



2018 Annual Performance Report Land Treatment Facility and Collection System

I. General Information

Facility/System Name: Jacksonville Land Treatment Facility

Responsible Entity: City of Jacksonville
PO Box 128
Jacksonville, NC 28541-0128

In Charge Contact: William E. Brown, Chief Operator
Anthony Futrell, Utility Services Superintendent

Applicable Permits: Non-Discharge Permit No. WQ0009267
Collection System Permit No. WQCS00268

The City of Jacksonville's wastewater collection system is composed of over 300 miles of sanitary sewer lines and 45 wastewater pumping stations. Twenty of these pumping stations have on-site generators to provide power in the event of power failures and the other 25 pumping stations have standby connections, which allow them to be powered by portable generators during power outages.

The City's Utilities Maintenance Division staff consists of 24 employees and is responsible for maintenance, repair and the proper functioning of the sewage collection system and the maintenance and efficient operation of the wastewater pumping stations. This Division provides routine inspections of the City's manholes and is responsible for jetting sewer lines to clear blockages. This staff also provides preventive maintenance to all the wastewater pumping stations and generators to ensure optimum operation. The Utilities Maintenance Division is also staffed by a Grease Trap Technician and an Inflow & Infiltration (I&I) Analyst.

The Jacksonville Land Treatment Site (LTS) totals 7,400 acres of land and is responsible for the treatment and land application of the City's wastewater. The system is presently designed to treat 9.0 million gallons of wastewater daily and spray irrigates 2,300 acres of primarily loblolly pine trees. Wastewater is transported 8 miles from Jacksonville to the LTS by a 36-inch diameter force main. The wastewater is treated with hydrogen peroxide for the removal of odors before flowing into the headworks facility. At the headwork facility, the influent (raw wastewater) passes through a Huber Step Screen where material greater than 1/8 inch in size is removed. The wastewater then flows into an aerated grit and grease removal system where inorganic material and floating materials are removed. Wastewater then flows into a series of aerated lagoons where biological treatment of the waste occurs. Secondary treated wastewater then flows into storage lagoons. The storage lagoons have a total capacity of 690 million gallons and provide storage of treated wastewater during periods of inclement weather and when spray irrigation of wastewater is not feasible. The treated wastewater is chlorinated to eliminate harmful bacteria and then used to irrigate 2,300 acres of pine forest on the LTS property. There are three classifications of soil types within the irrigation fields: Well-drained, Moderately well-drained, and Seasonally Suitable. The spray irrigation fields are divided into 28 blocks and the annual hydraulic loading for each block is a permitted maximum ranging from 49.0 inches to 62.6 inches, depending on the relative percentage of each soil type. As the pines mature and their ability to store nutrients decreases, the mature trees are harvested and used for pulp wood. Young seedlings are planted to repeat the cycle.

The Land Treatment Facility is staffed by the Chief Operator, seven Wastewater Plant Operators, two Plants Maintenance Mechanics, two Plants Maintenance Workers, a Crew Leader and three Equipment Operators. The Supervising Chemist, assisted by a Chemist I and a Laboratory Technician, is responsible for the certification of the water and wastewater laboratory and performs all the required analyses for both the wastewater and water sections.



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II. Facility Performance

The City of Jacksonville's Land Treatment Facility treated 2,196 million gallons of wastewater during the 2018 calendar year, at an average daily flow of 6.017 million gallons. During 2018, greater than 110 inches of rainfall occurred at the Land Treatment Facility. Hurricane Florence effected the City of Jacksonville on September 12, 2018. On September 16, 2018, the wastewater flow to the facility peaked at 17.5 million gallons. To maintain freeboard level at 2.0 feet in the facility storage lagoons, emergency irrigation was implemented four (4) times during the 2018 calendar year. Emergency irrigation commenced on the follow dates:

- May 22 – June 14, 2018
- August 1 – September 4, 2018
- September 15 – October 12, 2018
- December 17, 2018 – Present

At no time during the calendar year of 2018 did the facility violate the freeboard level of 2.0 feet. In accordance with the permit and after notification to NCDWQ, City laboratory staff collected surface water samples as stipulated by the guidelines of the City's Emergency Action Plan.

The City exceeded the annual hydraulic loading permitted maximum for the Land Treatment Facility spray irrigation fields four (4) times during the 2018 calendar year. The application rates have exceeded the permitted annual hydraulic loading during the following months:

- August 2018: 23 blocks out of 28 blocks
- October 2018: 16 blocks out of 28 blocks
- November 2018: 6 blocks out of 28 blocks
- December 2018: 17 blocks out of 28 blocks

There were no other violations of monitoring or reporting requirements during the 2018 calendar year.

III. Collection System Performance

There was one (1) reported overflow from the collection system during the 2018 calendar year greater than 1,000 gallons in volume. The locations with overflows that exceeded 1,000 gallons were as follows:

- March 19, 2018: Indian Drive & Brookdale Plaza (manhole # 143) approximately 4,000 gallons of untreated wastewater was estimated to have spilled and reach surface waters (Mill Creek). A buildup of grease and baby wipes caused the sanitary sewer overflow. The City continues to educate its citizens on the proper disposal of grease and baby wipes to prevent future overflow occurrences.

There were six (6) reported overflows from the collection system during Hurricane Florence in September 2018 greater than 1,000 gallons in volume. The locations with overflows that exceeded 1,000 gallons during the hurricane were as follows:

- 308 Southbridge Drive (manhole # 2243) approximately 2,031,000 gallons was estimated to have spilled.
- 155 Brookview Drive (manhole # 1748) approximately 338,646 gallons was estimated to have spilled.
- 518 Sherwood Street (manhole # 1613) approximately 1,015,000 gallons was estimated to have spilled.
- 802 Maple Street (manhole # 1732) approximately 677,293 gallons was estimated to have spilled.
- Brookview Pump Station (manhole # 107) approximately 2,031,000 gallons was estimated to have spilled.
- Three (3) manholes located on Onslow Drive (manhole #'s 4119, 4121, 4122) approximately 4,000,000 gallons was estimated to have spilled.



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The City maintained constant communication with NCDWQ after each of these events to ensure full compliance with Environmental Laws and Regulations. The City continues to identify and remediate inflow and infiltration, as well as rehabilitate wastewater infrastructure to prevent further overflows.

IV. Summary

The City of Jacksonville's Land Treatment Facility and collection system performed very well during the calendar year 2018. The total rainfall for 2018 was 110.20 inches at the Administration Building of the Land Treatment Facility and the total influent and effluent for 2018 was 2,196 million gallons and 2,018 million gallons, respectively.

The City has ongoing maintenance programs to ensure the wastewater collection system continues to function effectively. The City utilizes cured-in-place lining, point repairs, and manhole lining to reduce or eliminate inflow and infiltration. In 2018, 164 vertical feet (VF) of manhole Raising was installed in flood prone areas. Other measures include the rain stopper program, fats, oils, and grease management, and pump station maintenance. The rain stopper program is a continuous effort to insert rain stoppers in manholes to prevent or minimize overflows when heavy rainfall occurs. As blockages continue to affect the effectiveness of the sewer system, the fats, oils, and grease management program attempts to mitigate these issues through ordinances, grease interceptors, cleaning and maintenance, and education and awareness efforts. In Jacksonville, there are 229 establishments with grease interceptors that must be cleaned every 30 days. They are also regularly inspected to ensure compliance. Lastly, the City has a program that evaluates and replaces pumps in wastewater stations that fail or are over 20 years old.

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