



## Sewage Collection and Wastewater Treatment Report for the Fiscal Year July 2017 – June 2018

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This is the nineteenth annual Sewage Collection and Wastewater Treatment Report for the City of Burlington, NC.

On July 21, 1999, North Carolina Governor James Hunt signed a law that placed new reporting requirements on the owners or operators of wastewater treatment and wastewater collection facilities in North Carolina. Part of this legislation was a requirement to provide the users or customers of the system with an annual report of the past year's performance that includes a summary of wastewater spills.

The purpose of these reports is to provide an understandable and informative description of the wastewater treatment facilities and collection system, describe the regulations with which these facilities must comply, and promote a general awareness of these facilities and their role in protecting the environment.

### INTRODUCTION

The City of Burlington operates two wastewater treatment facilities and a sewage collection system that collects and transports the sewage to each of these two locations. The names and permit information for these facilities are listed below as well as those professionals designated by the State of North Carolina as Operators in Responsible Charge (ORC)

#### East Burlington Wastewater Treatment Plant

Quarry Road, Burlington, NC  
Phone (336) 578-0515  
NPDES Permit # - NC0023868  
Operator in Responsible Charge (ORC) – Darrin Allred

#### Sewage Collection System

1103 S. Mebane Street, Burlington, NC  
Phone (336) 222-5140  
Collection System Permit # - WQCS00008  
Operator in Responsible Charge (ORC) – Donnie West

#### South Burlington Wastewater Treatment Plant

Boywood Road, Graham, NC  
Phone (336) 227-6261  
NPDES Permit # - NC0023876  
Operator in Responsible Charge (ORC) – Rick Asher

This report is being provided to meet the requirements of North Carolina law (HB 1160). Copies will be available at the East Burlington Wastewater Treatment Plant, the South Burlington Wastewater Treatment Plant, the Water and Sewer Pipe Maintenance facility, the Municipal office building (City Hall) at 425 Lexington Avenue, the May Memorial Public Library, the Public Works building at 234 E Summit Avenue, the Water Resources Office at 1302 Belmont St. and published on the City of Burlington website – [www.burlingtonnc.gov](http://www.burlingtonnc.gov).

Customers will be notified of the availability of this report by ads in the Burlington Times News.

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### THE IMPORTANCE OF WASTEWATER TREATMENT

Every living organism interacts with its environment. Pollution is the addition of impurities to the environment. For millennia, humans have put their sewage (and trash) into streams, lakes, or oceans. This pollution did not cause significant environmental impact because natural processes could eliminate it faster than it would accumulate. However, as the human population increased, natural decomposition could no longer keep up with the wastes being generated. ***The purpose of a wastewater treatment plant***

***is to facilitate the natural decomposition of sewage so that the water released back to the environment – typically into a stream or river – will have minimal or no negative impact on the environment.*** The City of Burlington owns and operates two wastewater treatment facilities that treat the sewage produced by approximately 70,000 people living in and around the City. The East Burlington wastewater treatment facility discharges treated water into the Haw River near the NC Highway 70 bypass near the town of Haw River. The South Burlington facility discharges into the Big Alamance Creek near Boywood Road in Swepsonville.

This treatment process ensures that water is constantly being recycled.

## NPDES PERMIT

The treatment of sewage and its return to the environment can be a delicate and complex balancing act. State agencies assure that stringent standards are met before the treated water can be released into a receiving stream. These standards are summarized in a **National Pollutant Discharge Elimination System (NPDES) permit**. Each facility, whether public or private, that releases treated wastewater into any surface water – a stream for example – must apply for and possess one of these permits. These permits regulate the type and amounts of pollutants that a facility can discharge. The discharge limits in these permits are based on a particular stream's ability to withstand the addition of pollutants without having a negative impact on the stream's water quality, i.e., small streams have more stringent requirements than a large river; wastewater plants that discharge into waters classified as a source of drinking water must meet more stringent requirements than wastewater plants that discharge into non-drinking water supply sources. These permits are different from one wastewater plant to another and even from one season to another. To protect the stream, a facility's NPDES permit assumes that the stream is ALWAYS flowing at its lowest flow. This is called the "7 Q 10" flow. It is meant to represent the lowest flow that the stream will experience in 7 consecutive days once every 10 years. Even when a stream or river is experiencing a high flow – perhaps due to a heavy rain – a wastewater plant must continue to discharge as if the stream were experiencing an unusually low flow. These strict standards provide wastewater plants with a margin of safety when it comes to protecting the environment.

## WHERE DOES IT ALL END UP?

Burlington is home to a number of mills and manufacturing plants. These plants use large amounts of water every day. Once used, this water is discharged into the sewer system. Wastewater treatment facilities are primarily designed to treat domestic waste – waste that comes from houses – and sometimes have difficulty treating industrial waste. The various pollutants from many different sources often makes the NPDES permit regulations more difficult to meet. It is a misconception that when something is flushed "down the drain", it is gone, never to be seen or worried about again. People who use the sewer system should be aware of the other end of the drain. When something goes into the sewer on one end, it will arrive - and must be treated - at the other end. When wastewater arrives at the treatment facility, it must go through the entire treatment process. Anything and everything that arrives at the plant must somehow be handled – and the treatment facility must still meet the NPDES permit requirements. This makes the operation of a wastewater plant vulnerable to chemicals or pollutants that might upset the biological treatment process. In order to help prevent unwanted pollutants from entering the sewage treatment process, the City of Burlington laboratory personnel monitor the industrial discharges. Industries that discharge into the Burlington sewer system are inspected and must comply with discharge permits of their own to help protect the

sewer collection system, the treatment facility, employees of the City's Water Resources Department, and the environment. Large industries are routinely monitored and in many instances, are required to provide treatment of their wastewater before discharging it into the city sewer system. This is often referred to as 'pretreatment' or 'industrial pretreatment'.

## COLLECTION SYSTEM OVERVIEW

Burlington's wastewater collection system consists of approximately 21,756 connections serving homes, businesses and industry<sup>1</sup>, 444 miles of gravity sewer line, 10,094 manholes<sup>2</sup>, 4 sewer lift stations and approximately 10,718 feet of pressurized force main that is active and maintained by the city. Every day an estimated 10.6 million gallons<sup>3</sup> of sewage is transported from our homes and businesses through this collection system to the East Burlington and South Burlington wastewater treatment facilities. The collection system has both gravity lines and force mains. Sewage discharged in neighborhoods flows by gravity into the collection system. As more and more sewage is collected from different service areas, the size of the sewer lines must increase to handle the larger volumes of wastewater. Eventually, these gravity lines reach low points in the collection system where the sewage must be lifted or forced uphill. The City of Burlington currently utilizes four lift stations with a maximum capacity of about 4 million gallons per day and an average flow of about 462,000 gallons per day in 2017-18<sup>4</sup>. These lift stations pump sewage up and over ridges where the sewage can once again flow by gravity the remainder of the distance to the treatment facilities. The City of Burlington has an ongoing program to clean and monitor the collection system. High-pressure washing, chemical treatment for root growth, a Fats, Oils and Grease (FOG) program, and closed circuit television monitoring program are a few of the tools we use to maintain your collection system and prevent sewer overflows. Last year the City of Burlington sewer collection system transported more than 3,800,000,000 gallons (3.879 Billion Gallons\*<sup>5</sup>) of wastewater (see Table 1). During that same period, the City experienced 5 reportable sewer overflows resulting in an estimated loss of 1,530 gallons of sewage. The single largest overflow of 650 gallons occurred on Tuesday, February 13, 2018 when a blockage due caused sewage to back up and out of a nearby manhole.

A summary of all the sanitary sewer overflows can be found in Table 3 at the end of this report. This report includes a list of all reportable sanitary sewer overflows between July 1, 2017 and June 30, 2018 in which untreated sewage was released. A reportable instance is one in which untreated sewage enters a stream or river or enters a ditch or waterway that leads to a stream or river, OR any spill that was greater than 1,000 gallons - regardless of whether or not it reached a waterbody.

High flows at the treatment plants are sometimes caused by heavy rains or long periods of rainy weather. These high flows are

<sup>1</sup> Customer Service provided the number of service connections in 2018

<sup>2</sup> Donnie West – Pipe Maintenance Assistant Superintendent updated in 2018

<sup>3</sup> Sum of combined DMR flows for fiscal year

<sup>4</sup> Plants Maintenance Superintendent Report

<sup>5</sup> \* to help understand how large one billion is: 1 billion seconds equals 32 years

caused by water infiltrating the sewer system. The City is engaged in a continual program to reduce the amount of overflows that result from the infiltration of rainwater. The City also pays close attention to those areas where falling debris (such as a fallen tree or tree limb) could damage above-ground sewer lines and result in a sewage release.

**SUMMARY**

In fiscal year 2017-18 the City of Burlington spent approximately \$1.98 million to construct, repair and maintain the city sewer collection lines and approximately \$5.19 million to operate and maintain the wastewater treatment facilities and equipment. In addition to the recurring annual expenses, the wastewater treatment plants recently completed a number of upgrades that began in 2012. These upgrades included enhancements to the biological treatment processes at both plants (\$16.6 Million), new tertiary filters at the South Burlington Plant (\$5.6 Million), a new 30" force main at the East Burlington Plant (\$1.1 Million) and 8,350 feet of a new 42" outfall to convey sewage to the East Burlington WWTP (\$5.7 Million). These modifications will help the facilities

comply with new nutrient regulations to help protect water quality in Jordan Lake that are scheduled to go into effect in 2019. The Water Resources Department is proud of the performance of our collection system and treatment plants for the past year. Despite the dedicated efforts of our wastewater treatment plant staff, it is often difficult to avoid violations of the NPDES permit. Table 2 at the end of this report contains a list of the NPDES permit violations for this past reporting year. Violations or spills are often a result of conditions that are beyond the reasonable control of the operator. Weather and vandalism are two examples that may cause a violation. Our ultimate goal is to have no spills or permit violations. We want to provide the best possible service to our customers and continue to be responsible stewards of our environment and of our financial resources. We also want the public to understand the importance of protecting our precious water resources. We believe providing information is one of the most effective tools to ensure the support needed to meet our goals to protect our environment – now and into the future.

For more information, please contact the Department of Water Resources at (336) 222-5133.

**Table 1 – Monthly Discharge Volumes**

<b>City of Burlington</b> Summary of Wastewater Flows July 1, 2017 - June 30, 2018 all flows are expressed as million gallons (MG)			
<b>Month / Year</b>	<b>South Burlington</b>	<b>East Burlington</b>	<b>Combined Total</b>
Jul-17	181.0*	123.9	<b>304.9</b>
Aug-17	177.2	117.1	<b>294.3</b>
Sep-17	167.1	116.2	<b>283.3</b>
Oct-17	164.4	118.9	<b>283.3</b>
Nov-17	160.2	116.7	<b>276.9</b>
Dec-17	167.4	110.8	<b>278.2</b>
Jan-18	193.1	136.4	<b>329.5</b>
Feb-18	194.1	130.8	<b>324.9</b>
Mar-18	256.2	153.3	<b>409.5</b>
Apr-18	255.6	158.1	<b>413.7</b>
May-18	223.7	147.9	<b>371.6</b>
Jun-18	182.6	126.6	<b>309.2</b>
<b>Total (MG)</b>	<b>2,322.6</b>	<b>1,556.7</b>	<b>3,879.3</b>
<b>Average Month (MG)</b>	<b>193.6</b>	<b>129.7</b>	<b>323.3</b>
<b>Average Day (MG)</b>	<b>6.363</b>	<b>4.265</b>	<b>10.628</b>
This table is based on a 365 day fiscal year beginning July 1, 2017 and ending June 30, 2018 An '*' indicates that a permit violation occurred during this month. See table 2.			

**Table 2 – NPDES Permit Violations**

<b>East Burlington WWTP - Summary of Violations - July 1, 2017 - June 30, 2018</b>			
<b>Month / Year</b>	<b>Violation</b>	<b>Environmental Impact</b>	<b>Number of Violations</b>
<b>NO PERMIT VIOLATIONS OCCURRED DURING THIS PERIOD</b>			

<b>South Burlington WWTP - Summary of Violations - July 1, 2017 - June 30, 2018</b>			
<b>Month / Year</b>	<b>Violation</b>	<b>Environmental Impact</b>	<b>Number of Violations</b>
<b>July 2017</b>	<b>Failed Whole Effluent Toxicity (WET) Test*</b>	<b>None Observed</b>	<b>1</b>
*WET test is a quarterly test that is performed on the plant effluent. A failed WET test requires 2 additional follow-up samples in the next two consecutive months. All required follow-up WET tests passed.			

**Table 3 – List of Reportable Sanitary Sewer Overflows**

<b>Date</b>	<b>Volume</b>	<b>Location of Overflow</b>	<b>Caused by</b>	<b>Environmental Impact</b>	<b>Action Taken</b>
10/28/17	35	515 E. Willowbrook Drive	Grease	None reported or observed	Jetted main to remove blockage
2/2/18	70	1305 N. Church Street	Grease	None reported or observed	Jetted main to remove blockage; flow hydrant to flush
2/3/18	500	Boone Station Dr.	Grease / Debris	None reported or observed	Jetted main to remove blockage; flow hydrant to flush
2/13/18	650	Behind 2426 Macloud St.	Debris	None reported or observed	Jetted main to remove blockage; Cleaned and limed area
6/7/18	275	376 Edinborough Dr.	Roots	None reported or observed	Jetted main to remove blockage; flow hydrant to flush

Total Estimated Overflow for fiscal year 2017 –18      1,530 gallons