



## City of Clinton: Wastewater Systems Annual Performance Report

January 2018 through December 2018

### I. General Information

Facility/System Name: City of Clinton Collection System and Norman H. Larkins Wastewater Treatment Plant

Responsible Entity: Michael Christopher Medlin, Public Works Director / ORC Collection System

Person(s) in Charge: Michael Christopher Medlin, Public Works Director  
Taylor Ray Johnson, Utilities Supervisor / Back-Up ORC Collection System  
Neil D. Carroll, Wastewater Treatment Manager, ORC Wastewater Treatment Plant  
Lisa Osthues, Environmental Programs Manager

Applicable Permit(s): Collection System Permit      WQCS00079  
NPDES Discharge Permit      NC0020117

Clinton Public Works and Utilities Department  
200 W. John St.  
Clinton, NC 28328  
Telephone - (910) 299-4905  
Facsimile - (910) 592-3825

Norman H. Larkins Wastewater Treatment Plant  
123 Mill Branch Road  
Clinton, NC 28328  
Telephone - (910) 299-4908  
Facsimile - (910) 590-2387

## **II. Collection System and Treatment Process Description**

### **A. Collection System**

The City of Clinton maintains approximately 91 miles of wastewater collection lines with 14 major lift stations, 61 simplex lift stations, 1613 manholes, and approximately 3,585 connections. The Collection System is staffed by ten (10) full time personnel, led by the City's state certified Operator in Responsible Charge and the Utilities Supervisor / Back-Up Operator in Responsible Charge. The Collection System staff is responsible for the routine required inspection, maintenance and cleaning, as well as repair and upgrading of the collection lines, manholes, connections and simplex lift stations.

The Collection System is permitted by the state and must adhere to state permit requirements. The system's use is regulated by the City's Sewer Use Ordinance, Chapter 22, Article V. Sewers, of the City of Clinton Code of Ordinances. The ordinance includes provisions for domestic and industrial users, as well as restrictions and requirements for treating wastewater prior to disposal in the City's Collection System with devices such as grease traps, or sand filters.

### **B. Wastewater Treatment Plant**

The Collection System discharges to the Norman H. Larkins Wastewater Treatment Plant. The treatment plant is staffed by eleven (11) full time employees: five (5) full time Wastewater Operators, a Certified Maintenance Technologist, an Environmental Programs Assistant / Backup Laboratory Analyst, a Certified Laboratory Analyst, the Chief Wastewater Operator, the Environmental Programs Manager / Laboratory Supervisor, and the Operator in Responsible Charge / Wastewater Treatment Manager. The Operator staff and the Utility Maintenance Tech are also responsible for the operation and maintenance of the City's fourteen (14) duplex lift stations.

The plant is permitted by the state to treat five (5) million gallons of wastewater per day by tertiary biological methods. Following mechanical separation of solids and biological treatment, the treated wastewater is filtered, disinfected, and received by the Williams Old Mill Branch which enters the Great Coharie Creek of the Cape Fear River Basin. Wasted biosolids are aerobically digested and recycled through a contractual land application program which is managed per North Carolina and EPA regulations. The City utilizes a combination of the on-site Wastewater Laboratory and a contract laboratory to monitor the incoming wastewater (influent), in-process water (intermediate) and biosolids (activated sludge), and outgoing water (effluent) routinely to ensure the treatment processes are successful and that the water adheres to state and federal standards. Additionally, the City is a member of the Lower Cape Fear River Program, and up and downstream monitoring is conducted via this program on behalf of the City.

## **III. Pretreatment**

The Environmental Programs Manager and Environmental Programs Assistant administer a state approved Pretreatment Program, which is required for any POTW to accept wastewater from any significant industrial user (SIU). The goals of the Pretreatment Program are to protect the waters of the state by preventing pollutant pass-through of the treatment facility, prevent interference with the wastewater treatment process, promote beneficial use of treated biosolids, and to protect the worker and the public health. These goals are accomplished through a program of cooperation between the POTW and the industrial users in which the industries maintain wastewater treatment operations in situ to reduce the amount of pollution in the influent of the wastewater treatment facility. The POTW helps the industries maintain a state of compliance through the issuance of Industrial User Permits, enforcement response, regular communication, inspections and sampling.

#### IV. Certifications

##### A. Collection System

For the calendar year of 2018, current City of Clinton Collection System employees maintained existing certifications, and one employee earned a Collections Systems Operator Grade I Certification.

##### B. Wastewater Treatment

For the calendar year of 2018, current City of Clinton Wastewater Treatment Plant employees maintained existing certifications, and one staff member earned a Biological Wastewater Operator Grade I Certification.

##### C. Laboratory

For the calendar year of 2018, the City of Clinton Wastewater Treatment Plant Laboratory successfully passed all annual proficiency testing and maintained certification for thirteen (13) pollutant test methods. The WWTP Laboratory was recognized by Environmental Research Associates during the 2018 calendar year as a Laboratory of Excellence for achieving 100% acceptable data in proficiency testing.

#### V. System Maintenance and Improvements

##### A. Collection System

During the 2018 calendar year, Collection System personnel performed routine cleaning of 56,099 ft. of collection lines. The crew has continued to utilize a camera system and a smoke machine which allow for better assessment of conditions within the Collection System. In addition to routine maintenance the following repairs and/or upgrades were made to the system in 2018:

Collection System Repairs/Upgrades in 2018
Collection Lines slip-lined: 1645 feet
Manholes: 33 manhole rings and covers replaced, 6 manholes rehabilitated
Cleanouts: 11 new cleanouts installed
Connections: 17 new connections added
Camera Assessment: 7,329 feet of sewer lines performed
Duplex (major) Lift Stations Annual Cleaning: All lift stations cleaned and jet-vacuumed
Loop Rd. Lift Station: Replaced contactor for pump #1 motor, replaced telephone dialer battery
Carter St. Lift Station: Rewired autodialer, replaced relays, replaced starter for pump #1, replaced and repaired two (2) ten (10) horsepower motors
Pugh Rd. Lift Station: Installed new filter element in generator
Ellis St. Lift Station: Rewired alarm buzzer, replaced capacitor, replaced grinder motor, installed pump and replaced float
Country Club Dr. Lift Station: Repaired shorted motor and control panel after Hurricane Florence, installed new 12V battery, repaired audible alarm and rewired autodialer, repaired pump motor
Fox Lake Lift Station: Removed two large Leyland cypress trees
County Complex Lift Station: Installed new autodialer
Deer Run Lift Station: Installed new float switch

## B. Wastewater Treatment Plant

During the calendar year of 2018, in addition to routine maintenance of the plant and effluent outfall receiving waterways, the following major repairs, replacements or upgrades were made to the WWTP:

Wastewater Treatment Plant Repairs/Upgrades in 2018
Jet Aeration Basin Pumps and Blowers: Installed pH probes; replaced disconnect/starter combination; rebuilt 1 pump and installed a stainless steel mounting bracket; rebuilt impeller on 4 pumps and added ceramic coating on 2 pumps; repaired 2 pumps; updated preventative maintenance plan for JAB blowers and installed new filter elements for 3 blowers; painted steel I-beams in blower building with protective coating
SCADA System Additions: Jet Aeration Basin blower control panel and lime tower controls
Aerated Grit Chamber: Rebuilt grit chamber in stainless steel; Installed new grit auger and control panel
Clarifiers: Installed stainless steel scum baffle in Primary Clarifier A
Tertiary Filters: changed out switches in the filter building; added stainless steel strapping to pipes and conduit in filter building
Aerobic Digester: Installed new motor with debris reflector, impeller, and labyrinth slinger
Post-aeration Basin: Repaired 2 pumps; installed new power controls for aerators; replaced drive surge protection and relays for aerator #2
Lime Tower: Painted lime tower with protective coating
Stormwater Pumps: Installed new catwalk for stormwater pumps; installed new transfer switch; elevated stormwater pump controls
Warranty Services: Extended 6-year warranty for new drives for Influent and Intermediate flows

## VI. Performance: Summary of Performance for Reporting Period

### A. Collection System Performance

The City's state issued Collection Systems permit (WQCS00079) was renewed in 2015 and remains effective through October 31, 2023.

The City of Clinton is routinely working to maintain and improve the efficiency of our Collection System by increasing routine maintenance of lines and lift stations and participating in an ongoing education program in which citizens are instructed in the importance of proper disposal of household waste, including fats, oils, and grease. The City is encouraging its citizens and system users to recycle used cooking oil, avoid the use of 'flushable' wipes, and limit garbage disposal usage, in particular. Flyers were distributed to areas throughout the City in 2018, and informational pamphlets were passed out to citizens at many of the City's annual events, such as the Street Fair and Alive After 5 concert series. The City's Call-Out system was used to notify citizens of problems resulting from the flushing of wipes. Additional information is available on the City's website at [www.cityofclintonnc.com](http://www.cityofclintonnc.com), and multiple postings were placed on the City's Facebook page with photos of pumps that were affected by the flushing of wipes.

#### Sanitary Sewer Overflows (SSOs):

Sanitary sewer overflows may result from a variety of causes: inflow and infiltration due to high water levels; blocked pipes from wipes, rags, roots, and grease accumulation; broken lines from corrosion or construction activity; power failures at pump and lift stations

within the system. The City of Clinton Collection System suffered the following four (4) reportable SSOs for the calendar year of 2018:

*July 8<sup>th</sup>, 2018*

*A spill occurred at Manhole #818 on Wilson Street near the Grove Street crossing. The spill was estimated to be 250 gallons which entered surface waters of the Cattail Branch of Great Coharie Creek due to wipes from domestic system users clogging the collection line. The wipes were manually removed and disposed of properly as solid waste, and the City's vac truck was used to vacuum the manhole and transport the wastewater to the Norman H. Larkins Water Pollution Control Facility. City of Clinton personnel spread lime around the manhole and samples were taken upstream and downstream from the manhole on July 9. The City also distributed 100 informational door-hanger fliers to residents along the Wilson Street line and contributing lines discussing proper use of the City's collection system and emphasizing the negative impact of wipes.*

*September 15<sup>th</sup> – 17<sup>th</sup>, 2018*

*A spill estimated to be 28,800 gallons from manhole # 1060 occurred due to loss of power to Country Club Drive Lift Station as a result of torrential rains and high winds associated with Hurricane Florence. It is not believed that any wastewater reached surface waters as a result of this spill. In order to lessen the impacts of such events, City crews worked actively through the storm according to emergency protocols, which mandate 24 hour diligence of employees working on 12 hour shifts.*

*September 17<sup>th</sup> – 19<sup>th</sup>, 2018*

*Due to flooding as a result of heavy rains associated with Hurricane Florence, approximately 100 gallons of wastewater entered the surface waters of the Cattail Branch of Great Coharie Creek from Manhole #294. Creek waters rose, surrounding the manhole, which was protected by an earthen berm constructed by City of Clinton personnel. On the 2<sup>nd</sup> day of the event, the berm was washed away, allowing the manhole to become inundated. In order to lessen the impacts of such events, City crews worked actively through the storm according to emergency protocols, which mandate 24 hour diligence of employees working on 12 hour shifts.*

*October 9<sup>th</sup>, 2018*

*A 4,000 gallon SSO occurred due to a power loss at Country Club Drive Lift Station. Control power to the lift station failed and the audible alarm sounded. The audible alarm was faulty and blew a fuse which cut power to the pump and the auto dialer. Since power was lost to the audible alarm and auto dialer, the spill was not discovered until the regular weekly lift station check. The City's vac truck and a contract vac truck were called in to pump out the wastewater, and electricians were called in to conduct repairs. The electricians repaired the audible alarm and wired the auto dialer on a separate circuit to prevent a similar problem from occurring in the future. No wastewater reached surface waters during this event. The City of Clinton received a Notice of Violation (NOV) for the incident, however, no monetary penalty has been issued.*

## B. Wastewater Treatment Plant Performance

During the calendar year of 2018, the City of Clinton Norman H. Larkins WWTP treated approximately 1.09 billion gallons of wastewater.

### NORMAN H. LARKINS WASTEWATER TREATMENT PLANT EFFLUENT ANALYSIS

The following table summarizes plant performance for the calendar year 2018 in comparison with National Pollutant Discharge Elimination System (NPDES) permitted limits:

Parameter	Limit Interval	Spring / Summer (April 1 to October 31)		Fall / Winter (Jan 1 to March 31 and November 1 to December 31)	
		NPDES Limits	Measured Values; Range or Mean	NPDES Limits	Measured Values; Range or Mean
<b>Flow</b>	Mean Monthly	5.0 MGD	<b>3.0 MGD</b>	5.0 MGD	<b>3.0 MGD</b>
<b>pH</b>	Daily	6.0 to 9.0 S.U.	<b>6.6 to 8.1 S.U.</b>	6.0 to 9.0 S.U.	<b>6.4 to 7.7 S.U.</b>
<b>Residual Chlorine</b>	Daily Maximum	17.0/50.0 µg/L	<b>48.8 µg/L</b>	17.0/50.0 µg/L	<b>42 µg/L</b>
<b>BOD<sub>5</sub></b>	Mean Monthly	5.0 mg/L	<b>3.13 mg/L</b>	10.0 mg/L	<b>2.99 mg/L</b>
<b>Ammonia Nitrogen</b>	Mean Monthly	1.0 mg/L	<b>&lt;1.0 mg/L</b>	2.0 mg/L	<b>&lt;1.0 mg/L</b>
<b>Total Suspended Residue</b>	Mean Monthly	30.0 mg/L	<b>5.06 mg/L</b>	30.0 mg/L	<b>3.97 mg/L</b>
<b>Fecal Coliform</b>	Geometric Mean Monthly	200 cfu/ 100 mL	<b>36 to 125 cfu/100mL</b>	200 cfu/ 100 mL	<b>34 to 169 cfu/100mL</b>
<b>Dissolved Oxygen</b>	Daily Minimum	6.0 mg/L min.	<b>6 mg/L</b>	6.0 mg/L min.	<b>6 mg/L</b>
<b>Temperature</b>	Daily	Monitor	<b>18 to 32.3°C</b>	Monitor	<b>13 to 26.2°C</b>
<b>Conductivity</b>	Daily	Monitor	<b>303 to 2066 µmhos/cm</b>	Monitor	<b>804 to 1684 µmhos/cm</b>
<b>Total Cyanide</b>	Quarterly	Monitor	<b>&lt;5 µg/L</b>	Monitor	<b>&lt;5 µg/L</b>
<b>Total Nitrogen</b>	Monthly	Monitor	<b>19.3 to 35.5 mg/L</b>	Monitor	<b>8.6 to 30.1 mg/L</b>
<b>Total Phosphorus</b>	Monthly	Monitor	<b>2.09 to 18.8 mg/L</b>	Monitor	<b>0.5 to 21.8 mg/L</b>
<b>Total Copper</b>	Quarterly	Monitor	<b>&lt;10 to 13 µg/L</b>	Monitor	<b>&lt;10 µg/L</b>
<b>Total Zinc</b>	Quarterly	Monitor	<b>37 to 43 µg/L</b>	Monitor	<b>30 to 42 µg/L</b>
<b>Total Mercury(LL)</b>	Quarterly	Monitor	<b>1.22 to 1.24 ng/L</b>	Monitor	<b>&lt;0.5 to 0.77 ng/L</b>
<b>Total Lead</b>	Monthly	Monitor	<b>&lt;10 µg/L</b>	Monitor	<b>&lt;10 µg/L</b>

The Norman H. Larkins Wastewater Treatment Plant had one (1) non-compliance event for the 2018 reporting period. During the week of February 19<sup>th</sup> to the 23<sup>rd</sup> numerous spikes in flow caused fines to clog the filters, reducing the effectiveness of the chlorine treatment. The limit on weekly geometric mean for fecal coliform bacteria was exceeded. This event was reported to the North Carolina Department of Environmental Quality (NCDEQ) as required. The POTW has not received a notice of violation or a monetary penalty for the non-compliance event.

**V. Notification**

This report has been published to the City of Clinton website's Document Center link at:

[http://www.cityofclintonnc.com/document\\_center/](http://www.cityofclintonnc.com/document_center/)

Paper copies may be obtained by visiting the City of Clinton Public Works Department, at 200 John Street, Clinton, NC, Monday-Friday, 7:00 AM to 3:30 PM, or by calling (910)299-4912.

**VI. 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.

Michael Christopher Medlin

Date

Public Works Director

City of Clinton

*Michael C. Medlin*

*3/5/19*

Neil Carroll

Date

Wastewater Treatment Manager / ORC Wastewater Treatment Plant

City of Clinton

*Neil Carroll*

*3/5/19*

Lisa Osthues

Date

Environmental Programs Manager

City of Clinton

*Lisa Osthues*

*3/5/19*