2024
Annual Performance Report

Roanoke River Wastewater Treatment Plant
NC0024201 & Collection System WQCS00027

Abstract

The Annual Performance Report provides key performance information that demonstrates the POTW's accountability to ensure Roanoke Rapids Sanitary District's stewardship and prosperity by addressing its environmental, operations, and maintenance challenges through transformative process and technology solutions.

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I. General Information:

A. Regulated entity: Roanoke Rapids Sanitary District, Collection Systems (C.S.) and Wastewater Treatment Plant (WWTP), together Publicly Owned Treatment Works (POTW)

B. Responsible entity: Roanoke Rapids Sanitary District, Thomas Wrenn, CEO
PO Box 308
Roanoke Rapids, NC 27870
Phone: 252-537-9137

C. Person in charge/contact

1. C.S.: David Warren Scott, Operator in Responsible Charge (ORC)
Eric Wes Deaton, Back-up ORC
Roanoke Rapids Sanitary District, Distribution & Collection
425 East 11th St.
Roanoke Rapids, NC 27870
Phone: 252-537-9747

2. WWTP: Steven Lee Ellis, Operator in Responsible Charge (ORC)
Timothy Skipper, Back-up ORC
Roanoke River Wastewater Treatment Plant
135 Aqueduct Road
Weldon, NC 27890
Phone: 252-536-4884

D. Applicable Permit(s)

1. C.S.: North Carolina Environmental Management Commission System-wide Wastewater Collection System Permit No. WQCS00027

2. WWTP:
- National Pollution Discharge Elimination System (NPDES): NC0024201
- Land Application (L.A.): WQ0001989
- Stormwater (General): NCG110000

E. Description of C.S.:
The collection system consists of approximately 146 miles of sewer lines and six lift stations that serve Roanoke Rapids, Gaston, and portions of Halifax and Northampton Counties, which serve an approximate population of 17,600. The sewer lines within Roanoke Rapids, Gaston and all sub-divisions, which connect to two main Interceptors, range in size from 8" to 12". There are two main 30" diameter Interceptors transporting wastewater to the WWTP.

The Roanoke River Interceptor collects wastewater from basins located on the north side of the Sanitary District. The Gaston basin and Northampton County are also served by this interceptor. The Interceptor begins just west of 100 Gaston Road (NC HWY 48) in Roanoke Rapids. There are 3 primary basin pump stations and 2 secondary pump stations served by the interceptor whose pipe sizes range from 18" to 30".

The Chockoyotte Creek Interceptor serves the south side of the Sanitary District and three sub-divisions located outside the Roanoke Rapids city limits: Lake View Park, Greenbriar Terrace, and Lincoln Heights. The Interceptor begins adjacent to 1100 Zoo Road. There is one primary basin pump station along the route. The interceptor pipe sizes range from 12" to 30".

The system has six sewer lift stations. Three stations are in the Gaston basin. HWY 46 Pump Station serves a Northampton County School. The Old Emporia Road Pump Station serves the Roanoke Chowan Regional Housing Authority and the Hwy 48 Pump Station pumps all flows from Gaston and Northampton County via an 8" force main suspended from the NC HWY 48 Bridge spanning the Roanoke River to the Roanoke River Interceptor. The remaining three pump stations are located within Roanoke Rapids basins and serve residential and some light commercial customers. Two of the stations, Belmont and Poplar Springs, discharge to the Roanoke River Interceptor while the Greenbriar Pump Station discharges to the Chockoyotte Creek Interceptor.

F. Description of WWTP:

The wastewater treatment plant is rated at 8.34 million gallons per day (MGD). Peak flow is rated at 12.5 MGD.

Treatment processes at the wastewater plant include grit and rag removal. This is followed by primary clarification, trickling filter BOD buffering, biological secondary treatment, activated solids treatment, secondary clarification, final effluent chlorination/de-chlorination processes, and final pH adjustment.

During these processes, solids are removed from two locations. Primary clarification removes settleable solids from incoming wastewater to an anaerobic digestion unit. Here, the solids in the absence of oxygen, receive pH adjustment, mixing, and heating to produce a stabilized material suitable for land application. Once the solids are stable, excess water is decanted and returned to the plant for further treatment. The stabilized, thickened solids are treated with lime for odor control and then removed to a holding tank prior to transportation for land application.

Secondary clarification removes solids from the activated solids process. Here, solids in the presence of oxygen and mixing, accumulate in excess. They are removed, chemically stabilized, and added to a holding facility. All stabilized solids are analyzed, and land applied according to their nutrient value, ceiling limit (mg/kg) and cumulative requirements.

There are two pumping stations distributing wastewater into and through the plant. They are the Influent Pump Station, which includes an equalization pump, and the Trickling Filter Effluent Pump Station. The Influent Pump Station has the capacity to pump 20 MGD, the equalization pump 6 MGD, and the Trickling Filter Effluent Pump Station 27 MGD. Standing by in conjunction with these pump stations is the Emergency Flood Pump Station with a capacity of 21 MGD to remove treated effluent from the plant during high river stages which prevent normal gravity flow discharge. Also, a storm water pump station has been installed. This station intercepts site runoff, an unnecessary treatment load and potential site flooding condition, and removes it before entry to the plant. It has the capacity to pump 11.5 MGD. Numerous other pumps and mixers are located throughout the plant to facilitate process control.

II. Performance:

1. C.S:

The collection system performed well in 2024, however there were 4 permit violations in the form of Sanitary Sewer Overflows and no monitoring and reporting violations. The District's Fat, Oil, and Grease (FOG) Program performed 31 inspections of area restaurants and food preparation facilities (FSE). Full facility inspections are now handled by the Northampton and Halifax County Health Departments. The District continues outside visual inspections for exterior traps, and interior inspections for potential problem areas as well as interior separators. There were no notices of violation. All FSE were advised to continue following "Best Management Practices" and maintain maintenance records. The District FOG program is continuing our public education program. There were no Sanitary Sewer Overflow (SSO) out of the 4 total SSOs during the period attributed to FOG in 2024. The District talked to the local businesses in the area and urged them to follow our "Best Management Practices" as well as passed out notes of our FOG Policy to residential customers.

The District contracted with NC Wildlife and Timber Solutions, LLC for outfall cutting, stream debris removal and beaver management from Chockoyotte Creek located adjacent to its interceptor. This ongoing work improved access to the interceptor and helped minimize flooding of manholes along the easement.

2. WWTP:

Over the course of 2024, the Roanoke River Wastewater Treatment Plant operated very efficiently. There was one violation in 2024 for CBOD weekly average limit exceedance in March. The weekly average limit for CBOD is 37.5mg/L, the reported average was 39.8mg/L. There were no penalties assessed, and the plant was compliant throughout the remainder of the year. The plant flows ranged from a daily maximum of 9.0 MGD to a minimum of 2.0 MGD. The average daily flow was 3.49 MGD. The plant treated 1,276,800,000 gallons of wastewater throughout the year, which was discharged to the Roanoke River.

Throughout 2024, there were 1,504,796 gallons of wastewater that were equalized due to high flows and maintenance and later returned to the plant for treatment.

The efforts to repair the collection system and reduce Inflow and Infiltration from prior years continued in 2024. This work has led to lower peak flows for shorter durations and reduced the number of bypasses from the plant as illustrated in the following table:

Year	2019	2020	2021	2022	2023	2024
Max Day (MGD)	11.4	12.4	12.68	9.30	11.5	9.00
Avg. Daily Flow - MGD	3.24	3.58	3.39	2.78	3.00	3.49
Estimated I & I - MGD	1.48	1.86	1.6	1.70	.912	1.31
Annual Rainfall - in.	46	66.3	44.10	47.4	48.7	42.2

The following table illustrates the treatment performance of the wastewater plant and its ability to meet and comply with the NPDES permit requirements:

PARAMETER	MONTHLY LIMIT	WEEKLY LIMIT	REQUIRED REMOVAL	ANNUAL REMOVAL	ANNUAL AVERAGE	DAILY MAX	DAILY MIN
CBOD	25mg/L	37.5mg/L	85%	96.1%	9.4mg/L	53.6mg/L	3.3mg/L
TSS	30mg/L	45mg/L	85%	91.8%	18.0mg/L	106.0mg/L	5.6mg/L
Fecal Coliform	200 Colonies	400 Colonies	N/A	N/A	43 Colonies	1072 Colonies	1 Colony
NH_3-N	N/A	N/A	N/A	N/A	3.7mg/L	16.6mg/L	<0.5mg/L
Total-N	N/A	N/A	N/A	N/A	11.0mg/L	16.1mg/L	1.9mg/L
Total-P	N/A	N/A	N/A	N/A	0.9mg/L	1.5mg/L	0.4mg/L

During 2024, the District continued its contract with Granville Farms, Inc. for the management of biosolids. A total of 1,535.15 applicable acres is permitted in the District's Land Application Program. The District is also listed as a producer on Granville Farms Permit which allows its solids to be placed on their permitted fields as well. There were 4,392,189 gallons, or 724.74 dry tons of biosolids applied to 259.69 Acres. There were no permit violations for the land application program in 2024.

One of the main treatment units at the wastewater plant is the activated sludge basins. This is where the majority of the biological treatment occurs. It is also one of the largest energy consumers at the plant due to the large centrifugal blowers needed to supply air to the process. In 2021, the District entered into contract with RK&K Engineering to do design work on a new blower system to provide the air needed to the basins in a more efficient manner. Work has continued on the design and permitting phase in 2024 and plans have been submitted to DWR for permitting.

A. Permit limit violation

1. C.S.: None
2. WWTP: One, CBOD weekly Average, March 16, 2024.

B. Monitoring and Reporting Violations

1. C.S.: None
2. WWTP: None

C. 2024 Sanitary Sewer Overflows

1. C.S.: There were 4 reportable SSO's in 2024.
    1. MH 54, 1/9/24, 16,250 gallons.
    2. MH 54, 1/12/24, 11,250 gallons.
    3. MH 54, 3/6/24, 2,850 gallons.
    4. MH I 122, 172 Carl St., 900 gallons

There was an estimated total of 31,250 gallons spilled in SSO's in 2024. These spills are the result of capacity exceedance due to wet weather conditions. This correlates to 2.74 spills per 100 miles of pipe.

2. WWTP: N/A

D. Bypass of Treatment Facility

1. C.S.: N/A
2. WWTP: There were no bypasses at the Wastewater Treatment Plant in 2024.

E. Description of any known environmental impact or violations.

1. C.S.: None
2. WWTP: None

F. Description of corrective measures taken to address violations or deficiencies.

1. C.S. : Along with the wildlife control, FOG program and outfall clearing discussed above, RRSD continues to perform preventative sewer backup maintenance by cleaning with Jetter and

Root Cutter; which is attached to the Jetter hose, followed by Closed Circuit TV (CCTV) camera to inspect the lines after cleaning. The District also uses its Combination Truck, which cleans the line more effectively and proves to be more reliable than the old unit. The District also continues to use the Rausch CCTV van purchased in 2018 extensively. In 2024, the District purchased a new trailer mounted sewer jetter to aid in the maintenance of the collection system.

District employees completed 4 Sanitary Sewer Point Repairs in 2024. The locations were as follows:

1. 1432 West Circle Dr., 5/16/24
2. Between MH 172 & 172, 5/17/24
3. 909 Cedar St., 6/4/24
4. 705 E 13th St., 11/5/24

District employees installed 12 new taps and replaced 16 existing taps in 2024. One new cleanout was installed in 2024.

District employees cleaned 22.57 miles of sewer lines and used CCTV to inspect all suspected problem areas.

District employees utilized the District's excavator mounted flail mower in conjunction with NC Wildlife Solutions LLC to cut and clear 18.57 miles of interceptor right-of-way's and cross-country lines in 2024.

The District contracted with M.J. Price Construction to repair and remediate 2 areas of Chockoyotte Creek behind ECU North Hospital to return the creek to the original streambed and protect the Chockoyotte Outfall.

In April 2022 RRSD entered an agreement with Freese and Nichols, Inc. to assist RRSD by providing evaluation and develop a Preliminary Engineering Report (PER) for the rerouting of the existing force main and the associated Belmont Pump Station improvements. The PER was completed in March of 2023. Design work on this project was begun in 2024 with 60% plans due in the beginning of 2025.

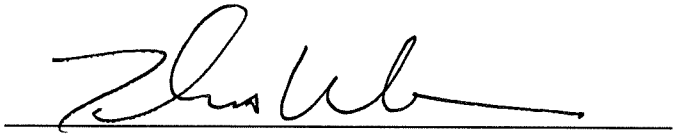
2. WWTP: All repairs to minimize Inflow & Infiltration are being made to correct known system deficiencies.

III. Notification:

This System Annual Performance Report will be noted on the monthly bill and available to customers via the Roanoke Rapids Sanitary District's Webpage at www.rrsd.org .

IV. Certification:

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



Thomas Wrenn
Chief Executive Officer

02/25/2025
Date