

City of Oviedo Water Reclamation Facility Monitoring and Operating Protocol

Revised April 2018

I. INTRODUCTION

The Monitoring and Operating Protocol program for the City of Oviedo Water Reclamation Facility (WRF) 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 for effluent with unacceptable quality for public access, slow rate land application.
4. Procedure while continuous monitoring equipment is down.
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 Number FLA011074, which addresses the water quality requirements for the City of Oviedo WRF. Basic treatment required is secondary treatment plus filtration and high level disinfection producing an effluent with less than 5 mg/L TSS with a chlorine residual greater than 1 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 mg/L.
2. Continuous monitoring of effluent from the chlorine contact chamber to verify that the chlorine residual is greater than 1 mg/L.

In addition, continuous monitoring of effluent from the chlorine contact chamber is provided to

verify that the pH is between 6.0 and 8.5 and the City maintains the operation of the HACH continuous reading low range Turbidimeter Model 1720D. This system is in place as a back-up to the TSS meter.

Reclaimed water is unacceptable for public access disposal if the TSS is greater than 5 mg/L or the chlorine residual is less than 1 mg/L. If unacceptable, reclaimed water shall be routed to the percolation ponds.

Primary and compliance metering is performed by the TSS meter. TSS is monitored continuously by the TSS meter sample point located after the tertiary filtration process and before addition of chlorine disinfectant. The TSS meter is fully contained at the sample location. The following equipment will be utilized for continuous TSS readings: the Cerlic Low Suspended Solids Meter, Cerlic CTX20/25LC Low Suspended Solids Sensor and Cerlic BBS Control box for the sensor. The meter is connected with the SCADA system for data logging. This meter is supplied with automatic brush cleaning system, which is activated every 30 minutes to remove any solids or algae build-up from the lens. This meter shall be calibrated with a lab test once a year, in accordance with EPA and the American Public Health Association Standard Methods for the Examination of Water and Wastewater. The operator shall take a grab sample and record the reading on the inline TSS meter. After processing, the TSS results from the grab sample shall be compared to the inline TSS meter reading. If the results are not similar, further testing and calibration of the inline TSS meter will be required. The operator shall maintain this data to provide a long term correlation and comparison trending analysis. Please also note Section VI, Water Quality Verification for addition data comparison.

Secondary or back-up monitoring is provided by the Turbidimeter. Turbidity is monitored continuously by the turbidimeter sample point located after the tertiary filtration process and before addition of chlorine disinfectant. The equipment is contained inside the operations building to minimize the adverse effects of weather. The following equipment will be utilized for continuous turbidity readings: Hach Continuous Reading Low Range Turbidimeter Model 1720D. The City has a complete unit "on-the-shelf" to replace this unit if the unit fails. This meter shall be calibrated with formazin at least once every month, in accordance with EPA and the American Public Health Association Standard Methods for the Examination of Water and Wastewater. Further, the turbidity is checked daily against a calibrated HACH Pocket Turbidimeter model 2100N with Formazin Stabical standards.

Chlorine residual is monitored continuously by the chlorine residual sample point located at the discharge of the chlorine contact chamber and after the effluent flow meter. The equipment is contained inside the monitoring shed located beside the chlorine contact chamber to minimize the adverse effects of weather. The following equipment is utilized for continuous readings of chlorine residual: Hach Chlorine Analyzer Model CL10 and is connected to the SCADA system for data logging. The City has a complete unit "on-the-shelf" to replace this unit if the unit fails. Output readings shall be monitored daily. The sample cell will be checked weekly, and cleaned at least once per month. The pump module tubing requires replacement every six months while the remainder of the tubing is replaced annually. This chlorine analyzer is factory calibrated only, but separate samples shall be taken weekly and tested for total chlorine residual with a HACH 3900 Pocket Colorimeter. The results of the separate sample test will be checked

against the analyzer output to ensure the analyzer results are accurate and reliable. If the CL10 varies by more than 20% from the HACH 3900, the CL10 will be cleaned and a new calibration run will be tested.

The spare parts inventory for the chlorine analyzer shall include the necessary tubing. Refer to the Wastewater Treatment Plant's Operation and Maintenance Manual to identify the correct part numbers when reordering.

Control Equipment

The effluent discharge piping system is equipped with an electrically operated valve connected to the monitoring equipment. Direction of effluent flow is controlled by this automatic valve and is determined by the results of the monitoring equipment. The valve is equipped with a manual reset. If the automatic system is activated, and flow is diverted, the valve can only be reset by manual operation. This valve is located directly downstream of the chlorine contact chamber. This valve is normally open. This valve is operated simultaneously by an automatic control system connected to the TSS meter and the chlorine analyzer. The control panels are equipped with an alarm system that sounds and activates the WINN 911 SCADA dialer when either the TSS meter reads greater than 5 mg/L or the chlorine analyzer reads less than 1 mg/L.

III. OPERATION AND CONTROL

Normal Operation Procedures

An operator will be present 6 hours/day, 7 days/week.

During normal operation when producing reclaimed water, the effluent control shall be on automatic, in which case the control valve is open. This condition sends effluent of acceptable quality to the reuse lift station and on to the ground storage tank. 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 WINN 911 SCADA dialer will be activated and the control valve will automatically close. This will cause the chlorine contact chamber and the filter water levels to rise and flow over a weir into the overflow piping. The overflow piping carries reclaimed water of unacceptable quality to the percolation pond pumping station (EFA- 1). 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

When producing reclaimed water, the control panel is left in the automatic setting. If at any time during the night the TSS exceeds 5 mg/L or the chlorine residual is less than 1 mg/L the alarm sounds and the flow is automatically diverted to the percolation ponds as previously described. If either parameter goes out of compliance, the auto-dialer will call the on-call operator. When the operator returns to the facility, he checks the TSS meter, chlorine meter and charts. If the meters indicate the TSS is below 5 mg/L and the chlorine is 1 mg/L minimum the effluent is tested in the lab to verify that the meters are correct. The automatic valves are

then reset by opening the control valve.

Note: When the TSS meter reading is above 5 mg/L and the TSS from lab testing is below 5 mg/L, TSS testing shall be done every fifteen minutes to verify compliance.

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

The effluent will be discharged to the percolation ponds while the effluent is of unacceptable quality for public access irrigation. In addition, the operator may elect to divert raw wastewater flows from the Oviedo WRF to the IBRWRF to reduce the flows to the facility. 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 lab testing indicates that the effluent is again acceptable for public access, slow rate land application, the effluent will be routed to the reuse storage and distribution system by manually resetting the control valve.

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

V. PROCEDURES WHILE CONTINUOUS MONITORING EQUIPMENT IS DOWN

If the effluent water quality TSS automatic sampling equipment goes down for repair, the sampling will change to the installed and fully functional automatic monitoring turbidimeter system. The turbidity shall be less than 3 NTU for the system to be judged in compliance. The turbidimeter shall be calibrated with Formazin at least once per month, in accordance with EPA and will be checked daily during use against a calibrated Hach bench turbidimeter. If the check differs from the inline by more than 20%, the inline meter will be calibrated with Formazin in accordance with EPA standards for the examination of water and wastewater. The City has an "on-the-shelf" turbidimeter to replace the installed unit in case of failure. Once the TSS equipment is repaired, the TSS continuous monitoring system will be reactivated.

The City has an "on-the-shelf" chlorine analyzer to replace the installed unit in case of failure. With this back-up capability, the continuous monitoring system would not be out of service for very long before the operators are able to correct the problem.

VI. WATER QUALITY VERIFICATION

TSS, chlorine and fecal grab samples shall be taken four days per week during the time when reclaimed water is being sent to the reuse storage tank. For each sample taken, the TSS meter reading and chlorine residual meter reading shall be noted at the same time. The fecal results will be correlated with the TSS result and the chlorine residual reading. This data must be maintained at the treatment facility and a summary included with the protocol for annual approval.

In addition, the results from the TSS grab samples shall be compared with the TSS meter reading that was recorded at the time of the grab sample. The results from the chlorine grab samples shall be compared with the chlorine meter reading that was recorded at the time of the grab sample. This data will be correlated and maintained by the operator.

On a daily basis, the effluent shall be tested for fecal coliforms 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 is of an acceptable quality for public access land application (TSS less than 5 mg/L and chlorine residual greater than 1 mg/L) and that this level of treatment maintains fecal coliform levels below detectable limits.

VII. PROCEDURES WHEN MONITORING PARAMETERS APPROACH SET POINT LEVELS

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

TSS

1. If TSS readings approach 5 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 for these processes are described in the Operation and Maintenance Manuals for the City of Oviedo WRF.
2. The operator also has the ability to pre-chlorinate to improve filter performance. The chlorine injection point is the percolation pond chlorine contact chambers; one (1) in each of the wastewater treatment plants. This tank section within the WWTP will provide for mixing and dispersion prior to the filtration process.
3. If TSS readings approach 5 mg/L for an extended period of time and other methods have not resulted in reducing the TSS, the operator shall initiate the use of a coagulant (chemical or polymer) to aid in the coagulation of particles to enhance removal. The operator shall inject the coagulant into the clarifier discharge at the percolation pond chlorine contact chamber on either or both of the two wastewater treatment plants. The feed equipment is available on site for injecting a coagulant.
4. If the actions taken in 1, 2 and/or 3 above are not sufficient to reduce TSS levels to less than 5 mg/L, the effluent flows shall be diverted to the percolation ponds and raw wastewater shall be diverted to the Iron Bridge Regional Water Reclamation Facility to the maximum flow allowed by agreement until such time as corrections can be made to the wastewater treatment system.

Chlorine Residual

1. If total chlorine residual approaches 1 mg/L, the operator may control further

reductions in the residual concentration by increasing the dosage of chlorine. The operator will monitor total chlorine residual, adjusting the chlorine dosage as required until the residual concentration is under control (no longer approaching 1 mg/L) and within a safe operating range.

2. The operator may also pre-chlorinate by using the chlorination system to chlorinate the plant effluent prior to filtration. This will decrease the total chlorine demand in the chlorine contact chamber and provide a higher residual in the chlorine contact chamber effluent for the same chlorine dosage rate at the chlorine contact chamber.