

2008 Annual Performance Report for the City of Jacksonville's Land Treatment Facility and Collection System

I. General Information

Facility/System Name:	Jacksonville's Land Treatment Facility
Responsible Entity:	City of Jacksonville P.O. Box 128 Jacksonville, NC 28541-0128
Person in Charge/Contact:	Raymond L. Holder, Plants Superintendent John Lareva, Utilities Maintenance Superintendent
Applicable Permits:	Spray Permit No. WQ0009267 Collection System Permit No. WQC500268

The City of Jacksonville's collection system is composed of over 248 miles of sanitary sewer lines and 40 wastewater pumping stations. Fifteen of these pumping stations have on-site generators to provide power in the event of power failures and the other 25 pumping stations have connections, which allowed them to be powered by portable generators during power outages.

The City's Utilities Maintenance Division's 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 pumping stations and generators to insure optimum operation. The Utilities Maintenance Division is also staffed by a Pretreatment Facilities Inspector and an I&I Analyst.

The Jacksonville Land Treatment Facility is responsible for the treatment and land application of the City's wastewater. Wastewater is transported 8 miles from Jacksonville to the Land Treatment Facility via a 36-inch diameter force main. The wastewater is treated with hydrogen peroxide for the removing of odors before flowing into the headwork 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 floatables 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 capacity of 340 million gallons and provide storage of treated wastewater during periods of inclement weather, when spray irrigation of wastewater is not feasible. The stored treated wastewater is used to irrigate a forested 6,270 acre pine plantation. Before irrigation, this treated wastewater is chlorinated to insure that no harmful bacteria are sprayed onto the forest. The treated wastewater is applied in the spray irrigation fields at the rate of 1.4 inches per week from April 1st through October 31st and 0.7 inches per week from November 1st through March 31st. As the pines mature and their ability to store nutrients decreases, the mature trees will be harvested and used for pulp wood. Young seedlings will be planted to repeat the cycle. The system is presently designed to treat 6.0 million gallons of wastewater daily and spray irrigates about 2,000 acres of loblolly pine trees. When additional capacity is needed, the facility will be expanded to treat a total of 9.0 million gallons daily. This expansion will cost approximately 45.0 million dollars and is estimated to be required around 2009.

The Land Treatment Facility is staffed by a Plants Superintendent, a chief operator, six wastewater plant operators, a Plants Maintenance Mechanic, a Plants Maintenance Worker II and four Equipment Operators. A Chemist, assisted by 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.

II. Facility Performance

The City of Jacksonville's Land Treatment Facility treated 1,766 million gallons of wastewater during the 2008 calendar year, at an average daily flow of 4.825 million gallons. The City was in compliance with all monitoring and reporting requirements during the 2008 calendar year.

Collection System Performance

There were 9 reported overflows from the collection system during the 2008 calendar year. Only one of these overflows was greater than 1,000 gallons in volume. Below is the detail summary of the overflow that exceeded 1,000 gallons.

At approximately 6:00 AM on January 16, 2008 City Staff discovered that the Main Pumping Station, which is responsible for pumping all of the City's wastewater to the Land Treatment Facility, was not pumping any wastewater. The controls and back-up systems responsible for controlling the pumps failed and operators on duty failed to notice that the pumps had not operator for 13 hours. Plant Maintenance had also failed to check some alarms that could have provided alerts. The combination of these failures caused approximately 2.1 million gallons of raw wastewater to overflow from a nearby manhole.

When the overflow was discovered, City crews were immediately dispatched to take action to contain the overflow. About 327,000 gallons of the overflow was contained in a swamp. The areas was buffered with sandbags and natural barriers. The sewage was pumped this area and the area was disinfected with the use of lime. It was estimated that approximately 1.8 million gallons of raw sewage flowed into nearby Chaney Creek.

The North Carolina Division of Water Quality was notified and representatives were dispatch to the area. City staff followed their recommendations for clean-up and creek and river sampling. The creek and river monitoring was continued for several days until the affect of the spill was neutralized.

The systems responsible for the spill have been repaired and new controls and monitors have been installed to avoid this kind of situation in the future. Operating procedures have been significantly changed to assure that the on-duty operators are adequately monitoring the condition of the City's wastewater collection system and that maintenance is routinely performed on critical monitoring and control systems. Unannounced tests, previously never routinely done, will be performed to test the monitoring system and the response of the operators.

Summary

The City of Jacksonville's Land Treatment Facility and collection system performed very well during the calendar year 2008. The rainfall for 2008 was 50.85 inches. The City has replaced 34 linear feet (LF) of 8-inch sewer lines, 457 LF of 10-inch sewer line, and 165 LF of 4-inch lines for new service drops within the City.

This year the City has started construction for the expansion of the City's Land Treatment Facility. The expansion will add an additional 3.0 million gallons of treatment and irrigation capacity, over 240 million gallons of effluent storage and an upgrade of the present Main Pumping Station that pumps all of the City's Wastewater to the Land Treatment Facility. The City also added approximately 34 million gallons of storage in the present effluent lagoon by extending the PVC liner to the top of the berm. Additional irrigation capacity was added by implementing 4,000 double spray head nozzle configuration which limits the amount of effluent being spray into the irrigation lanes allowing for longer irrigation times in these areas.

In addition to replacing deteriorated sewer lines, the City has a program that replaces pumps in pumping stations that are over 20 years old. The City replaced and upgraded the Barden Pumping Station from 425 gpm to 1200 gpm. The City also has a program to install rainstopper manhole inserts in manholes throughout the collection system. The City experiences many blockages in the collection system due to oil and grease entering the system. There is also a provision in the City's Sewer Use Ordinance that requires individual restaurants to clean their grease interceptors at least every 60 days. Over 120 restaurants are visited and their grease traps inspected at least twice a year to insure compliance.