MW-2025-10
Operations

Report

Report to:	Mayor and Council
Date:	May 6, 2025
Title:	**Stormwater Management and Wastewater Collection System Summary Report and Overview**

Recommendation(s)
That this report be **RECEIVED** for information.

Executive Summary
In accordance with the Consolidated Linear Infrastructure Environmental Compliance Approval (CLI-ECA) for Stormwater Management (068-S701) and Wastewater Collection (068-W601) under the Ontario Environmental Protection Act, 1990, the Municipal Council, having jurisdiction over its stormwater management system and wastewater collection system is required to receive and publish both Systems Annual progress Reports prior to May 25 in each calendar year. This report provides an annual overview regarding the system's performance in compliance with the CLI-ECA.

This report presents key findings from the 2024 Stormwater Management System and Wastewater Collection System Annual Reports, covering the period from January 1, 2023, to December 31, 2024. The City of Niagara Falls continues to make significant improvements in managing its municipal stormwater management system and wastewater collection system while maintaining compliance with the CLI-ECA. Key highlights include implementing regulatory requirements, stormwater management facility inspections, storm water and downstream water quality monitoring, and municipal system alterations. Challenges remain, particularly in addressing high sediment levels in some stormwater management facilities, and localized water quality in stormwater receiving water bodies. Recommendations focus on enhancing monitoring programs, optimizing stormwater infrastructure, and integrating climate resilience strategies to support long-term sustainability.

Additionally, attached are the Stormwater Management System Annual Report and Wastewater Collection System Annual Report which are to be provided to the system Owner annually. The annual reports evaluate the system performance, adequacy, and effectiveness of the environmental quality management. The purpose of this report is to provide the Owners of the stormwater management system and wastewater collection system and documentation confirming that the City is operating in accordance with all current legislation and is taking appropriate measures to ensure public health and environmental safeguard.

Background

The City of Niagara Falls operates its stormwater and wastewater collection systems under the regulatory framework established by the Ministry of the Environment, Conservation and Parks (MECP). The CLI-ECA provides a consolidated approval process to streamline environmental compliance for municipalities. The CLI-ECA ensures that all municipal stormwater and wastewater infrastructure meets operational, reporting, and monitoring requirements set by the province. Compliance with these regulations safeguards public health and the environment while promoting sustainable low impact development.

The Mayor and City Council, as the designated owners of municipal infrastructure, play a critical role in overseeing the management and operation of these systems. Their responsibilities include ensuring regulatory compliance, allocating resources for infrastructure upgrades, and making policy decisions that guide the long-term sustainability of municipal water management. Through strategic planning and proactive investment, the City aims to enhance service reliability, reduce environmental risks, and meet the growing needs of the community.

This report provides a summary of key findings and highlights from the 2024 Stormwater Management System and Wastewater Collection System Annual Reports, covering the reporting period from January 1, 2023, to December 31, 2024. These reports, prepared in compliance with the CLI-ECA, provide an overview of system performance, environmental monitoring, maintenance activities, and improvement initiatives undertaken by the City of Niagara Falls. The findings presented here are critical to ensuring sustainable infrastructure management and regulatory compliance.

Analysis

Stormwater Management System

The City’s stormwater management system spans 216 km² and drains into four main sub-watersheds: Lake Ontario, Niagara River, Welland River, and Welland Canal. The system includes catch basins, storm mains, ditches, stormwater ponds, culverts, and outlets, with 29 active stormwater management facilities (25 wet and 4 dry) playing a key role in controlling runoff and reducing pollutant discharge into natural water bodies.

In 2024, the City's stormwater monitoring programs continued to evaluate pond and creek water quality. Results showed that most ponds effectively reduce pollutant loads, as evidenced by lower conductivity and higher dissolved oxygen at outlet points. However, some ponds exhibited high Total Suspended Solids (TSS) levels at their outlets, which raises concerns about sediment resuspension and potential impacts on receiving ecosystems. Additionally, climate data analysis indicated higher-than-average temperatures in 2024, affecting stormwater runoff patterns and increasing the risk of localized flooding.

Public complaints related to stormwater management slightly decreased from 224 in 2023 to 222 in 2024. While reports of blocked catch basins declined, flood-related complaints rose significantly from 9 to 24, highlighting a growing concern regarding drainage system capacity. The City also undertook key infrastructure alterations to enhance stormwater flow and reduce environmental risks. Spills and abnormal discharge events were minimal, with four reported incidents, none causing severe environmental impacts. Moving forward, the City plans to expand monitoring programs, implement wet weather event tracking, and enhancing bi-annual (spring and fall) stormwater pond inspections and monitoring activities.

Wastewater Collection System

The wastewater collection system serves a population of 94,415 and includes 489.73 km of gravity sewer mains, 29.44 km of forcemains, 33,111 active connections, 6,797 manholes, and 23 pumping stations. The Niagara Region operates wastewater treatment facilities, while the City is responsible for collection system maintenance and performance.

Operational performance improvements were observed in 2023 and 2024 due to increased preventative maintenance activities. CCTV inspections, sewer flushing, and manhole evaluations helped reduce system inefficiencies and preempt potential failures. The City's Weeping Tile Removal Assistance Program (WRAP) has experienced a significant increase in participation, with 95 approvals in 2024 compared to 49 in 2023. This program is designed to alleviate basement flooding and reduces stormwater inflow into the sanitary system from foundation drains, contributing to enhanced infrastructure resilience and improved service efficiency.

Complaint analysis revealed that sanitary lateral blockages remained the most frequent issue, with 643 reports in 2024 compared to 615 in 2023. Particularly, sewer backup complaints decreased from 51 to 26, indicating that proactive maintenance strategies are yielding positive results. However, pest influx complaints increased from 64 to 101, necessitating further investigation into potential entry points within the sewer network. Infrastructure modifications continued, with four major system alterations approved, including upgrades to sewer mains. Environmental incidents were minimal, with only one recorded overflow event in 2024, which was promptly addressed.

Operational Implications and Risk Analysis

The City of Niagara Falls has maintained its stormwater management and wastewater collection systems in a state of good repair through proactive monitoring, maintenance, and infrastructure upgrades. However, challenges such as increased flooding complaints, high TSS levels in certain stormwater management facilities, and rising pest infestation reports in the wastewater system require continued attention.

Moving forward, the City should prioritize climate-adaptive stormwater management practices, enhance sediment control measures in stormwater ponds, and strengthen preventative maintenance programs for wastewater infrastructure. Public awareness

campaigns and best practices should also be expanded to reduce system blockages and improve overall water quality. Additionally, findings from the upcoming Master Servicing Plan should be integrated into long-term strategies to ensure the sustainability and resilience of municipal water systems.

This report, along with the full 2024 Stormwater Management System and Wastewater Collection System Annual Reports, is provided for Council's review and information.

Financial Implications/Budget Impact
There are no financial implications directly related to this report.

Strategic/Departmental Alignment
This report is to ensure adherence to Provincial Legislation and is consistent with the Council's strategic commitment to continually monitor the efficiency and effectiveness of the City's stormwater management and wastewater operations.

Strategic Plan Pillars

Sustainability - Environmental
Implementing practices and policies to ensure the health and well-being of the environment for current and future generations.

Contributor(s)
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List of Attachments
2024 Stormwater Management System Annual Report
2024 Wastewater Collection System Annual Report

Written by:
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Submitted by:	**Status:**
Erik Nickel, General Manager of Municipal Works	Approved - 25 Apr 2025
Jason Burgess, CAO	Approved - 30 Apr 2025

City of Niagara Falls
Municipal Works – Operations
W&WW Compliance

2024 Stormwater Management System Annual Report

CLI-ECA Stormwater Management 068-S701

Reporting Period:
January 1, 2023 to Dec 31, 2024

February 17, 2025

Contents

1. Introduction

The Consolidated Linear Infrastructure Environmental Compliance Approval (CLI-ECA) is an integrated approval process that the Ministry of Environment, Conservation and Parks (MECP) in Ontario has established for wastewater and stormwater systems. This eliminates the need for individual approvals for every linear infrastructure project, as they can all be captured in a single approval for the entire network. The MECP adopted the CLI-ECA to streamline regulatory processes, lighten the administrative burden to municipalities and the development communities, as well as to enhance consistency and efficiency in environmental oversight.

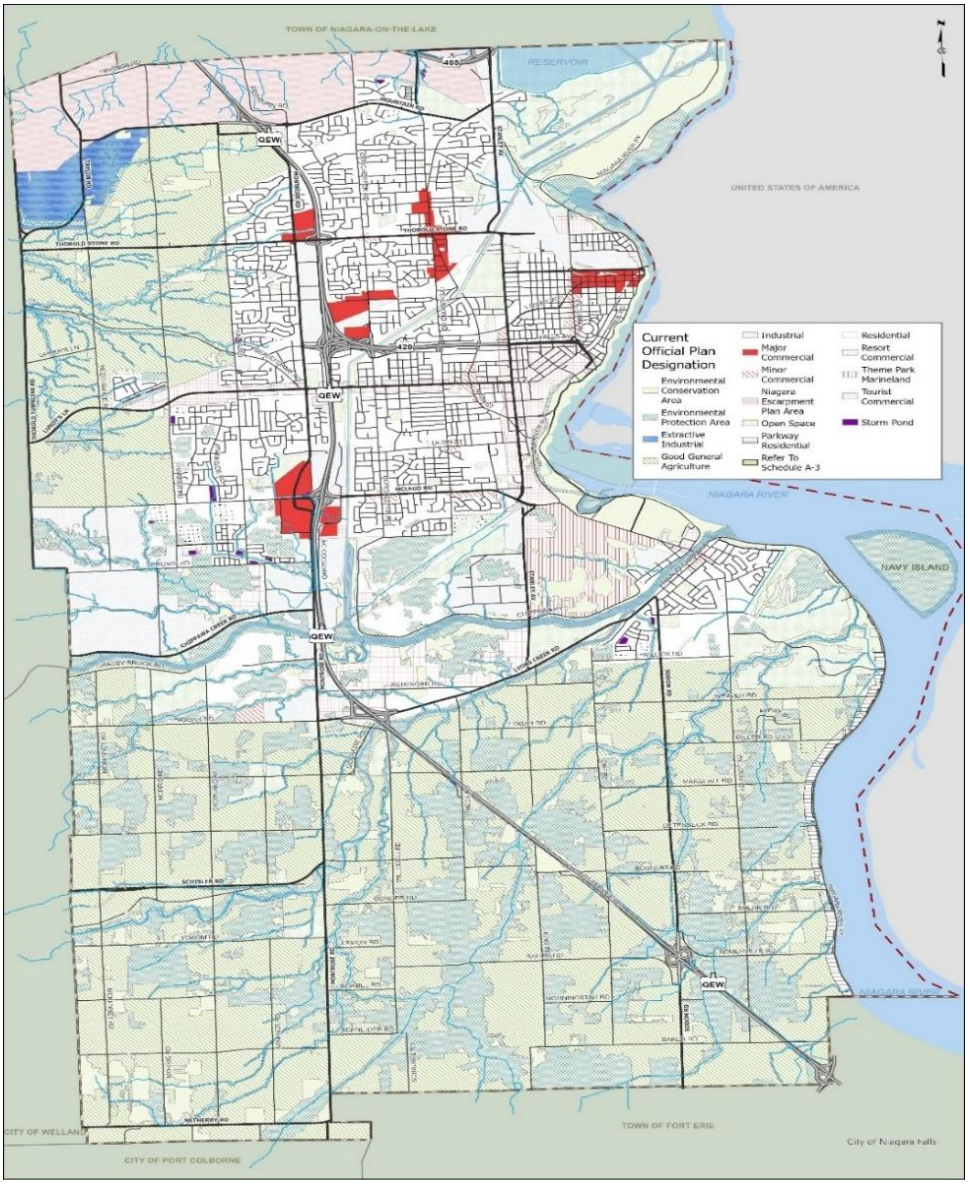

Figure 1: Land-use pattern of the City of Niagara Falls

The ***2024 Annual Report*** has been prepared in compliance with the terms and requirements outlined in the CLI-ECA (068-S701) for municipal stormwater management, issued to the City of Niagara Falls (the City) on June 20, 2023, under the Environmental Protection Act, 1990. This report covers the period from January 1, 2023, to December 31, 2024. It must be submitted to the MECP by April 31, 2025, and made available to the public by June 1, 2025. This is the first annual report of the City covering the past two years, as the MECP revised the CLI-ECA in June 2023 and deferred the first annual report to April 2025, covering both 2023 and 2024.

The municipal stormwater management system includes catch-basins and maintenance holes, storm mains, ditches, stormwater management facilities, stormwater management ponds, culverts and outlets. The municipal stormwater management system serving the City's drainage area is exclusively designated to manage rainwater runoff, reduce flooding, and minimize water pollution, meaning it does not convey any sanitary or combined sewage to the natural environment.

A total area of 216 km^2 of the City drains to four main sub-watersheds: Lake Ontario (via Six-Mile Creek), Niagara River, Welland River, and Welland Canal (via Beaverdam Creek).Shriner's Creek and Ten-Mile Creek, and several other tributaries join at various points along the catchment. In the city of Niagara Falls, the land-use is mostly characterized by a mix of urban, agriculture, and natural areas. The City's Official Plan presents a vision for sustainable growth: balance development with the preservation of natural heritage and agricultural lands. The main concentrations of urban areas are spread from center to east and along major transportation corridors, featuring residential, commercial, and industrial zones, while agricultural lands are predominantly located on the outskirts. Large areas are allocated to natural heritage areas, such as parks, conservation areas, and the Niagara Falls area, which is considered the most attractive place in the region.

This report is organized into sections to cover the following information: monitoring program of SWM infrastructures; interpretation of environmental trends (based on water quality monitoring data); operation of the SWM infrastructure and system; summary of complaints; summary of alterations; spills and abnormal discharges; actions to correct performance and additional notes. This information will also be made available to the public.

2. Monitoring Programs

The City conducts annual monitoring programs designed to inspect, monitor and collect data related to the SWM system condition and performance. Programs include the following:

- A Stormwater Pond monitoring program.
- A program focusing on annual inspections and monitoring within our linear network of Stormwater management System.
- A creek-based water quality sampling and monitoring program (Shriners Creek, Thompson Creek, Beaver Dams Creek and Ontario Power Generation (OPG) Canal that is delivered by the Niagara Peninsula Conservation Authority (NPCA).

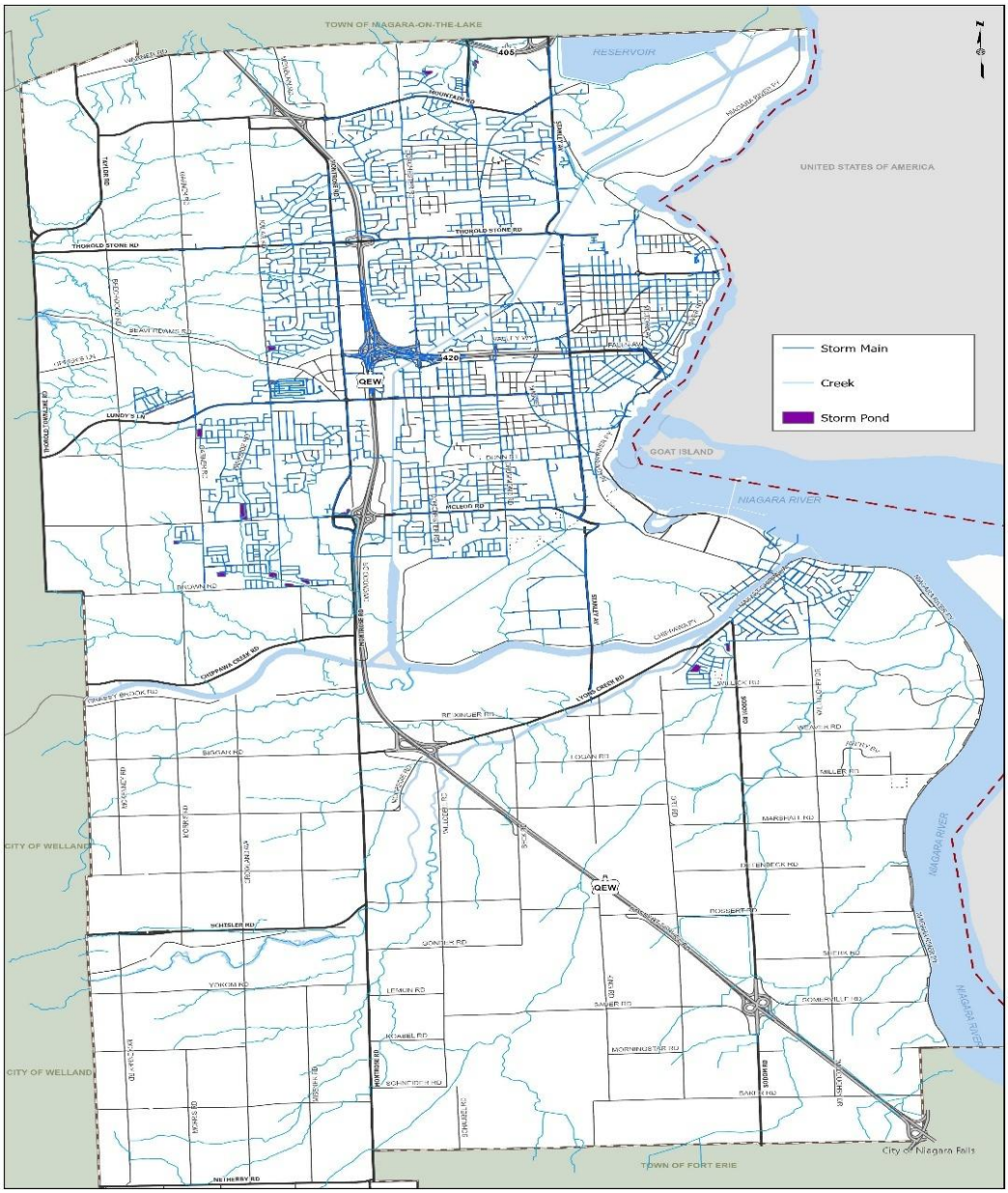

Figure 2: Stormwater Network of the City of Niagara Falls

2.1 Climate Parameters

Figure 3 provides the historical 30-year average monthly climatology (average temperature and total precipitation), compared to that of 2023 and 2024. The City of Niagara Falls has a humid continental climate with cold winters and warm summers. The 30-year historical climate data indicate a typical temperate climate with distinct seasonal variation, characterized by a gradual temperature rise from January to a peak in July, followed by a steady decline toward December. Precipitation, under historical trend, remains relatively consistent throughout the year, with slight increases during the summer and autumn months.

The 2023 data shows that mean temperatures were generally aligned with the historical averages, demonstrating only minor deviations. However, 2023 was characterized by a significant precipitation spike in July, well above historical levels. In contrast, 2024 data suggest a deviation from historical temperature norms, with consistently higher-than-average temperature, particularly during the summer months. This warming trend in 2024 is accompanied by a shift in precipitation patterns, with increased rainfall observed in the early months of the year (January to March) and a more balanced distribution throughout the remaining months. The hotter temperatures and altered precipitation patterns in 2024 may pose challenges for stormwater management, agriculture, and local ecosystems. These findings underscore the increasing variability in climate conditions, highlighting the need for adaptive strategies to mitigate potential impacts on the region's environmental systems.

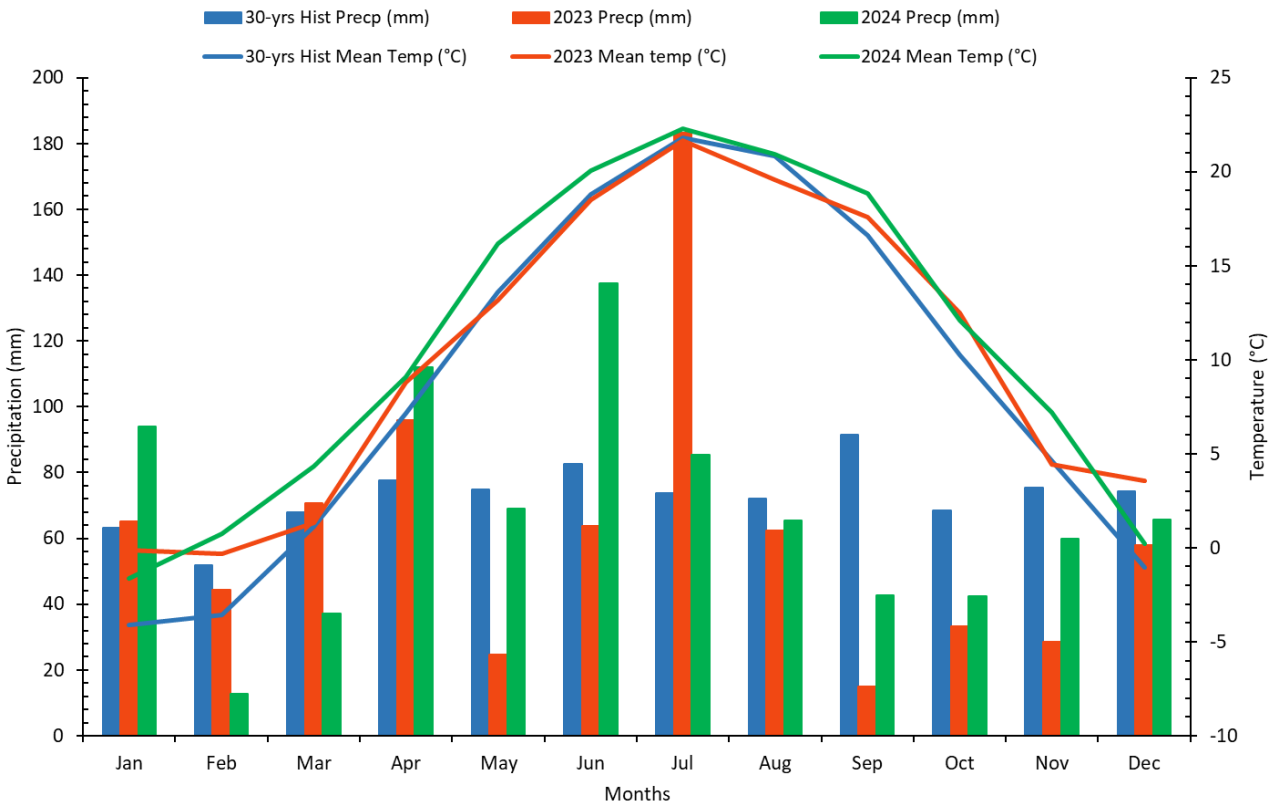

Figure 3: Ave Monthly Temperature and Total monthly Precipitation in the City of Niagara Falls

Note: Historical climate data (1970-2000) was taken from the closest station, St. Catherines, station ID: 6137287. Air temperature and precipitation data for 2024 and 2024 was taken from South Side Highlife SPS Climate Station (GISOBJID: 84000007) and Garner Road Biosolid Climate Station (GISOBJID: 84000007), data source: https://niagaraopendata.ca/dataset/niagara-weather-information-systems

2.2 Stormwater Pond monitoring Program

The stormwater pond monitoring and inspection program commenced in Fall of 2024. In total, the city maintains 29 active ponds, of which 4 are dry ponds and 25 are wet ponds. All ponds, including wet and dry, were inspected in 2024 and 14 wet ponds were sampled for water quality monitoring purposes. Detailed monitoring and sampling data is presented below. In 2024, pond sampling and monitoring were conducted exclusively during the fall season. Beginning in 2025, the sampling program will be expanded to include more ponds and will be conducted biannually, during the spring and fall seasons. Additional monitoring and sample testing will be considered during major wet weather events (rainfall > 25mm within 24 hours) as well.

2.2.1 Monitoring Result Analysis for creeks and SWM Ponds

Storm Pond Water Quality

The following table presents a summary of performance of various water quality parameters monitored over the Fall 2024 monitoring season: October and November 2024.

Table 1: Water Quality summary of storm ponds

Pond ID	Sampling Locations	Conductivity (µS/cm)	DO (mg/L)	pH	TSS (mg/L)	Temperature (°C)
DSP_00003	Inlet	778	10.5	7.81	7	10.73
	Outlet	582	13.6	7.44	4	12.27
DSP_00004	Inlet	1144	9.34	8.5	1	12.27
	Outlet	692	11.74	8.85	22	9.17
DSP_00005	Inlet	680	4.15	7.79	7	15.33
	Outlet	581	2	7.96	<1	12.57
DSP_00016 DSP_00017 DSP_00018	Inlet	527	10.55	8.55	5	9.23
	Outlet	533	10.67	8.53	21	8.73
DSP_00019	Inlet	1102	8.33	7.46	9	11.30
	Outlet	1072	8.51	7.57	4	9.83
DSP_00023	Inlet	662	5.75	7.98	6	13.53
	Outlet	643	6.51	7.94	11	15.87
DSP_00026	Inlet	430	7.26	8.2	18	13.60
	Outlet	450	8.35	8.18	19	12.80
DSP_00029	Inlet	385	7.87	8.2	23	12.60
	Outlet	389	5.99	8.05	9	12.93
DSP_00030	Inlet	551	13.31	8.74	<1	14.20
	Outlet	410	12.02	8.77	16	10.07
DSP_00031	Inlet	635	10.4	7.39	6	12.17
	Outlet	603	9.88	7.41	7	12.50
DSP_00032 DSP_00033	Inlet	525	11.61	8.62	6	11.47
	Outlet	436	11.25	8.59	4	9.13

The above table provides the water quality assessment of parameters sampled from the stormwater management ponds. These stormwater management ponds have an important role in managing the flow of urban runoff as its effluent discharges into the natural environment. The analysis focuses on key metrics, including conductivity, dissolved oxygen (DO), pH, and total suspended solids (TSS), measured at both inlet and outlet points of each pond. The data provides useful information on the efficiency of these systems for pollutant removal and the quality of the water released into the downstream natural environment.

Conductivity

The conductivity, which expresses the dissolved ionic content, was always higher at the inlets than at the outlets, showing the ponds' potential to reduce pollutant loads. For instance, pond DSP_00004 showed a significant decline from 1144 µS/cm at the inlet to 692 µS/cm at the outlet, indicating the removal or dilution of ionic substances in the pond. Similarly, DSP_00030 recorded a significant decline from 551 µS/cm to 410 µS/cm as well. These decreases reflect the ability of the ponds to purify the water before discharge.

Dissolved Oxygen (DO)

DO levels, important for supporting the aquatic life in receiving waters, have generally shown an improving trend from inlets to outlets. The increase in DO at outlets in DSP_00003 from 10.5 mg/L to 13.6 mg/L and DSP_00026 from 7.26 mg/L to 8.35 mg/L is believed to be indicative of the aeration and natural oxygenation that has taken place within the ponds. However, in some cases, like DSP_00005, DO levels decreased from 4.15 mg/L to 2 mg/L; this could indicate oxygen consumption by decomposition processes of organic matter or inefficient reoxygenation.

pH

The pH of the pond water remained relatively stable, generally within the neutral to slightly alkaline range (7.39–8.85), indicating that these systems neither significantly alter nor introduce pH fluctuations to the effluent. For instance, DSP_00031 recorded a minimal change with a pH of 7.39 at the inlet and 7.41 at the outlet. This is beneficial for the receiving ecosystems since too much variation in pH can disturb aquatic habitats.

Total Suspended Solids (TSS)

TSS levels showed a significant variation between ponds, indicating great variability in sedimentation and particulate capture efficiencies. The remarkable increases in the TSS values at the outlets of some ponds, such as DSP_00004-from 1 mg/L to 22 mg/L-and DSP_00018-from 5 mg/L to 21 mg/L-can be explained by resuspension of sediments during discharge events. Besides, bottom-feeding species of fish, like carp, stir up sediments from the bottom of the pond and thereby increase TSS. Organic matter from the decomposition of plants and animals, and from living and dead bacteria and phytoplankton also adds to the volume of suspended solids in the water. Conversely, some ponds, like DSP_00005, have a high sedimentation efficiency with TSS levels less than 1 mg/L at the outlet, reflecting effective capture and retention of sediments.

2.2.2 Effluent Water Quality and Environmental Implications

The quality of the effluent originating from these ponds directly impacts downstream ecosystem health. Conductivity reductions and stable pH reduce ionic and acidic/alkaline inputs into natural waters. The increased DO levels in most effluents are positive, thereby encouraging aquatic organisms and reducing hypoxic conditions. However, the high TSS at some outlets raises concerns about sediment transport, which degrades habitats and transports absorbed pollutants into receiving environments. The data outlines the great importance of stormwater management ponds in improving water quality upon discharge into the natural environment. While many ponds prove to be performing well in pollutant reduction, the parameters of some, such as TSS in specific cases, call for further optimization for better performance. Continuous monitoring and adaptive management are recommended to make these systems perform their role in protecting of the environment.

2.3 Creek-Based Water Monitoring Program

The purpose of the Creek-based water quality monitoring program is to monitor the baseline conditions of various water quality indices within the urban water system in the City of Niagara Falls. In 2023 and 2024, the program included four (4) different locations including three (3) creeks and the OPG Canal, capturing wide range of land-use throughout the sub-watershed area of the City of Niagara Falls. For each station, monthly sampling was performed from April to Nov each year (except during subzero seasons), resulting in eight (8) samples per location by the NPCA. Water samples were analyzed by certified laboratories (Niagara Analytical lab and Eurofins Scientific). Additionally, major wet weather event sampling will be conducted from the 2025 summer onward. All creeks and canal sampling results are summarized in the appendices below.

Nutrient Levels:
Shriners Creek has relatively high levels of nitrate (0.9 mg/L) and phosphorus (0.099 mg/L) concentrations, which could promote algal growth and eutrophication.
Thompson Creek also has relatively high phosphorus (0.172 mg/L), indicating potential agricultural runoff or wastewater discharge.

Bacterial Contamination: Shriners Creek has relatively high E. Coli (252 CFU/100mL) and Total Coliform (7,770 CFU/100mL) counts, indicating fecal contamination, possibly from livestock.

High Conductivity: The high conductivity in Shriners Creek (1,350 µS/cm) indicates high dissolved salts, potentially from road de-icing or industrial runoff.

Human-Induced Stress: The elevated ammonia and phosphorus levels, along with high bacterial counts, indicated significant human-induced stress, particularly from agriculture, urban runoff, and possible storm sewers. Despite moderate nutrient levels in Beaver Dams Creek, shows relatively high total solids (400 mg/L), indicating possible sedimentation problems.

3. Interpretation of Environmental Trends

The City of Niagara Fall does not collect or maintain environmental trend data. However, it is predicted that the primary climate change-driven weather impacts within the City's sub-watershed will be increase precipitation intensity, rapid snow melt and rises in temperature in short to medium term. A monthly comparison between the 30-year historical average trend verses the year 2023 and 2024 is shown above in Figure 3.

The city aims to run Stormwater Management (SWM) model to redefine and calibrate our stormwater management system which will greatly enhance the city's capacity to evaluate the effects of climate change on its linear stormwater infrastructures. The city is committed to being proactive in identifying these at-risk areas, which will reduce the potential for hazards and improve flood resilience across the city. Data gathered in previous years will form the basis of the initial calibration of the SWM model and provide the necessary evidence to support the stormwater risk assessment due to be completed in 2025.

The following key environmental indicators will be assessed as part of risk assessment framework in relation to the environmental risk category; a) impact on water quality; b) erosivity impact; and c) potential contamination of groundwater and source water. These indicators will therefore provide the basis for evaluating the environmental risk in each sub-watershed. The outcome of this risk assessment will also provide a discussion on the system and its deficiencies which must be addressed for future mitigation strategies. These mitigation strategies will be integrated into the city's capital planning effort.

3.1 Flooding and Bank Erosion

Erosion is an important environmental concern in Niagara Falls, primarily driven by the Niagara River and the unique geological features of the area. Erosion along the banks of the Niagara River and near the falls is an ongoing challenge. Authorities have implemented shoreline stabilization projects to reduce the risks. Besides the risk of erosion from Niagara River, there is no other substantial record of erosion and flooding in and around the city. The city does not have an established flood and erosion database. However, stormwater pond and creek inspections (bank erosion) were completed in 2024 which indicated no flooding or bank erosion had been observed. These inspections will be continued annually and as needed after a major wet weather event (25mm in 24 hrs.).

4. Operations

4.1 Inspection

Inspection of stormwater infrastructures are completed proactively to catch any issues and perform maintenance activities before they pose any further problems to the existing system as described in table below.

Table 2: Inspections and Maintenance Programs

Maintenance Program	Program Description	Frequency	# Completed in 2023	# Completed in 2024
SWM Pond Inspection	Pond inspection includes inlet & outlet structures, outfall channels, upstream & downstream, emergency spills ways, permanent ponds, vegetation, forebays, water quality and reporting of any repairs needed.	Annually (Fall 2024)		29 (wet and dry ponds)
Catch basin Inspection and cleaning	Inspection includes structure condition, functionality assessment, and damage reporting. Performed by an external contractor.	Annually	7102 (East of QEW except Chippawa)	4844 (West of QEW with Chippawa)
Maintenance Hole Inspection	Inspection includes structure condition, functionality assessment, and damage reporting. Performed by an external contractor.	Annually		*Planned for 2025*
OGS Inspection and Cleaning	Inspection includes structure condition, functionality assessment, damage reporting and cleaning. Performed by an external contractor.	Annually		20
Ditches & Culvert Inspection	Inspection includes structure condition, functionality assessment and damage reporting.		82	48
Creek Inspection	Inspected for obstruction channels conditions, erosion and any evidence of pollution			1

4.2 Calibration and Maintenance of Monitoring Equipment

The calibration of the HACH HQ4300 Portable Multi-Meter with gel pH, conductivity, and dissolved oxygen electrodes is pivotal in providing water quality measurements, so accuracy and reliability are imperative. More importantly, regular calibration is needed for precise measurement using the standard solutions. For pH, a two-point calibration with buffers of known values is recommended. Conductivity calibration is completed with certified conductivity standards, and calibration of the dissolved oxygen probes utilizes either air or water saturated calibration procedures. Routine maintenance involves rinsing electrodes with deionized water after use, checking for physical damage, and storing electrodes in appropriate solutions to prevent degradation. Gel electrolyte replacement in the pH and dissolved oxygen probes on a periodic basis is also necessary in maintaining the sensors. Proper calibration and maintenance scheduling further extends the life of the instrument, while continuing to provide consistent, quality data from the environmental monitoring.

5. Complaints

In 2024, stormwater-related complaints decreased slightly to 222 from 224 in the previous year. The most common issue remained blocked catch basins, which decreased from 87 in 2023 to 82 in 2024. However, a notable rise was observed in flooding complaints, which surged to 24 from 9, showing a growing concern for the blocked drainage systems that needed immediate attention. The number of complaints about infrastructure conditions decreased from 49 to 40. The sinkhole complaints increased slightly from 14 to 17. Issues related to restoration of damage, vandalism, and unpleasant odors remained roughly constant over the two years, suggesting that these concerns were more consistent in nature. All complaints were handled diligently, with prompt responses to clear blockages, stabilize sinkholes, restore infrastructure, and ensure ongoing maintenance through inspections. This proactive approach helped maintain the overall functionality of the stormwater system, addressing both recurring and emerging challenges.

Table 3: List of Complaints

Complaints	Number Received		Description	Response
	2023	2024		
Catch Basin Blocked	87	82	Debris obstructs catch basin leading to reduce drainage capacity	Cleared obstructions promptly and ensure drainage efficiency
Damage - Restoration	9	9	Infrastructure damage caused by wear, construction activities, or accidents requiring restoring functionality	Completed necessary repairs and restoration, ensuing minimal disruption
Flooding	9	24	Reports of Water pooling or overflowing onto roads or properties due to inadequate drainage function	Cleared blocked drainage system
Inspection Request	20	21	Request from residents for inspection of stormwater infrastructure to assess potential issues	Inspected and completed maintenance as needed
Other	26	21	Miscellaneous stormwater issues	Investigated each case individually and provided appropriate solutions
Poor Condition	49	40	Complaints about visible structural issues	Scheduled and carried out maintenance to improve system performance
Sinkhole	14	17	Reports of sinkholes forming due to soil erosion posing safety and infrastructure risks	Stabilized sinkholes, investigated underlying causes
Smell	4	6	Complaints about foul odors from stormwater drains, typically due to trapped organics matter	Cleaned and flushed affected drains applied odor control treatment where necessary
Vandalism / Tampering	6	2	Reports of unauthorized access or damage to stormwater infrastructure	Repaired damaged infrastructures, reported incidents to authorities
Total	224	222		

6. Summary of Alteration to the System

Table 4: List of system alteration

Alteration Type	No. of Alterations	No. of Alteration that Pose a Significant Drinking Water Threat
Pre-Authorized Storm Sewer, Ditch or Culvert	4	0
Pre-Authorized Stormwater Management Facility	0	0
Schedule C Works	0	0

7. Spills and Abnormal Discharge Events

Table 5: Spills and Abnormal Discharge Events

Date	Location/ Receiver	Description of Spill event	Estimated Duration	Estimated Volume	Action Taken
Sept 01, 2023	6665 McLeod Rd	Contractors were dumping into catch basin on McLeod between Dorchester and Drummond	unknown	unknown	Case passed over to the Niagara Region as McLeod Rd is regional road and catch basin responsibility goes with road authority.
Aug 10, 2023	6051 Crimson Dr	Winnebago umping raw sewage into the catch basin in front of Crimson Park	Unknown	Unknown	Immediate site inspection confirms no dumping into the catch basin.
July 29, 2024	4663 Second Ave	Watery liquid was dumped into the catch basin in front of 4663 Second Av. It might be pool cleaning chemicals with water.	15 mins	~ 45 gallons	The catch basin was inspected, no color or odor associated with what was poured down into the catch basin and no left-over residual on the grate. It is possible that it was just rainwater.
Sept 24, 2024	8004 Lundy's Ln	Illegal dumping of sewer into private storm catch basin that drains into municipal storm trunk	30 min	unknown	Regional Bylaw and MECP compliance officer from Niagara District Office have been involved in, owner vacuumed catch basin and second catch basin to downstream and hauled out

8. Action Taken to improve or Correct Performance

Table 6: Action taken to improve or correct system performance

#	Issue	Actions to be Taken	Target Completion Date
1	SOP development/revision	Create new SOPs as required, update recently developed SOPs.	Dec 2025
2	Inspection, monitoring	Routine inspection and monitoring of all stormwater structures including downstream creeks.	On going
3	Sampling and water quality monitoring		Spring and Fall 2025 And continue every year

4	Major Wet weather event monitoring	High risk categorized structures such as ponds with partially plugged outlets will be inspected with high priority during wet weather events.	On going

9. Additional Notes/Comments

As the city continues to grow, maintaining and upgrading the municipal stormwater management system is essential to thrive with current system demands and support ongoing residential and commercial development. The implementation of the CLI-ECA framework remains a strategic priority. Efforts will be continued on improving operational efficiency by introducing additional Standard Operating Procedures (SOPs) and enhancing the inspection and monitoring program in the coming years.

With increased development activity, a corresponding rise in planning applications is expected that will require further system modifications and enhancements to the existing system. Furthermore, based on recommendations from water quality monitoring over the next 2 to 4 years, the city will develop a comprehensive action plan to support long-term environmental sustainability and operational effectiveness.

10. Making Available to the public

A digital version of this report is available to public on the city of Niagara Falls website.

Appendices

I. Niagara Falls SWM Pond Sampling ID lists

S.N.	Pond ID	Types	Catchment Area (ha)	Pond Inlet Sample ID	Pond Outlet Sample ID	Reference Address
1	DSP_00002	Wet	31.4	DSP2N	DSP2U	Domenic Dr
2	DSP_00003	Wet	28.72	DSP3N	DSP3U	Garner Rd/Forestview Bv
3	DSP_00004	Wet	39.33	DSP4N	DSP4U	Black Maple Dr
4	DSP_00005	Wet	37.23	DSP5N	DSP5U	Sodam Rd
5	DSP_00008	Wet	3.98	DSP8N	DSP8U	Handershot Bv
6	DSP_00009	Wet	4.39	DSP9N	DSP9U	Handershot Bv
7	DSP_00010	Wet	4.92	DSP10N	DSP10U	Handershot Bv
8	DSP_00011	Wet	10.23	DSP11N	DSP11U	Handershot Bv
9	DSP_00012	Wet	6.54	DSP12N	DSP12U	Handershot Bv
10	DSP_00013 DSP_00014 DSP_00015	Wet	22	DSP13N	DSP13U	Orchard Grove Pkwy Karla Rd on the other side
11	DSP_00016 DSP_00017 DSP_00018	Wet	N/A	DSP16N	DSP16U	In between McGarry Dr & McLeod Rd
12	DSP_00019	Wet	25.09	DSP19N	DSP19U	Montrose Rd/McLeod Dr
13	DSP_00023	Wet	12.61	DSP23N	DSP23U	Karla Dr./Brown Rd.
14	DSP_00026	Wet	12.99	DSP26N	DSP26U	HackBerry Trl
15	DSP_00029	Wet	32.7	DSP29N	DSP29U	Tallgrass Ave
16	DSP_00030	Wet	N/A	DSP30N	DSP30U	Odell Dr./Warren Wood Ave
17	DSP_00006	Dry	4.2	DSP6N	DSP6U	In between Magnolia Dr & Woodview Cres.
18	DSP_00027	Dry	N/A	DSP27N	DSP27U	Marpin Ct
19	DSP_00007	Dry	N/A	DSP7N	DSP7U	Fourth Ave
20	DSP_00028	Dry	N/A	DSP28N	DSP28U	Thorold Stone Rd
21	DSP_00032 DSP_00033	Wet	N/A	DSP32N	DSP32U	Emily BV/Jonathan Dr
22	DSP_00031	Wet	45.3	DSP31N	DSP31U	Seabiscuit Dr.
23	DSP_00020	Wet	N/A	DSP20N	DSP20U	St Paul Ave
24	DSP_00021	Wet	N/A	DSP21N	DSP21U	St Paul Ave

II. List of Alterations

Year	Project Number	Project Name	Project Description	Length of new infrastructure type	Project Address	Alteration Type	Identified as a SDWT	Mitigation Measures of SDWTs	Status
2023	2023-531-20	Armoury St / Crysler Av / St Lawrence Av - Sewer Separation Phase 1	Armoury Street, from Victoria Avenue to Crysler Avenue. St. Lawrence Avenue from Simcoe Street to Jepson Street. Crysler Avenue from Simcoe Street to Jepson Street.	Replacement of 710 metres of existing 250mm, 225mm and 200mm diameter concrete combined sewers with 250mm and 200mm diameter PVC sanitary sewer, replacement of maintenance holes and services to the property line.	Armoury Street from Victoria Avenue to Crysler Avenue. St. Lawrence Avenue from Simcoe Street to Jepson Street. Crysler Avenue from Simcoe Street to Jepson Street.	SAN, STM	NO		Phase 1 completed
2024	2024-495-19	Ferry Street Reconstruction	Full reconstruction of Ferry Street from Stanley Avenue to Clark/Ellen Avenue, and Buchanan Avenue from Spring Street to Ferry Street. The work includes sanitary and storm sewer replacements, new watermains, and road reconstruction including decorative concrete sidewalks, curbs, landscaping, decorative street lighting and asphalt paving.	130m of 450mm Concrete SAN. 111m of 300mm Concrete SAN. 42m of 300mm Concrete STM. 111m of 900mm Concrete STM. 5m of 150mm PVC Watermain. 74m of 200mm PVC watermain. 130m of 300mm PVC watermain.	from Victoria Avenue to Crysler Avenue. St. Lawrence Avenue from Simcoe Street to Jepson Street. Crysler Avenue from Simcoe Street to Jepson Street.	SAN, STM, WATER	NO		In Progress
2024	2024-531-20	Armoury St / Crysler Av / St Lawrence Av - Sewer Separation Phase 1 & 2	Armoury Street, from Victoria Avenue to Crysler Avenue. St. Lawrence Avenue from Simcoe Street to Jepson Street. Crysler Avenue from Simcoe Street to Jepson Street. Works to be undertaken include:	Replacement of 710 meters of existing 250mm, 225mm and 200mm diameter concrete combined sewers with 250mm and 200mm diameter PVC sanitary sewer, replacement of maintenance holes and services to the property line.	Armoury Street from Victoria Avenue to Crysler Avenue. St. Lawrence Avenue from Simcoe Street to Jepson Street. Crysler Avenue from Simcoe Street to Jepson Street.	SAN, STM, WATER	NO		Phase 2 in progress (complete Dec 2024)
2024	2024-594-23	Main Street (Chippawa) Road Reconstruction	Reconstruction of Main St (Willoughby to Sodom Rd) including replacement of sanitary and storm sewers, road, curbs and sidewalks.	730m of 200mm PVC Sanitary Sewer 79m of 300mm PVC Storm Sewer 75m of 375mm PVC Storm Sewer 120m of 450mm Conc Storm Sewer 317m of 525mm Conc Storm Sewer 42m of 900mm Conc Storm Sewer	Main St (Chippawa) from Willoughby Dr to Sodom Rd	SAN, STM	NO		In Progress

III. Creek Water Quality Monitoring 2023

Creek/ Canal	Station Code	Date	Alkalinity mg/L	NH_3 mg/L	Ca mg/L	Cl- mg/L	Conduct. uS/cm	E Coli CFU/100mL	Hardness mg/L	Mg mg/L	NO_3 mg/L	NO_2 mg/L	PO_4 mg/L	pH	P mg/L	K mg/L	Na mg/L	SO_2 mg/L	T. Coli. CFU/100mL	TDS mg/L	TKN mg/L	TS mg/L	TSS mg/L
Beaver Dams Creek	BE004	4/24/2023	250	<0.05	98.4	73.1	945	43	386	34	<0.2	<0.1	<0.02	8.1	0.074	4.7	55	143	994	610	0.6	630	18
Beaver Dams Creek	BE004	5/29/2023	130	0.06	50.6	51.6	551	32	199	17.7	<0.2	<0.1	<0.02	8.2	<0.05	2.81	36.1	53.6	1120	320	0.1	330	14
Beaver Dams Creek	BE004	6/26/2023	110	<0.05	38.2	31.4	392	74	146	12.4	<0.2	<0.1	<0.02	8	0.065	2.1	21	35.4	2740	230	0.3	240	12
Beaver Dams Creek	BE004	7/24/2023	120	0.18	49.2	53.1	576	68	191	16.6	<0.2	<0.1	0.02	7.6	0.087	4.4	35.6	67.2	5230	420	0.7	450	25
Beaver Dams Creek	BE004	8/30/2023	120	0.06	44	36.3	454	48	170	14.6	<0.2	<0.1	<0.02	7.5	0.069	2.9	26.7	46.5	3070	340	0.4	360	23
Beaver Dams Creek	BE004	9/13/2023	120	<0.05	42.6	36.7	422	26	161	13.2	<0.2	<0.1	<0.02	7.6	0.088	2.9	23	39.6	4600	250	0.4	270	18
Beaver Dams Creek	BE004	10/30/2023	120	<0.05	48.2	36.8	469	136	179	14.3	<0.2	<0.1	<0.02	7.5	0.053	3.3	24.6	44.8	2180	280	0.4	290	15
Beaver Dams Creek	BE004	11/27/2023	130	<0.05	48.2	38.6	499	20	182	14.9	<0.2	<0.1	0.02	8	0.03	2.7	26.6	55.8	1630	300	0.4	310	5
Shriners Creek	SH002	4/24/2023	330	<0.05	115	174	1320	163	491	49.5	0.6	0.1	<0.02	8.4	0.063	2.5	106	112	1890	810	0.3	810	<3
Shriners Creek	SH002	5/29/2023	310	0.06	108	188	1350	252	499	55.5	0.2	<0.1	<0.02	8.3	<0.05	2.58	102	94.4	4900	860	0.3	870	9
Shriners Creek	SH002	6/26/2023	300	0.08	90.4	159	1200	264	399	42	<0.2	0.1	0.2	8.1	0.286	3.2	91.4	76.9	8660	750	0.6	750	4
Shriners Creek	SH002	7/24/2023	310	0.13	97	146	1180	161	423	43.9	0.4	<0.1	0.07	8.2	0.162	3	81.4	92.3	7770	810	0.4	820	7
Shriners Creek	SH002	8/30/2023	300	0.18	103	148	1200	256	443	45.2	0.9	0.2	0.03	7.9	0.099	2.9	84	78.5	>12098	920	1.4	930	5
Shriners Creek	SH002	9/13/2023	300	<0.05	106	186	1300	98	457	46.8	0.7	0.1	<0.02	8	0.044	2.9	105	104	9930	880	0.6	890	12
Shriners Creek	SH002	10/30/2023	80	<0.05	29.4	18.8	276	5600	107	8.08	0.2	<0.1	0.08	7.4	0.214	3.8	13.7	25.2	>12098	230	0.5	270	42
Shriners Creek	SH002	11/27/2023	250	<0.05	84.5	94.7	947	493	356	35.1	0.6	<0.1	0.03	8	0.095	1.6	60.1	78.3	7070	600	0.5	610	14
Power Canal	PR001	4/17/2023	101	0.21	31	18	234	16	110	8	0.19	<0.10	0.016	8.2	0.016	1	10	20		152		190	4
Power Canal	PR001	5/23/2023	105	0.237	34	20	235	10	122	9	0.17	<0.10	0.011	8.2	0.011	1	12	22		153		160	4
Power Canal	PR001	6/20/2023	102	0.113	32	16	226	7	117	9	0.13	<0.10	0.008	8.2	0.008	1	10	18		147		150	<2
Power Canal	PR001	8/21/2023	101	0.111	30	15.8	225	10		8	<0.1	<0.1	0.007	8.1	0.007	<1	10	19				150	<2
Power Canal	PR001	9/25/2023	104	0.168	30	16.7	226	40		8	<0.1	<0.1	0.01	8.1	0.01	<1	10	19			0.438	173	<2
Power Canal	PR001	10/23/2023	108	0.204	31	17.3	228	2		8	<0.1	<0.1	0.012	7.9	0.012	1	10	20			1.65	168	3
Power Canal	PR001	11/21/2023	105	0.103	30	16.5	225	450		8	<0.1	<0.1	0.011	8	0.011	1	10	20			0.273	146	<2
Thompson Creek	TC001	4/17/2023	138	0.27	72	64	699	117	237	14	0.89	<0.10	0.235	8.2	0.235	4	41	95		454		520	27
Thompson Creek	TC001	5/23/2023	125	0.053	60	63	574	10	203	13	2.98	<0.10	0.105	8.4	0.105	3	42	73		373		380	8
Thompson Creek	TC001	6/20/2023	115	<0.020	44	48	459	25	155	11	0.73	<0.10	0.172	8.6	0.172	2	35	43		298		290	8
Thompson Creek	TC001	7/17/2023	120	0.053	48	63.3	547	140		13	0.66	<0.1	0.4	8.2	0.4	3	44	61				344	13
Thompson Creek	TC001	8/21/2023	129	0.123	43	52.5	488	130		11	0.7	<0.1	0.339	8.1	0.339	2	36	43				330	24
Thompson Creek	TC001	9/25/2023	119	0.044	37	62.9	476	880		10	0.56	<0.1	0.174	7.9	0.174	2	40	32			0.164	314	19
Thompson Creek	TC001	10/23/2023	116	0.091	38	98.7	566	70		10	0.44	<0.1	0.18	7.8	0.18	2	65	35			0.554	378	40
Thompson Creek	TC001	11/21/2023	129	0.125	46	60	527	90		13	0.87	<0.1	0.193	8	0.193	3	39	54			0.795	454	131

IV. Creek Water Quality Monitoring 2024

Creek/ Canal	Station Code	Date	Alkalinity mg/L	NH_3 mg/L	Ca mg/L	Cl- mg/L	Conduct. uS/cm	E Coli CFU/100mL	Hardness mg/L	Mg mg/L	NO_3 mg/L	NO_2 mg/L	PO_4 mg/L	pH	P mg/L	K mg/L	Na mg/L	SO_2 mg/L	T. Coli. CFU/100mL	TDS mg/L	TKN mg/L	TS mg/L	TSS mg/L
Beaver Dams Creek	BE004	2024-03-25	170	<0.05	75.8	179	1100	15	300	26.8	<0.2	<0.1	<0.02	8	0.036	3.3	113	102	388	660	0.5	670	8
Beaver Dams Creek	BE004	2024-04-22	180	0.11	66	55.2	691	26	253	21.4	0.2	<0.1	<0.02	7.7	0.135	4	40.7	77.3	1380	490	0.8	520	30
Beaver Dams Creek	BE004	2024-05-27	140	0.08	56.2	54.3	570	345	212	17.5	<0.2	<0.1	<0.02	7.6	0.11	3.4	37.1	57.8	8660	350	0.8	390	36
Beaver Dams Creek	BE004	2024-06-24	140	0.05	51.2	41.4	504	198	190	15.2	0.2	<0.1	<0.02	7.8	0.138	4.2	28.1	68.2	8660	300	0.8	350	48
Beaver Dams Creek	BE004	2024-08-26	130	<0.05	44.8	35.7	460	31	166	13.2	<0.2	<0.1	<0.02	7.9	0.098	3.2	25.2	52.5	3240	300	0.5	320	19
Beaver Dams Creek	BE004	2024-09-23	110	<0.05	42.1	29.5	400	37	155	12.2	<0.2	<0.1	<0.02	7.6	0.066	2.6	21.5	37.9	5600	270	0.6	290	17
Beaver Dams Creek	BE004	2024-10-28	130	<0.05	53.7	31.8	501	15	202	16.4	<0.2	<0.1	<0.02	8.1	0.032	3.4	24.9	84.8	556	310	0.2	320	8
Beaver Dams Creek	BE004	2024-11-18	130	<0.05	51	26.8	459	5	187	14.4	<0.2	<0.1	0.04	8	0.019	2.9	20.3	46.2	231	310	0.2	320	7
Shriners Creek	SH002	2024-03-25	330	<0.05	109	255	1580	48	468	47.5	0.7	<0.1	<0.02	8.3	0.03	2.2	151	107	725	940	0.3	950	5
Shriners Creek	SH002	2024-04-22	330	<0.05	104	162	1280	49	447	45.6	0.9	<0.1	<0.02	8.4	0.095	2.3	93.5	103	2310	760	0.6	780	22
Shriners Creek	SH002	2024-05-27	90	0.11	36.6	30.7	343	>12098	135	10.5	0.4	<0.1	0.04	7.5	0.285	3.2	23.7	24.6	>12098	220	1.2	300	84
Shriners Creek	SH002	2024-06-24	230	<0.05	82.2	117	932	776	335	31.6	1	<0.1	0.03	8.2	0.113	2.7	73.6	87.5	>12098	600	0.6	600	<3
Shriners Creek	SH002	2024-08-26	320	<0.05	99.6	146	1190	37	434	45.1	0.3	<0.1	<0.02	8.1	0.133	2.6	82.8	110	7770	840	1.7	850	10
Shriners Creek	SH002	2024-09-23	160	<0.05	71.7	231	1210	>12098	278	24	1.4	<0.1	0.05	7.5	0.282	6.6	147	66.4	>12098	830	3.1	870	42
Shriners Creek	SH002	2024-10-28	310	<0.05	111	169	1280	43	472	47.2	0.4	<0.1	<0.02	8	0.069	3.4	97.8	134	5600	810	0.5	840	33
Shriners Creek	SH002	2024-11-18	280	<0.05	94.5	118	1040	43	396	38.8	<0.2	<0.1	0.08	7.9	0.103	3.4	65.7	81.1	1570	690	0.4	700	9
Power Canal	PR001	3/18/2024	99	0.146	37	20.6	244	680		9	0.22	<0.1	0.01	8.02	0.022	2	11	23		159	0.466	170	9
Power Canal	PR001	4/16/2024	101	0.361	35	19.3	239	10		9	0.29	<0.1	0.025	7.95	0.037	2	12	21		155	0.656	170	6
Power Canal	PR001	5/21/2024	98	0.09	34	18.2	237	2		9	<0.1	<0.1	<0.01	8.01	0.008	1	10	20		154	0.316	161	<2
Power Canal	PR001	6/17/2024	97	0.169	32	17.2	231	16		8	0.24	<0.1	<0.01	8.12	0.009	1	10	19		150	0.477	240	3
Power Canal	PR001	8/19/2024	100	0.235	35	19	232	30		9	0.13	<0.1	<0.01	8.1	0.014	2	11	21		151	0.915	180	<2
Power Canal	PR001	9/16/2024	99	0.134	35	17.9	233	15		9	<0.1	<0.1	<0.01	7.98	0.011	1	10	19		151	0.429	150	<2
Power Canal	PR001	10/21/2024	99	0.082	35	17.5	230	50		9	<0.1	<0.1	<0.01	8.06	0.008	1	11	20		150	0.453	130	<2
Power Canal	PR001	11/25/2024	100	0.116	35	17.2	230	3900		9	<0.1	<0.1	<0.01	8.08	0.014	1	10	19		150	0.394	160	7
Thompson Creek	TC001	3/18/2024	139	0.424	89	86.2	785	20		18	7.49	<0.1	0.096	8.13	0.18	5	52	110		510	2.26	560	26
Thompson Creek	TC001	4/16/2024	134	0.248	86	50	662	25		15	7.06	<0.1	0.199	7.89	0.313	6	35	107		430	2.18	540	28
Thompson Creek	TC001	5/21/2024	116	0.107	53	57.1	533	40		12	1.88	<0.1	0.089	8.07	0.201	2	38	56		346	0.826	464	116
Thompson Creek	TC001	6/17/2024	119	0.172	47	57.5	521	39		12	2.11	<0.1	0.072	8.22	0.109	3	36	45		339	0.917	480	21
Thompson Creek	TC001	8/19/2024	127	0.149	57	72.1	596	70		15	0.49	<0.1	0.162	7.92	0.228	4	45	74		387	1.14	480	12
Thompson Creek	TC001	9/16/2024	102	<0.020	39	53.5	441	90		10	0.36	<0.1	0.046	7.91	0.09	2	35	31		287	0.392	260	9
Thompson Creek	TC001	10/21/2024	104	0.19	41	64.4	471	330		10	0.43	<0.1	0.051	7.94	0.083	2	42	34		306	0.327	230	17
Thompson Creek	TC001	11/25/2024	121	0.122	57	60.6	568	570		15	0.98	<0.1	0.083	8.07	0.184	4	42	78		369	0.671	360	26

City of Niagara Falls
Municipal Works – Operations
W&WW Compliance

2024 Wastewater Collection System Annual Report

CLI-ECA Wastewater Collection System 068-W601

Reporting Period:
From January 1, 2023 to Dec 31, 2024

March 03, 2025

Contents

1. Introduction

The Consolidated Linear Infrastructure Environmental Compliance Approval (CLI-ECA) is an integrated approval process that the Ministry of Environment, Conservation and Parks (MECP) in Ontario has established for wastewater and stormwater management systems. This eliminates the need for individual approvals for every linear infrastructure project, as they can all be captured in a single approval for the entire network. The MECP adopted the CLI-ECA process to streamline regulatory processes; lighten the administrative burden to municipalities and the development communities; and enhance consistency and efficiency in environmental oversight.

The ***2024 Annual Report*** has been prepared in compliance with the terms and requirements outlined in the CLI-ECA (068-W601) for the municipal wastewater collection system issued to the City of Niagara Falls on June 20, 2023, under the Environmental Protection Act, 1990. This report covers the period from January 1, 2023, to December 31, 2024. It must be submitted to the MECP by April 31, 2025, and made available to the public by June 1, 2025. This is the first annual report of the City covering the past two years, as the MECP revised the CLI-ECA in June 2023 and deferred the first annual report to April 2025, covering both 2023 and 2024.

The City of Niagara Falls owns and operates the wastewater collection system, which is classified as a Class II wastewater collection system. The system includes separate sewers and combined sewers (both gravity mains and forcemains). The forcemains and pumping stations are monitored and operated by the Regional Municipality of Niagara (the upper-tier municipality). The new CLI-ECA replaces the numerous pipe-by-pipe Environmental Compliance Approvals (ECAs) that were previously issued for components of the municipal sewage collection system. The new CLI-ECA articulates conditions precedent in respect of any changes in the sewage works. It also establishes normalized conditions for operations and reporting, to safeguard accountability and govern at the higher expectations with respect to monitoring and system management. The operators of the City's Municipal Works - Operations are certified and thoroughly trained to operate the system in compliance with the Ontario Water Resources Act, O. Reg 129/04.

1.1 Wastewater Collection System

According to the census 2021, the City of Niagara Falls' wastewater collection system serves a population of 94,415. In addition to this, the City receives a substantial number of visitors/tourists annually. The wastewater collection system consists of the following:

489.73 km of gravity sewer mains
29.44 km of forcemains
33,111 wastewater connections (active connections)
6,797 manholes
23 pumping stations

The City of Niagara Falls wastewater collection system sewermains range in size from 150 mm to 600 mm and are constructed using asbestos cement, cast iron, clay, concrete, clay, ductile iron, corrugated steel, high density polyvinyl (HDPV), polyvinyl chloride (PVC), reinforced concrete, vitrified clay, and unknown materials. The City of Niagara Falls does not provide any treatment for

wastewater. All discharges are routed to the Niagara Falls Wastewater Treatment Plant which is owned and operated by the Niagara Region.

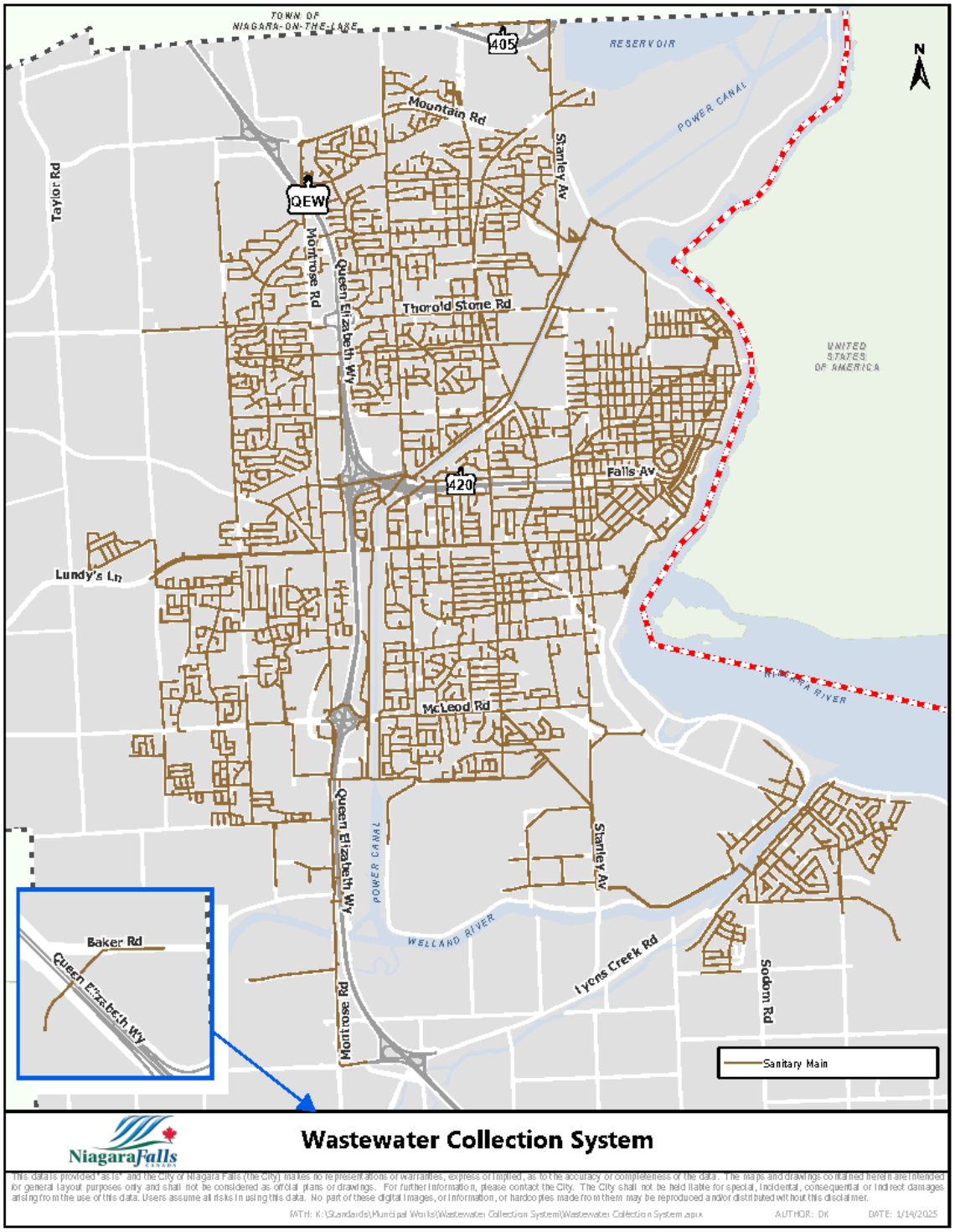

Figure 1: Wastewater Collection System of the City of Niagara Falls

Table 1: Wastewater Collection System Sewer Mains Materials and its Length

Material	Length (KM)	% of Total
Asbestos Cement	38.18	8.61
Brick	1.67	0.38
Clay	30.50	6.88
Concrete	128.02	28.87
Corrugated Polyvinyl Chloride	0.60	0.14
Corrugated Steel Pipe	0.78	0.18
High Density Polyethylene	1.48	0.33
Polyethylene	1.63	0.37
Polyvinyl Chloride	150.68	33.98
Reinforced Concrete	31.18	7.03
Stainless Steel	0.00	0.00
Unknown	43.65	9.84
Vitrified Clay	15.10	3.40
Total	443.49	100.00

1.2 Collection System Types

The City of Niagara Falls is serviced through a network of combined, partially separated and fully separated sanitary and storm sewers, defined as follows:

A. **Combined** – In a combined sewer system, sanitary sewage and stormwater are collected and conveyed within the same sewer trunk. Such sewer construction is commonly found in older urban areas where separate storms and sanitary sewer networks are not as standard. Only during dry weather conditions does the system carry wastewater originating from residential, commercial, and industrial sources. On the other hand, during rainfall events, stormwater also contributed to the system, hence augmenting flow volumes. In case of extreme rainfall or snowmelt events, the system may become saturated, and combined sewer overflow is observed. In this case, untreated sewage and stormwater are released directly into surface water or seep into groundwater, causing environmental contamination and posing significant public health risks.

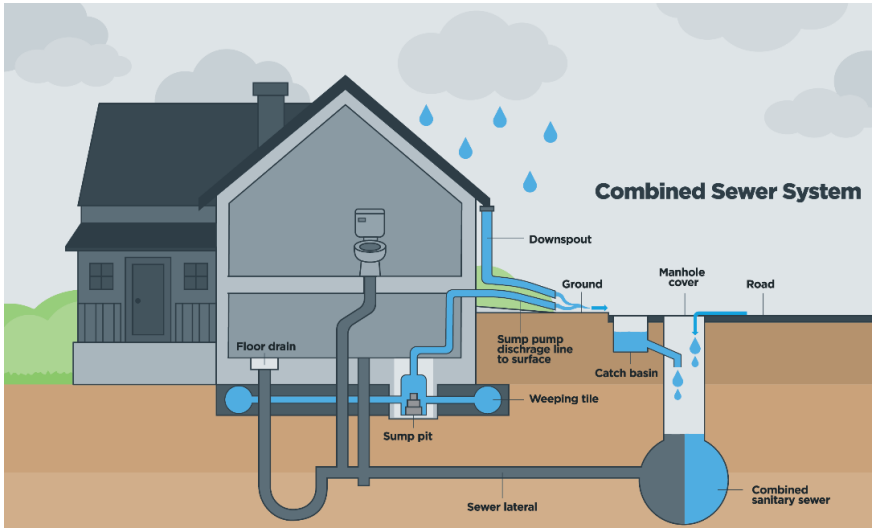

Figure 2: Sketch of Combine Sewer System

B. **Partially Separated** – Compared with the combined type, the partially separated sewer is an improved arrangement in the respect that there would be a minimal amount of stormwater in a sanitary sewer system. The partially separated sewer carries all flows from sanitary sources and a part of stormwater from weeping tiles and roof leaders while stormwater from roadways is collected through a separated storm sewer. This system helps alleviate the combined sewer overflows occurrences by partly diverting some stormwater out of sanitary network. However, the system remains quite vulnerable to overflows during extreme rainfall since excess stormwater may result in surcharging of the sanitary sewer, leading to capacity exceedance potential system backflows, and localized flooding.

C. **Fully Separated** - A fully separated sewer system consists of two completely independent collection networks, one solely for the collection and carriage of sanitary sewage and another for stormwater management. The sanitary sewer collection system collects wastewater from residential, commercial, and industrial properties to a wastewater treatment facility, with no stormwater connection allowed. At the same time, stormwater is channeled into a separate storm sewer system that discharges natural water bodies or stormwater management facilities. Fully separated sewer systems are required for all new developments, as regulations prohibit stormwater connections to the sanitary sewer network. This approach offers many advantages, like the complete avoidance of combined sewer overflow issues during wet weather, reducing basement flooding due to the prevention of stormwater intrusion into the sanitary system, and lower treatment cost since stormwater does not have to be treated at wastewater treatment plants. Fully separated sewer systems fulfill modern environmental and infrastructure standards due to their capabilities in efficiently handling wastewater and stormwater.

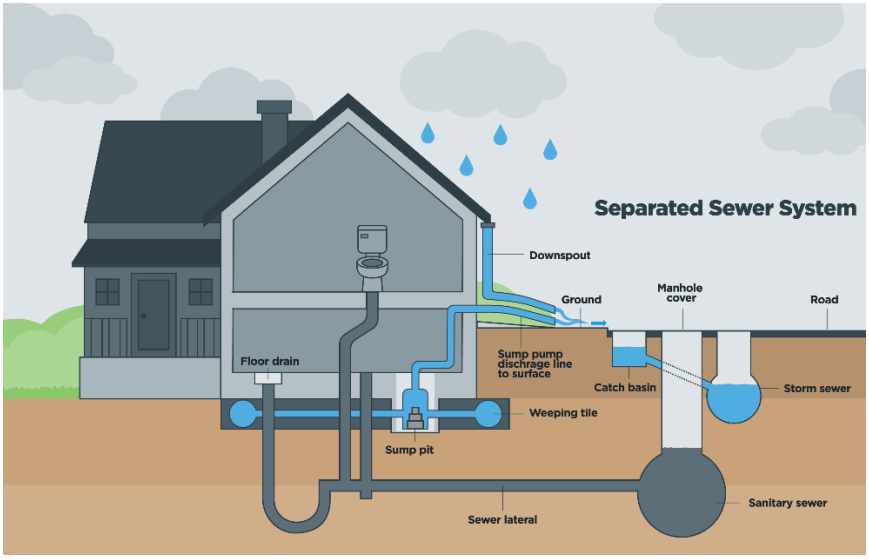

Figure 3: Sketch of Separated Sewer System

1.3 Sanitary Sewer Improvement Initiatives

The City is dedicated to improving the performance and reliability of its municipal wastewater collection system through a series of sanitary sewer improvement programs. These programs consist of proactive maintenance programs, sewer rehabilitation programs, and infrastructure

upgrades to minimize inflow and infiltration, prolong asset life, and decrease the probability of system failure. The City also continues to analyze system capacity and implement capital improvements to accommodate future growth while maintaining environmental compliance.

1.3.1 Weeping Tile Disconnection

The Weeping Tile Disconnection program is designed to reduce the risk of basement flooding and alleviate pressures on the municipal wastewater collection system by diverting stormwater from the sanitary system. Connected weeping tiles can contribute to system overflows during heavy storms, leading to basement backups and combined sewer overflows. Disconnecting weeping tiles and diverting stormwater to the appropriate drainage systems allows municipalities to add system capacity, streamline wastewater management, and foster environmental sustainability.

The Weeping Tile Removal Assistance Program (WRAP) provides financial rebates to homeowners for the installation of flood protection devices, including weeping tiles disconnected from sanitary sewer and sump pump installations (rebates of up to $4,000) and backwater valve installation (rebates of up to $1,200). In 2024, there was a significant increase in approved applications under the program, from 49 in 2023 to 95 in 2024, due to a temporary suspension of the program in the previous year. However, not all approved applicants proceeded with work within the approved timeframe. While 39 applicants installed and were paid rebates in 2024, 56 did not. Total rebates paid out increased from $145,369 in 2023 to $162,289 in 2024, reflecting growing program participation. WRAP continues to be a mainstay in expanding wastewater system capacity, preventing basement flood threats, reducing inflow to the sanitary system, and promoting environmental sustainability throughout the City, at an average annual budget of $350,000.

1.3.2 Sanitary Sewer Improvement Studies

The City is in the process of updating its Master Servicing Plan (MSP) to evaluate the condition and capacity of the municipal wastewater collection system of the City. The study determines the infrastructure upgrading that is required to improve system efficiency, provide for future development, and reduce risks like sewer overflows and basement flooding. The MSP gives a long-term strategic investment plan for sanitary sewer upgrade, which will enable a sustainable and resilient wastewater system for the City.

2. Performance Report

2.1 Operational Performance Overview

The requirements of the CLI-ECA set out that the wastewater collection system must be properly operated and maintained. Proper operations and maintenance imply a system which is adequately funded, operated, maintained and monitored for effective performance. The municipal wastewater collection system is monitored on a 24/7 basis with an after-hours procedure to respond to emergencies.

The City's water and wastewater operations include multiple maintenance programs to assess the condition and performance of the system. Results from these programs are analyzed to identify corrective and preventive maintenance actions and/or recommendations for improvement and system upgrades. Preventive maintenance program data, such as gravity main flushing, manhole

inspections and laterals inspection are captured through in the field collection and subsequently uploaded to Cartegraph entries. Pump station operations are monitored by the Region of Niagara and the City monitors any remote surveillance as well.

2.2 Maintenance Activities

The City has a comprehensive maintenance program to ensure the effective operation and longevity of the wastewater collection system. Manhole inspections, sewer main inspections, and sewer main flushing's are part of the program, all of which are vital in identifying possible operational issues before they escalate into a more serious problem. A well-maintained collection system reduces the likelihood of service disruption, structural failure, and environmental contamination, as well as improves compliance with regulations and protection of public health.

Maintenance operations in the wastewater collection system are categorized into preventative and corrective maintenance. Preventative maintenance is a proactive strategy, comprising of periodic inspections, cleanings, minor repairs to avoid blockage and/or structural failure, and other operational issues. Through the prevention of probable problems before they occur, preventative maintenance minimizes emergency measures, saves long-term repair expenses, and maximizes infrastructure life. Corrective maintenance is reactive and undertaken when Municipal Works – Operations are notified of an issue requiring immediate attention. Issues are identified through regular system monitoring or more often, customer complaints. The most prevalent corrective maintenance procedure is clearing sewer laterals. These laterals can become plugged, which results in service interruptions and potentially localized backups if not addressed. Corrective actions are those that keep the collection system operating in good condition by restoring normal operation in a timely manner.

Preventative and corrective maintenance activities are crucial to having a reliable wastewater collection system. Total numbers of these maintenance activities performed by the City is provided in the table below.

Table 2: Maintenance activities

Tasks	2023	2024
Sewermains CCTV Inspections	2	8
Sewermains Flushing	310	185
Manhole Inspections	0	7
Sanitary Lateral – Camera inspection	369	258
Sanitary Lateral - Blockage Cleanout	615	643

2.3 Repair and Replacement

Repair and replacement are occasionally required in a collection system to maintain the functionality of its various components. There were 10 work orders in 2023 and 9 work orders in 2024 relating to a repair or replacement in the wastewater collection system, correcting issues with manholes, sinkholes and sanitary mains.

2.4 Complaints Received

In 2023 and 2024, the municipality received several complaints about the sanitary sewer collection system, the most common of which were blockages in sanitary laterals, followed by pest infestation and sewage backup. The remaining complaints received were damage to sewer infrastructure, poor system condition, sinkholes, and odors. The City responded by conducting inspections, emergency cleanups, CCTV assessments, scheduling maintenance and repairs, as needed. Corrections to the system included locating the underlying cause of clogging, closing pest entry points, clearing blockages, fixing broken infrastructure, minimizing sinkhole hazards, and examining odor issues. A proactive and systematic approach was upheld to improve the efficiency and reliability of the sewer system, with emphasis on early intervention and long-term upkeep of the infrastructure.

Table 3: List of complaints received

Complaints	# Received in		Description	Response
	2023	2024		
Sanitary Lateral - Blockage / Cleanout	615	643	Blocked sanitary lateral preventing proper drainage from the property.	Inspected and determined blockage location. If on private property, inform the owner of their responsibility. If on municipal property, schedule cleaning or repairs.
Sewer Sanitary - Animal / Pest	64	101	Presence of rodents or other pests in the sanitary sewer system.	Investigated possible entry points, checked for damaged infrastructure allowing pest access and recommended pest control measures,
Sewer Sanitary - Backup	51	26	Sewage backing up into homes or streets due to blockages or system failure.	Conducted emergency inspection, cleared blockages, assessed system defects, and informed the residents of any required private property repairs.
Sewer Sanitary - Damage - Restoration	1	4	Physical damage to sanitary sewer infrastructure requiring restoration.	Assessed the extent of damage, scheduled repairs, and restored any disturbed areas post-repair.
Sewer Sanitary - Inspection Request	1	1	Resident or business requests a sewer system inspection.	Scheduled an inspection, reviewed for blockages, defects, or compliance issues, and provided necessary recommendations.
Sewer Sanitary - Main Clean Out	5	2	Maintenance request for cleaning the sanitary sewer main.	Conducted CCTV inspection, assessed cleaning needs, and scheduled jet flushing or other necessary maintenance.
Sewer Sanitary - Other	43	36	Sewer-related complaints that do not fit into predefined categories.	Reviewed the specific issue, determined the appropriate response, and addressed it accordingly.
Sewer Sanitary - Plugged / Blocked	13	3	Sewer system blockage affecting multiple properties.	Investigated blockage cause, cleared obstruction, and evaluated long-term mitigation strategies.
Sewer Sanitary - Poor Condition	12	9	Deteriorating sewer infrastructure, such as cracked pipes or structural failures.	Conducted condition assessment, prioritized repairs or replacement, and scheduled maintenance as needed.

Sewer Sanitary - Sinkhole	15	24	Sinkhole formation is due to sewer line collapse or leakage.	Investigated cause, secured the area, conducted emergency repairs, and restored the surface.
Sewer Sanitary - Smell	2	2	Persistent foul odor from the sewer system.	Inspected for leaks, blockages, or venting issues, and applied odor control measures where necessary.

3. Alternations/Modifications to Wastewater Collection System

From 2023 to 2024, the City authorized a total of four alterations to the sanitary collection system as part of their ongoing efforts to enhance system efficiency, capacity, and environmental compliance. These alterations were approved to support infrastructure upgrades, accommodate future growth, and address maintenance needs. Of the four authorized modifications, one alteration has been successfully completed, ensuring improved service reliability in the affected area. The remaining three projects are currently in the construction phase and are expected to be completed by 2025. These projects involve upgrades to sewer mains, the installation of new system components, and improvements to existing infrastructure to enhance flow management and reduce the risk of overflows or blockages.

A detailed list of the approved alterations, including project locations, scope, and anticipated works, is provided in the appendices below. The City remains committed to maintaining and improving the wastewater collection system to meet regulatory requirements and support sustainable community development.

4. Environmental Incidents

In 2024, the Public Works – Operations department recorded one incident of collection system overflow. The summary of collection system overflow and spill incident is listed below.

Table 4: List of environmental incidents (overflow/spill)

Date	Duration (hr.)	Volume (m^3)	Disinfection	Adverse Impacts	Corrective Actions
Jan 26, 2024	11.9	4054.176	None	Level alert at pumping station	Pumped to drain into the Welland River,

5. Effort to Reduce Collection System Overflows

The City's Municipal Works Department has implemented both preventive and corrective measures to maintain the municipal wastewater collection systems effectively. A key initiative in this effort is the ongoing implementation of the Weeping Tile Removal Assistance Program (WRAP), which helps eligible homeowners reduce the risk of basement flooding by diverting stormwater away from the sanitary system. This initiative also contributes to minimizing combined sewer overflows.

Additionally, the City is in the process of updating its Master Servicing Plan (MSP) to assess system capacity and recommend capital investments needed to support future growth and the increasing

population. These updates will guide infrastructure improvements and ensure the wastewater collection system remains resilient and efficient.

Appendices

Appendix 1: List of system Alterations in 2023 and 2024

Year	Project Number	Project Name	Project Description	Length of new infrastructure type	Project Address	Alteration Type	Identified as a SDWT	Mitigation Measures of SDWTs	Status
2023	2023-531-20	Armoury St / Crysler Av / St Lawrence Av - Sewer Separation Phase 1	Armoury Street, from Victoria Avenue to Crysler Avenue. St. Lawrence Avenue from Simcoe Street to Jepson Street. Crysler Avenue from Simcoe Street to Jepson Street.	Replacement of 710 metres of existing 250mm, 225mm and 200mm diameter concrete combined sewers with 250mm and 200mm diameter PVC sanitary sewer, replacement of maintenance holes and services to the property line.	Armoury Street from Victoria Avenue to Crysler Avenue. St. Lawrence Avenue from Simcoe Street to Jepson Street. Crysler Avenue from Simcoe Street to Jepson Street.	SAN, STM	NO		Phase 1 completed
2024	2024-495-19	Ferry Street Reconstruction	Full reconstruction of Ferry Street from Stanley Avenue to Clark/Ellen Avenue, and Buchanan Avenue from Spring Street to Ferry Street. The work includes sanitary and storm sewer replacements, new watermains, and road reconstruction including decorative concrete sidewalks, curbs, landscaping, decorative street lighting and asphalt paving.	130m of 450mm Concrete SAN. 111m of 300mm Concrete SAN. 42m of 300mm Concrete STM. 111m of 900mm Concrete STM. 5m of 150mm PVC Watermain. 74m of 200mm PVC watermain. 130m of 300mm PVC watermain.	from Victoria Avenue to Crysler Avenue. St. Lawrence Avenue from Simcoe Street to Jepson Street. Crysler Avenue from Simcoe Street to Jepson Street.	SAN, STM, WATER	NO		In Progress
2024	2024-531-20	Armoury St / Crysler Av / St Lawrence Av - Sewer Separation Phase 1 & 2	Armoury Street, from Victoria Avenue to Crysler Avenue. St. Lawrence Avenue from Simcoe Street to Jepson Street. Crysler Avenue from Simcoe Street to Jepson Street.	Replacement of 710 meters of existing 250mm, 225mm and 200mm diameter concrete combined sewers with 250mm and 200mm diameter PVC sanitary sewer, replacement of maintenance holes and services to the property line.	Armoury Street from Victoria Avenue to Crysler Avenue. St. Lawrence Avenue from Simcoe Street to Jepson Street. Crysler Avenue from Simcoe Street to Jepson Street.	SAN, STM, WATER	NO		Phase 2 in progress (complete Dec 2024)
2024	2024-594-23	Main Street (Chippawa) Road Reconstruction	Reconstruction of Main St (Willoughby to Sodom Rd) including replacement of sanitary and storm sewers, road, curbs, and sidewalks.	730m of 200mm PVC Sanitary Sewer 79m of 300mm PVC Storm Sewer 75m of 375mm PVC Storm Sewer 120m of 450mm Conc Storm Sewer 317m of 525mm Conc Storm Sewer 42m of 900mm Conc Storm Sewer	Main St (Chippawa) from Willoughby Dr to Sodom Rd	SAN, STM	NO		In Progress