

Q4 2024 Quarterly Progress Report Niagara Falls Water Board Order on Consent R9-20170906-129

Prepared for submission to:

New York State Department of Environmental Conservation Region 9
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Buffalo, New York 14203

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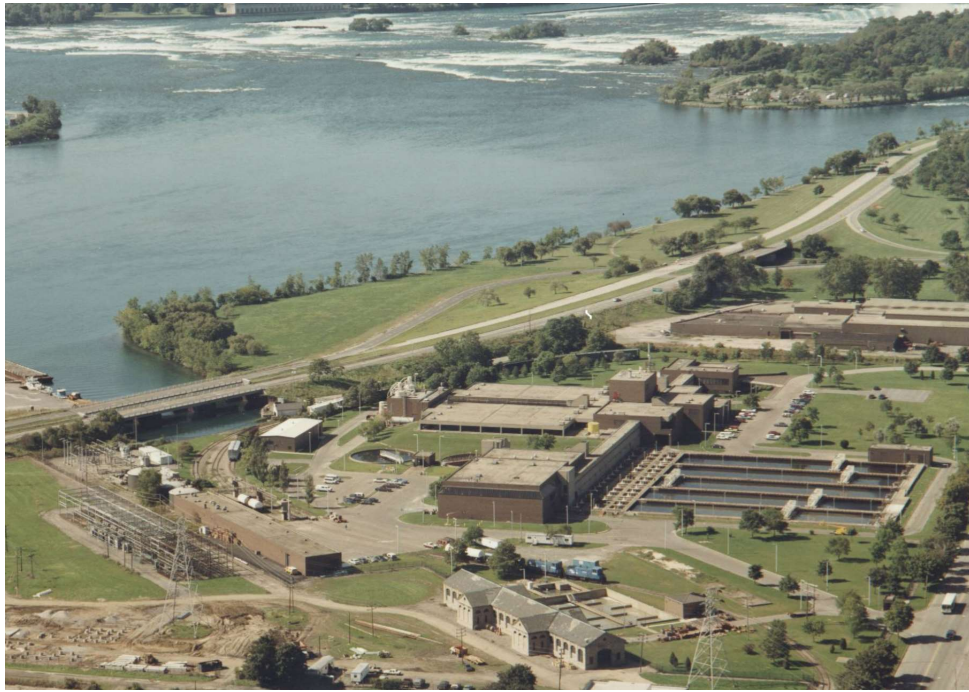
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January 31, 2025



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Executive Summary

This document is the twenty eighth (28th) quarterly progress report for the Niagara Falls Water Board (NFWB) Order on Consent R9-20170906-129 (Consent Order) as originally required by Schedule A Item 15 of the Consent Order. This progress report covers the period from October 1, 2024 through December 31, 2024.

During the past quarter, the NFWB has properly operated the wastewater treatment plant (WWTP) and has met all State Pollution Discharge Elimination System (SPDES) permit requirements with one exception for effluent fecal coliform (7-day geometric mean) during the first week of October 2024. There was no apparent reason for the violation as effluent disinfection proceeded as usual throughout this time period. Solids processing (settling, thickening, dewatering) during this period has functioned as intended. Primary effluent is clean which has allowed the WWTP's activated carbon filters to efficiently process the plant's flow. Dewatering throughput during this period has kept up with incoming solids, compared to influent solids loadings. The WWTP was operated substantially free of odors during the past quarter.

Maintenance activities during the reporting period have been ongoing, and as of the end of the quarter major treatment systems and components are functional with a number of exceptions that affect redundancy. The WWTP is undertaking capital upgrades and improvements that are within the capability of the WWTP's maintenance staff and/or contractors awarded service contracts. In addition to the projects being undertaken by the WWTP's staff and outside contractors, project planning, design, and construction of \$27 million in major capital upgrades are taking place. Projects 2, 4, 6, 7, 8, 9, and 11 have been completed and work continues on Projects 1, 3, 5 and 10. Project 6 was reopened in Q4 2023 by the addition of sodium hypochlorite storage tank upgrades to the existing Project 6 scope. This work includes replacement of Tank 216 along with some sodium hypochlorite pump, piping, and secondary containment upgrades.

The NFWB has met all scheduled requirements of the Consent Order as identified in Schedule A of the Consent Order. Specific submissions during the past quarter include:

- The twenty seventh (27th) quarterly report for the third quarter of 2024 (Q3 2024) was submitted October 31, 2024 to the New York State Department of Environmental Conservation (NYSDEC) and posted on the NFWB's website (Consent Order Item 15).

In May 2024 the NFWB and NYSDEC entered into Order on Consent R9-20230411-13, which also pertains to the WWTP. This major development must be noted here though it does not require quarterly reports or an Onsite Environmental Monitor (OEM) in connection with its requirements. The schedule in the new Order on Consent may be regarded as providing a roadmap for future improvements to the WWTP facility. The new Order on Consent is posted to the NFWB website, like these quarterly reports, and should be consulted for further details.

The NFWB is committed to working cooperatively and openly with the NYSDEC to improve the Niagara Falls WWTP and operate it to the best of its capability.

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1. WWTP Performance

This section discusses the operation of the NFWB WWTP during the reporting period of October 1, 2024 through December 31, 2024. In the following sections, Treatment Plant Operations, Solids Removal Performance, and Treatment Plant Equipment Readiness are discussed.

1.1 Treatment Plant Operations

Mr. Dennis Kirkland serves as Chief Operator of the wastewater treatment plant as of January 4, 2022. During Q2 2024, Mr. David Conti (New York State Grade 4 Licensed Operator #14329) assumed the role as the licensed Grade 4 plant operator. Mr. Conti's principal work location is at the WWTP where he is responsible for plant operations and maintenance. Mr. Conti will serve as the licensed plant operator. This change was previously reviewed and approved by Mr. Robert Locey (NYSDEC Region 9) on October 27, 2023 via email.

During Q4 2024 solids processing has kept up with the incoming solids, and equipment maintenance and repair activities have been conducted as promptly as possible.

Sodium hypochlorite consumption has begun to subside during Q4 2024 with December's usage averaging 4,900 gallons per day. The average during Q4 2024 was 9,300 gallons per day. The practice of chlorinating the primary effluent was stopped on January 26, 2023 due to issues with the filters and reduced sulfide generation. Chlorination of the filter backwash water continues to be practiced during long washes and is included in the above totals.

The following operational considerations were noted during Q4 2024:

- Cascades has continued to discharge relatively low amounts of both total suspended solids (TSS) and soluble organic carbon (SOC) during Q4 2024.
- Carbon filter backwash numbers have remained low (approx. 25 to 35 per day). During Q4 2024 filter backwash water was directed to the East end of the influent channel (Sedimentation Basin 5 end) where it is retreated through the sedimentation basins and activated carbon. This was done to facilitate cleaning and work on the Rapid Mix Tank mixers. During Q4 2024 the West Rapid Mix Tank mixer was replaced including new motor, gearbox, and hub/impeller assembly. The East Rapid Mix Tank mixer is expected to be repaired or replaced in Q1 2025. While this work is ongoing carbon filter backwash will continue to be directed to the East end of the influent channel.
- Construction on Sedimentation Basin 2 (Project 1) was completed in Q4 2024 and the basin has been returned to service. The contractor for Project 1 has elected to hold off starting work on Sedimentation Basin 1 until the spring of 2025. Therefore as of the end of 2024, the facility has the use of all five sedimentation basins, for the first time in several years.
- In late November 2023, the NFWB potable water treatment plant (WTP) began discharging its solids generated in sedimentation basins and filter backwash to the sewer which transports

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the material to the WWTP for treatment. The WTP solids result from the use of an alum coagulant at the WTP. With a year of operational experience it is believed that the WTP solids result in higher sludge blankets in the thickeners (sludge is less dense) and cause the belt filter presses to run “sloppier” which produces a wetter/sticky sludge cake. While not ideal, these conditions have been managed by running additional belt filter press hours at reduced sludge throughput rates.

- Main Pump #1 had a new variable frequency drive installed in Q4 2024 and the pump was returned to service.
- During September 2024 the grit screw conveyor installed as part of capital Project #3 sheared and parts were ordered (new screw). A new screw was received and was installed along with on-hand conveyor liners which were extremely worn and warranted replacement. By the end of Q4, 2024 the North Grit screw conveyor was returned to service.
- Carbon Activated Corporation finished their carbon changeout work in early November 2024 by changing out the activated carbon in Filters 8 and 18, bringing the total amount of activated carbon replaced in 2024 to approximately 359 tons.

1.2 Solids Removal Performance

A solids balance for October, November, and December 2024 is presented in Table 1. The data is based upon effluent flow meter measurements and influent/effluent total suspended solids sample results generated by the facility. The data shows that the quantity of solids sent to the landfill has generally exceeded the amount of solids removed from the wastewater plus chemical solids added (ferric chloride and lime).

Influent suspended solids have continued to be lower than historical averages. The trend of lower influent solids began in November 2021 and appears to correlate with major reductions in suspended solids discharged from Cascades. During the past quarter influent suspended solids loadings averaged 131 dry tons per month (DTPM) which is below the 2023 annual average of 195 DTPM. The 2024 annual average influent suspended solids loadings were 165 DTPM.

1.3 Treatment Plant Equipment Readiness

During the reporting period there were several treatment plant equipment breakdowns that required maintenance staff to repair or replace equipment. Minor repairs have been made this past quarter for pumps, belt filter presses, and sedimentation basin equipment to address issues that have arisen. Although these repairs may have kept equipment out of service for periods of time during the past quarter, it has not significantly affected the plant performance. In general, a sufficient number of sedimentation basins with fully functional sludge removal equipment have been available to treat all incoming flows. As of the close of Q4 2024, the following can be said regarding treatment equipment operability:

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- Four (4) Main Pumps are operational although Pumps 1 and 4 continue to experience intermittent controls issues likely related to variable frequency drive (VFD) issues that result in pump shutdown.
- Five (5) sedimentation basins are functional. During the past quarter, two (2) sedimentation basins have been used for flows up to 40 mgd, three (3) basins used for flows between 40 mgd and 60 mgd, and four (4) basins for flows over 60 mgd.
- The lower effluent submersible pump in Sedimentation Basin 5 is out of service with an apparent electrical motor failure. The pump is scheduled to be pulled and sent out for inspection in Q1 2025.
- The West Rapid Mix Tank mixer has been repaired. The East Rapid Mix Tank mixer remains out of service and is awaiting repair or replacement. Influent flow is currently bypassing the rapid mix tanks and it is not intended to return the rapid mix tanks to service until such time as the East Rapid Mix Tank mixer is repaired.
- The East Rapid Mix Tank grit pump is out of service with undetermined electrical issues.
- As of the close of 2024, the north grit classifier and grit screw were returned to service and is being used for treatment of grit pumped from the sedimentation tanks. Because the rapid mix tanks are out of service, the south grit classifier has been shut down.
- Three (3) Intermediate Pumps are operational and control/drive issues are being monitored. Intermediate Pump 2 was taken out of service and the motor and Eddy Current drive (DC Magnetic drive) have been sent out for servicing. The rotating element removed previously from Intermediate Pump 1 was sent out for rebuilding and when returned will be installed in Intermediate Pump 2. The facility intends to continue rebuilding intermediate pump rotating elements, motors and drives throughout 2025.
- Twenty-eight (28) activated carbon filters are functional.
- Filter backwash pump 2B experienced a VFD failure and a new VFD was ordered and installed. Programming of the VFD remains to be done and as of the end of 2024 backwash pump 2B remains out of service.
- Thickened sludge pump #1 is out of service with VFD control issues. The problem will be addressed as part of the belt filter press control upgrades associated with capital project #3.
- Thickened sludge pump #3 is out of service and is awaiting alignment following installation of a new coupler. The pump is expected to be returned to service in Q1 2025.
- Belt filter press polymer makeup unit #1 (west) that was installed as part of capital project 3 is out of service with SCADA/communications issues. The problem is being evaluated by Motion AI under their capital project 10.
- During Q4 2024, belt filter press 1 remained out of service due to hydraulic and belt tracking issues. On December 16, 2024 belt filter press 3 experienced a failed roller support bracket. The failure of belt filter press 3 left the facility with only one (1) functional belt filter press

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(BFP#2). Following the failure of belt filter press 3, maintenance staff quickly swapped parts between belt filter press 3 and belt filter press 1 to get belt filter press 1 back in service. As of the end of 2024, belt filter presses 1 and 2 are in service and parts have been ordered for belt filter press 3.

- Two (2) pugmills, two (2) lime feed systems, and two (2) lime storage silos are fully functional.
- Work is being done in the WWTP main switchyard to facilitate automatic switching between independent power feeds 187 and 188. Currently automatic switching does not exist.
- Work is being done at the GPS switchgear to facilitate automatic switching between independent power feeds. Currently automatic switching does not exist.

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Table 1
Q4 2024 NFWB WWTP Solids Balance

Month & Year	Average Daily Flow mgd	Average Influent TSS mg/l	Average Effluent TSS mg/l	TSS Removed (Dry) Tons/day	Ferric Chloride Added to Wastewater (Dry) Tons/day	Lime Added to Sludge (Dry) Tons/day	Total Solids (Dry) (TSS + Lime + Ferric) Tons/day	Solids Content of Landfilled Sludge %	Total Solids (Wet) Tons/day	Solids Landfilled (DRY) Tons/day	% Landfilled %
Oct-24	20.2	55.2	12.3	3.6	1.34	1.87	6.8	26.8%	25.5	9.1	134%
Nov-24	20.3	42.9	10.6	2.7	1.39	1.54	5.7	29.9%	19.0	8.5	149%
Dec-24	27.0	63.9	7.3	6.4	1.32	1.28	9.0	29.9%	30.1	8.00	89%

NOTES: mgd million gallons per day
 TSS Total Suspended Solids
 1 % greater than or equal to 100 indicates all incoming solids plus all chemicals added are removed and sent to landfill.

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2. Deliverables and Routine Communications

This section presents a listing and discussion of deliverables prepared by the NFWB for submission to the NYSDEC. In addition, other related written communications between the NYSDEC and the NFWB are also discussed.

2.1 Deliverables Status

All deliverables required under the consent order have been submitted to the NYSDEC in accordance with the schedule in the Consent Order. Deliverables submitted during the past quarter are listed in Table 2.

**Table 2
NFWB Submissions to NYSDEC per Schedule A of the Consent Order**

Date	Prepared By	Consent Order Schedule A Items	Comment
October 31, 2024	AECOM	Item 15	The twenty seventh quarterly progress report for the third quarter of 2024 (Q3 2024) was submitted.

2.1.1 Existing WWTP Optimization Efforts

At this time, no further modifications/optimizations to the WWTP treatment process are being considered or planned.

2.2 Deliverables in Next Quarter

All deliverables required under the Consent Order have been submitted. No other deliverables are pending or due under the consent order other than this quarterly report.

2.3 Routine Communications in Past Quarter

On December 23, 2024 the NFWB received a draft SPDES permit from the NYSDEC that contains substantially revised effluent discharge limitations.

2.4 Unresolved Issues/Delays

There are no unresolved issues or delays.

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3. Capital Improvement Program

In this section, progress on WWTP capital upgrades is discussed. Capital upgrades are proceeding on several fronts. Projects that are within the capability of in-house maintenance staff are being undertaken as quickly as possible. Additionally, outside contractors selected for WWTP work (Mechanical Contractor – Danforth, Electrical Contractor – Ferguson Electric) are being utilized for larger projects. Lastly, design and construction are underway to perform a number of capital upgrades that are necessary to stabilize the operation of the existing treatment plant. Each of these items is discussed in this section.

3.1 In-House Capital Upgrades Completed/Underway

This category of projects includes work being undertaken by plant maintenance staff or outside contractors without the need for extensive design and engineering documents. This work is generally considered repair and/or replace in kind and therefore NYSDEC approval is not generally required prior to performing the work. At this time all work slated to be performed in-house has been performed.

3.2 Capital Improvement Projects

A schedule for the ongoing capital projects is shown in Figure 1. Note that the NFWB has sought and obtained approval from the NYSDEC to upgrade certain chemical bulk storage facilities under the existing Project 6 engineering services agreement, therefore Project 6 (effluent disinfection upgrades) was reopened in Q4 2024 to facilitate engineering and eventual construction of sodium hypochlorite improvements to Tank 216 and its secondary containment system.

Figure 1
Capital Projects Estimated Construction Schedule

ESTIMATED CONSTRUCTION SCHEDULE			
NFWB CAPITAL IMPROVEMENT PROJECTS			
<i>Updated: 12/23/2024</i>			
TASK DESCRIPTION	PLAN START	PLAN END	2022
			2023
			2024
			J F M A M J J A S O N D
			J F M A M J J A S O N D
			J F M A M J J A S O N D
Project #1: Sed. Basin Upgrades (CPL) - CA/CI Approved (10-26-20)			
Design and Bidding	5/22/2019	10/1/2020	
Mobilization	11/1/2020	2/1/2021	
Construction (Phase 1)	3/1/2021	6/30/2022	█
Construction (Phase 2)	7/1/2022	2/3/2023	█
Construction (Phase 3)	3/1/2023	2/3/2024	█
Construction (Phase 4)	3/1/2024	5/30/2025	█
Project #3 Polymer and Grit (Arcadis) - CA/CI Approved (10-26-20)			
Design and Bidding	5/30/2019	10/1/2020	
Updated Design	12/1/2023	3/31/2024	█
Construction	11/1/2020	12/31/2024	█
Project #5 Electrical System Improvements (EI Team)			
Design and Bidding	4/25/2019	2/1/2022	█
Construction	3/1/2022	12/31/2024	█
Project #10 SCADA Improvements (Kaman) - CA Services Not Required			
Design and Bidding	6/1/2019	12/1/2019	
Construction	1/1/2020	11/30/2024	█
Project #12 Int. Pump Improvements (GHD)			
Design	3/23/2022	8/23/2022 (RFP Pending)	█
			J F M A M J J A S O N D
			J F M A M J J A S O N D
			J F M A M J J A S O N D

