




Hamilton

INFORMATION REPORT

TO:	Chair and Members Public Works Committee
COMMITTEE DATE:	May 13, 2024
SUBJECT/REPORT NO:	Annual Wastewater Treatment Bypass Report (PW24028) (City Wide)
WARD(S) AFFECTED:	City Wide
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SUBMITTED BY:	Shane McCauley Director, Water & Wastewater Operations Public Works Department
SIGNATURE:	

COUNCIL DIRECTION

In 2019 Council directed Hamilton Water to provide the Public Works Committee with an annual report on discharges to the natural environment from the Dundas and Woodward Wastewater Treatment Plants.

INFORMATION

Report PW24028 details the bypass frequency and volume for the Woodward and Dundas Wastewater Treatment Plants for 2023 and provides the five-year average for each. Report PW24028 also provides similar data from other Ontario municipalities that publicly report wastewater treatment plant bypass information. The City of Hamilton's (City) website features a live map of bypass and combined sewer overflow locations and a historical log of wastewater treatment plant bypass and combined sewer overflow events (<https://www.hamilton.ca/home-neighbourhood/water-wastewater-stormwater/wastewater-collection-treatment/monitoring>). The site is currently unavailable due to the on-going cybersecurity incident but will be made available once full services have been restored.

OUR Vision: To be the best place to raise a child and age successfully.

OUR Mission: To provide high quality cost conscious public services that contribute to a healthy, safe and prosperous community, in a sustainable manner.

OUR Culture: Collective Ownership, Steadfast Integrity, Courageous Change, Sensational Service, Engaged Empowered Employees.

Wastewater Treatment Plant Discharges

The City operates two wastewater treatment plants. The Woodward Wastewater Treatment Plant is located at 700 Woodward Avenue, Hamilton, and discharges to the Red Hill Creek. The Dundas Wastewater Treatment Plant is located at 135 King Street East, Dundas and discharges to the Desjardins Canal. Both discharge locations are connected to the Hamilton Harbour.

The City has a large complex wastewater collection network consisting of both separated sewer and combined sewer systems. Combined sewers are found in older areas of the City and carry a combination of stormwater and wastewater in the same pipe. During periods of heavy rainfall, snowmelt, or elevated lake levels the combined sewers may be inundated with large volumes of stormwater that can exceed the capacity of the pipes.

This can result in combined sewer overflows and can also overwhelm the wastewater treatment plants requiring a temporary bypass of different treatment processes. Wastewater treatment plant operators monitor incoming flows and make operational adjustments to the treatment processes as required. To protect the wastewater treatment plant from infrastructure damage, prevent flooding, and maintain compliance with the Wastewater Treatment Plant Environmental Compliance Approval (ECA) the operator will initiate a bypass when required.

Woodward Wastewater Treatment Plant

At the Woodward Wastewater Treatment Plant, a bypass can occur at various stages in the wastewater treatment process. In 2023, there were four different levels of treatment bypass that could occur at the Woodward Wastewater Treatment Plant as described in the following table.

Table 1 - Treatment Levels of Bypass Locations at the Woodward Wastewater Treatment Plant

Bypass Type and Location	Treatment Processes Bypassed
Secondary treatment bypass (secondary bypass gate)	Secondary and tertiary treatment processes including aeration, secondary clarification, and filtration. Bypasses receive chlorine disinfection between May 15 and October 15.
Primary treatment bypass with disinfection (primary bypass gate)	Primary, secondary, and tertiary treatment processes including primary clarification, aeration, secondary clarification, and filtration. Bypasses receive chlorine disinfection between May 15 and October 15.

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Primary treatment bypass without disinfection (headworks bypass gate)	Primary, secondary, and tertiary treatment processes including primary clarification, aeration, secondary clarification, and filtration. Bypasses do not receive chlorine disinfection.
Preliminary treatment bypass (pumphouse bypass)	All processes at the Wastewater Treatment Plant are bypassed. Bypasses do not receive chlorine disinfection.

Since the completion of infrastructure upgrades in 2012 most bypass events have been secondary bypasses. Occasionally, flows to the Woodward Wastewater Treatment Plant are sufficiently large that both a primary bypass and a secondary bypass must be initiated at the same time. On rare occasions, a preliminary treatment bypass may be required where flows exceed the preliminary treatment capacity, or where flows risk flooding and causing damage to surrounding properties, the main pumping station, or other wastewater treatment plant infrastructure.

In 2023, all bypass events at the Woodward Wastewater Treatment Plant were the result of wet weather that generated flows greater than the wastewater treatment plant's treatment capacity. Bypasses are promptly reported to the Ministry of Environment, Conservation, and Parks Spills Action Centre and to Public Health Services as required by regulation.

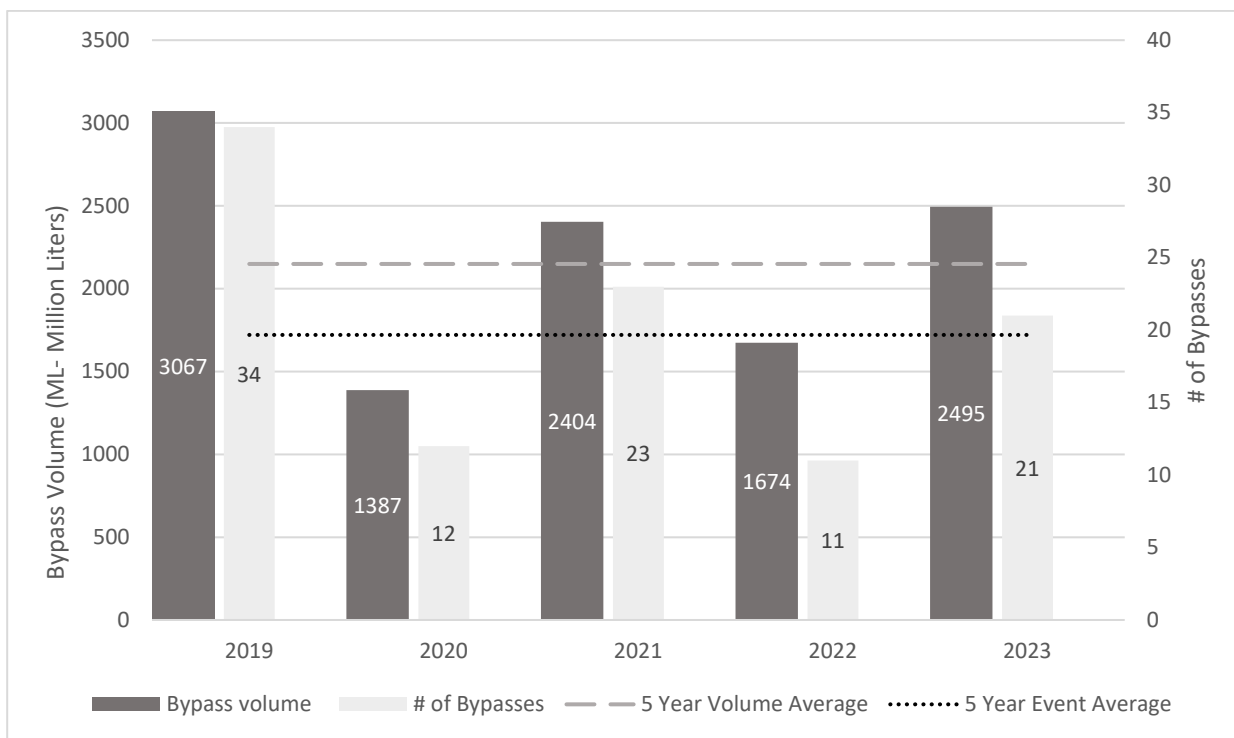
In October 2022, a new Woodward Wastewater Treatment Plant outfall was commissioned to accommodate the new tertiary treatment process. This new outfall discharges further upstream of the former location and discharges fully treated effluent.

The old outfall is now the discharge point for partially treated wastewater from bypasses. It is important to note that this location also receives flows from the Dunn Avenue combined sewer overflow outfall. There is a floating containment boom installed and if abnormal materials such as floatables are present, it is highly probable that they originated from the Dunn Avenue combined sewer.

Both Woodward Wastewater Treatment Plant outfall locations are inspected regularly and after every significant wet weather event or bypass event. Any abnormal materials such as floatables that are present are removed by staff or a City contractor.

The 2023 Woodward Wastewater Treatment Plant bypass event data is presented in the following chart along with the five-year average for comparison.

Figure 2 - Woodward Wastewater Treatment Plant Bypass Frequency and Volume



2023 was a wetter than normal year with approximately 10% more precipitation than the 5-year average. Additionally, the precipitation in 2023 was characterized by high-intensity rainstorms, particularly concentrated during the spring/summer months. Intense weather events are more likely to overwhelm the combined system capacity and lead to bypass events. As a result, and as shown in the Figure 2 above, both the number bypass events, and the total volume bypassed were above the 5-year averages. Of the 21 bypass events in 2023, 17 were secondary bypasses and four were primary bypasses without disinfection.

Dundas Wastewater Treatment Plant

Flows from the Dundas Wastewater Treatment Plant are carefully controlled and any flows exceeding the plant’s capacity are directed to the Woodward Wastewater Treatment Plant rather than initiating a bypass at the Dundas Wastewater Treatment Plant. A bypass could occur at the Dundas Wastewater Treatment Plant if wastewater treatment plant operators are unable to divert flow quickly enough. In this case a bypass would be a tertiary bypass. A tertiary bypass means the wastewater has been almost fully treated including the removal of large solids, grit, and floatable material, chemicals have been added to assist with phosphorus removal, biological treatment has been completed to break down organic material and nutrients, and most of the remaining

solids have been removed. Between May 15 and October 15 each year, any tertiary bypasses that occur would also receive chlorine disinfection; however, would not have the chlorine removed prior to being discharged to the natural environment. The Dundas Wastewater Treatment Plant had no bypass events in 2023 and has not had a bypass in the last seven years.

Municipal Comparison

Council requested at the January 13, 2020, Public Works Committee meeting, that available wastewater treatment plant bypass volumes for comparable municipalities be presented along with the bypass data for Hamilton’s Wastewater Treatment Plants. The table below provides this data for Hamilton along with other Ontario municipalities that publicly report wastewater treatment plant bypasses. It should be noted that many comparator municipalities do not report this data publicly. Furthermore, direct comparisons between municipalities cannot be easily made as all collection systems and treatment facilities are unique and higher bypass volumes do not necessarily indicate poorer performance.

Table 3 - Municipal Wastewater Treatment Plant Bypass Volume Comparison in Millions of Litres

		Total Bypass Volume (Millions of Litres)	
Municipality	Number of Wastewater Treatment Plants	2022	2023
Hamilton	2	1,674	2,495
Kingston	3	12	4
London	5	48	605
Greater Sudbury	10	223	1,240
Niagara Region	11	1,314	2,042
Toronto	4	2,721	5,172

The City of Hamilton along with the City of Kingston are the only known municipalities in Ontario who report overflows and bypasses publicly in real-time. The City’s webpage which shows real-time overflows and bypasses (www.hamilton.ca/home-neighbourhood/water-wastewater-stormwater/wastewater-collection-treatment/monitoring) and houses historical data on Hamilton’s wastewater overflows and bypasses, was launched in June 2020. The site is currently unavailable due to the on-going cybersecurity incident but will be made available once full services have been restored.

APPENDICES AND SCHEDULES ATTACHED

N/A