



Sewage Collection and Wastewater Treatment Report for the Fiscal Year July 2015 – June 2016

This is the seventeenth 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.ci.burlington.nc.us/.

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

THE IMPORTANCE OF WASTEWATER TREATMENT

Every living organism interacts with its environment. Pollution is the addition of impurities to the environment. For centuries humans put their sewage 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. 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 21,137 connections serving homes, businesses and industry¹, 428 miles of gravity sewer line, 9,695 manholes², 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 12.3 million gallons³ 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 517,000 gallons per day in 2015-16⁴. 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 4,504,800,000 gallons (4.505 Billion Gallons⁵) of wastewater (see Table 1). During that same period, the City experienced 9 reportable sewer overflows resulting in an estimated loss of 6,600 gallons of sewage. The single largest overflow of 5,300 gallons occurred on Saturday, May 7, 2016 when grease in a section of sewer line combined with roots to block the flow of sewage through the sewer line and forced it 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, 2015 and

¹ Customer Service

² Donnie West – Pipe Maintenance Assistant Superintendent

³ Sum of combined DMR flows for fiscal year

⁴ Plants Maintenance Superintendent Report

⁵ * to help comprehend how large one Billion is: 1 billion seconds is equal to 32 years

June 30, 2016 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 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 falling tree or tree limb) could damage above-ground sewer lines and result in a sewage release.

SUMMARY

In fiscal year 2015-16 the City of Burlington spent approximately \$1.3 million to construct, repair and maintain the city sewer collection lines and approximately \$4.0 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 3,800 feet of a new 42" outfall to convey sewage to the East Burlington WWTP (\$5.3 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

City of Burlington			
Summary of Wastewater Flows*			
July 1, 2015 - June 30, 2016			
all flows are expressed as million gallons (MG)			
Month / Year	South Burlington	East Burlington	Combined Total
Jul-15	171.5	130.3	301.8
Aug-15	159.5	131.5	291.0
Sep-15	175.8	139.7	315.5
Oct-15	208.3	159.4	367.7
Nov-15	248.4	174.5	422.9
Dec-15	302.5	173.6	476.1
Jan-16	245.4	155.6	401.0
Feb-16	254.9	175.9	430.8
Mar-16	226.7	159.6	386.3
Apr-16	204.3	145.8	350.1
May-16	240.8	170.2	411.0
Jun-16	193.0	157.6	350.6
Total (MG)	2,631.1	1,873.7	4,504.8
Average Month (MG)	219.3	156.1	375.4
Average Day (MG)	7.189	5.119	12.308
This table is based on a 366 day fiscal year beginning July 1, 2015 and ending June 30, 2016			
An "*" indicates that a permit violation occurred during this month. See table 2.			

Table 2 – NPDES Permit Violations

East Burlington WWTP - Summary of Violations - July 1, 2015 - June 30, 2016			
Month / Year	Violation	Environmental Impact	Number of Violations
NO PERMIT VIOLATIONS OCCURRED DURING THIS PERIOD			

South Burlington WWTP - Summary of Violations - July 1, 2015 - June 30, 2016			
Month / Year	Violation	Environmental Impact	Number of Violations
NO PERMIT VIOLATIONS OCCURRED DURING THIS PERIOD			

Table 3 – List of Reportable Sanitary Sewer Overflows

Date	Volume	Location of Overflow	Caused by	Environmental Impact	Action Taken
7/13/15	50	1905 E. Webb Ave	Grease	None reported or observed	Removed blockage to restore flow. Flushed hydrant
10/7/15	200	1446 Morningside Dr.	Debris	None reported or observed	Freed blockage, flowed hydrant, limed area
2/14/16	300	303 Portsmouth Dr.	Grease	None reported or observed	Freed blockage, flowed hydrant, limed area
2/24/16	100	Harden St @ Young St.	Grease	None reported or observed	Freed blockage, flowed hydrant, limed area
3/1/16	150	744 Grover Ln.	Debris	None reported or observed	Freed blockage, flowed hydrant, limed area
3/9/16	50	523 Country Club Dr.	Debris	None reported or observed	Freed blockage, cleaned area, limed area
3/29/16	400	153 Huffman Mill Rd.	Grease	None reported or observed	Freed blockage, flowed hydrant
5/2/16	50	811 Day St.	Pipe Failure	None reported or observed	Replaced section of pipe, flowed hydrant
5/7/16	5,300	709 Westbrook Dr.	Roots / Grease	None reported or observed	Freed blockage, flowed hydrant, cut out roots

Total Estimated Overflow for fiscal year 2015 –16 6,600 gallons