

TOWN OF OAK ISLAND

Annual Wastewater Treatment and Collection Report

July 1, 2015 – June 30, 2016

Oak Island Water Reclamation Facility
 4600 Fish Factory Rd.
 Oak Island, NC 28465
 Permit # WQ0005790
 Expiration Date: 7-31-2021

Satellite Water Reclamation Facility
 5209 E. Yacht Dr.
 Oak Island, NC 28465
 Permit # WQ0031857
 Expiration Date: 8-31-2016

David E. Kelly II Operator in Responsible Charge
 Steve Poarch Backup Operator
 Sonny Wright Backup Operator

The Oak Island Biological Treatment Facility is designed to treat 400,000 gallons per day, which allowed for growth within the system; average daily flows for this past FY was 147,837 gallons per day with a max day of 360,000 on July 25th. There are several options for treating wastewater but this plant was built as what is known as an *Activated Sludge* plant. To provide you with a general description of the plant, we will follow the path of the wastewater as it passes through the plant.

When wastewater enters the plant, it flows through a splitter box; the box has a bar screen and allows for some debris and grit removal. The water then flows into aeration tanks. Oxygen is supplied by extreme mixing, and microorganisms are grown to feed on organic contaminants. This is the Activated Sludge part, referred to as secondary treatment. As these microorganisms grow, they form particles that clump together (called *floc*). As the water passes from the aeration tanks into the secondary clarifier tanks, it is slowed down and allowed to settle. The floc falls to the bottom and is removed and sent back to the beginning of the aeration process to do more work, and the mostly clear water, free of organic matter and solids, is allowed to flow over and out of the tanks. This process is highly efficient, with more than 98% removal of organic material. The water then travels through the chlorine contact chamber which is used to provide for disinfection to destroy any remaining bacteria; after about 30 minutes it then flows through the weirs, which apply the flow evenly over a filter bed system; this allows further removal of the remaining solids. From there it flows out of the plant and can be disposed of by placing it into a rapid infiltration pond, which will allow the water to infiltrate back into the ground, or by placing it into a lined storage pond which will be used to spray (irrigate) around the treatment plant and also Bill Smith Park.

The operation of the plant's processes requires monitoring and testing on a continuous basis. The plant maintains a laboratory for testing the quality of the water as it passes through each plant process and the sludge quality. Contract laboratory testing is also used to assure compliance with the stringent regulatory requirements of the Permit. The permit specifies the monthly average and maximum levels of settleable solids, suspended solids, biochemical oxygen demand, ammonia nitrogen, total kjeldahl nitrogen, residual chlorine, fecal coliform, chloride, temperature, flow, and the pH of the effluent discharge. The Town performs more than 2,200 tests on an annual basis. The following is a list of the Non-Compliant Items for this reporting period.

| <u>Date</u> | <u>Non-Compliant Item</u> | <u>Reason</u> | <u>Corrective Measure</u> |
|-------------|---------------------------|--------------------|---------------------------|
| April 2016 | Daily/Monthly Fecal Limit | Bad Sample Bottle | Sampling Procedures |
| Sept 2016 | Daily/Monthly Fecal Limit | Sampling Procedure | Re trained Procedures |

No violations were received by the Town from the State.

The Town also has a 400,000 gallon per day Satellite Water Reclamation Facility which uses membrane technology for its treatment process. The facility was placed online September 1, 2015. The Town has completed working on a project that will allow for the disposal of the effluent from this facility to be placed into rapid infiltration ponds on the Oak Island Golf Course. The facility was to be sampling for Phosphorous but does not have a reporting limit; Town staff was notified to start sampling, which started in November of 2015. The facility has been in compliance for the FY 15-16. No violations were received from the State. The daily average for this facility was 88,121 gpd, max day of 124,359 on the 27th of September.

Town-wide Collection Permit

Permit # WQCS00334

Expiration Date: 1-31-18

David E. Kelly II Operator in Responsible Charge

Mark Moore Backup Operator

The Town's collection system for Fish Factory Plant Treatment Facility is located in two sections within the Town limits: 79th St. eastward to Oak Island Dr. on the golf course and from 46th St. to 65th St. along E. Oak Island Dr. (Commercial Corridor). The collection system contains gravity lines from 6" to 15", force mains from 2" to 6" and with service lines ranging from 4" and 6". There are 16 duplex grinder pump lift stations within this system; each one is equipped with a telemetry alarm system (SCADA). The Town of Caswell Beach has a connection point located at the intersection of Hwy 133/Yaupon Way to send wastewater to be treated at Fish Factory.

The remainder of the collection system is primarily the Vac System. The Vac System consists of 9 Vac Stations, 17 Duplex Grinder Pump Stations, 17 Dual Buffer Tanks, 2 Single Buffer Tanks, 3,819 Vacuum Pits, Vacuum Mains sizing from 4" to 10", and Force Mains from 6" to 24". The Town has a main lift station located at 103 E. Oak Island Dr. which pumps the collected sewer to the County's West Brunswick Regional Wastewater Plant for treatment and disposal.

The Town has equipment for videoing and cleaning of gravity sewer lines. The Town is required to clean 10% of gravity lines annually. Within the Town, there are approximately 13 miles of Gravity lines, 82 miles of Vacuum Main and 20 miles of Force Mains. The Town cleaned and video inspected approximately 3.2 miles of gravity lines; along these lines the manholes and service connections were inspected. Town staff cleans out debris and grease from the lift stations monthly to help reduce odor problems.

The Town rehabbed the SE 59th St. lift station, which serves the Commercial Corridor, and purchased two (2) by pass pumps for the larger lift stations and vac stations to keep them operational during power outages or mechanical failures. The odor control project for all vac stations has been completed and is working as designed; staff is are still working to find solutions for the main pump station located at Middleton. The Town will be installing a wash down system in wet well to break up the debris and scum which is brought into station, which in turn will introduce oxygen into the wet well; this should help break down the microorganisms. As a reminder, this station handles 87% of all the raw sewage from the Town before pumping it to Brunswick County for treatment. The flow for the Middleton Station to the County was 196,321,000 gallons for a daily average of 537,866 gallons.

The Town also has an inventory of spare parts for lift stations, vac stations, and vacuum pits, along with line repair items for gravity, vacuum and force mains of all sizes. The Utilities Department has a five-year capital improvement plan that is reviewed annually by staff.

Many of you may see employees walking the streets and yards and wonder, “What are they doing?” Well, the system requires bi-annual inspections and maintenance. If you are on a vacuum system, you may have a vacuum pit in your lawn. Inside that pit, there is a vacuum valve. Twice a year the valve is inspected and evaluated to ensure it is operating properly. The vacuum is generated from our vacuum stations. The vacuum stations are equipped with three vacuum pumps and two sewage pumps. The pumps are monitored and inspected on a daily basis. When a vacuum valve fires, it makes a distinct sound through the vent pipe for three to four seconds. If you hear a suction noise coming from the vent pipe at your home for a long period of time, the valve is probably misfiring. A crew will be called in and will walk from vacuum pit to vacuum pit looking for the misfiring valve. Please, if you hear this sound, call us at (910) 201-8007 or after hours at (910) 278-5595, and let us know as soon as possible. Your call is greatly appreciated.

If you are on the gravity system, you will see a control panel which is somewhat distinctive because it is equipped with a red light and information sign. The red light is a warning light so if you see the red light flashing or hear an alarm from the control panel, we ask that you call us immediately. Why? Because that alarm means it needs immediate attention, and you can be of great help to us by calling (910) 201-8007 or after hours at (910) 278-5595.

For this reporting cycle, the Town had approximately 47 vacuum pits malfunction for which corrective measures were performed; some of the corrective items performed included replacement on controllers, no-hubs and actuators.

The Town’s “Fats, Oils, and Grease Program” (FOG) has been in effect for six years. The purpose of the program is to prevent the accumulation of fats, oils, and grease in the sanitary sewer system. We have 28 commercial facilities with 14 grease traps participating in the program. Our FOG coordinator inspected 6 grease traps this year. Town staff continues to clean and video the gravity portion of the collection system. All of us can work together to protect the environment and maintain the sewer infrastructure. To educate the public on FOG, we sent out an educational pamphlet in the August 2015 water bills.

Information on the Internet:

Visit the Town of Oak Island’s website to view and print this report at (www.oakislandnc.com) and for information on all town departments and departmental contacts. Also, the North Carolina Department of Environment and Natural Resources has a Web site (www.ehnr.state.nc.us) that provides complete and current information on water and wastewater issues in North Carolina.

Town of Oak Island Public Access Channel

Please view the Town of Oak Island’s Public Access Channel on Time Warner Cable Channel 8 for coverage of Council meetings, information on sewer and water activities, street closings, community announcements, and other information relevant to Town activities.

For more information about this report, copies, or any questions relating to the wastewater treatment system, please call David Kelly, Public Services Director, at (910) 201-8041.

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.

David E. Kelly, II,
Public Services Director
Town of Oak Island

Date 8-23-16