



Wetzel Road
Wastewater Treatment Plant

Wet Weather Operating Plan



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TABLE OF CONTENTS

Section 1	Introduction and Overview.....	1
Section 2	Wet Weather Operational Strategy.....	2
	a. Wet Weather Operation Condition # 1.....	2
	b. Wet Weather Operation Condition # 2.....	3
	c. Wet Weather Operation Condition # 3.....	4
	d. Wet Weather Operation Condition # 4.....	5
Section 3	Process Wet Weather Operation.....	6
	a. Headworks - Screenings & Grit.....	6
	b. Primary Clarifier Tanks.....	7
	c. Fine Screens & Intermediate Pump Station.....	8
	d. Biological Aerated Filter (BAF) System.....	8
	e. Cloth Media Disk Filter (CMDf) System.....	9
	f. Disinfection & Post Aeration.....	10
	g. Solids Handling Facilities.....	11
Appendix A	Wetzel Road WWTP Site Plan and Sampling Locations	

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 of 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 a mechanical screen rake, 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 one of two (2) automatic step screen rakes which remove finer debris. This wastewater gravity flows to the Intermediate Pumping Station where 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 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 one facility bypass (Outfall #002). This bypass outfall has the capability to convey Primary Effluent to the Seneca River on an emergency basis only.

Performance Goals

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.

- Maintain SPDES compliance.
- Minimize impact on treatment process units.
- Return facility to full treatment capabilities as soon as possible.

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 Oak Orchard board) will increase slowly. When flows reach 7 MGD and are observed to be trending upward to 8 MGD, proceed as follows:

1. Ensure that the Fine-Screens local H/O/A switch is in the “Off” position, and ensure that the screening plates are properly aligned. Due to the long slot configuration of this rake, any running during high flow allows accumulated material to roll between the plates, ultimately contributing to premature blinding of the BAF inlet strainers (manually cleaned only) - this is to be avoided whenever possible. Monitor the inlet channel level during the high flow event and run manually as needed.
2. If/when effluent flow reaches 8 MGD, using the installed lifting winch, lift up the effluent flume attenuating rack until the bottom has cleared the water in the channel. Place red safety cones (located inside the sample shed) around the open channel.
3. Monitor both the Headwork's and Intermediate wet wells and number of pumps running.

When flow drops below 8 MGD, proceed as follows:

1. Lower the effluent flume attenuating rack back into the channel.

b. Wet Weather Operation Condition # 2

If the heavy rain/snowmelt event continues for over 4 hours, the influent flows will continue to climb and exceed 8 MGD. If this condition is anticipated, proceed as follows:

1. Ensure that the Fine-Screens local H/O/A switch is in the “Off” position and that the screening plates are properly aligned. Due to the long slot configuration of this rake, any running during high flow allows accumulated material to roll between the plates, ultimately contributing to premature blinding of the BAF inlet strainers (manually cleaned only) - this is to be avoided whenever possible. Monitor the inlet channel level during the high flow event and run manually as needed.
2. Tip all primary clarifier grease troughs slightly forward (towards inlet end) to help alleviate the amount of grease leaving the tanks in carry over.
3. Shut off the primary sludge degritter, and adjust the primary sludge flow from 300 gpm to 100 gpm.
4. Pre-emptively clean all four (4) BAF C-cell strainers.
5. *As necessary*, 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.
6. Using the installed lifting winch, lift up the effluent flume attenuating rack until the bottom angled supports are 3-inches from leaving the top of the flume inlet. Place red safety cones around (located inside the sample shed) around the open channel.
7. The Headwork's influent screen rakes have had the differential triggers adjusted and should run in Auto properly during high flows.
8. Pre-emptively run the Fine-Screens using the local H/O/A switch, leaving it in the “Off” position, and ensure that the screening plates are properly aligned. Due to the long slot configuration of this rake, any running during high flow allows accumulated material to

- roll between the plates, ultimately contributing to premature blinding of the BAF inlet strainers (manually cleaned only) - this is to be avoided whenever possible. Monitor the inlet channel level during the high flow event and activate them only when needed.
9. 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 9.0 feet.
 10. Closely monitor the Intermediate Pump Station. The wet well controller is programed to avoid having to use manual control of pumps during high flow events. The wet well set-point is currently at 9.0 feet.
 11. If it appears that the flow will reach and exceed 10 MGD, proceed to Wet Weather Operation Condition #3 below.

c. Wet Weather Operation Condition # 3

This condition is triggered when plant flows approach or exceed 10 MGD. Typically, this will occur with the onset of heavy extended rainfall coupled with a deep snowpack and rapid warming - refer to the Wet Weather Operations as described under Wet Weather Condition #2. Flows in this extreme (approaching or exceeding 10 MGD) may exceed the intermediate pump station pumping capacity which would cause primary effluent to overflow the Fine-Screens channels. In an effort to prevent this, the Head Operator or the designee will contact a Flow Control supervisor during normal business hours, or Oak Orchard board after normal working hours, and direct that Gaskin Rd PS flow be diverted to Oak Orchard for the duration of the event. If this condition occurs, proceed as follows:

1. When flow reaches 10 MGD, shut off all primary sludge pumps, this will increase the rate at which BAF cells can go into backwash—which will be necessary during extended high flows. Note: the influent solids in such an event will be greatly diluted, and stopping the primary sludge pumping for a period of time is not likely to have any deleterious effect on the process.
2. If it appears that flows will continue to climb, contact the Head Operator and discuss the need to divert Gaskin Road pump station to the Oak Orchard WWTP. **Note: It can take up to 2-hours for this to be done, so plan accordingly.** If it is determined to be required, the Head Operator or his designee will:
 - a. If during normal work day hours, contact the Sewer Maintenance supervisor.
 - b. After normal work day hours, contact the Oak Orchard board, they will in-turn contact the appropriate personnel.
3. Closely monitor the BAF C-cell's for strainer condition and clean as needed. Closely monitor the C-cells for indications of cells beginning to plug. If this occurs, evaluate all cells, and arrange the back-wash queue as required.
4. If the high flow conditions continue and the primary sludge pumps have been off over 4-hours, the primary sludge pumps will need to be run. Set the Primary Sludge Pump controller for 80 GPM, and the auto rotation for 1-hour, and restart the pumps. Note: This will ensure that there is sufficient sludge in the thickeners to maintain proper concentrated sludge for feeding the anaerobic digesters without adversely increasing the plant recycle flow.
5. Keep an eye on pending C-cell backwashes, and clean BAF Influent strainers before the

back-wash starts to prevent dropping below 3-online cells.

When the extreme flow condition has abated and flows begin to trend downward and drop below approximately 10 MGD, proceed as follows:

1. Contact the Oak Orchard board or Sewer Maintenance, depending on the time of day, and have the Gaskin Road pump station flow returned to Wetzel Road.
2. Re-start the primary sludge pumps, setting the pump controller to the original settings.
3. Start putting BAF cells back into auto mode, allowing backwashes to proceed normally.
4. Check the Fine Screens channel differentials, and run in hand as needed.
5. When flow drops below 8 MGD, lower the effluent flume attenuating rack back into the channel.
6. If after normal working hours, once flows have come down sufficiently and the operators feel it is safe to do so, the second person may leave. Notify the Head Operator that conditions have returned to normal.

d. Wet Weather Operation Condition # 4

This condition is triggered when plant flows approach 15 MGD. Typically this will occur with the onset of heavy extended rainfall coupled with a deep snowpack and rapid warming. Under this very extreme circumstance, it may be necessary to take manual control of the Headwork's raw pumps to prevent having to open the Primary Effluent bypass to the river. If this condition is imminent, 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 pumps, for as long as possible.
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. Place the Raw pumps in manual control, and adjust to keep the flow at the maximum that the Intermediate pumps can handle.
5. 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 switch should be placed in OFF position with the rake at the HOME position. Manually run the rakes as needed to maintain flow.
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 up the primary effluent bypass valve – record the date and time. Note: Notification to the NYSDEC on the day of the event is required when a Primary Effluent Bypass occurs.

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 is capable of handling 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 9.0 feet.

Pre-Wet Weather Event Activities

- Make sure both channels are operational.
- Verify that mechanical screen rake is operational, should be 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 grease/scum troughs as needed.

During Wet Weather Activities

- **Wet Weather Operation Condition #2, #3, #4** – Tip all primary clarifier grease/scum troughs slightly forward (towards inlet end) to help alleviate the amount of grease leaving the tanks in carry over.
- **Wet Weather Operation Condition #2, #3, #4** – Shut off the primary sludge degritter.
- **Wet Weather Operation Condition #2, #3, #4** – Adjust the primary sludge flow from 300 gpm to 100 gpm.
- **Wet Weather Operation Condition #3, #4** – Shut off All primary sludge pumps.
- Note: If the high flow conditions (#3 & #4) continue and the primary sludge pumps have been off over 4-hours, the primary sludge pumps need to be run. Set the Primary Sludge Pump controller for 80 GPM, and the auto rotation for 1 hour, and restart the pumps.
- Verify the operation of flight and chain system.

Post Wet Weather Activities

- Return the primary clarifier grease/scum troughs to the normal operational position.
- Re-start or re-adjust the primary sludge flow rate.
- Verify the operation of flight and chain system.
- Re-start the primary sludge degritter 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 climber screen 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 local H/O/A switch is in the “Off” position and ensure that the screening plates are properly aligned.

During Wet Weather Activities

- **Wet Weather Condition # 1** – Monitor the inlet channel level during high flow and run manually only as needed.
- **Wet Weather Condition # 2, #3, #4** – Preemptively run the fine-screens using the local H/O/A switch, leaving it in the “Off” position and ensure that the screening plates are properly aligned.
- During high flow events, closely monitor the Intermediate Pump Station. The wet well controller is programmed to avoid manual control of pumps during high flow events. The wet well set-point is currently 9.0 feet.

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 are 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 screens is a major concern, especially during high flow events. Blinding of these screens will cause BAF cells to be taken out of service while the screens are cleaned. This screen cleaning causes significant overtime and complication of BAF cell rotation. Monitoring this system 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

- **Wet Weather Condition # 2** – Preemptively clean all four (4) BAF “C” cell strainers.
- **Wet Weather Condition # 2** – 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, 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.
- **Wet Weather Condition # 2, #3, #4** – Closely monitor the BAF C-cell strainers and clean as needed. Also, monitor the cells to determine if they are beginning to plug up.
- **Wet Weather Condition # 2, #3, #4** – Monitor C-cell backwash requirements to

- prevent dropping below three (3) “Active” cells when needing to clean strainers.
- **Wet Weather Condition #4** – In order to help prevent a primary effluent bypass, turn off the backwash pumps. This should only be done for a brief period of time 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 has the ability to 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

- **Wet Weather Condition # 2** – Pre-emptively evaluate all four (4) CMDF units.
- **Wet Weather Condition # 2, #3, #4** – If the restriction of flow creates a problem, bypass the CMDF units as needed.

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 is capable of providing 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.

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.
- **Wet Weather Condition # 2, #3, #4** – When effluent flow reaches 8 MGD, use the lifting winch to lift the attenuating rack up, such that the bottom of the rack is lifted above the water level in the flume. Place safety cones around the open channel.

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 8 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

- Wet Weather Condition #1, #2, #3, #4 - 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

