

# ROANOKE RAPIDS SANITARY DISTRICT

1000 Jackson St., Roanoke Rapids, NC 27870

Wastewater Treatment Plant 536-4884  
Collection System 537-9747  
Administrative Office 537-9137  
Pay-By-Phone (888) 626-9056

PERMITS:  
NPDES - NC0024201  
LAND APPLICATION - WQ0001989  
LAB - NC70  
COLLECTION SYSTEM - WQCS00027



Board of Commissioners:  
E. J. St. Clair, Chairman  
J. R. Barber, Secretary  
S. M. Holliday, Member

Administrative Officers:  
Dan Brown, P.E., CEO  
Thomas Wrenn, Finance Director  
Gregg Camp, ORC, WWTP  
Gregg Wilson, Supervisor, Collection Sys.

2016

## Wastewater System Report

www.rrsd.org

### MISSION STATEMENT

**To affordably provide the highest quality water services; safely collect wastewater and return clean water to the environment while promoting public trust and partnerships to the benefit of our associates and satisfaction of our customers.**

The Sanitary District owes an enduring debt of gratitude to Allen Gregg Camp retiring after 36 years with us and it is to his service we dedicate this Annual Wastewater System Report.

The Roanoke River Wastewater Treatment Plant (WWTP) operated by the Roanoke Rapids Sanitary District (RRSD) treats wastewater from Roanoke Rapids, Gaston, Halifax and Northampton Counties encompassing an approximate population of 17,600. Wastewater from industry, businesses, and homes enters collection system pipes and flows to the WWTP. Harmful pollutants, as determined by the North Carolina Department of Environmental Quality (DEQ), are removed by the treatment process. The public health and environment is protected through the discharge of high quality wastewater to the Roanoke River. Cost effective treatment is performed to maintain reasonable rates for customers of the RRSD.

DEQ has determined wastewater includes conventional and non-conventional pollutants. Conventional pollutants contain suspended solids from fecal matter or food. Non-conventional pollutants contain dissolved metals like copper and zinc. Pollutants can come from organic sources such as plant or animal origin or inorganic sources such as mineral origin. All pollutants combined and entering the treatment facility are called plant loading. Plant loading comes from two sources; controllable (industrial) and non-controllable (residential). Residential wastewater must meet RRSD's general use ordinance. It prohibits such items as petroleum products, toxic substances and cooking grease.

#### ROANOKE RIVER WWTP FUN FACTS

Location: 135 Aqueduct Road; Weldon, NC 27890  
DEQ Plant Classification: IV (Largest State Classification)  
Hours of Operation: 24 hours a day, 365 days a year  
(Note: DEQ requires a licensed operator onsite at all times)  
Year Constructed: 1963.  
Treatment & Flow Capacity Expansion: 1983  
Original Design Capacity: 5.5 Million Gallons per Day (MGD)  
Current Design Capacity: 8.34 MGD  
Design Peak Flow: 12.5 MGD  
Treatment Type: Secondary Biological  
2016 Average Daily Flow (ADF): 3.6 MGD  
2016 ADF Range: 2.6 MGD to 5.5 MGD  
2016 Minimum Flow: 1.8 MGD on September 2nd  
2016 Peak Flow: 17.3 MGD on October 9th (Hurricane Matthew)  
NPDES Permit Effective Period: 2012 – 2017  
Number of Employees: 15 (including nine Licensed Operators)  
Departments: Operations, Certified Laboratory, and Maintenance  
Year Clean Water Act Passed: 1970 (EPA established)

#### EN ESPANOL

El informe contiene informacion importante sobre la calidad del agua residual en su comunidad.  
Traduzcalo o hable con alguien que lo entienda

**Permit Violations** - In 2016 there were no permit limit violations, no monitoring or reporting violations. All TSS, CBOD, Fecal Coliform, pH, Residual Chlorine & WET parameters were met (see **NPDES Permit Limits** table). This was last accomplished in 2015. The WWTP strives to be compliant not only with NPDES limits but also stream standard regulations, rules or statutes. The permit contains a standard conditions section which the WWTP must also be in compliance with. Failure to comply with all conditions of the NPDES permit could lead to enforcement action. This could be a notice of violation or a civil penalty.

During the reporting period RRSD did not exceed the 85% removal rate requirement for CBOD and TSS influent loading.

**Bypasses** - All bypasses must be reported, by phone, to DEQ within 24 hours of first knowledge. A written report must follow within 5-days with corrections. In 2016 there was one bypass: 10/8, 5,506,776 gallons; due to heavy, intense rainfall during Hurricane Matthew. All repairs to minimize the inflow and infiltration during heavy rain are being made to correct known deficiencies.

**Bypass Control** - Wastewater that comes into the plant faster than can be treated due to storms is pumped through two storage tanks capable of holding approximately 750,000 gallons. These two tanks are also used when maintenance on plant equipment requires draining and holding wastewater. In 2016 approximately 7,590,000 gallons were stored and returned to the plant from various high flow events and maintenance projects. At an ADF of 3,600,000 gallons in 2016 this is over two whole day's worth of flow prevented from bypassing. Since use of these tanks began in 2000, 78,633,503 gallons of wastewater has been prevented from bypassing. At the 2016 ADF of 3,600,000 this would be 21.8 days of flow. A full-load diesel generator is used to prevent bypasses during a power outage. In 2016 there were 2-power outages. The total time of power outage for both events was 20 minutes. A total of 44,791 gallons were prevented from bypassing without normal power supply.

**NPDES Permit Limits**

<u>Effluent Parameter</u>	<u>Weekly</u>	<u>Monthly</u>	<u>2016 Actual</u>
TSS	45 mg/l	30 mg/l	17.4 mg/l
CBOD	37.5mg/l	25 mg/l	5.2 mg/l
Fecal Coliform	400 colonies	200 colonies	6 colonies

pH = continuous monitoring must be between 6.0 and 9.0 units.  
 Residual Chlorine = continuous monitoring must be less than 50 ppb.  
 WET = quarterly testing must be Pass.  
 Note: - Permit requirements for TSS & CBOD removal are 85%.  
 - Also test only/no limit parameters include nitrogen, phosphorus, dissolved oxygen & metals such as chromium & mercury.



**Collection System** - The collection system consists of six pump stations and 130 miles of sewer pipes connecting homes and businesses to the WWTP. Main sizes are 8 inches in subdivisions and 12 to 30 inches along the river and creeks. The oldest pipes have been in the ground and in use since before 1930. During 2016 over 19.47 miles of sewer lines were TV inspected and cleaned; 12 miles (approximately 29 acres) of outfalls and cross country lines were cut and cleared by RRSD. In 2016 we had 12 reportable Sanitary Sewer Overflows (SSO) at eight locations; totaling 145,450 gallons. In 2016, RRSD rehabbed 290 ft. section of 8" clay pipe, rehabbed 18-manholes, applied Root Control treatment on 9,293 feet of line and rebuilt our Hwy 48 lift station. During 2016 District employees performed 5 point repairs on sewer lines:

1. 1336 Williams St. - replaced 5ft. of 8" sewer line with PVC.
2. 608 Carolina St. - replace 8ft. of service line with DIP.
3. Fairfield Apartments - replaced 5 ft. of sewer line with PVC.
4. South Bay St. - replaced 24 ft. of sewer line with DIP over storm drain.
5. 344 East Littleton Rd. - replaced 6 ft. of sewer with PVC.

- **HYDRO-PAY - 537-9137**
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The Roanoke Rapids Sanitary District takes great pride in providing its customers with a Water and Wastewater system that runs smoothly. Our Board and Management team insist that we put customer service as a top priority.

The District invests significant resources in manpower and assets to provide modern equipment to help meet the needs of the Department to provide good customer service. We have recently purchased a new Vac-con truck to jet and clean grease and debris from our some 130 miles of sewer lines and to keep our lift stations clear of debris so they can operate normally. We also have updated our Camera Van with Modern equipment to better see problems in our sewer mains. We have purchased a valve exerciser and excavator to help kept our water main valves working smoothly, so if we have a break we can stop the flow and we can also detect any broke valves in our system.

Our employees have been trained to operate this new equipment safely and have been trained in traffic control to minimize any inconvenience the public. We have been accepted into the Star Program by the North Carolina Dept. of Labor and we are striving to keep the public and our employees' safe by reducing or trying to eliminate accidents.

### **How a Sewer System Works**

A typical sanitary sewer is constructed of pump stations and a network of below ground pipes connected to each building or residence that is used to transport sewage to a wastewater treatment plant. A property owner's sewer pipes are called private service laterals and connect to the public sewer lateral, local mainline and regional trunk lines. Operation and maintenance of the public lateral, mainlines and regional trunk lines are the responsibility of the Sanitary District.

### **What is a Sewage Overflow**

A sanitary sewer overflow (SSO) is any overflow, spill, release, discharge or diversion of wastewater from a sanitary sewer system. SSO's include: (i) overflows or releases of wastewater that reach waters of the State; (ii) overflows or releases of wastewater that do not reach waters of the State; and (iii) wastewater backups into buildings and on private property that are caused by blockages or flow conditions in a sanitary sewer, other than a building lateral. Wastewater backups into buildings caused by a blockage or other malfunction of a building lateral that is privately owned is a SSO when sewage is discharged off of private property into streets, storm drains, or waters of the State.

### **Common Causes**

Grease builds up inside and eventually blocks sewer lines. Grease gets into the sewer from food establishments, household drains, as well as from poorly maintained commercial grease traps and interceptors. Structure problems caused by tree roots in the lines, broken/cracked pipes, missing or broken cleanout caps, or undersized sewers can cause blockages. Grease and root intrusion are the most common cause of pipe blockages. Infiltration and inflow happen when groundwater or rainwater enters the sewer system through pipe defects and illegal connections. Pipes are not large enough to carry rain water along with wastewater and this can cause wastewater to back up in a system.

### **What to look For**

Sewage spills can be very noticeable gushing of water from a manhole or a slow water leak that may take time to be noticed.

Look for:

- Drain backups inside the building.
- Wet ground and water leaking around manhole lids on your street.
- Leaking water from cleanouts or outside drains.
- Unusual odorous wet areas: sidewalks, external walls, ground around a building

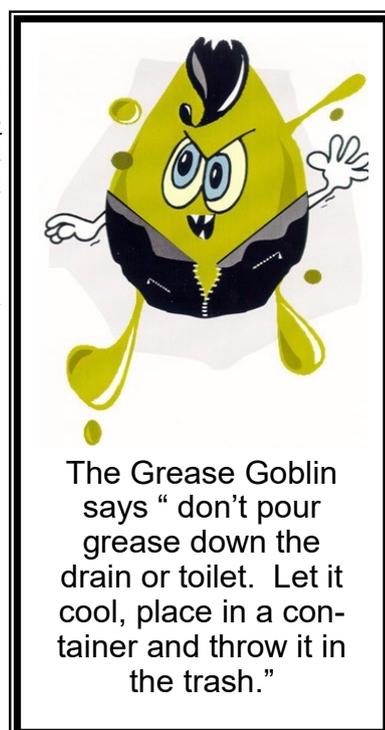
### **How you can prevent Sewage Spills**

- Never put grease down garbage disposals, drains or toilets.
- Perform periodic cleaning to eliminate grease, debris and roots in your sewer lateral.
- Repair any structural problems with your sewer system.

### **CAUTION!**

Keep people and pets away from the sewer spill area. Untreated sewage has high levels of disease-causing viruses and bacteria.

**If the Sanitary District can help in anyway. Please call us at 252-537-9747**



## WASTEWATER PROGRAMS AND SERVICES

**Pretreatment Program** - The pretreatment program monitors local industries that discharge a controllable load. Overloading may interfere with the WWTP or cause pass through of the plant of a pollutant. The plant capacity to treat pollutant loading from controllable and uncontrollable sources is known from plant design capacity; verified by the results of certified lab testing. Available pollutant loading may be allocated to industry or left in reserve for future growth. Just as DWQ issues RRSD a permit to limit our discharge to the Roanoke River; RRSD issues industry permits to limit discharge to the WWTP.

**FOG Program** - Fats, Oils and Grease (FOG) are a controllable load discharged by restaurants or homeowners. The program is regulated by Ordinance as a condition of the Collection System Permit issued under a DEQ administrative order to reduce SSOs ( Sanitary System Overflows). One full time employee is responsible for public education, enforcement and inspection of grease traps. Placing ads in newspapers and distributing brochures to restaurants help educate the public about both the monetary and environmental benefit that the elimination of FOG has on the District. In addition to homeowner plumbing bills and collection system costs, FOG loading interferes with WWTP processes.

**Bio-Solids Program** - Removal of TSS and CBOD by the wastewater treatment process produces solids, which must be treated using anaerobic digestion and lime stabilization to reduce harmful pathogens. The anaerobic digestion process heats primary solids to 95° F with mixing in the absence of oxygen. Lime stabilization raises the pH of secondary solids to 12.0 for a specified period of time. Thousands of tests are performed annually on residual solids to ensure regulated levels of treatment are met. In 2016, approximately 2,888,538 gallons, or 595.35 dry tons of solids were stabilized. Once stabilized, solids can be land applied for its nutrient value, moisture content, and soil amendment properties. DWQ issued RRSD a 5-year

**Land Application** permit in 2007 that authorizes the District to safely manage the application of bio-solids. The District has over 1,985 acres permitted with local area farmers for this program. There are periods when crop rotations or weather conditions prevent land applying bio-solids. In 2004, the District purchased 150 acres of pasture land for bio-solids application. During 2016, the District did not apply bio-solids to the site. The site is developed as a model site with the help of the Soil Conservation Service. Trees have been cut, areas fenced off and buffer zones created.



### DEFINITIONS

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|--|--|
| <p>I/I - Inflow of rain water or water from swollen creeks. Infiltration of ground water into cracks in old deteriorated collection system pipes. Excess I/I is expensive to treat at the WWTP and uses valuable capacity reserved for future economic development. <u>It is a violation of the Sewer Use Ordinance to connect roof drains or basement water pumps to the wastewater collection system.</u></p> <p>NPDES - DWQ issues RRSD a National Pollutant Discharge Elimination System permit, which is reviewed and approved by the Environmental Protection Agency (EPA). During the next five years DWQ will do extensive testing not only on the waters of the Roanoke River but also its aquatic life to validate the limits that must be met in the NPDES permit.</p> <p>PPA - Priority Pollutant Analysis tests for dozens of wastewater contaminants. Conventional (oil &amp; grease), Metals (lead) Volatile organic (benzene) Acid-extractible (phenol) &amp; Base neutral (fluorene). EPA has determined these to be harmful to the WWTP. Elevated levels of the constituents can cause permit violations. They must be removed.</p> <p>CBOD - Carbonaceous Biochemical Oxygen Demand represents the Biological Oxygen Demand (BOD) from organic compounds and oxidation of inorganic compounds like ferrous iron and sulfide. Any BOD from nitrifying organisms, which consume oxygen in the nitrification process of converting ammonia to nitrate, is removed by adding a nitrification inhibitor. Effluent is tested for CBOD daily and the results are reported to DWQ monthly. Over 97% of CBOD in the wastewater is removed.</p> | <p>TSS - Total Suspended Solids include all particles suspended in water which will not pass through a filter. Suspended solids are present in residential wastewater and many types of industrial wastewater. Effluent is tested for TSS daily and the results reported to DWQ monthly. Over 94% of the TSS in the wastewater is removed.</p> <p>Effluent - Treated wastewater discharge into a receiving stream which is the Roanoke River.</p> <p>Bypass - Incomplete treatment of wastewater into the Roanoke River. Considered as a spill.</p> <p>WET - Whole Effluent Toxicity refers to the total toxic effect to aquatic organisms from all pollutants contained in a facility's wastewater (effluent). RRSD uses the "Pass or Fail" Chronic Toxicity test procedure and it is one way EPA implements the Clean Water Act's prohibition of the discharge of toxic pollutants in toxic amounts. Quarterly WET tests measure our wastewater's effect on the water flea's (<i>Ceriodaphnia Dubia</i>) ability to survive, grow and reproduce.</p> <p>mg/l - A milligram per liter of water is equivalent to 1 ppm (part-per-million) because a liter of water weighs 1,000 grams and a milligram is 1 one thousandth of a gram. 1 ppm = 1 drop of gas in an auto gas tank or one minute in two years.*</p> <p>ppb - A part-per-billion is equivalent to 1 microgram (ug/l) per liter of water. 1 ppb = one second of time in 32 years or about one drop of water in a swimming pool.*</p> |
|--|--|

\*Analogies are used to help people understand the magnitude of a concentration; not to minimize the risk of a concentration-its effect on human health or the environment

A new addition to the current NPDES permit was the additional requirement of a **Mercury Minimization Plan (MMP)**. All waters of the state are recognized as mercury impaired. As a result, a statewide fish consumption advisory for mercury has been established. As a response, DWR has issued a statewide total maximum daily load (TMDL). The TMDL calls for a 67% reduction in mercury levels. Most of the mercury, 98%, comes from atmospheric deposition. Only about 2% comes from point sources such as wastewater treatment plants. Although the contribution of mercury from wastewater treatment plants is small, they have also been incorporated into the overall reduction of mercury in the waters of the state. Because the RRSD WWTP has a flow above 2 MGD and has detectable mercury in its effluent, the MMP is required. Typically, MMP's focus on three areas. First, an internal WWTP review of mercury containing products and their disposal. Secondly, pretreatment controls on non-domestic users. And third, outreach to the general public regarding the proper use and disposal of mercury containing household products. DWR provided a model MMP which could be adopted or a completely independent plan could be developed. The RRSD WWTP used the state's model with some of its own additions. The permit had a development date requirement which was met. MMP's do not have to be submitted to DWR for approval. The plan only has to be available for review by DWR plant inspectors. Two years after the development deadline date implementation must begin. A summary of the plan's activities will be submitted as part of the next NPDES permit renewal process.



A full detail of this report is available upon request. The report can be obtained from the Administration office at 1000 Jackson Street. Office hours are 8:30 am - 5:00 pm Monday through Friday.

## **Roanoke Rapids Sanitary District Mercury Minimization Plan Implementation**

Mercury is a naturally occurring element. It has been used in many industrial, power generating, medical, and dental processes. Mercury has exited these processes through smoke, vapor, steam, air and wastewater release.

Global concern over the health effects of mercury in humans and aquatic species is driving the environmental community towards reducing the amounts of mercury released to the air and streams. All 100 major streams in North Carolina have been declared in some sections, if not entirely, as mercury impaired.

Although less than 2% of the environmentally released mercury into streams comes from wastewater treatment plant discharges, the North Carolina Department of Environment and Natural Resources has issued a statewide total maximum daily loading (TMDL) for mercury. The TMDL calls for a 67% reduction of mercury levels from the year 2002 baseline mercury loading. The NPDES wastewater share of the TMDL is 81 pounds/year. The actual wastewater loading was 252 pounds in 2002. It is believed that wastewater loading is currently well under 81 lbs of Hg per year. The target for wastewater sources by 2016 will be met.

The Roanoke River Basin begins in southwestern Virginia near Roanoke, Virginia and continues through North Carolina to the Albemarle Sound, 410 miles. The Roanoke River Basin currently has 263.2 miles of impaired waters that limit fish consumption for pregnant women, young children and the elderly. All 138.7 miles of the Roanoke River are considered impaired.

In 2013, National Pollutant Discharge Elimination System (NPDES) permit NC 0024201 was re-issued to the sanitary district through the North Carolina Department of Environment and Natural Resources (NCDENR). This permit requires the following:

“The permittee shall develop and implement a mercury minimization plan during this permit term. The MMP shall be developed within 180 days of the NPDES permit effective date, and shall be available for inspection on-site. A sample MMP was developed through a stake holder review process and has been placed on the Division website for guidance (<http://portal.ncednr.org/web/wq/swp/ps/npdes>, under Mercury Minimization Plan). The MMP should place emphasis on identification of mercury contributors and goals for reduction. Results shall be summarized and submitted with the next permit renewal application.”

The district put into place a Mercury Minimization Plan (Plan) October 1, 2013 to further reduce the amount of mercury in wastewater discharges and land applied biosolids. The plan does not have to be submitted for NCDENR approval but has to be available upon request. The plan must be implemented within two years after the 180 day develop period and can be modified or updated at any time.

In order to provide public awareness regarding mercury and its potential environmental and health effects, the district has posted this information on its web page for easy access to information on how

households and industry can reduce the amount of mercury that enters the wastewater discharge. The wastewater treatment plant is not designed for the treatment of mercury so reduction in the incoming levels is important in reducing the levels of mercury potentially entering the receiving stream.

**The first step in the removal of mercury is assessing the potential presence of mercury.** Some sources of mercury include:

- Glass mercury containing thermometers
- Compact fluorescent light bulbs
- Tube fluorescent lights
- Batteries
- Electronics (computers, etc)
- Medications
- Mercury switches in home heating and air conditioning thermostats
- Mercury switches in automobile parts
- Industrial chemicals
- Blood pressure measuring equipment in doctor's office
- Dental amalgam (filling material)
- Household chemicals
- Disinfectants
- Toiletries (soap, shaving cream, etc.)
- Processed meats
- Fruits and vegetables
- Laundry products
- Preservatives in medicines

Mercury in the items listed above is in extremely small amounts. Without proper disposal, as a whole, they may add up or bio-accumulate in the state's streams.

**The second step towards eliminating mercury in the environment is proper disposal.** If any of the items listed are utilized by your employer or in your home, please follow proper disposal procedures. These disposal procedures usually can be found on the product packaging. Many home improvement stores offer recycling of compact fluorescent light (CFL) bulbs and rechargeable batteries. Solid waste facilities also provide for disposal of electronics.

Should you have any questions regarding how to dispose of a mercury containing item, please contact a local waste management facility or the Roanoke Rapids Sanitary District's industrial pretreatment program at 252-536-4884.

Additional information may be found at the following web links:

<http://www.ncdhhs.gov/pressrel/2009/2009-11-18-lakegaston.html>

[http://www.epa.gov/mercury/mgmt\\_options.html](http://www.epa.gov/mercury/mgmt_options.html)

<http://portal.ncdenr.org/web/deao/recycling/citizens>

[www.recyclenc.org](http://www.recyclenc.org)

<http://epi.publichealth.nc.gov/oeo/mercury/safefish.html>

# NC Department of Environment and Natural Resources

## Mercury Minimization Plan

### **Background**

The North Carolina Department of Environment and Natural Resources, Division of Water Resources (DENR) has issued a statewide total maximum daily load (TMDL) for mercury. The TMDL responds to a statewide fish consumption advisory for mercury. The TMDL calls for a 67% reduction in mercury levels from the year 2002 baseline mercury loading. The ultimate goal of the TMDL is to ensure safe-levels of mercury in fish throughout North Carolina for human consumption.

As explained in the TMDL, 98 percent of the mercury in North Carolina waters comes from atmospheric sources- the vast majority of which are located outside of the State. Under the Clean Water Act, atmospheric deposition of mercury into surface waters is regarded as a nonpoint source. Minor amounts of mercury are discharged directly into surface waters by industrial and municipal point sources as a group. Specifically, the TMDL determined that point sources contribute less than two (2) percent of the annual mercury loadings to State waters. The TMDL allocates two percent of the statewide allowable loadings collectively to the point source sector. This does not mean that an individual discharger may not have significant levels of mercury in its discharge in terms of local water quality considerations. While we expect such instances to be rare based upon the Department's review of statewide mercury data, discharges with higher mercury loadings will be expected to implement more aggressive mercury controls.

Notably, unlike any other source, local governments actually reduce mercury loadings in the environment by first filtering mercury out in the treatment of public drinking water (particularly where the source of raw drinking water is surface water) and then a second time when wastewater is treated.

In order to implement the two percent point source sector wasteload allocation, the Department has developed a point source permitting strategy which is located at <http://portal.ncdenr.org/web/wq/ps/mtu/tmdl/tmdls/mercury>. The Environmental Management Commission has approved both the TMDL and the Permitting Strategy. The permitting strategy calls for certain point sources to develop and implement mercury minimization plans (MMPs). For POTWs, an MMP will be required if the facility has (1) a permitted capacity of more than two million gallons per day and (2) mercury at quantifiable levels in their effluent. MMPs feature best management practices and have been implemented successfully in numerous states around the country. The attached document is Roanoke Rapids Sanitary District's MMP.

Typically, MMPs focus on pretreatment controls – a local government's interaction with non-domestic users of its sewer system as well as outreach to the public at large regarding the proper use and disposal of household products containing mercury.

The MMP approach is intended as a reasonable, low-cost approach toward making some progress toward managing the two percent loading statewide from point sources. Mercury treatment and even testing is very expensive and does not make sense to reduce a small part of the already insignificant two percent overall point source annual loading to State waters.



# Roanoke Rapids Sanitary District WWTP

## Mercury Minimization Plan

October 1, 2013

### SECTION I – PURPOSE

The purpose of this Mercury Minimization Plan (“MMP”) is to describe best management practices through which **Roanoke Rapids Sanitary District (District), Wastewater Treatment Plant (WWTP)** will seek to reduce the amount of mercury, also called quicksilver, discharged into its system and ultimately to the environment. The MMP compiles mercury reduction-related efforts to-date and potential future action items. It is designed to be a working document to help guide Roanoke Rapids Sanitary District, WWTP in its efforts to control mercury loadings discharged into its Publicly-Owned Treatment Works (POTW) by users of the sewer system. Such a reduction in loadings to the sewer system should translate to a reduction in the amount of mercury which is discharged from the treatment plant.

### SECTION II-FACILITY DESCRIPTION

**Roanoke Rapids Sanitary District** operates a publicly owned treatment works (POTW); including a sanitary sewer collection system and wastewater treatment plant (WWTP) that serves the **City of Roanoke Rapids**, the **Town of Gaston**, and the surrounding areas in Halifax and Northampton counties, North Carolina. **Roanoke Rapids Sanitary District** does not have community solids waste or storm water management responsibilities.

**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 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 digester unit. Here solids, in the absence of oxygen, receive pH adjustment, mixing, and heating to produce a stabilized biosolids. 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 then removed to a holding tank to await land application.

Secondary clarification removes solids from the activated solids process. Here, solids in the presence of oxygen, pH control, and mixing, accumulate in excess. They are removed, chemically stabilized with lime, and added to a holding facility. All stabilized solids are analyzed and land applied according to their nutrient value, ceiling and accumulative requirements.

There are two pumping stations in the wastewater plant distributing wastewater into and through the plant. Of these two pump stations; one has the capacity to pump 20 MGD and the other 27 MGD. Also, to aid these two pump stations; a storm water pump station has been installed. This station intercepts

rainwater, an unnecessary load to the treatment plant, and removes it before entry to the plant. It has the capacity to pump 11.5 MGD. In conjunction to these three pump station there is one pump station with the capacity of 21 MGD to remove treated flow from the plant in the event of high river levels preventing normal gravity flow discharge. Various other pumps and mixers are located throughout the plant for process control.

**THE COLLECTION SYSTEM** consists of approximately 130 miles of sewer lines. The sewer lines within the City of Roanoke Rapids, Town of Gaston and all subdivisions, which connect to two main interceptors, range in size from 8” to 12”. There are two main interceptors transporting wastewater to the WWTP.

The Roanoke River Interceptor collects wastewater from basins located on the north side of Roanoke Rapids. The Gaston and Northampton basins are included in this service area. The interceptor begins at Hwy NC 48 in Roanoke Rapids. There are 4 primary basin pump stations and 2 secondary pump stations along this route. Pipe sizes for the Roanoke River Interceptor ranges from 18” to 30”.

The Chockyotte Creek Interceptor handles the south side of Roanoke Rapids and three subdivisions, Lake Park, Greenbriar, and Lincoln Heights, outside the Roanoke Rapids city limits. The interceptor begins east of Zoo Road. There is one primary pump station along the route. Pipe sizes ranges from “12 to 30”.

The system has six sewer lift stations. Three stations are located in the Gaston, NC system. One of these serves a Northampton County school, one serves the Chowan Housing Projects, and the other pumps all flows from Northampton County across the Hwy NC 48 Bridge crossing the Roanoke River to the Roanoke River Interceptor. The remaining three pump stations are located within the Roanoke Rapids system. Two of the stations, Belmont and Poplar Springs, discharge to the Roanoke River Interceptor while the Greenbriar Pump Station discharges to the Chockyotte Creek Outfall.

Most municipal treatment plants are not designed to remove mercury and it is exceedingly expensive to do so to very low levels. Incidental mercury removal occurs through typical municipal treatment with trace levels of mercury (and other metals) ending up in solids removed from raw wastewater.

Mercury is not used in the treatment processes at the WWTP. Mercury may be introduced into sewer system through a variety of sources, such as from industrial users, laboratories, dental offices, and other businesses. Residential deposits of mercury are possible in the sewer system from historic practices. Finally, trace amounts from household products and atmospheric deposition (both wet and dry) contribute to sewer system mercury loadings.

While there is typically some mercury contributed to public sewer systems statewide, it is usually in minute quantities and comprise a tiny portion of the already insignificant statewide loading for all point sources – just two percent of the annual mercury loadings to all State waters.

Roanoke Rapids Sanitary District WWTP has never had a mercury limit or monitoring requirement in its NPDES permit. However, the District must test for mercury annually as a requirement of the Effluent Scan in the permit. However, the District must test for mercury annually as a requirement of the Effluent Pollutant Scan in the permit. Low level testing is required. The District is also required to run mercury because of the Long Term Monitoring Plan (LTMP), a part of the pretreatment program. Only standard level testing is required of the LTMP. The District has had two significantly high measurements of mercury over the last thirteen years. They occurred ten years apart. Because of this, the District voluntarily began running monthly low level mercury testing. This began in May of 2012 and ran through January 2013. There were no significantly high test results for this period. The minimum result for this period was 1.2 parts per trillion (PPT). The maximum was 42.0 PPT and the average was 12.0

PPT. The water quality standard for North Carolina is 12.0 PPT. Due to the results of this testing, mercury is considered at quantifiable levels. Also, the WWTP has a permitted design flow above two million gallons per day. For these two reasons a mercury minimization plan was required by the current NPDES permit.

### **SECTION III- PROGRAM PLAN**

#### **A. EVALUATION OF POTENTIAL NON-DOMESTIC SOURCES CONTRIBUTING MERCURY TO THE POTW**

Within 24 months from the NPDES required 180-day period for development of an MMP, the **Roanoke Rapids Sanitary District WWTP** will evaluate available information to assess the potential for non-domestic users of the sewer system to contribute mercury to the system. The information to be reviewed may include (1) POTW influent and effluent mercury data and trends; (2) industrial user permits and associated mercury monitoring data; (3) Toxic Release Inventory (TRI); (4) state hazardous site registry and the National Priority List relating to mercury contamination; and (5) historical records of industrial sites which have contributed mercury loadings to the sewer system.

**Roanoke Rapids Sanitary District WWTP** will also survey and evaluate the following common sources of mercury in its service area: (1) dentist offices; (2) hospitals; (3) laboratories; (4) auto recyclers; and (5) other potential sources of mercury based on existing information.

**Roanoke Rapids Sanitary District WWTP** will request that industrial users review mercury concentrations in high-volume process chemicals and demonstrate that the mercury concentrations are below industry average. **Roanoke Rapids Sanitary District WWTP** will request that alternative sources for chemicals be explored if the mercury levels are determined to be significantly higher than would normally be expected.

The evaluation of potential non-domestic sources of mercury to the sewer system will be updated five years, as warranted by prior sampling results and any additional new potentially significant sources to the system.

#### **B. ADDITIONAL CONTROL MEASURES**

This MMP identifies reasonable and cost-effective control measures to minimize mercury being discharged to the POTW. Below is a listing of initial Best Management Practices (BMPs) for this POTW.

##### **Pollution Prevention**

Substances used at the WWTP will be evaluated to determine if they contain mercury or mercury based compounds. Any such chemicals will be evaluated for substitution with non-mercury-containing substances.

##### **Housekeeping, Spill Control and Collection, and Education**

**Roanoke Rapids Sanitary District WWTP** will develop procedure to minimize the possibility of any spill or release at the WWTP involving mercury containing substances. **Roanoke Rapids Sanitary District WWTP** will add mercury identification and proper disposal to ongoing and future operator training procedures.

The WWTP recycles fluorescent bulbs because of the mercury in them. Also, when low level mercury fluorescent bulbs became available the WWTP switched to these. These are also recycled. The plan now is to move away from fluorescent bulbs altogether and replace them with LED's which contain no mercury. Many of the pumps at the WWTP are controlled on and off with float switches. These switches contain mercury. As these switches have gone bad or other upgrades occurred they have been replaced with other controllers that do not contain mercury. The WWTP has a storm water permit. The permit requires development of Stormwater Pollution Prevention Plan (SPPP). The goal of this plan is to minimize or prevent contaminants from washing off the plant site during rain events. Part of the plan requires training. The MMP will be incorporated into this training.

### **Public Outreach**

**Roanoke Rapids Sanitary District WWTP** will make available educational information regarding sources of household mercury and appropriate use/disposal practices. This information may be posted on the [www.rrsd.org](http://www.rrsd.org) website. The availability of this information will be highlighted in periodic outreach to **Roanoke Rapids Sanitary District's** customers. The **Roanoke Rapids Sanitary District WWTP** will also facilitate public awareness regarding community collection points for mercury-containing products from residents/customers for proper disposal. Periodic reminders of such collection programs will be provided as part of **Roanoke Rapids Sanitary District's WWTP** ongoing public outreach.

### **Laboratory Practice**

The Roanoke Rapids Sanitary District WWTP operates a laboratory for purposes of complying with state and federal monitoring and sampling requirements. The laboratory is a potential source of small quantities of mercury-containing compounds. Laboratory employees will be trained in the proper handling and disposal of these materials. The laboratory has also replaced mercury thermometers with non-mercury thermometers, wherever practical.

There are areas on the plant site where thermometers are used. These thermometers have also been replaced with non-mercury thermometers. The laboratory has done a review of the chemicals used, for potential presence of mercury. One test was found to use a chemical which contains mercury. An alternative test was adopted. Another test used a vial which contains mercury. For daily use and alternative vial was switched to one with no mercury. The mercury containing vials are still used for certification, which is of minimal use. These vials are collected and stored in a recycling kit. Once the kit is filled, it is returned to a recycling facility. Overall, use of mercury vials has been significantly reduced. In the event mercury is spilled in the lab, a mercury spill recovery kit has been purchased for cleaning up the spill.

## **C. TRACKING AND MONITORING**

In order to assess the implementation of the control measures, Roanoke Rapids Sanitary district WWTP proposes to undertake the following evaluations beginning after the first full year that this MMP is implemented:

1. Survey annually at least ten percent (10%) of any non-domestic users identified as possible Significant sources of mercury to the POTW;
2. Track the implementation of the programs outlined above;
3. Monitor influent mercury at least annually. Require significant non-domestic sources of Mercury to monitor periodically as warranted; and
4. Measure effluent mercury as required by the NPDES permit #NC0024201.

These efforts will allow Roanoke Rapids Sanitary District WWTP to establish a baseline of influent and effluent mercury levels to assist in identifying any trends in mercury contributions from domestic and non-domestic users of the sewer system. This baseline will be tracked annually.

To obtain a better overall illustration of the mercury presence in the District's drinking water supply has been tested. The residuals from the drinking water process have been tested. Areas of the District's collection system identified as domestic only have been tested. Upstream analysis has been tested and finally, site rain water has been tested for the mercury presence.

#### **SECTION IV – IMPLEMENTATION OF CONTROL MEASURES**

The WWTP has removed equipment over the years that contained mercury. The mercury was stored on site until a disposable volume was collected. A recycling facility was contacted which supplied the collection/shipping container. The mercury was packaged and sent to the recycling facility.

The WWTP has a pretreatment program which issues permit to its industries. Through this permitting program industries are required to test for mercury. The industries will also review chemicals which may contain mercury. If any are found they will be asked to look for an alternative replacement. The District does regulate how the collection system may be used. This is done with a Sewer Use Ordinance (SUO).

Local limits for mercury are in the SUO.

**Roanoke Rapids Sanitary District WWTP** will implement the control measures summarized in Section III over the permit term and will update this MMP as warranted.

#### **SECTION V – REPORTING**

A summary of the MMP activities will be submitted as part of the NPDES permit renewal process.