

City of Greensboro Water Resources Department



Sewage Collection and Water Reclamation Plant Report for 2011

INTRODUCTION

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 report must detail how a system operates, how well it performed during the year, what violations occurred, and other information. This report is produced in compliance with these requirements and covers the calendar year January - December 2011.

The City of Greensboro Water Resources Department operates two water reclamation plants and a sewage collection system that collects and transports the sewage to these two plants; some transfer of sewage occurs between the two plants. Following are the professionals designated by the state as the "Operators in Responsible Charge" (ORC) of the respective systems and permits for the systems:

North Buffalo Water Reclamation Facility
Permit No. NC0024325, ORC Nathan Osborne, (336) 373-7850

T. Z. Osborne Water Reclamation Facility
Permit No. NC0047384, ORC Lori Cooper, (336) 373-4502

Sewage Collection System
Permit No. WQCS00006, ORC Mark Malloy, (336) 373-2033

This report will be available at all City Water Resources Facilities, Libraries, the Melvin Municipal Office Building, and also on the City's website. All customers will be notified of its availability in the *At Your Service* newsletter, that are distributed in water and sewer bills from March to May 2012. This report was compiled by staff of the Water Resources Department and cost approximately \$1,000.

The information contained herein is accurate to the degree possible:

Steven Drew, Director of Water Resources

System Overview

The sewage collection and water reclamation system of the City of Greensboro begins with approximately 101,946 connections that serve homes, commercial establishments, and industries.

Every day an average of 27 million gallons of sewage is generated in our homes and industries that must be collected, transported, and treated to very stringent standards before it is released back into our environment (in our streams). 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 our customers.

Nearly all of the sewage or wastewater that is generated by customers flows by gravity through sewers that range from 6 to 72 inches in diameter. As the lines leave neighborhoods they increase in size to accommodate the flows that are collected from the many areas that are served. These sewers generally follow terrain to take advantage of gravity flow but at certain low points pumping stations are used to push the flow uphill to the next drainage basin and set of lines.

Our sewer collection system transports Greensboro's wastewater to two large water reclamation facilities. The wastewater is processed so that it can be returned to our streams with minimal environmental impact. The North Buffalo Facility and the T.Z. Osborne Facility are permitted to process up to 16 and 40 million gallons of wastewater per day, respectively.



Aerial photo of T.Z. Osborne Plant

Greensboro's Difficult Location

Many of Greensboro's residents recognize that our location is not ideal for water supply development; our streams are very small because we are at the top of the watershed where our streams drain to limited amounts of land. What they may not recognize is that this makes wastewater reclamation very difficult as well. The permitting of treated wastewater discharges makes the assumption that streamflow is at the lowest volume so as to offer the protection needed when streamflow is at its lowest.

In North Carolina, this process is known as "7Q10" flow, or the lowest volume expected to occur on a particular stream for 7 consecutive days once every 10 years. The permit limits for discharges takes this level of stream protection into account in calculating the limits; yet it applies 24 hours per day, 7 days per week, 365 days per year. Since Greensboro's limits are calculated for discharging to such small streams, our limits are very low. Not only does North Carolina have some of the most stringent stream standards in the country, Greensboro is a large city located on very small streams. Our discharge flow constitutes over 97% of the stream below our discharge points at the lowest streamflows; therefore our permits are written so as to protect the streams at all times as though such minimal flow was present.



Aerial photo of North Buffalo Plant

Wastewater Treatment Plant Performance

The City of Greensboro's Treatment plants operate under National Pollutant Discharge Elimination System permits, most commonly known as NPDES. These are highly complex permits that include monitoring requirements and discharge limits, some of which vary from season to season and have different maximums for daily values, weekly averages, monthly averages, and quarterly averages. The permits are complex and can be viewed at our treatment plants upon request.

Compliance with these permits requires that our laboratory must conduct over 10,500 tests per year.

Any one of these tests may result in a value that causes us to violate the limits of the NPDES permit.

There are some limits, such as cyanide, fluoride, selenium, and cadmium, over which the operators of the treatment plant have no control other than through regulating what industry and households can discharge to the sewers.

During 2011 the Water Resources Department treated 10.1 billion gallons of wastewater and returned it to our streams. We are proud of the outstanding performance of these facilities that was made possible by the dedicated efforts of the professionals who operate, maintain, and conduct tests for these facilities. Whenever there is a NPDES permit violation that occurs, we report them to the State to ensure compliance with all reporting regulations. A list of the violations that occurred during the 2011 calendar year is at the end of this report (Table 1 & 2). There were no detected environmental impacts from any of these permit excursions.

Collection System Performance

The City of Greensboro operates a sewage collection system comprised of 1,593 miles of gravity line, 39,054 manholes, 47 pump stations, and 90 miles of pressurized sewage force main. The system is subject to many rules and regulations that are now in effect. All spills of any volume must be reported to the State. Spills that exceed 1,000 gallons must also be reported to all outlets of the news media.

Sewage spills from a collection system can be caused by a variety of reasons such as roots, grease, pump station failures, rainwater overload and foreign objects obstructing the sewer. A list of sewage spills in excess of 1,000 gallons that reached surfaced water is included at the end of this report (Table 3). There were no detected environmental impacts from any of these incidents.



Wastewater laboratory staff



Facility maintenance by wastewater staff

System Improvements

The City of Greensboro has an on-going cleaning and inspection program to monitor and maintain our sewer system, including rodding, high pressure flushing, and closed circuit television inspection of lines. The City has an aggressive program to rehabilitate old leaking sewer lines to begin reducing the amount of rainwater entering our collection system. The total spending amount for rehabilitation exceeds \$3 million per year.

We are also enhancing our regulations of grease discharge in those areas where we are experiencing grease buildup in lines. In September 2011, the newly installed fluidized bed incinerator system located at the TZO wastewater facility was fully operational replacing the old deteriorating system that was installed in 1996. The new incinerator will provide solid disposal services generated by both wastewater facilities.

The Water Resources Department continues to upgrade our two water reclamation plants to comply with the Jordan Lake Rules regulations.

The rules were issued to offer water quality protection to the B. Everett Jordan Reservoir by reducing the amount of nutrients, specifically nitrogen and phosphorus, that enter streams that empty to this water body. The phosphorus limits were effective January 1, 2010 and the total nitrogen NPDES limits, which will require additional treatment processes will be effective January 1, 2016. In anticipation of the requirements, the City will make process changes beginning early 2013.

The improvements will cost approximately \$75 million in capital expenses.

Fats, Oils and Grease Program

It is the duty and responsibility of the City of Greensboro Water Resources Department to prevent the excessive introduction of oil and grease into the sanitary sewer system and the wastewater treatment plants. The FOG policy is designed to outline, implement and enforce oil and grease discharge rules and to have an educational program for both residential and commercial users. This policy is applicable to industries, school cafeterias, nursing homes and all food service establishments that discharge wastewater containing grease to the City of Greensboro sanitary sewer system. In order to reduce sewer blockages, food service establishments discharging wastewater that contains grease to the City of Greensboro sanitary sewer system must install and maintain a grease trap or grease interceptor to prevent grease from entering the sewer system. The accumulation of grease within sanitary sewer lines increases the potential to create sewer blockages. Sanitary sewer blockages can result in sanitary sewer overflows (SSOs), which may reach the surface waters of North Carolina.

Residential customers should also practice proper disposal of cooking grease by placing grease in sealed containers and discarding in the garbage. To protect the environment reduce the amount of fats, oils, and grease that enters the sewer system.

Summary

The Greensboro Water Resources Department is proud that given the capacity of our treatment plants and the age of our collection system, our permit departures have been minimal, especially when compared to similar cities. We recognize however, that in the changing climate of environmental concern, total compliance is demanded by the public.

For more information, please visit our website at www.greensboro-nc.gov/water.

Table 1

**T.Z. Osborne Publicly Owned Treatment Works
National Pollutant Discharge Elimination System (NPDES) Permit #NC0047384**

Month	Description	Number of Violation	Type of Violation (s)
March	Ammonia	2	One Weekly Average One Monthly Average
April	CBOD	2	One Weekly Average One Monthly Average
	Ammonia	2	One Weekly Average One Monthly Average
November	Fluoride	1	One Weekly Average

Table 2

**North Buffalo Publicly Owned Treatment Works
National Pollutant Discharge Elimination System (NPDES) Permit #NC0024325**

Month	Description	Number of Violation	Type of Violation (s)
N/A	N/A	0	0

Note: There were no environmental impacts noted for the above violations.

Definitions:

Monthly average –The arithmetic mean of all “daily discharges” of a pollutant measured during the calendar month.

Weekly average –The arithmetic mean of all “daily discharges” of a pollutant measured during the calendar week.

Contact Information

WATER RESOURCES ADMINISTRATION: 336-373-2055

T. Z. OSBORNE WATER RECLAMATION: 336-373-7740

NORTH BUFFALO WATER RECLAMATION: 336-373-5913

www.greensboro-nc.gov/water

Table 3
Sewage Spills from Collection System Exceeding 1,000 Gallons

Permittee	Permit Number	Incident Started	Volume Reaching Surface Water	Surface Water Name	Location	Probable Cause
City of Greensboro	WQCS000006	1/2/2011	3,000	South Buffalo II	3835 Raintree Drive	Grease
City of Greensboro	WQCS000006	1/14/2011	1,800	South Buffalo I	4303 Green Point Drive	Debris in line
City of Greensboro	WQCS000006	8/2/2011	4,000	Horsepen Creek	Bledsoe Lift Station Force Main	Pipe failure (Break)