

Monitoring and Operating Protocol

**Utilities Inc. of Florida
Pennbrooke Wastewater Treatment Facility
DEP Facility ID FLA010570**

June 2019

Prepared By:

Kimley-Horn and Associates
189 S. Orange Ave, Suite 1000
Orlando, FL 32801

I. INTRODUCTION

The Monitoring and Operating Protocol program for the Pennbrooke 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.

II. SITE DESCRIPTION

Monitoring Locations and Equipment

Two water quality parameters are monitored continuously to determine if the wastewater treatment plant effluent is of an acceptable quality for public access, slow rate land application (spray irrigation). The Wastewater Treatment Plant operates under Permit No. FLA010570. Basic treatment required is secondary treatment plus filtration and high-level disinfection producing an effluent with less than 5.0 mg/L TSS with a chlorine residual greater than 1.0 mg/L. The reclaimed water shall be considered acceptable for public access slow rate land application (spray irrigation) if the following two guidelines are met:

1. Continuous monitoring of the filter effluent to verify that the TSS is less than 5.0 mg/L.
2. Continuous monitoring of effluent from the chlorine contact chamber to verify that the chlorine residual is greater than 1.0 mg/L.

Reclaimed water is unacceptable for public access disposal if either the TSS is greater than 5.0 mg/L or the chlorine residual is less than 1.0 mg/L, and shall be routed to the reject ponds, RIB#1 and RIB#2.

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 at the plant. 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. The TSS meter will be located in the filter backwash tank, a.k.a filtered water tank, after filtration and before disinfection. The spare parts inventory for the recorders will include pens and chart paper. Refer to the Operation and Maintenance Manual for Pennbrooke WWTF to identify the correct part numbers when reordering.

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.

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.

Control Equipment

The reclaimed water pump is electrically connected to the monitoring equipment. If both parameters are in compliance, the reclaimed pump sends water to the golf course storage pond. If either parameter is out of compliance the pump shuts off, and the effluent gravity flows to percolation pond 1 or 2. The control panels are equipped with an alarm system that sounds and activates the autodialer when either the TSS meter reads greater than 5 mg/L or the chlorine analyzer reads less than 1.0 mg/L. The location of the monitoring equipment is shown on the Process Flow Diagram located in Appendix A of this report.

III. OPERATION AND CONTROL

Normal Operation Procedures

An operator will be present normally from 8:00 am to 4:30 pm seven days a week.

During normal operation, the effluent control shall be on automatic. This condition sends effluent of acceptable quality to either the off-site reuse storage pond (located at the golf course) or to percolation ponds 3 and 4. If at any time the TSS exceeds 5 mg/L or the chlorine residual is less than 1.0 mg/L an audible alarm will sound and the autodialer will be activated, the reclaimed pump will shut off and effluent will gravity flow to ponds 1 or 2. 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.

Normal Operation Without Operator Present

An operator is not normally present from 4:30 pm to 8:00 am.

During normal nighttime operation (4:30 pm to 8:00 am) the control panel is left in the automatic setting. If at any time during the night the TSS exceeds 5.0 mg/L or the chlorine residual is less than 1.0 mg/L the alarm sounds and the flow is automatically diverted to either of the reject ponds (1 or 2). If either parameter goes out of compliance, the audible alarm will sound and the autodialer will call the on-call operator. When the operator returns to the facility, the operator checks the TSS meter, chlorine meter and charts. If the meters indicate that the TSS is below 5.0 mg/L and the chlorine is 1.0 mg/L minimum the effluent is tested to verify that the meters are correct, the control system is reset allowing the production of reclaimed water.

If when the operator returns and the monitoring meters and lab testing indicate that the effluent is unacceptable then steps are taken to bring the wastewater plant back into compliance.

IV. PROCEDURES FOR EFFLUENT OF UNACCEPTABLE QUALITY

When the reclaimed water reaches unacceptable quality, the pump that transports the reclaimed water to the off-site golf course storage pond shuts off. As this pump shuts off, the effluent water collects in the 5,000 gallon effluent storage tank. As the tank fills, the water flows over a weir and is then piped to either pond 1 or 2. All valves located on the lines to the percolation ponds are manually operated. Whichever valve is left open (pond 1 or 2) will determine which pond receives unacceptable water. The operator will determine which water quality parameter is out of compliance and take appropriate corrective action. The corrective actions are described in Section VII, Procedures When Monitoring Parameters Approach Set Point Levels. Once the monitoring equipment and testing indicates that the effluent is again acceptable (over a period of 75 consecutive minutes to account for the 5,000 gallons retained in the effluent storage tank) for public access slow rate land application, the effluent will be routed to either the off-site reuse storage pond or to percolation ponds 3 and 4.

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

V. PROCEDURES WHILE CONTINUOUS MONITORING EQUIPMENT IS DOWN

If the effluent water quality equipment goes down for repair, samples shall be manually collected and tested every fifteen minutes. TSS samples will be collected from the filter backwash tank between the filters and the first chlorine contact tank, while chlorine samples will be collected at the discharge point for the last chlorine contact chamber. Sampling and testing will continue in this manner until the monitoring equipment is back on line and properly operating. The plant effluent will go to either pond 1 or 2 until all the monitoring equipment is back on line.

If either the effluent TSS or chlorine residual test result is at an unacceptable level for public access, slow rate land application, the reclaimed water pump will shut off, automatically diverting the flow to ponds 1 and 2. The actions taken to bring the effluent back to an acceptable quality and return to normal operation are described in Section IV, Procedures for Effluent of Unacceptable Quality, and Section VII, Procedures When Monitoring Parameters Approach Set Point Levels.

VI. WATER QUALITY VERIFICATION

At a minimum of four (4) days per week, the effluent shall be tested for fecal coliforms in compliance with the facilities 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 < 5.0 mg/L, and chlorine residual > 1.0 mg/L) maintains fecal coliform levels below detectable limits.

VII. PROCEDURES WHEN MONITORING PARAMETERS APPROACH SET POINT LEVELS

The WWTF Operator will advance with the following treatment operation adjustments when monitoring parameters approach or exceed their respective set point levels.

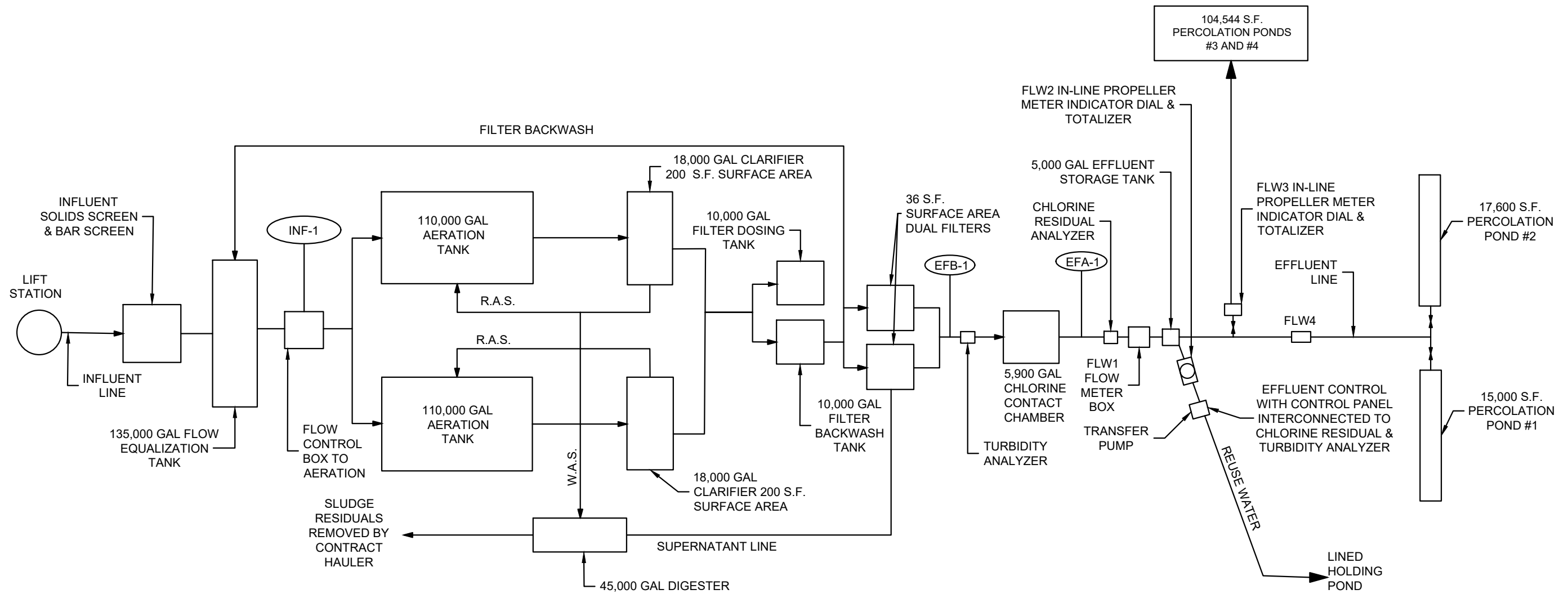
TSS

1. If turbidity readings approach 5.0 mg/L, the operator must verify that the aeration and clarification processes are operating correctly and if not, adjust the process to achieve proper performance. The corrective actions are described in the Operation and Maintenance Manual for the Pennbrooke WWTF.

2. The Utility will maintain a polymer in the maintenance shed at the facility. The operators will have the ability to apply polymer via a chemical feed pump to the aeration basins for enhanced TSS control, if needed.

Chlorine Residual

1. If total chlorine residual approaches 1.0 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 will 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 (no longer approaching 1.0 mg/L) and within a safe operating range.



LEGEND	
FLW1	TOTAL FLOW THROUGH PLANT
FLW2	FLOW TO PUBLIC ACCESS REUSE SYSTEM
FLW3	FLOW TO RIB#3 & RIB#4
FLW4	FLOW TO RIB#1 & RIB#2
INF-1	RAW INFLUENT TO SPLITTER BOX
EFA-1	CHLORINE CONTACT TANK EFFLUENT
EFB-1	FILTER EFFLUENT PRIOR TO CHLORINATION

PROCESS FLOW DIAGRAM

PENNBROOKE WWTF
UTILITIES INC. OF FLORIDA

Kimley»Horn