



# DURHAM COUNTY

## Triangle Wastewater Treatment Plant PERFORMANCE ANNUAL REPORT

JULY 2023—JUNE 2024

### CALL BEFORE YOU DIG - NC 811

Triangle Wastewater  
Treatment Plant  
5926 NC Hwy. 55 E.  
Durham, NC 27713  
(919) 560-9033

**Permits:**

Wastewater  
Treatment Plant:  
NC0026051

Collection System:  
WQCS00038

Stormwater:  
NCG110054

Reclaimed Water:  
WQ0032821

**Owned and Operated  
by:**

Durham County  
Engineering  
&  
Environmental Services  
Utilities Division

**Contact:**

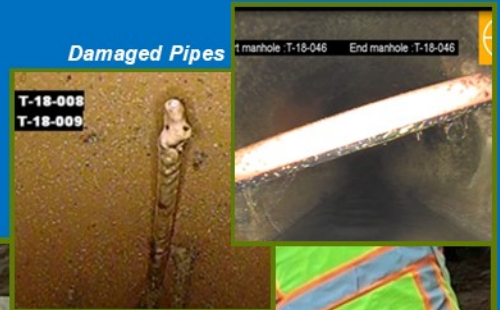
Stephanie Brixey  
Deputy Director

## **D** ID YOU KNOW there is a North Carolina law that mandates underground utilities to be located *before* any excavation occurs?

NC General Statute Chapter 87, Article 8A, requires existing facilities be identified in advance of any excavation in North Carolina. The reason being, many utilities provided to you, such as water, sewer, cable, gas, etc. are often buried underground close to the surface. The law requires a notification prior to digging to NC811, which will alert utility owners in that area so they can be located and marked prior to any digging.

Durham County Utilities has dedicated staff that locates County owned utilities so contractors, home

*Damaged Pipes*



### APWA UNIFORM COLOR CODE FOR MARKING UNDERGROUND UTILITY LINES



- |  |   |  |   |
|--|---|--|---|
|  | PROPOSED EXCAVATION                                       |  | COMMUNICATION, ALARM OR SIGNAL LINES, CABLES OR CONDUIT |
|  | TEMPORARY SURVEY MARKINGS                                 |  | POTABLE WATER   |
|  | ELECTRIC POWER LINES, CABLES, CONDUIT AND LIGHTING CABLES |  | RECLAIMED WATER, IRRIGATION, AND SLURRY LINES           |
|  | GAS, OIL, STEAM, PETROLEUM OR GASEOUS MATERIALS           |  | SEWERS AND DRAIN LINES                                  |

**For all locate requests, call  
811 or 1-800-632-4949**

**Need the status of a locate?  
1-877-632-5050**

Educational Resources – North Carolina 811 ([nc811.org](http://nc811.org))

and business owners, etc. know where to excavate safely. Sometimes this is not the case, and lines may be damaged that can result in sanitary sewer overflows (SSO) and costly repairs. Often, County staff determine sewer pipes have been affected by watching videos taken within the pipe. If the responsible party cannot be determined, repairs are paid for by the County which may result in higher sewer and water rates for customers.

# Collection System

**D**urham County owns and maintains a wastewater collection system which includes 110 miles of gravity sewer, 11 miles of pressurized force mains, and 13 lift stations.

In the past 12 months Durham County had two reportable sewer spills.

- On July 26, 2023, a spill estimated at 5,000 gallons of wastewater occurred because of a blockage in the line.
- September 1, 2023, a spill estimated at 180 gallons of wastewater occurred at a step system in the Wexford Development due to a broken discharge line.

Durham County Utilities prides itself on providing a high level of customer service. All commercial, industrial, and residential customers' questions and concerns are responded to in a timely manner. If you have a question or concern regarding the collection system, services, or any item covered in this report, please call (919) 560-9033 or send an e-mail to [utilities@dconc.gov](mailto:utilities@dconc.gov).



## Reclaimed Water

**T**riangle Wastewater Treatment Plant (TWWTP) operates a reclaimed water system. Some of the uses of this water include: landscape irrigation, industrial cooling, industrial process water, and sewer cleaning. Approximately 188 million gallons of reclaimed water was distributed to customers during the fiscal year.

The reclaimed water annual average data is reflected in the effluent annual average data except for the following:

- Fecal Coliform: <1 cfu/100 ml
- Turbidity: 0.60 NTU
- Total Residual Chlorine: 3.3 mg/l

There were no reportable reclaimed water spills in the past 12 months.

## Projects & Rehabilitation

**T**hroughout the last year, the County has continued its efforts to rehabilitate aging collection system infrastructure and increase sanitary sewer capacity to facilitate economic growth in our service area.

- ⇒ Replaced 500 linear feet of 16" DIP force main with 16" PVC on Hopson Road.
- ⇒ Lake Park Lift Station was rehabilitated.
- ⇒ Bypass connections were installed at Page Park and Fairfield Lift Stations.
- ⇒ Six manholes were rehabilitated.
- ⇒ TWWTP BNR Train #3 - Cleaned the interior basin, repaired the seams, replaced the flapper valves, installed two new adjustable weirs, and four new rotors with variable frequency drives.

BNR Train #3 Project



Rehabilitated Manhole



## Biosolids System

**T**WWTP generates biological residuals (approximately 6,389 wet tons per year), which are dewatered by centrifuges. The dewatered cake (approximately 1,213 dry tons per year) is transported to McGill Environmental Systems, where it undergoes further biological treatment to produce a Class A biosolid. These biosolids are beneficially used as soil amendments in commercial landscaping and agricultural activities.

Ultraviolet (UV) System



In the past year, the TWWTP treated 1.7 billion gallons of wastewater.



Aerator

# Treatment System & Process

The **Influent Pump Station (IPS)** is used to pump raw wastewater (sewage) to the treatment process to be biologically treated. The IPS is sized for 12 million gallons per day average flow.

The **Fine Screens** are used to remove fine materials from the wastewater such as grit, sand, egg shells, etc. All of the organic materials are washed off and used in the biological treatment process.

The **Five Stage Biological Nutrient System** is where all biological treatment takes place, such as removing ammonia through nitrification and denitrification processes as well as the removal of phosphorus.

The **Chemical Polishing** process removes any phosphorus that is remaining after the biological treatment process. Methanol is used in this polishing process to add additional BOD to support the denitrification treatment process.

The **Clarifiers** are where the biomass is separated from the treated wastewater and then is returned to the BNR for further treatment.

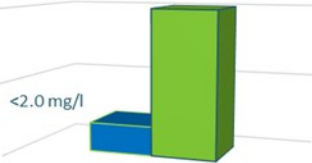
The **Tertiary Filters** are next in the clarification process which removes all remaining unsettled biomass in the treatment process.

The **Ultraviolet Disinfection** treatment process is used to remove all disease causing bacteria without creating harmful by-products.

The **Reaeration** stage of the treatment process adds dissolved oxygen to the treated wastewater to meet required permit limits before it is discharged to Northeast Creek.

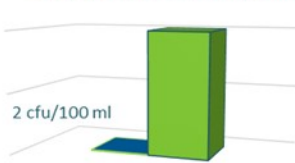
## Effluent Annual Average Data

5.0 mg/l Monthly Avg. Permit Limit



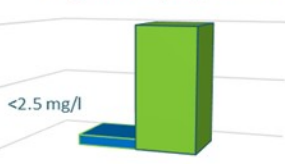
BIOCHEMICAL OXYGEN DEMAND

200 cfu/100ml Monthly Avg. Permit Limit



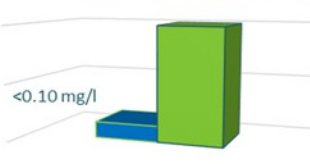
FECAL COLIFORM

30 mg/l Monthly Avg. Permit Limit



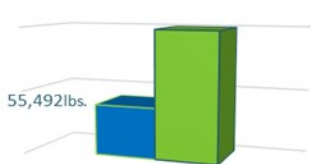
TOTAL SUSPENDED SOLIDS

1.0 mg/l Monthly Avg. Permit Limit



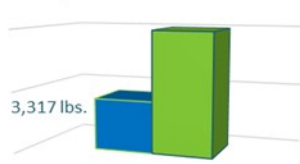
AMMONIA-NITROGEN

111,207 lbs. Annual Permit Load Limit



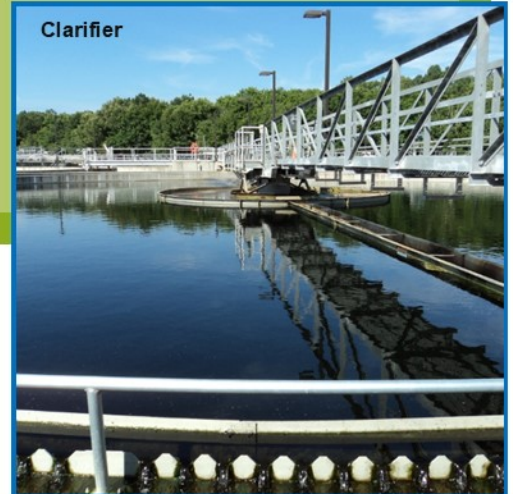
TOTAL NITROGEN

8,432 lbs. Annual Permit Load Limit



TOTAL PHOSPHORUS

Clarifier



## Lab

**T**riangle Wastewater Treatment Plant's (TWWTP) laboratory staff collects and analyzes wastewater samples as required by the NPDES permit and the reclaimed water permit. Currently, the laboratory is certified by the Division of Water Resources Laboratory Certification Branch to analyze ammonia, biochemical oxygen demand, total residual chlorine, conductivity, dissolved oxygen, fecal coliform, pH, temperature, and total suspended solids. Staff determines the age and health of the activated sludge and identifies microorganisms, such as amoebae, bacteria, ciliates, flagellates, nematodes, rotifers, and water bears.

## Fats, Rags, Oil & Grease

**D**isposing of Fats, Rags, Oils, and Grease (FROG) down the drain or toilets causes build up inside pipes and could result in a complete blockage. Clogged pipes overflow in your home and in the environment resulting in costly maintenance and repairs to residents.



Pipe with Congealed F.O.G.

## Industrial Pretreatment Program

**T**WWTP implements an Industrial Pretreatment Program (IPP) to control pollutants which may cause pass through or interfere with the treatment plant's processes, which may contaminate sewage sludge, or potentially be hazardous to worker's health and safety. Currently, there are sixty-seven permitted industries that are regularly inspected and monitored to ensure their discharges meet specific permit limits. Sixteen of these industries are Significant Industrial Users (SIUs). Biosafety Laboratories in our service area have also been identified and ten are currently permitted. Several of the Industrial Pretreatment Permit holders are required to certify that their facility has followed biosafety procedures consistent with the fifth edition of the Biosafety in Microbiological and Biomedical Laboratories, US DHHS -PHS, -CDC and -NIH for the deactivation of Biosafety Level 1, 2, 3 or 4 materials prior to discharge to the sewer system.



CCTV view of grease lined sewer pipe

**FATS** are solid at room temperature. Examples include butter, shortening, margarine, peanut butter, meat trimmings, uncooked poultry skin, and dairy products; chesses, milk, cream, sour cream, and ice cream. **RAGS** consist of paper towels, disposable wipes, tissues, napkins, and other textiles. **OILS** are liquid at room temperature and include all cooking oils and salad dressings. **GREASE** turns to liquid during cooking, but solidifies when cooled such as gravy, mayonnaise, melted meat fat, bacon and sausage, boiled poultry skin, and salad dressing.

August 31, 2024

Notification:

This Performance Annual Report covering July 1, 2023 through June 30, 2024, was forwarded to the NC Department of Environmental Quality. Public Notice of the report was advertised in the Durham Herald Sun newspaper and is available for review at the following locations:

Clerk to the Board  
200 East Main St.

Main Library  
300 N. Roxboro St.

South Regional Library  
4505 S. Alston Ave.

Website  
[www.dconnc.gov/utilities](http://www.dconnc.gov/utilities)

Certification:

I certify under penalty of law that this report is complete and accurate to the best of my knowledge. I further certify that this report has been made available to the users or customers of the named system and that those users have been notified of its availability.

Stephanie Brixey  
Deputy Director