GREENSBORO
WATER RESOURCES

2023 Sewage Collection & Water Reclamation Plant Report

The City of Greensboro's wastewater system includes two major components: the collection system and T.Z. Osborne Water Reclamation Facility (TZO). The City's highly-trained, state-certified staff does an excellent job with both. Wastewater collection/treatment is a 24-hour-a-day, 7-day-a-week responsibility. Ultimately, the goal is to protect both the environment and the quality of life not only for Greensboro's residents, but for neighboring communities as well. Downstream neighbors along the Cape Fear River Basin are affected by the quality of water discharged from TZO.

The Clean Water Act of 1999 (House Bill 1160) requires all entities that own or operate wastewater collection and treatment systems to make an annual report available to their customers. The purpose of the report is to show how a system operates, how well it performed during the year, what violations occurred, and other important information.

This report is produced in compliance with these requirements and covers the calendar year January - December 2023. It is submitted to the North Carolina Department of Environmental Quality. This report is available to all customers at the Water Resources Customer Service Center at 2602 S. Elm Eugene St. and online at www.greensboro-nc.gov/WastewaterReport or in Spanish.

T.Z. Osborne Water Reclamation Facility | **336-373-7740** | **www.greensboro-nc.gov/water**

To report sewer overflows, please contact 336-373-2033

T.Z. Osborne Water Reclamation Facility

- Constructed in 1984 with several major upgrades and expansions since
- Design capacity of 56 million gallons per day (MGD)
- Treated 12.2 billion gallons of wastewater in 2023

System Overview

The long history of water reclamation in Greensboro began with the construction of the original four million gallon per day (MGD) South Buffalo Creek Treatment Plant in 1928. Over the next 10 years, the North Buffalo Water Reclamation Plant opened to provide secondary treatment for the northern half of Greensboro. By 1984, South Buffalo Creek Treatment Plant closed only to be replaced by TZO.

Currently, the City of Greensboro Water Resources Department operates one water reclamation plant and a sewage collection system that collects and transports sewage to that plant. The North Buffalo Facility was decommissioned in October 2017. It is now a transfer pump station and all wastewater is currently treated at TZO.

The sewage collection and water reclamation system of the City begins with approximately 106,310 connections that serve homes, commercial establishments, and industries. Every day an average of 33.52 million gallons of sewage is generated in homes and industries that must be collected, transported, and treated to very stringent standards before it is released back into the environment at South Buffalo Creek. This service is provided by the City's Water Resources Department and is funded almost entirely from the user charges that are paid monthly by customers.

The sewage collection system is comprised of 1,469 miles of gravity lines, 35,022 sewer manholes, 52 pump stations, and 75 miles of pressurized sewage force mains. The system is subject to many federal and state rules and regulations designed to enforce the provisions of the Clean Water Act. All spills and overflows, of any volume, that reach surface waters must be reported to the state. The City notifies the media any time a spill results in 1,000 gallons or more reaching surface waters.

Wastewater Treatment Plant Performance

The City's wastewater treatment plant operates under a National Pollutant Discharge Elimination System (NPDES) Municipal Wastewater Permit. This highly complex permit includes monitoring requirements and discharge limits. The permit can be viewed at the treatment plant upon request. Compliance with these permits requires laboratory staff to conduct more than 50,000 tests per year. Wastewater treatment plants have no control over some parameters, other than through regulating what industries and households can discharge to the sewers through the Industrial Waste and Pretreatment Program.

During 2023, the Water Resources Department treated more than 12.2 billion gallons of wastewater and returned it to local streams. The City is proud of the performance of these facilities, which is made possible by the dedicated efforts of the professionals who operate, maintain and conduct tests for the plant. All NPDES permit violations are reported to the state to ensure compliance with reporting regulations. A list of violations that occurred during the 2023 calendar year is at the end of this report (Table 1).

The City's water reclamation facility is a tertiary treatment plant that utilizes activated sludge processes. Biosolids generated in these processes are disposed of by two fluidized bed incinerators.

System Improvements

Water Resources is proud that given the capacity of its treatment plant and the age of its collection system, permit violations have been minimal. Recognizing the changing climate of environmental concern, total compliance is the City's commitment to its customers.

In an effort to continue to meet new regulations and requirements, the following capital improvement projects have been initiated.

- The Solids Handling Design Build project will refurbish Fluidized Bed Incinerator #2, replace an existing dewatering centrifuge, and rehabilitate ash-handling clarifier. This project will also include structural and safety improvements to the Solids Handling Building.
- The North Buffalo Transfer Pump station electrical improvements will move essential electrical components at the facility out of the North Buffalo Creek flood plain.
- The TZO Primary Settling Tank rehabilitation project will refurbish original primary tanks one through four to incorporate new mechanisms and concrete tank repairs.

Protecting the System

Each year, the City evaluates the wastewater collection system and prioritizes needs and resources. The system is monitored and maintained daily with the implementation of both preventative and corrective maintenance measures. In addition, the City continually improves the system using an aggressive program to rehabilitate old infrastructure that exhibits signs of deterioration. Planning and making improvements to our wastewater collection system extends the life and operating efficiency of the City's sewer system. Learn more about sewer rehabilitation at greensboro-nc.gov/SewerRehab.

COVID-19 Wastewater Testing Program

At the request of the North Carolina Department of Public Health, TZO has been participating in COVID-19 wastewater testing since June 2021. Twice per week, influent (raw untreated) wastewater samples are collected by the TZO laboratory staff and prepared for shipment. COVID virus genetic material is excreted in the feces of infected persons and the same types of tests that laboratories use to detect the virus from nasal swabs can be used to detect COVID concentrations in wastewater. The wastewater testing is very sensitive and since it does not depend on people to realize they are sick, or even to have symptoms at all, it is often the earliest warning a community has a wave of COVID-19 infections on the way. Although COVID can be detected/measured in wastewater, it is not transmitted through wastewater. TZO is proud to be part of this national testing program to help better understand the pandemic and protect the public health of the community.

Summary of Collection

In 2023, there were 50 Sanitary Sewer Overflows (SSOs) in the community, which is a slight increase from the 41 spills reported in 2022. SSOs occur when problems in the system cause sewage to emerge from manhole covers, service cleanouts or plumbing fixtures. The major contributors to sewer overflows include grease, wipes, trash or debris, tree and shrub roots, pump station equipment failure, and pipe failures or breaks. A list of SSOs that exceeded 1,000 gallons during the 2023 calendar year are at the end of this report (Table 2).

While an important part of avoiding SSOs is reducing the introduction of inappropriate materials into the sewer collection system, Water Resources also operates a fleet of six flusher trucks which help keep the sewer lines clear of blockages.

How it Works

- Two main elements to the truck: a water jet hose on the front of the vehicle and the vacuum located on the back, attached to a swinging boom.
- The operator deploys the water jet hose through a manhole, washing buildup off the sides of the sewer pipe with over 1,000 psi of water pressure.
- The vacuum equipment collects the loose debris in the downstream manhole and pumps it into a large tank on the truck.
- Cutter heads can be fitted to the water jet hose to remove harder buildups and root intrusion.

Tips to Prevent Sanitary Sewer Overflows

- Remember no wipes in pipes! Only flush the four Ps: Pee, Poop, Puke & (toilet) Paper.

- Place cooled oil and grease into trash bins or covered collection containers. Never pour grease down the drain!
- Scrape food scraps from dishes into trash bins.
- Wipe off all fats, oils, grease and food residue from dishes and cookware into trash bins.
- Use a strainer in the sink to collect excess food particles.
- Clean up grease spills with absorbent material and place into trash bins.

Fats, Oils and Grease Program

Grease from cooking oils, gravy, lard or shortening, and butter or margarine may not look harmful as a liquid, but when they cool they get thick and stick to pipes.

SSOs result from cooking oil, fats, and grease that enter the sanitary system from household drains and poorly maintained grease traps in restaurants, food and meat processing factories, and other food establishments. These SSOs can cause health hazards, damage home interiors and threaten the environment.

The City implements a Fats, Oils, and Grease (FOG) policy designed to educate about and enforce proper disposal of FOG within the community. The FOG policy educational and enforcement programs are intended for all customers (food service establishments, nursing/group homes, schools/cafeterias, industries, and residents) that discharge wastewater into the City's Sanitary Sewer System with the aim of mitigating or eliminating SSOs that are grease related. The City FOG policy requires all commercial and food service establishments to install and regularly maintain an appropriately sized grease trap or interceptor.

To learn more, please visit www.greensboro-nc.gov/FOG

The Cost of Wipes to America's Utilities

In 2019, the National Association of Clean Water Agencies (NACWA), along with other water associations and national and state organizations, conducted the first nationwide comprehensive examination of the impact of wipes on the operating costs of America's utilities.

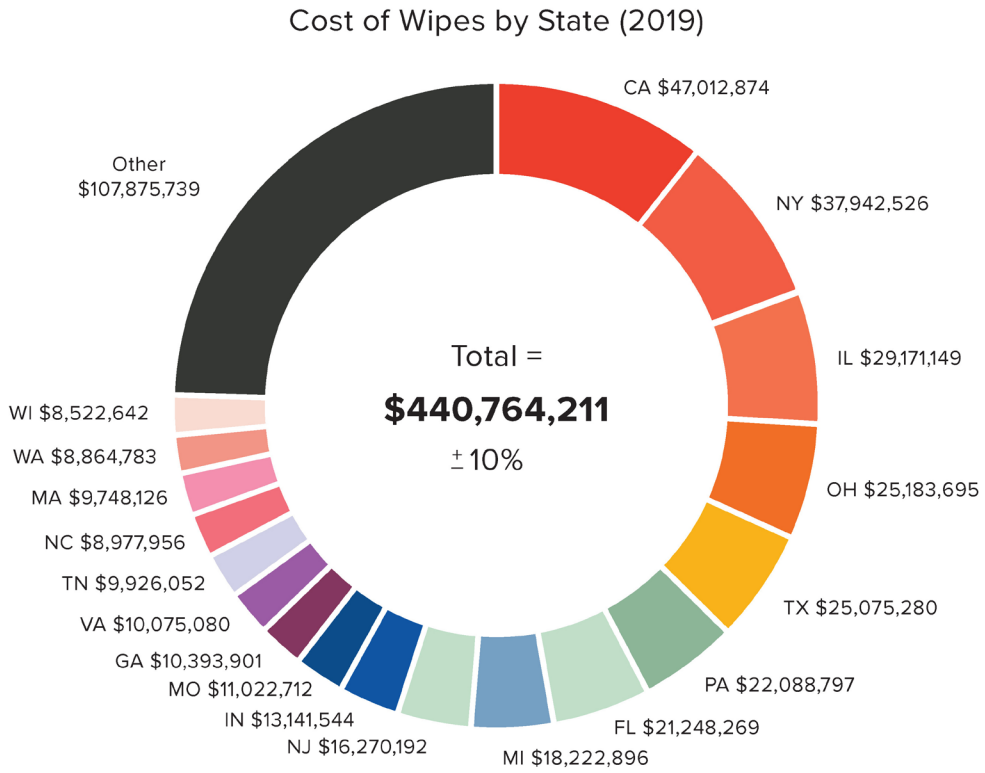
TOILETS ARE NOT TRASHCANS™
visit www.nacwa.org/toilets
Only Flush the 3 P's: Pee, Poop, & Toilet Paper

Background

- North American consumers spent about $2.5 billion on personal wipes in 2019.
- Each year in North American, there are hundreds of reports of household plumbing clogs and damage to public sewer systems and treatment plants caused by flushed wipes.
- Wipes manufacturers are encouraged to label their products as "flushable" or "non-flushable" based on product testing.
- Ryerson University, 2019 study examined 101 single-use wipes products:
  None of the 23 labeled "flushable" wipes fell apart or dispersed enough to safely pass through an average home's plumbing system to the public sewer and through the sewer system for 30 minutes without "a risk of clogging or causing damage to infrastructure."

Results

NACWA estimates that wipes result in about $441 million a year in additional operating costs for America's utilities. The distribution of these costs by state, which generally corresponds with wastewater flow volumes by state, is shown in the graphic below:



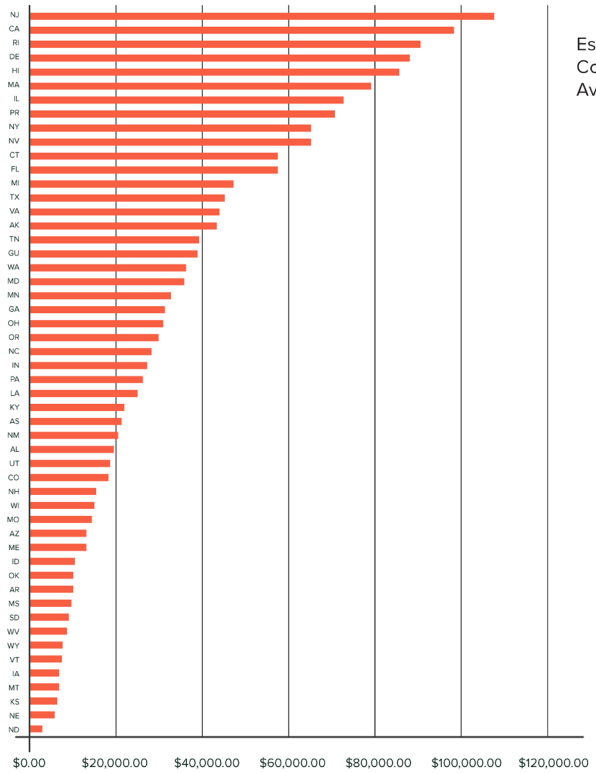
Not surprisingly, the 18 states with the highest levels of wastewater collection account for about 75 percent of total national cost of wipes. Eight states account for about half of the total US costs of wipes. States with the highest costs of wipes tend to be located along coasts and in heavily populated industrial portions of the midwest.

Based on these estimates, wipes impose $30,467 a year in additional operating costs on the average utility nationwide.

Concluding Thoughts

This is the first comprehensive examination of the cost of wipes on operations of American utilities.

There were four conservative assumptions within the study that eliminated certain costs from the estimates despite ample anecdotal evidence that they exist in practice. NACWA believes that these estimates are substantially less than actual costs in any given year.

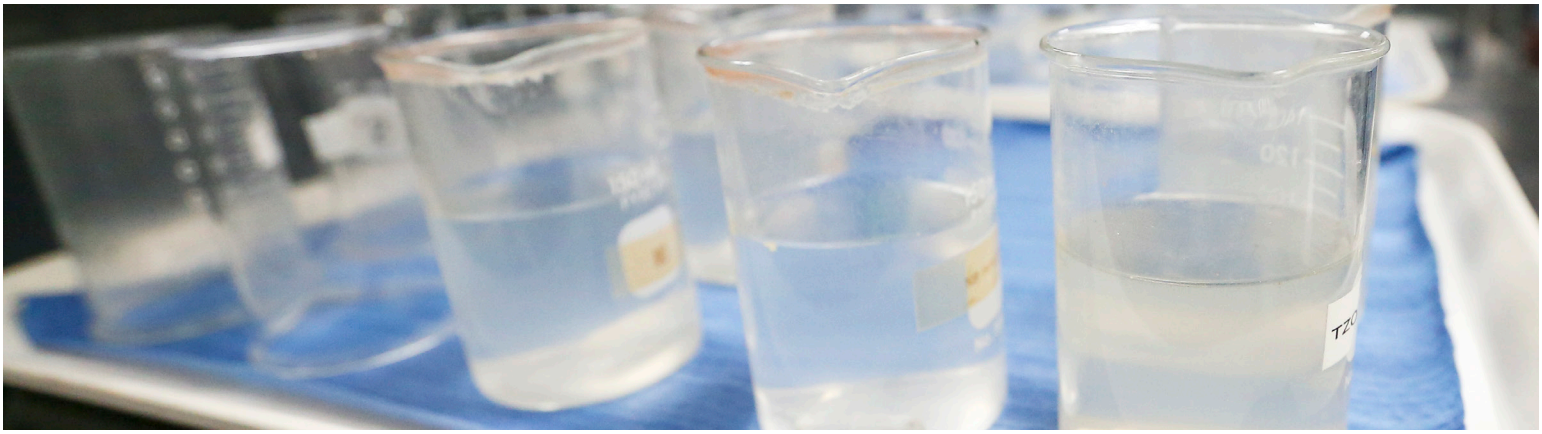


Estimated Annual Cost of Wipes at the Average Utility (2019)

Assumptions did not consider:

- Costs associated with household, commercial, or industrial plumbing or laterals that connect these systems to public collection infrastructure.
- Damage that wipes may cause to on-site septic systems.
- Capital replacement costs. Our estimates at the national, state, and utility levels include only operating costs associated with wipes. The study does not include costs associated with Clean Water Act fines for sanitary sewer overflows attributed to wipes.
- Costs of wipes that impose on treatment infrastructure or the environment.

Read the full "The Cost of Wipes on America's Clean Water Utilities" report. (nacwa.org)



2023 Wastewater Treatment & Sewer Collection Violations

T.Z. Osborne Water Reclamation Facility NPDES Permit #NC0047384

TABLE 1

Month	Effluent Parameter Violation	Type of Violation
—	No violations or compliance value exceedances	—

2023 Wastewater Treatment & Sewer Collection Violations

Sewage Collection System
Permit #WQCS00006

Sewage Spills from Collection System Exceeding 1,000 Gallons

TABLE 2

PERMITTEE: CITY OF GREENSBORO				
Incident Started	**Volume Reaching Surface Water**	**Surface Water Name**	**Location**	**Probable Cause**
1/1/2023	1,200 gallons	North Buffalo	3503 Kenmore St.	Debris in line
1/10/2023	1,200 gallons	South Buffalo	2603 Floyd St.	Debris in line
1/10/2023	2,300 gallons	North Buffalo	600 Green Valley Rd.	Grease
1/16/2023	1,800 gallons	North Buffalo	Murrow Blvd. & E. Market St.	Debris in line
2/4/2023	5,650 gallons	South Buffalo	421-A Rocky Knoll Rd.	Grease
2/23/2023	3,000 gallons	North Buffalo	2001 Lutheran St.	Debris in line
2/23/2023	3,000 gallons	North Buffalo	2419 Hawthorne St.	Grease
3/28/2023	2,000 gallons	South Buffalo	2805 Grimsley St.	Debris in line
4/3/2023	2,000 gallons	Contained	1517 N. Church St.	Grease
4/7/2023	7,800 gallons	South Buffalo	1117 Highland Ave.	Debris in line
4/7/2023	3,900 gallons	South Buffalo	1117 Highland Ave.	Debris in line
5/22/2023	10,000 gallons	Contained	3700 Elmsley Ct.	Grease
6/11/2023	5,100 gallons	Brush Creek	5908 Cardinal Lake Dr.	Grease
6/15/2023	2,000 gallons	East Fork	7619 Thorndike Rd.	Roots
6/16/2023	5,275 gallons	South Buffalo	1904 Cedar Fork Dr.	Grease
7/23/2023	2,500 gallons	N/A	107 Elmsley Dr.	Grease
8/25/2023	6,000 gallons	Horse Pen Creek	7 Regal Ct.	Debris in line
9/7/2023	2,500 gallons	Brush Creek	4032 Battleground Ave.	Grease
9/14/2023	3,000 gallons	South Buffalo	2000 Randolph Ave.	Pipe failure
9/15/2023	8,400 gallons	South Buffalo	4207 Romaine St.	Debris in line
9/23/2023	130,000 gallons	Horse Pen Creek	2132 New Garden Rd.	Pipe failure
10/24/2023	2,500 gallons	South Buffalo	1724 Bristol Rd.	Pipe failure
11/10/2023	4,000 gallons	North Buffalo	Kenilworth St. & Theta St.	Debris in line
11/26/2023	9,100 gallons	South Buffalo	3700 Elmsley Ct.	Grease
12/1/2023	2,500 gallons	South Buffalo	3006 W. Gate City Blvd.	Grease
12/30/2023	3,600 gallons	Big Alamance	6530 Judge Adams Rd.	Debris in line

The names below are professionals designated by the state as the "Operators in Responsible Charge" (ORC) of the respective systems:

T.Z. Osborne Water Reclamation Facility
Permit Number: NC0047384
ORC: Bradley Flynt, 336-433-7262

Sewage Collection System
Permit Number: WQCS00006
ORC: Robert Martin, 336-373-2033