Inspection Photos)
- B. Attendance Lists

Oak Ridge Pump Station Inspection  
10/28/2009



Figure 1. East Plant Lift Station



Figure 2. East Plant Lift Station Manhole



Figure 3. Emory Heights LS at Coe Road



Figure 4. Emory Heights LS wet well

Enclosure 2

Gravity Pipe/Manhole Inspection  
Oak Ridge, TN

(Figures 1 through 5 show manholes located behind Big Lots on S. Illinois Avenue.)



Figure 1. Manhole #1,  
10/28/2009



Figure 2. Manhole #1,  
10/28/2009



Figure 3. Manhole #2  
10/28/2009



Figure 4. Manhole #3, 10/27/2009;  
approximately 5 p.m.



Figure 5. Manhole #3, 10/28/2009

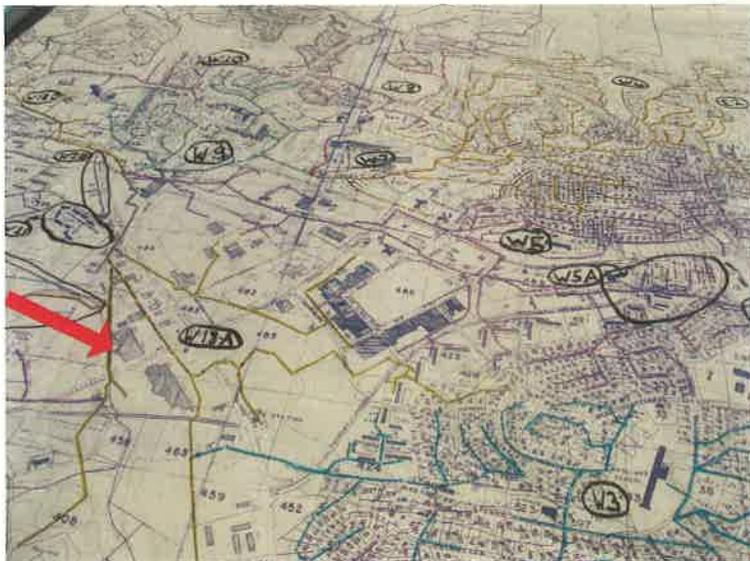


Figure 6. Red arrow marks Big Lots parking lot and the  
approximate location of the manholes inspected.



Figure 7. Manhole behind Van Hicks Housing



Figure 8. Manhole behind Van Hicks Housing

Enclosure 3

Constructed Bypasses  
Oak Ridge, Tennessee  
10/28/2009



Figure 1. 100 Dresden Rd.



Figure 2. 100 Dresden Rd. outfall to ditch



Figure 3. Located at the Christian Outreach Academy

**Inspection key attendees:**

**U.S. Environmental Protection Agency, Region 4**

Dennis Sayre, Enforcement Officer

Laurie Jones, Enforcement Officer

**Tennessee Department of Environment and Conservation:**

John West, Manager, TDEC-Knoxville

Michael Atchley, Environmental Specialist, TDEC-Knoxville

Larry Bonds, Environmental Specialist, TDEC-Knoxville

**City of Oak Ridge, Public Works Department:**

Scott Jackson, Operations Manager

Ken Glass, Environmental and Regulatory Compliance Coordinator

Robert Currier, Wastewater Plant Operations Supervisor