Onondaga County Department of
WATER ENVIRONMENT PROTECTION

Wetzel Road
Wastewater Treatment Plant

Wet Weather Operating Plan

February 2024

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Section 1 – Introduction and Overview

The Wetzel Road Wastewater Treatment Plant (WWTP) has a design flow of 7.0 MGD and provides advanced secondary treatment of wastewater using a Biological Aerated Filter (BAF) system and tertiary treatment with Cloth Media Disk Filters (CMDF). Wastewater is collected throughout portions of the Towns of Salina and Clay via a series of gravity sewers and small pump stations. These sewers combine into a total of five (5) influent streams: four (4) main gravity trunk sewers (Old Route. 57, Anchor Drive, Route 57; Bayberry) and one (1) force main (Sawmill PS). All these influent streams combine at Special Manhole #3, located approximately 100 yards upstream of the Headworks Building (HWB), which is then transported via a 48" sewer pipe into the HWB. The Gaskin Road pump station flows contribute to the Route 57 trunk sewer. The wastewater influent is primarily from residential sources, with some commercial use and four (4) permitted industries contributing to the flow. This facility received significant rehabilitation and upgrades with the BAF system becoming operational in 2008, and the remainder of the upgrades having been completed in 2010.

The wastewater undergoes screening and grit removal in the HWB, utilizing two (2) mechanical screen rakes followed by grit removal in two (2) covered aerated grit chambers, which use a mechanical clamshell removal system. Wastewater flows through the aerated grit channels into a wet well where it is pumped via four (4) submersible pumps to the primary clarifier structures. Three (3) primary clarifiers provide for settling of solids and skimming of floating scum and grease. Primary effluent then flows via gravity through the Fine-Screens Building where it passes through two (2) continuous perforated-band style fine screens units which remove finer debris. This wastewater gravity flows to the Intermediate Pumping Station where four (4) submersible pumps lift the wastewater up to the influent channel of the BAF building. The BAF influent flows down through manually cleaned strainers before passing upwards through the media of the four (4) BAF "C" cells, where carbonaceous nutrients are broken-down through biological action. Effluent from the "C" cells flows into the four (4) "N" cells in the same manner, passing upwards through the media, where biological nitrification is accomplished. Periodic backwashes of each BAF cell are performed to maintain the biological colony on the media. The backwash water gravity flows to the Backwash Holding tank; from there it is pumped to the two (2) Gravity Thickener tanks. Effluent from the BAF process gravity flows to the four (4) CMDF cells, which assist in removal of suspended solids. The CMDF effluent then passes through two (2) Trojan Ultraviolet (UV) disinfection systems for seasonal disinfection of the final effluent, which then passes through a Post Aeration tank for additional aeration prior to discharge through a Parshall flume and finally into the Seneca River. Phosphorus is removed year round with the addition of aluminum sulfate in the plant return drain system which discharges to the Headworks wet well.

- *Plant Bypass* – Wetzel Road WWTP has <u>one</u> facility bypass (Outfall #002). This bypass outfall has the capability to convey Primary Effluent to the Seneca River on an emergency basis only.

<u>Performance Goals</u>

The overall goal of the wet weather operating plan is to provide the best possible treatment to high flows in an effort to maintain SPDES compliance, minimize the impact of high flows on the treatment process and to resume full treatment quickly as wet weather conditions abate.

Utilization of the Manual

The purpose of this manual is to provide a set of operating guidelines to assist the Wetzel Road WWTP and collection system staff in making operational decisions which will best meet the performance goals and the requirements of the SPDES discharge permit.

Managing high influent wastewater flow effectively during a wet weather event requires numerous operational decisions. Multiple control structures, varying conditions of the treatment processes, equipment service status and varying degrees of intensity and duration of the storm/snowmelt make each event and the reactive operational strategy potentially unique. No manual can describe the decision-making process for every possible operating scenario. However, this manual will serve as a useful reference for both new and experienced operators to utilize during wet weather events. Covered specifically are preparations for a pending wet weather event, strategies for processes control during the event and a checklist of critical steps involved to monitor and control processes during and after an event.

This manual is designed to allow use as a quick reference during wet weather events. It is broken down into sections which cover major unit processes at the Wetzel Road facility. Each section includes the following information:

- Operational Description – Overview of the designated treatment process and associated equipment.
- Pre-Wet Weather Event Activities – Activities to be performed in anticipation of pending wet-weather event.
- During Wet Weather Activities – Major activities to be performed during the wet-weather event.
- Post Wet Weather Activities – Activities to be performed following the wet weather event, and in anticipation of future events.

This manual is a living document. Users of the manual are encouraged to identify new steps, procedures, and recommendations to improve the overall utility of the manual. All recommendations shall be submitted to the user's immediate supervisor for consideration for inclusion in the manual.

Section 2 - Wet Weather Operational Strategy

a. Wet Weather Operation Condition # 1

This occurs when conditions are otherwise dry, yet a heavy rain has fallen over a three hour or longer period and subsided. Subsequently, plant influent flows (monitored on-site or remotely via Metro board) will increase relatively slowly. When flows reach 9 MGD and are observed to be trending upward, proceed as follows:

1. If/when effluent flow reaches 10 MGD, using the installed lifting winch, lift the attenuating rack completely out of the flume and set to the side. Reinstall the grating over the flume.
2. Monitor both the Headwork's and Intermediate wet wells and number of pumps running. Clean the C-cell strainers as necessary.

When flow drops below 10 MGD, proceed as follows:

1. Lower the effluent flume attenuating rack back into the channel as soon as possible.

b. Wet Weather Operation Condition # 2

If the heavy rain/snowmelt event continues for several hours, the influent flows will continue to climb and reach or exceed 12 MGD. If this condition is anticipated, proceed as follows:

1. Pre-emptively clean all four (4) BAF C-cell strainers.
2. Place all eight (8) BAF cells in "Semi-Auto" and "Filter" mode. This will prevent cells from backwashing while strainers are being manually cleaned, thus preventing reduction to two (2) online cells and hydraulic overloading.
3. Using the installed lifting winch, lift the attenuating rack completely out of the flume and set to the side. Reinstall the grating.
4. The Headwork's influent screen rakes have had the differential triggers adjusted and should run in Auto properly during high flows.
5. Closely monitor the Headwork's pumps and wet well level. Wet well controller is programed to avoid manual control of pumps during high flow events. The wet well set-point is currently at 8.0 feet.
6. Closely monitor the Intermediate Pump Station. The wet well controller is programmed to automatically sustain wet well level with three (3) pumps. If all three pumps are running at 100% speed and the wet well level is still rising, turn the fourth Intermediate pump on in Manual from SCADA and adjust the speed as necessary. The wet well set-point is currently at 7.0 feet.
7. If it appears that the flow will exceed 12 MGD, proceed to Wet Weather Operation Condition #3 below.

c. Wet Weather Operation Condition # 3

This condition is triggered when plant flows reach or exceed 13-15 MGD. Typically this will occur with the onset of heavy extended rainfall coupled with a deep snowpack and rapid warming, or remnants of tropical weather systems that track over the area Under this extreme condition, it is possible that Influent flow exceeds the Headworks pumping capacity. This may result in rising wet well levels despite all three pumps running at 100%. If sustained, the wet-well will begin to back up into the lower Headworks building area. If this condition occurs, proceed as follows:

1. Shut off the Odor Control System blower. This is to prevent liquid from being drawn into the system piping.

2. Shut off the backwash holding tank pumps, for as long as possible. This eliminates ~1.2 MGD of recycle flow and helps reduce hydraulic overload.
3. Shut off power to the Grit Chamber cover lifting motors 1-A, B, C, and 2-A, B, C. (The breakers are located in the Headwork's electrical room on MCCE-6 on the far right side). Also shut off breakers for Sluice Gates 1 & 2 (same breaker locations).
4. Note: The screen rake motors are enclosed in such a way as to allow for the submersion of the motor housing. However, the H/O/A switches should be placed in the OFF position with the rakes at the HOME position and all efforts should be made to not submerge the motors. If necessary, manually run the rakes as needed to maintain flow.
5. **If extreme conditions continue and the Headworks building is flooding, it may be necessary to contact Sewer Maintenance and have Gaskin PS flow diverted to Oak Orchard. Call the Head Operator of Oak Orchard to verify they can handle the additional flow before contacting Sewer Maintenance. This action will help minimize damage to equipment and help to alleviate backing up of the sewer system into the community.**
6. **Only at the direction of the Head Operator, or the Superintendent, is the Primary Effluent bypass valve to the river to be opened!** If directed, open the primary effluent bypass valve only enough to gain control of the wet well levels and prevent tank overflows – record the date and time. Note: Notification to the NYSDEC within (2) two hours of the event via NY ALERT followed by an email to the DEC engineer who oversees permit compliance is required when a Primary Effluent Bypass occurs.
7. **Monitor UV Channel level.** Current operational control programing will automatically open the channel level gate (at 15.2 mgd) to prevent total submergence of UV bulbs. Visual observation of the gate position is required. Manual removal of the sixteen (16) UV modules will occur if there is a gate malfunction.

Section 3 – Process Wet Weather Operation

In general, prior to any wet weather events, the operational staff monitors storm development via internet access to assist in predicting the onset of a wet weather event. This allows both the Head Operator and plant operator(s) the ability to review the personnel roster to ensure adequate staff is available and call in additional personnel as required. In addition, the monitoring of storm development allows the operational and maintenance staff to begin pre-wet weather activities as identified herein.

At this time, the Department does not have a policy, mechanism or corresponding procedure for issuing wet weather related advisories to the municipalities that discharge to the County's collection system. The current inter-municipal agreement does not grant the Department authority to minimize, reduce, or even require the implementation of Best Management Practices (BMPs) by the municipalities that discharge to the Wetzel Road service area.

a. Screenings & Grit Removal - Headworks Building (HWB)

The screenings and grit removal occurs in the HWB, which receives wastewater from a single 48" gravity sewer pipe. Wastewater flows into the HWB where it passes through

two (2) automated mechanical screen rakes in parallel channels. The wastewater then flows into two (2) covered aerated grit channels. Note that each individual screen rake, and grit chamber can handle the plant design flow. Grit removal is accomplished using a clam shell and hoist grit removal system. Collected grit is placed in 2-cubic yard containers.

Wastewater flows into a HWB wet well where it is pumped up to the primary clarifier tanks via four (4) submersible pumps (Lead; Lag 1; Lag 2; Standby). When in the automatic mode of operation, the pump operation depends on the wastewater level in the wet well. Closely monitor the Headwork's pumps and wet well level. Wet well controller is programed to avoid manual control of pumps during high flow events. The wet well set-point is currently at 8.0feet.

Pre-Wet Weather Event Activities

- Make sure both channels are operational.
- Verify that the mechanical screen rakes are operational and in Auto.
- Verify adequate dumpster capacity.

During Wet Weather Activities

- Automated screen rake may be put in "Hand-Continual Run" mode to avoid channel back-up during high flows. However, the screen rakes should be able to run in Auto.
- Monitor the screen rake system continuously for plugging and clear as necessary.
- Under normal conditions, de-gritted wastewater flows by gravity to the wet well tank in the HWB. When in the automatic mode of operation, the pump operation depends on the wastewater level in the wet well. Any combination of the four (4) influent pumps may be used as needed, depending on the wet well level and flow rate.

Post Wet Weather Activities

- Return all equipment to dry weather operation.

b. Primary Clarifier Tanks

Under normal and wet weather operating conditions, wastewater is pumped to and distributed evenly into the three (3) primary clarifiers.

Pre-Wet Weather Event Activities

- Verify the operation of flight and chain system.
- Maintain the scum troughs as needed.

During Wet Weather Activities

- Monitor Primary Sludge pumping. In the most extreme flows, primary sludge pumps

may be shut off for several hours at a time to temporarily eliminate ~0.2 MGD recycle flow.

- Note: If the high flow condition #3 continue and the primary sludge pumps have been off over 4-hours, the primary sludge pumps should be run. Run in Auto as normal and if needed, shut off again as necessary.
- Verify the operation of flight and chain system.

Post Wet Weather Activities

- Re-start the Primary Sludge Pumps in Auto.
- Verify the operation of flight and chain system.

c. Fine-Screens System & Intermediate Pump Station

Under normal operating conditions, wastewater flows by gravity to the Fine-Screens Building. In this building there are two (2) separate channels, each with an automated continuous perforated band screen with 2mm holes that can run individually or concurrently. These fine screens are intended to remove smaller particles prior to entering the Intermediate Pump Station and subsequently the BAF System.

Pre-Wet Weather Event Activities

Ensure that the Fine Screens equipment is functioning properly going into the wet weather event.

During Wet Weather Activities

- Monitor Fine Screens for proper operation during the event.
- During high flow events, closely monitor the Intermediate Pump Station. The wet well controller is programed to automatically maintain wet well level at 7.0 feet using **three (3) pumps**. If flows are increasing and the (3) Intermediate pumps are at or approaching 100% speed, and the wet well level is increasing, it is necessary to manually start and adjust the fourth pump from SCADA.

Post Wet Weather Activities

- Return all equipment to dry weather operation.

d. BAF System

Under normal operating conditions wastewater is pumped from the Intermediate Pump Station via four (4) dedicated submersible pumps to the BAF influent structure. The wastewater then flows via gravity from the BAF influent structure (thru in-line strainers) into the active BAF C-cells. The BAF C-cell effluent then flows via gravity into the active N-cells, where further nutrient breakdown takes place. There a four (4) C-cells and four (4) N-cells, which are typically rotated automatically between "Active" and "Backwash" status, adjusted as needed by the dedicated PLC. **Clogging of the in-line strainers is a**

concern during high flow events. Blinding of these strainers will cause BAF cells to be taken out of service while the strainers are cleaned. Monitoring this system and manually cleaning these strainers as needed is a high priority.

Pre-Wet Weather Event Activities

- Verify the proper function and operation of the BAF system. Clean all C-cell strainers.

During Wet Weather Activities

- Preemptively clean all four (4) BAF "C" cell strainers.
- As necessary; place all eight (8) BAF cells into "Semi-Auto" and "Filter" mode. This will prevent cells from backwashing while strainers are being manually cleaned, thus preventing reduction to two (2) online cells. Monitor all C-cells, and as long as flows do not exceed 12 MGD place cell with the highest differential pressure, or run-time hours in "Auto" mode so the cell can backwash. Return to "Semi-Auto" and "Filter" mode when complete.
- Closely monitor the BAF C-cell strainers and clean as needed. Also, monitor the cells to determine if they are beginning to plug up.
- C-cell backwash requirements to prevent dropping below three (3) "Active" cells when needing to clean strainers.
- In order to help prevent a primary effluent bypass, turn off the backwash holding tank pumps any time flows exceed 15 MGD, or wet well level is rising with all pumps running at maximum. This should only be done for a brief period to help alleviate extremely high flows.

Post Wet Weather Activities

- Return all equipment to normal dry weather operation.

e. CMDF System

Under normal operating conditions, BAF effluent gravity flows from the Clear Well storage tank into four (4) CMDF units. The purpose of the CMDF is to aid in removal of small particulate solids. This system can operate the four (4) units individually or to be completely bypassed as needed.

Pre-Wet Weather Event Activities

- Verify the proper function and operation of the CMDF system.

During Wet Weather Activities

- Pre-emptively evaluate all four (4) CMDF units.
- If the restriction of flow creates a problem, such as CMDF High Basin Level alarms, bypass the CMDF units as needed by incrementally opening the CMDF bypass gate

located near the effluent end of CMDF #1.

Post Wet Weather Activities

- Return all equipment to normal dry weather operation.

f. Disinfection and Final Post-Aeration

Effluent from the CMDF units flows via gravity to the ultraviolet disinfection system. This is a seasonal requirement and can provide disinfection to the maximum flow. This effluent then flows via gravity to the Post-Aeration tank, which is used to provide an oxygen addition to the effluent prior to discharge into the Seneca River. This post-aeration tank can be operated seasonally or all year round. The final effluent is measured through a 2 ft. Parshall flume, which has an attenuating rack in place to help create a more laminar flow of effluent through the flume, increasing flow measurement accuracy.

Pre-Wet Weather Event Activities

- Verify proper function of the ultraviolet disinfection system.
- Verify proper function of the Post-Aeration tank.
- Verify that the Parshall flume is clean and functioning properly.

During Wet Weather Activities

- Verify proper function of the ultraviolet disinfection system.
- Verify proper function of the Post-Aeration tank.
- – When effluent flow reaches 10 MGD, use the lifting winch to lift the attenuating rack completely out of the flume and set to the side. Reinstall the grating.
- **At plant flows above 15.2 MGD verify position of UV Channel gate level.**

Post Wet Weather Activities

- Verify proper function of the ultraviolet disinfection system.
- Verify proper function of the Post-Aeration tank.
- When the flow drops below 10 MGD, lower the attenuating rack into the original position.

g. Solids Handling Facilities

The solids handling facilities receives solids from the primary clarifiers and the BAF Backwash Holding tank. Solids are thickened in two (2) Gravity Thickener tanks then anaerobically digested in two (2) Primary Anaerobic Digesters, followed by one (1) Secondary Anaerobic Digester. Anaerobically digested solids are then hauled via tanker truck to the Metropolitan-Syracuse Wastewater Treatment Plant for dewatering and final disposal.

Pre-Wet Weather Event Activities

- Verify that equipment is in good working condition.

During Wet Weather Activities

- Monitor all solids handling operations.

Post Wet Weather Activities

- Return all equipment back to dry weather operation.

Appendix A

Wetzel Road WWTP

Site Plan - Process Units and Sampling Locations