

Monitoring and Operating Protocol

**Lake Utility Services, Inc.
Lake Groves Wastewater Treatment Plant
Facility I.D. No. FLA010630**

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1.0 Introduction

The Monitoring and Operating Protocol program for the Lake Groves Wastewater Treatment Facility (WWTF) is described herein in compliance with FDEP Rule 62-610.463. This short form addresses all items requested by Rule 62-610.463 and includes the following:

1. Site description of monitoring parameters and locations, monitoring equipment (including maintenance and calibration), and all pertinent control equipment and devices.
2. Normal operation when reclaimed water is of acceptable quality.
3. Procedures when reclaimed water is of unacceptable quality.
4. Procedure while continuous monitoring equipment is out of service.
5. Water quality verification.
6. Procedures when monitoring parameters approach set point levels.

The Facility will utilize two (2) different methods for treated wastewater disposal, rapid infiltration basins (restricted access sites) and residential irrigation (public access sites). The treatment requirements for public access and restricted access sites are detailed below:

Public Access Sites: Beyond secondary treatment such that the total suspended solids (TSS) are not to exceed 5.0 mg/L and high level disinfection (chlorine residual greater than 1.0 mg/L).

Restricted Access Sites: Secondary treatment, basic disinfection, and nitrate nitrogen (NO₃) not to exceed 12 mg/L for discharge to percolation ponds.

1.1 Compliance Monitoring Parameters

The Lake Groves Wastewater Treatment Facility operates under Permit No. FLA010630, which addresses the water quality requirements. Basic biological treatment is required (secondary treatment), plus filtration and high level disinfection producing an effluent with less than 5 mg/L TSS and a chlorine residual greater than 1 mg/L. Two water quality parameters are monitored continuously to determine if the wastewater treatment plant effluent is of an acceptable quality for public access reuse. The reclaimed water shall be considered acceptable for public access reuse if the following two guidelines are met:

1. Continuous monitoring of the filter effluent to verify that the TSS is less than 5 mg/L.
2. Continuous monitoring of the effluent from the chlorine contact chamber to verify that the total chlorine residual is greater than 1 mg/L.

Reclaimed water is unacceptable for application on public access sites if either the TSS is greater than 5 mg/L or the chlorine residual is less than 1 mg/L, and shall be routed to the onsite percolation ponds.

1.2 Equipment and Location

The TSS meter location will be located in the pipe connecting the tertiary filters and the chlorine contact chamber, after filtration and before disinfection. The chlorine residual will be sampled in the flow control box connected to the transfer pump station. The chlorine contact chambers will discharge into this box for flow measurement and required sampling. The TSS and chlorine analyzer will be housed in a weather protective structure, eliminating any affects from the environment.

1.2.1 Total Suspended Solids Meter

The Utility will utilize the Solitax TSS Probe to measure total suspended solids. The TSS Analyzer is housed in an enclosure to protect against adverse weather conditions. Continuous TSS readings are recorded remotely in the Operations Building.

The zero-point for the sensors is set permanently in the factory and re-calibration is not necessary. A regular zero-point check is recommended and is performed in the laboratory, as described in the product manual.

1.2.2 Chlorine Analyzer

Chlorine residual is monitored continuously at the chlorine residual sample point located at the discharge of the chlorine contact chamber and after the effluent flow meter. The following equipment is utilized for continuous readings of chlorine residual: Analytical Technology, Inc. (ATI) Q46H Residual Chlorine Monitor and is connected to the SCADA system for data logging. Output readings shall be monitored daily. The sample cell will be checked weekly, and cleaned at least once per month. When the sensor membrane becomes fouled, the membrane is to be replaced and refill the membrane with fresh electrolyte. The chlorine residual is also checked daily with a calibrated HACH Pocket Colorimeter 2 (Hach 2) to verify the accuracy of the chlorine analyzer. If the Q46 varies by more than 20% from the Hach 2 or reaches the useful life of 3 months, the Q46 membrane will be replaced with a new membrane and refilled with electrolyte. Additionally, a new calibration run will be tested.

1.2.3 Spare Parts

The spare parts inventory for the chlorine analyzer shall include the spare membranes, electrolyte, and o-rings. The spare parts inventory for the recorders will include pens and chart paper. Refer to the Wastewater Treatment Plant's Operation and Maintenance Manual to identify the correct part numbers when reordering.

1.3 Control Equipment

The transfer pump station transmission main will be equipped with electronically operated butterfly valves, which will be connected to the TSS and chlorine analyzer. Direction of effluent flow will be controlled by these automatic valves and is determined by the output of the monitoring equipment. The valves will be equipped with a manual reset located in the valve operator control panel, which is located in the plant operations building.

Valve V-1 will control the flow to the proposed ground storage tank and shall be normally open when effluent meeting reclaimed water standards for public access irrigation is being produced. Valve V-2 will control the flow to the percolation ponds and shall be normally closed in the aforementioned scenario. If the automatic system is activated and flow is diverted, the valves can only be reset by manual operation. In this scenario valve V-1 will automatically close and valve V-2 will automatically open, sending the flow to the onsite percolation ponds. Figure 1 illustrates the proposed locations for both automatic valves.

The valves will operate simultaneously by an automatic control system connected to the TSS and the chlorine analyzer. The control panels are equipped with an alarm system that generates an audible alarm and activates the remote telemetry equipment when either the TSS value is greater than 5 mg/L or the chlorine analyzer is less than 1 mg/L, which then alerts the on-call operator.

1.4 Operation and Control

1.4.1 Normal Operation Procedures

During normal operation, the effluent control shall be on automatic, in which case valve V-1 is open and valve V-2 is closed. This condition sends effluent of acceptable quality to the ground storage tank for public access irrigation use. If at any time the TSS exceeds 5 mg/L or the chlorine residual is less than 1 mg/L an audible alarm will sound and the remote telemetry equipment will be activated, simultaneously valve V-1 automatically closes and valve V-2 automatically opens sending the unacceptable effluent to the

percolation ponds. Figure 1 illustrates a flow schematic for operation and control.

This process will continue until the treated water is of acceptable quality. The actions taken to bring the effluent back to acceptable quality and return to normal operation are described in Section IV, Procedures for Effluent of Unacceptable Quality.

1.4.2 Normal Operation Without Operator Present

During hours of unmanned operation the control panel is left in the automatic setting. If at any time the TSS value exceeds 5 mg/L or the chlorine residual is less than 1 mg/L the audible alarm sounds and the flow will be automatically diverted to the percolation ponds. If either parameter goes out of compliance, the remote telemetry equipment will alert the on-call operator. When the operator returns to the facility, he checks the TSS, chlorine meter and charts. If the meters indicate the TSS is below 5 mg/L and the chlorine is 1 mg/L minimum, the automatic valves are then reset closing the valve to the percolation ponds and opening the valve to the ground storage tank.

If the operator identifies that the TSS and total chlorine residual meters indicate that the effluent is substandard, then the operator will take immediate action to bring the wastewater plant back into compliance.

1.5 Procedures for Effluent of Unacceptable Quality

The effluent will continue to be discharged to the percolation ponds while the effluent is of substandard quality. The operator will determine which water quality parameter is out of compliance and take appropriate corrective action. The corrective actions are described in Section 1.8, Procedures When Monitoring Parameters Approach Set Point Levels.

When the monitoring equipment indicates that the effluent is of acceptable quality, he can manually close valve V-2 and open valve V-1, sending acceptable effluent to the ground storage tank.

The operator shall report all activities, including corrective actions taken, in the log book.

1.6 Procedures While Continuous Monitoring Equipment is Down

If the effluent water quality equipment is out of service for repair, samples shall be manually collected and tested every sixty (60) minutes. TSS samples will be collected between the filtration process and the point of chlorine addition, while chlorine samples will be collected from the flow control box located after the

chlorine contact chamber. Sampling and testing will continue in this manner until the monitoring equipment is back on line and properly operating. Otherwise, the plant effluent will be diverted to the percolation ponds until all the monitoring equipment is back on line. Once the test results and equipment illustrate an acceptable effluent, the operator can manually open valve V-1, and close valve V-2, thus sending treated water to the ground storage tank for public access use.

If either the effluent TSS or chlorine residual test result is at an unacceptable level for public access reuse, the valve to the storage tank, V-1, shall be manually closed and the valve to the percolation ponds, V-2, shall be manually opened. The actions taken to bring the effluent back to an acceptable quality and return to normal operation are described in Section 1.5, Procedures for Effluent of Unacceptable Quality and Section 1.8, Procedures When Monitoring Parameters Approach Set Point Levels.

1.7 Water Quality Verification

The frequency of the TSS and fecal coliform grab samples shall be identified in the Facility's operating permit. For each sample taken, the TSS reading and chlorine residual reading shall be noted.

On a daily basis, the effluent shall be tested for fecal coliform in compliance with the facility's permit specific conditions. The sampling program results will be compared with the TSS and chlorine residual readings to verify that reclaimed water of acceptable quality for public access land application (TSS < 5 mg/L, and chlorine residual >1 mg/L) maintains fecal coliform levels below detectable limits.

1.8 Procedures When Monitoring Parameters Approach Set Point Levels

The WWTF Operator will accomplish the following operational adjustments to the treatment process when monitoring parameters approach or exceed their respective set point levels.

1.8.1 Total Suspended Solids

The operator must verify that the aeration and clarification processes are operating correctly and, if not, adjust the process to achieve proper performance. The operator has the ability to manually adjust the amount of air being fed into the aeration bays of the treatment train. This allows the operator to fine tune the process to achieve optimum performance. The operator also has the ability to adjust the return activated sludge (RAS) flow rate and the waste activated sludge (WAS) flow rate. This allows the operator to control the level of the sludge blanket in the clarifier to achieve proper treatment. The corrective actions are described in the Operation and Maintenance Manual for the Lake Groves WWTF.

The Utility maintains powdered polymer in the maintenance shed at the facility. The operator has the ability to hand apply the polymer to the aeration basins for enhanced TSS control, if needed.

1.8.2 Chlorine Residual

If the total chlorine residual approaches 1 mg/L, the operator may control further reductions in the residual concentration by increasing the dosage of chlorine. This may be accomplished by manually adjusting the flow pacing unit to increase the chlorine dosage. If the flow pacing unit is not operating properly, the operator can manually override the unit to provide the required chlorine dosage. The operator will monitor total chlorine residual, adjusting the chlorine dosage as required until the residual concentration is under control (>1 mg/L) and within a safe operating range.

FIGURES

