
Memorandum

PWC-C 9-2024

Subject: Receipt of Written Warning under the Wastewater Systems Effluent Regulation

Date: August 13, 2024

To: Public Works Committee

From: Dawn MacArthur, B.Sc., C.Chem.

This memorandum is to inform Council that a written warning has been issued to Niagara Region for contraventions of the Wastewater Systems Effluent Regulation (WSER) that occurred at the Niagara Falls wastewater treatment plant (WWTP).

The written warning is cautionary and does not carry any fines or penalties but is intended to bring this matter to the attention of the Niagara Region and outline potential consequence should Niagara Region fail to take corrective action.

Background

Niagara Region wastewater systems are regulated both under Provincial and Federal regulations. Federally, the *Wastewater Systems Effluent Regulation* (WSER) applies to Niagara Region's facilities and is enforced by Environment and Climate Change Canada.

Under the WSER, effluent from a wastewater system must meet conditions related to biochemical oxygen demand (CBOD), suspended solids (TSS), residual chlorine (TRC), ammonia, and toxicity¹.

The recent written warning cited the following contraventions:

- 26 instances of CBOD exceedances since 2021
- 21 instances of TSS exceedances since 2021
- 1 instance of an acute toxicity exceedance that occurred on March 4, 2024 with a test result of 60% mortality

¹ The toxicity of effluent is determined by acute toxicity lab testing using rainbow trout. If greater than 50% of the fish die during the test period, the effluent is considered toxic.

Why is Niagara Falls WWTP in Contravention with the WSER?

CBOD Exceedances

CBOD is primarily removed from wastewater during the secondary treatment process. The secondary treatment equipment at the plant has passed its useful life expectancy which results in frequent breakdowns and equipment out-of-service regularly. This impacts the plant's ability to remove CBOD effectively. Despite ongoing repair and maintenance efforts, CBOD removal was reduced by an average of 30% in 2023 due to the state of deterioration of the secondary treatment process.

A capital project is already underway to replace the current secondary treatment system. Until the completion of the capital upgrades in approximately Q2 2025, enhanced maintenance and upkeep of the equipment will be required.

TSS Exceedance

TSS exceedances are attributed to two main factors at the plant: (1) the underperforming secondary treatment process equipment as described above, and (2) current construction of the new secondary treatment system requires rehabilitation of the four (4) final clarifiers. To do this, they are being taken out of service on a rotating basis, leaving only three (3) final clarifiers in operation at any given time. This reduces the plant's ability to remove solids by approximately 25%. Construction of the final clarifiers is anticipated to be complete by Q4 2024.

Acute Toxicity Failure

Determining the cause of acute toxicity failure is challenging as there can be many undetectable sources of toxicity in wastewater. However, typically for wastewater effluent, toxicity failure occurs from three causes: ammonia, poor effluent quality, or chemical usage (either from something put in the sewer upstream of the plant, or from chemicals used within the plant).

Based on the toxicity results from the failure on March 4, 2024, it is likely that poor effluent quality is the primary cause of the failure, with ammonia as a contributing factor.

Failure of the acute toxicity test is also attributed to the degradation of the secondary treatment process.

Corrective Actions

The following actions have been completed or are currently underway to address the full range of exceedances noted in the written warning from Environment and Climate Change Canada:

- A capital project is underway to replace the secondary treatment process. The new equipment is anticipated to come online in Q2 of 2025.
- Maintenance efforts will continue to support the existing secondary treatment equipment to the extent possible.
- A polymer is being added in the primary and secondary clarifiers to optimize settling of solids and TSS removal.
- Hauled sewage receiving has been restricted to domestic sewage from sources within the City of Niagara Falls boundaries only. Specifically, barring winery waste helps to reduce CBOD and TSS loading to the facility.
- Additional toxicity testing is being completed on polymers utilized in the process as a precaution to ensure there is no toxicity occurring from their use.
- Process staff are investigating the feasibility of using an additive that may be applied at Niagara Falls WWTP to reduce ammonia levels.

Summary

Staff are working hard to remain in compliance with all applicable regulations and work co-operatively with regulatory authorities. Degradation of existing treatment equipment continues to hinder staff's ability to meet the regulatory requirements for CBOD and TSS. Many efforts have been and will continue to be taken to achieve compliance.

Staff will respond to the ECCC warning with a letter outlining all corrective actions that have or are being taken to demonstrate Niagara Region's actions and due diligence.

Respectfully submitted and signed by

Dawn MacArthur, B.Sc.,C.Chem.
Supervisor, Wastewater Compliance and Enforcement

Appendices

Appendix 1 Written Warning - Niagara Falls WWTP Contraventions of the
Wastewater Systems Effluent Regulation



**ENFORCEMENT
BRANCH**
Environmental Enforcement



**DIRECTION GÉNÉRALE DE
L'APPLICATION DE LA LOI**
Application de la loi en environnement

WRITTEN WARNING

FISHERIES ACT

WASTEWATER SYSTEMS EFFLUENT REGULATIONS

File: 8330-2023-10-30-5416

PROTECTED B

May 22, 2024

Registered with acknowledgement of receipt

The purpose of this warning is to inform:

Regional Municipality of Niagara
1815 Sir Isac Brock Way
Thorold, ON
L2V 4T7

c/o Ron Tripp
Chief Administrative Officer
Regional Municipality of Niagara
1815 Sir Isac Brock Way
Thorold, ON
L2V 4T7

That observations made during an inspection of your facility at 3450 Stanley Avenue, Niagara Falls, Ontario, on April 17, 2024, by the undersigned Fishery Officer designated by the Minister of Environment and Climate Change under the *Fisheries Act*, provided reasonable grounds to believe that Regional Municipality of Niagara and its responsible officials were in contravention of section 6 of the Wastewater Systems Effluent Regulations [the Regulations] made pursuant to the *Fisheries Act* as well as subsection 36(3) of the *Fisheries Act*, thereby committing offences under subsection 40(2) and 40(3) of the *Fisheries Act*.

ALLEGED FACTS

As a result of an on-site inspection and review of submitted data, I, the undersigned fishery officer determined the following alleged facts:

1. Ron Tripp is the highest ranking non-elected official at the Regional Municipality of Niagara.
2. The following wastewater system ("the system") is owned by the Regional Municipality of Niagara:

- Niagara Falls Wastewater Treatment Plant, located at 3450 Stanley Ave, Niagara Falls, Ontar
- 3. The systems' effluent is deposited into water frequented by fish.
- 4. The system collects an average daily volume of wastewater influent greater than 100 cubic metres.
- 5. The system is therefore a regulated wastewater system under the Wastewater Systems Effluent Regulations ("the regulations").
- 6. That on March 11, 2024, the Regional Municipality of Niagara reported an acute toxicity exceedance at the Niagara Falls Wastewater Treatment Plant (Spill Action Centre Incident Report # 1-4UVU3S).
- 7. The Acute Lethality report confirmed that 60% mortality of rainbow trout occurred in accordance with the RM50 acute lethality test method. The deposit of acutely lethal wastewater effluent is an alleged violation under subsection 36(3) of the Act.
- 8. On April 17, 2024, I attended the Niagara Falls Wastewater Treatment Plant and collected effluent samples. The samples were determined to have 41.7 mg/L Carbonaceous Biochemical Oxygen Demand and 21.9 mg/L Suspended Solids (SS). The sample collected and tested in accordance with the RM50 acute lethality test method was determined to have 0% mortality of rainbow trout.
- 9. The Regulations state that the maximum authorized average concentration of suspended solids in an averaging period is 25mg/L. The averaging period for Niagara Falls Wastewater Treatment Plant is monthly. The monthly average of suspended solids exceeded the maximum average concentration at the Niagara Falls Wastewater Treatment Plant in the following months, contrary to paragraph 6(1)(b) of the Regulations:
 - 2021 Suspended Solids results:
 - March - 26.9 mg/L
 - October - 26.2 mg/L
 - 2022 Suspended Solids results:
 - January – 35.4 mg/L
 - February – 36.1 mg/L
 - April – 28.3 mg/L
 - May - 25.7 mg/L
 - July - 28.4 mg/L
 - August – 34.4 mg/L
 - September – 33.4 mg/L
 - October – 32.1 mg/L
 - November – 27.0 mg/L
 - 2023 Suspended Solids results:
 - April – 30.6 mg/L
 - May - 29.9 mg/L
 - September – 32.6 mg/L
 - October – 36.5 mg/L
 - November – 40.1 mg/L
 - December – 32.5 mg/L
 - 2024 Suspended Solids results:
 - January – 40.4 mg/L

- February – 33.6 mg/L
- March – 28.9 mg/L
- April – 29.7 mg/L

10. The Regulations state that the maximum authorized average CBOD in an averaging period is 25mg/L. The averaging period for Niagara Falls Wastewater Treatment Plant is monthly. The monthly average of CBOD exceeded the maximum average concentration at the Niagara Falls Wastewater Treatment Plant in the following months, contrary to paragraph 6(1)(a) of the Regulations:

- 2021 cBOD results:
 - March – 27.1 mg/L
 - April – 25.2 mg/L
 - May – 26.7 mg/L
 - July – 26.9 mg/L
 - August – 26.3 mg/L
 - October – 30.7 mg/L
 - November – 32.4 mg/L
- 2022 cBOD results:
 - February – 30.4 mg/L
 - April – 28.6 mg/L
 - May - 35.2 mg/L
 - June – 26.0 mg/L
 - July – 30.0 mg/L
 - August – 25.4 mg/L
 - September – 27.7 mg/L
 - October – 37.4 mg/L
 - November – 26.9 mg/L
- 2023 cBOD results:
 - April – 31.7 mg/L
 - May - 38.3 mg/L
 - September – 29.5 mg/L
 - October – 37.2 mg/L
 - November – 39.0 mg/L
 - December – 28.3 mg/L
 -
- 2024 cBOD results:
 - January – 27.5 mg/L
 - February – 30.5 mg/L
 - March – 25.1 mg/L
 - April – 27.4 mg/L

THE LAW

Wastewater Systems Effluent Regulations

Definitions

1 The following definitions apply in these Regulations.

acutely lethal, in relation to effluent, means that the effluent at 100% concentration kills, during a 96-hour period, more than 50% of the rainbow trout subjected to it

carbonaceous biochemical oxygen demanding matter or CBOD matter means carbonaceous matter that consumes, by biochemical oxidation, oxygen dissolved in water.

effluent means wastewater that is deposited from a wastewater system.

final discharge point means the point, other than an overflow point, of a wastewater system beyond which its owner or operator no longer exercises control over the quality of the wastewater before it is deposited as effluent in water or a place.

previous month, in respect of a given period and a wastewater system, means the most recent month during which effluent was deposited via the system's final discharge point that ended before the given period.

Procedure for pH Stabilization EPS 1/RM/50 means the Procedure for pH Stabilization During the Testing of Acute Lethality of Wastewater Effluent to Rainbow Trout (EPS 1/RM/50), March 2008, published by the Department of the Environment, as amended from time to time.

suspended solids means any solid matter contained in effluent that is retained on a filter of 2.0 micrometre (µm) or smaller pore size.

wastewater system means any work or undertaking, at least part of which is located on land, that is used for the collection and deposit of wastewater, whether or not the wastewater is treated, and includes a site that contains a wastewater lagoon.

Application

2(1) These Regulations apply in respect of a wastewater system that, when it deposits effluent via its final discharge point, deposits a deleterious substance prescribed in section 5 in water or a place referred to in subsection 36(3) of the Act and that

- (a) is designed to collect an average daily volume of 100 m³ or more of influent; or
- (b) during any calendar year, collects an average daily volume of 100 m³ or more of influent.

Types of wastewater systems

3 For the purpose of these Regulations, there are two types of wastewater systems, as follows:

- (a) an intermittent wastewater system, namely, one with a hydraulic retention time of at least 90 days that deposits effluent via its final discharge point during at most four periods per calendar year, each of which is separated from every other period by at least seven clear days during which no deposit occurs; and

- (b) a continuous wastewater system, namely, any wastewater system other than an intermittent wastewater system.

Prescribed deleterious substances

- 5 For the purpose of the definition “deleterious substance” in subsection 34(1) of the Act, the following substances or classes of substances are prescribed as deleterious substances:

- (a) carbonaceous biochemical oxygen demanding matter;
- (b) suspended solids;
- (c) total residual chlorine; and
- (d) un-ionized ammonia.

Authorization to deposit

- 6 (1) For the purpose of paragraph 36(4)(b) of the Act, the owner or operator of a wastewater system may — during a given calendar year, quarter or month, determined in accordance with subsection (2) — deposit or permit the deposit of effluent that contains any of the deleterious substances prescribed in section 5 via the system’s final discharge point in any water or place referred to in subsection 36(3) of the Act if the effluent is not acutely lethal as determined in accordance with section 15 and if — during the previous calendar year, previous quarter or previous month, determined in accordance with subsection (2) — the effluent met the following conditions:

- (a) the average carbonaceous biochemical oxygen demand due to the quantity of CBOD matter in the effluent did not exceed 25 mg/L;
- (b) the average concentration of suspended solids in the effluent did not exceed 25 mg/L;
- (c) the average concentration of total residual chlorine in the effluent did not exceed 0.02 mg/L, if chlorine, or one of its compounds, was used in the treatment of wastewater; and
- (d) the maximum concentration of un-ionized ammonia in the effluent was less than 1.25 mg/L, expressed as nitrogen (N), at 15°C ± 1°C.

Averaging period

- (2) The averages referred to in paragraphs (1)(a) to (c) and the maximum referred to in paragraph (1)(d) must be determined on the following basis:
 - (a) each calendar year, if the average daily volume of effluent deposited via the final discharge point during the previous calendar year was
 - (i) less than or equal to 17 500 m³, for an intermittent wastewater system, or
 - (ii) less than or equal to 2 500 m³, for a continuous wastewater system with a hydraulic retention time of five or more days;
 - (b) each quarter, if the average daily volume of effluent deposited via the final discharge point during the previous calendar year was
 - (i) greater than 2 500 m³ and less than or equal to 17 500 m³, for a continuous wastewater system with a hydraulic retention time of five or more days, and
 - (ii) less than or equal to 17 500 m³, for any other continuous wastewater system; and
 - (c) each month, if the average daily volume of effluent deposited via the final discharge point during the previous calendar year was greater than 17500 m³.

Acute Lethality Testing

Taking samples

- 11 (1) The owner or operator of a wastewater system that — during the previous calendar year in respect of the calendar year, quarter or month in question — deposited via the system’s final discharge point an average daily volume of effluent set out in column 1 of the table to this subsection must, for that calendar year, quarter or month, take at the final discharge point a grab sample of effluent at the minimum frequency set out in column 2.

TABLE

	Column 1	Column 2
Item	Average Daily Volume Deposited Annually (m3)	Minimum Sampling Frequency
1	>2500 and ≤ 50000	Quarterly but at least 60 days after other sample
2	>50000	Monthly but at least 21 days after any other sample

Acute lethality

- (2) The owner or operator must, for each sample taken under subsection (1), determine, or cause the determination of, whether or not it is acutely lethal in accordance with section 15

Additional test

- (3) If a sample is determined to be acutely lethal in accordance with section 15, the owner or operator must take a grab sample twice a month, but at least seven days after any previous sample, and determine, or cause the determination of, whether or not it is acutely lethal in accordance with section 15.

Consecutive samples — not acutely lethal

- (4) If three consecutive samples are, under subsection (3), determined not to be acutely lethal, subsections (1) and (2) apply to subsequent samples.

Subsequent samples

- (5) For greater certainty, subsection (3) applies to any subsequent sample referred to in subsection (4) that is determined to be acutely lethal when tested under subsection (2).

Change in sampling frequency

- (6) The minimum sampling frequency set out in column 2 of the table to subsection (1) is reduced
- i. for item 1, to yearly, but at least six months after any other sample, if samples were taken under subsection (1) for each of four consecutive quarters and those samples were tested under subsection (2) and determined not to be acutely lethal; and
 - ii. for item 2, to quarterly, but at least 60 days after any other sample, if samples were taken under subsection (1) for each of 12 consecutive months and those samples were tested under subsection (2) and determined not to be acutely lethal.

Fisheries Act**Application of Act to His Majesty**

3(2) The Act is binding on His Majesty in right of Canada or a province.

Deposit of Deleterious Substance Prohibited

36(3) Subject to subsection (4), no person shall deposit or permit the deposit of a deleterious substance of any type in water frequented by fish or in any place under any conditions where the deleterious substance or any other deleterious substance that results from the deposit of the deleterious substance may enter any such water.

Subsection 36(4) refers to deposits made under the authority of certain types of regulations and does not apply in this instance.

Deposits authorized by regulation

36(4) No person contravenes subsection (3) by depositing or permitting the deposit in any water or place of
[...]
(b) a deleterious substance of a class and under conditions — which may include conditions with respect to quantity or concentration — authorized under regulations made under subsection (5) applicable to that water or place or to any work or undertaking or class of works or undertakings; or
[...]

Offence and punishment

40(2) Every person who contravenes subsection 36(1) or (3) is guilty of an offence and liable

(a) on conviction on indictment,

(i) in the case of an individual,

- (A) for a first offence, to a fine of not less than \$15,000 and not more than \$1,000,000, and
- (B) for a second or subsequent offence, to a fine of not less than \$30,000 and not more than \$2,000,000, or to imprisonment for a term not exceeding three years, or to both,

(ii) in the case of a person, other than an individual or a corporation referred to in subparagraph (iii),

- (A) for a first offence, to a fine of not less than \$500,000 and not more than \$6,000,000, and
- (B) for a second or subsequent offence, to a fine of not less than \$1,000,000 and not more than \$12,000,000, and

(iii) in the case of a corporation that the court has determined to be a small revenue corporation,

- (A) for a first offence, to a fine of not less than \$75,000 and not more than \$4,000,000, and
- (B) for a second or subsequent offence, to a fine of not less than \$150,000 and not more than \$8,000,000; or

(b) on summary conviction,

(i) in the case of an individual,

- (A) for a first offence, to a fine of not less than \$5,000 and not more than \$300,000, and
- (B) for a second or subsequent offence, to a fine of not less than \$10,000 and not more than

\$600,000, or to imprisonment for a term not exceeding six months, or to both,

- (ii) in the case of a person, other than an individual or a corporation referred to in subparagraph (iii),
 - (A) for a first offence, to a fine of not less than \$100,000 and not more than \$4,000,000, and
 - (B) for a second or subsequent offence, to a fine of not less than \$200,000 and not more than \$8,000,000, and
- (iii) in the case of a corporation that the court has determined to be a small revenue corporation,
 - (A) for a first offence, to a fine of not less than \$25,000 and not more than \$2,000,000, and
 - (B) for a second or subsequent offence, to a fine of not less than \$50,000 and not more than \$4,000,000.

Other Offences

40(3) Every person who

- (a) in carrying on a work, undertaking or activity, fails to comply with a prescribed condition of an authorization under paragraph 35(2)(a) or (c), with a condition established by the Minister under paragraph 35(2)(b), or with a condition set out in the regulations or established under any other authorization issued under this Act,

[...]

is guilty of an offence punishable on summary conviction and liable, for a first offence, to a fine not exceeding two hundred thousand dollars and, for any subsequent offence, to a fine not exceeding two hundred thousand dollars or to imprisonment for a term not exceeding six months, or to both.

Continuing Offence

78.1 Where any contravention of this Act or the regulations is committed or continued on more than one day, it constitutes a separate offence for each day on which the contravention is committed or continued.

CONCLUSION

This warning alleges a contravention of the *Fisheries Act* and the *Wastewater Systems Effluent Regulations*. It is intended to bring this matter to your attention in order for you to take the necessary corrective action to ensure compliance with the *Fisheries Act* or in order for you to exercise due diligence in the future. This document is not a finding of guilt or civil liability, and is not an administrative adjudication.

This warning and the circumstances to which it refers will form part of Environment and Climate Change Canada's records of Regional Municipality of Niagara and will be taken into account in future responses to alleged violations and for internal purposes such as setting the frequency of inspections. Environment and Climate Change Canada will consider taking further action if you do not take all necessary corrective steps to comply or if you do not exercise due diligence in the future.

This warning is issued in accordance with the Compliance and Enforcement Policy for the Habitat Protection and Pollution Prevention Provisions of the *Fisheries Act*. The complete text of this policy is available on Environment and Climate Change Canada's website: <https://www.canada.ca/en/environment-climate-change/services/environmental-enforcement.html>

The complete text of the *Fisheries Act* and/or its regulations is available on the Department of Justice website: <http://laws-lois.justice.gc.ca/eng/acts/F-14/>

For more information or to respond to the alleged facts contained in this warning, please call or write the undersigned. Your comments will be considered, and where appropriate, a response provided. Any comments you make, as well as Environment and Climate Change Canada's response, will be maintained on file with this warning in Environment and Climate Change Canada's records.

Dave
Ross

Digitally signed by: Dave
Ross
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