City of Waterloo, IPPW, City Utilities

2025

Wastewater Collection System Annual Report

CLI-ECA Wastewater Collection 112-W601

January 1, 2025, to December 31, 2025

Executive Summary

The Wastewater Collection (WWC) 2025 Annual Performance Report provides a comprehensive overview of the City of Waterloo's performance achievements and initiatives during 2025. The report highlights our operational challenges and corrective actions.

The collection system is continuously monitored and maintained, via regular inspections, remote monitoring and timely issue resolution. Looking ahead, we anticipate two new sewage pumping stations (SPS) in 2027 and 2028-2029 to provide service to a newly developed area of the city.

Public transparency and communication remain a priority, with updates provided through social media and the annual performance report.

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1.0 Introduction

The 2025 Annual Performance report has been prepared in accordance with the terms and requirements set out in the Consolidated Linear Infrastructure Environmental Compliance Approval (CLI-ECA) 112-W601, issued to the City of Waterloo on February 8, 2023, under the *Environmental Protection Act, 1990*. It covers the period from January 1, 2025, to December 31, 2025. It must be submitted to the Ministry of Environment, Conservation, and Parks (MECP) no later than March 31, 2026. It must be made available to the public, no later than June 1 of the same year.

This report summarizes the monitoring and maintenance results for the WWC system received by the CLI-ECA and describes the systems overall operational performance. See **Table 1** for the reporting requirements.

Table 1: Reporting Requirements per CLI-ECA Wastewater Collection 112-W601

Category	Details
Monitoring Data	Summary and interpretation of data; conclusions on need for future modifications/alterations
Operating Problems	Summary of operational problems encountered, and corrective actions taken
Calibration, Maintenance and Repairs	Summary of calibration, maintenance and repairs on major structures and equipment
Complaints and Resolutions	Summary of complaints received, and the actions taken to address them
Alterations	Summary of alterations to the authorized system and significant drinking water threats (SDWT)
Overflows and Spills	Summary of any collection system overflows and spills: include dates, volume, duration disinfection and corrective actions
Efforts to Reduce Overflows and Spills	Summary of efforts to reduce overflows and spills, including projects, expenditures, Pollution Prevention Control Plan (PPCP) progress, effectiveness assessments and public reporting

1.1 System Description

The City of Waterloo owns the WWC system; City Utilities is responsible for the operation of the Class II WWC system, including trunk sewers, separate sewers, forcemains and sewage pumping stations (SPS) (**Table 2**). The system also receives additional flows from outside the city boundaries, including parts of the Township of

Woolwich and two sewage pumping stations (SPS) located in the City of Kitchener. A small portion of the discharge is routed cross-border to the Kitchener WWC system. In accordance with the *Ontario Water Resources Act O. Reg. 129/04*, City Utilities wastewater operators are licensed and adequately trained for the operation of the system.

According to the Region of Waterloo Year End 2024 *Population and Household Estimates*, the City's WWC system serves a population of 155,550 people, including temporary, non-resident students (33,610). The WWC system consists of the following (2024 data):

- 411.99 km gravity sewer main
- 11.35 km of forcemain
- 31,754 wastewater connections (active accounts)
- 6,409 maintenance holes*
- Six sewage pumping stations

* Note: The calculated maintenance hole value was updated for this report reflecting only active maintenance holes. Previous year values captured, included active + inactive maintenance holes.

The City of Waterloo WWC system sewer mains range in size from 100mm to 1200mm and are constructed from cast iron, ductile iron, steel, clay, vitrified clay, asbestos cement (AC), concrete, high density polyethylene (HDPE) and polyvinyl chloride (PVC). Alterations to the City's collection system are documented through applications, Records of Future Alterations forms.

The City of Waterloo does not provide any treatment to wastewater. Discharge is routed to the Waterloo Wastewater Treatment Plant (WWTP), which is owned by the Region of Waterloo and operated by the Ontario Clean Water Agency (OCWA).

Table 2: Sewage Pumping Stations (SPS) within the Collection System

SPS Name	SPS Address	CSO* to the Environment
Beaver Creek	325 Laurelwood Dr.	No
Colonial	475 Denholm St.	Yes (Colonial Creek)
Frobisher	2700 University Ave. E	Yes (Frobisher SWM** Pond)
Malabar	460 Malabar Dr.	Yes (Colonial Creek)
Millennium	2001 University Ave. E	Yes (Colonial Creek)
Northlands	2401 University Ave. E	Yes (Dorwood SWM** Pond)

* CSO - Collection System Overflow ** SWM Stormwater Management

2.0 Performance Report

2.1 Operational Performance Overview

The requirements of the CLI-ECA set out that the WWC system must be properly operated and maintained, to be interpreted as adequately funded, operated, staffed and monitored on a 24/7 basis, with an after-hours procedure to respond to emergencies.

Monitoring programs are designed to regularly track and observe conditions, processes or performance over time. It is used for long-term data collection aimed at detecting trends or irregularities. City Utilities employs the use of a Supervisory Control and Data Acquisition (SCADA) system (including hardware, networking equipment, and software) at each pump station to assist with continuous monitoring.

Flow monitors are used for tracking the flow of wastewater. Flow monitoring helps to assess system capacity, identify leaks, inflow and infiltration, and potential blockages. The flow monitors provide data to assist in maintenance planning and help plan for future upgrades to the WWC system.

City Utilities maintains multiple preventive maintenance (PM) programs to assess the condition and performance of the system. Results from these programs are analyzed to identify corrective maintenance actions through repairs or replacements and/or recommendations for improvements and system upgrades. Rehabilitation and/or reconstruction projects are identified and replaced in conjunction with other public utilities.

2.2 Monitoring Program

The City of Waterloo has monitoring programs which monitor various aspects of the WWC system. **Table 3** provides a summary of the monitoring programs undertaken by City Utilities.

Table 3: Summary of Monitoring Programs

Monitoring Program	Purpose	Interpretation of Data	Conclusions
Wastewater Flow Monitors	Estimate the inflow and infiltration into the WWC system at select locations and determine the impact that inflow and infiltration have on the WWC system	Monitoring confirms pipe flow is under 80% capacity	Limited sample size: shows occasional exceedances linked to rain events and WWTP operations

Monitoring Program	Purpose	Interpretation of Data	Conclusions
SPS Flow Monitors and Station Monitoring	Continuous monitoring via SCADA	On site inspections confirm SCADA operation	Monitoring provides good oversight of overall operation of the SPS

SPS – Sewage Pumping Station

2.2.1 Flow Monitor and Level Sensors

Flow monitors and level sensors are installed in the WWC system, to monitor inflow and infiltration at select locations. These devices collect continuous information, and the data is used to understand system capacity, unusual flow patterns and to spot early signs of inflow and infiltration. **Figure 1** shows the locations of the various monitors within the City of Waterloo.

2.2.2 Hydrogen Sulfide Monitoring

Hydrogen Sulfide (H_2S) monitoring began in fall 2025 at the outfall where leachate from the Waterloo Landfill enters the WWC system. As leachate is known to contain significant levels of H_2S, monitoring was initiated to assess potential impacts on public health, infrastructure and maintain operational awareness. **Figure 1** shows the location of the H_2S monitoring.

2.2.3 SPS Monitoring

Pump station operation is monitored remotely by using SCADA software, with all data collected and stored in a separate database (Historian). This includes parameters such as:

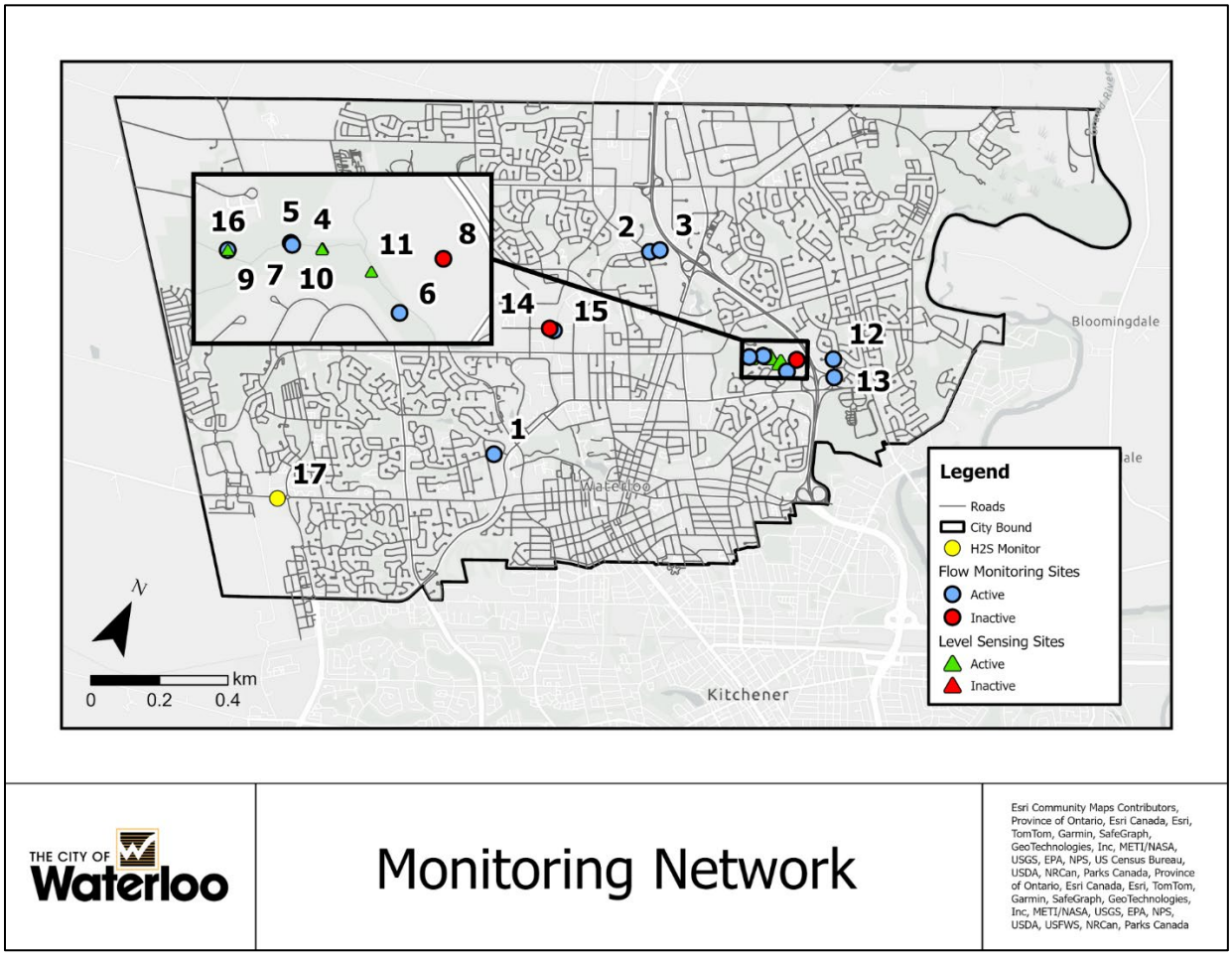
- Inflow in the pump stations
- Forcemain pressure
- Number of pump cycles
- Pump runtime
- Wet well level
- Discharge flow

Alarms are set to trigger and notify staff if values of parameters breach defined thresholds at the pump stations. These alarms have different priority levels: low, moderate, and high. Alarms are tested weekly. In 2025, there were 19 alarms that required operational response. Some examples of alarms include:

- Programmable Logic Controller (PLC) communication disruption
- Flow meter fault
- High wet well level
- Pump overload

The SPS monitoring system is important for safeguarding public health, protecting private and public property, and caring for the environment.

Figure 1: Locations of Wastewater Monitors in the City of Waterloo.



2.3 Operational Problems and Corrective Actions

In 2025, the City of Waterloo experienced no bypasses, no power outages leading to pump station failures, and no main collapses, resulting in uninterrupted service and confidence in the infrastructure reliability.

City Utilities executes preventive maintenance programs to identify operational issues and ensure the collection system remains in good condition. Operational problems are addressed through corrective maintenance activities, as well as identified through customer complaints. **2.4.2 Maintenance Activities** provides details on these activities.

In March 2025, City of Waterloo staff were made aware of a discharge event from the Region of Waterloo's Landfill and Recycling Centre at 925 Erb St. W., Waterloo. The discharge occurred on March 18, 2025, during which dangerous concentrations of hydrogen sulfide (H_2S) were detected in the City of Kitchener's collection system because of leachate release. The City of Waterloo also receives leachate from this

property. On March 21, 2025, City staff inspected the collection system downstream of the discharge point and identified no abnormal H_2S levels or other conditions that would pose a risk to the public or the municipal collection system. Following this event, the City of Waterloo entered into a cost-sharing agreement with the Region of Waterloo to purchase and maintain a real-time H_2S monitor in maintenance hole CH25-18, located at 659 Erb St. W., where leachate enters the City's system (see **Figure 1**).

2.4 Calibration, Maintenance, and Repairs

The following is a summary of the calibration, maintenance and repair activities performed on key structures, equipment, apparatus, and mechanisms within the collection system. These activities are necessary adjustments and repairs to maintain optimal performance.

2.4.1 Calibration Summary

Each year, the forcemain flow meter at every SPS is calibrated. Backflow certifications are also completed annually for backflow devices.

In 2025, the forcemain flow meters were calibrated and successfully passed. The backflow prevention devices were also successfully certified in 2025. If any SPS forcemain flow meter fails, it will be repaired or replaced. The same process is followed for any failing backflow prevention devices.

2.4.2 Maintenance Activities

Maintenance actions in the WWC system are split into two categories: preventive and corrective. Preventive maintenance is pre-emptive and occurs before an issue arises. Corrective maintenance is responsive and occurs once City Utilities is made aware of an issue. These figures are broken down in **Table 4**.

Table 4: Maintenance Activities

Maintenance Type	Number of Instances
Preventive	89
Corrective	142
Total	231

Preventive Maintenance

City Utilities maintains PM programs for maintenance hole inspections, gravity main inspections, gravity main flushing, and pump station inspections. These programs can help identify operational problems, while maintaining a robust collection system in good repair. **Table 5** provides a summary of the preventive activities.

Table 5: Summary of PM Activities

Preventative Maintenance Activity	Total # Completed	Notes/Comments
Visual Maintenance Hole Inspections	5,347	Visually inspect 1/3 of the maintenance holes each year; includes structural integrity and area blockages.
Trunk Maintenance Hole Inspections	936	Inspect all trunk maintenance holes yearly.
Acoustic Main Inspections	3238	Acoustic inspection of 190.3 km of gravity mains; completed on contract
CCTV Main Inspections	34.88 km	CCTV inspection of 34.88 km; 29.45 km completed on contract
Flushing of Gravity Main	110.53 km	110.53 km completed by City Utilities operations staff; 2.16 km completed on contract
SPS Inspections	312	Weekly inspections of each SPS
Infrared Electrical Box Inspections	6	Annual inspection of each SPS electrical box inspected for hot spots

SPS – Sewage Pumping Station

Table 6 provides a summary of the inspection programs.

Table 6: Summary of Inspection Programs

Inspection Program	Purpose	Interpretation of Data	Conclusions
Visual Maintenance Hole Inspections	Confirm integrity of structure and observe flow irregularities	Assesses structural integrity and allows visual inspection of flow in the WWC system at designated locations	Address concerns, structural deficiencies and blockages to ensure proper flow, public safety and environmental protection
Trunk Maintenance Hole Inspections			

Inspection Program	Purpose	Interpretation of Data	Conclusions
Acoustic Main Inspections	Inspection of the WWC system used to screen blockages within small diameter gravity sewers (<600 mm or smaller)	Data to identify areas of concern based on possible blockages	Helps identify key areas for risk management; meets obligations for system-wide inspections. In 2025 50% of collection system completed
CCTV Main Inspections	Identify blockages, assess pipe conditions and help detect and prevent future issues, identify inflow and infiltration	Guide maintenance program, prioritize repair and ensure proper functionality	Insight into the condition of the sewer system and allow for a proactive approach for continued reliability
Flushing of Gravity Mains	Remove sediment, debris and blockages to ensure ideal flow and system performance	Assess sediment levels and wastewater movement before and after flushing to assess system condition	Flushing improves flow capacity and system longevity while preventing blockages and odour
SPS Inspections	Ensure proper operation and identify potential issues	Monitor pump performance, alarms and equipment conditions	Ensures reliable operation, prevents failures and maintains system efficiency
Infrared Electrical Box Inspections	Ensure electrical components are safe and functional	Check for signs of wear, corrosion, proper operation of electrical components	Ensures electrical safety, prevents malfunctions and prolongs equipment life

SPS – Sewage Pumping Station

Corrective Maintenance

At times, during preventive maintenance or inspections (as described in **Table 5** and **Table 6**), additional repairs or replacements are necessary to restore the functionality of the system. Corrective maintenance activities can also be identified through customer complaints, which City Utilities address as needed, with service interruptions the most

reported issue. As noted in **Table 4**, there were 142 corrective maintenance instances in 2025 that included activities such as inflow and infiltration repairs, sanitary lateral repairs, replacement of force main, and sewer blockages. Table 7 provides additional information.

Table 7: Sewer Blockages

Corrective Maintenance Activity	Total # Completed	Notes/Comments
Inflow and Infiltration repairs in Maintenance Holes	18	Identify sources of groundwater and stormwater entering the sanitary system.
Sanitary Lateral Repairs/Replacements	32	Private and municipal laterals repaired or replaced due to age, root intrusion, cracks or structural failure. Helps reduce inflow, prevents backups and extend asset life
Force Main Repairs/Replacements	1	Proactive replacement
Sewer Blockage Complaints	91	Blockages cleared through response and proactive cleaning.
Total	142	

Sewer Blockages

City Utilities responded to 91 blockages in 2025, both in sewer laterals and in the sewer mains. As can be seen in **Table 8**, 19% of the known blockages were in City owned infrastructure. The summary does not include responses to complaints where a blockage was not confirmed onsite by the City Utilities responding operator.

Table 8: Categorized Summary of Sewer Blockages Based on the Location

Location	Number of Blockages
Private Infrastructure – Sewer Lateral	64
Private Infrastructure – Sewer Main	2
City Infrastructure – Sewer Lateral	17
City Infrastructure – Sewer Main	0

Location	Number of Blockages
Unknown	8
Total	91

Table 9 provides a breakdown by blockage cause.

Table 9: Summary of Sewer Blockages Categorized by Type of Blockage

Cause	Number of Blockages
Debris (gravel/dirt)	5
Grease	7
Groundwater	1
Roots	32
Sanitary Wipes	1
Structural Failure	10
Other	7
Unknown	26
Total	89

2.5 Complaints and Resolutions

Complaints are received from customers and other sources external to the City of Waterloo. **Table 10** provides a summary of complaints received related to the WWC system. Examples of complaints received related to the WWC system include:

- Infrastructure deficiencies (e.g. sinkhole around maintenance hole)
- Noisy or missing maintenance hole cover
- Odour suspected to be emanating from wastewater infrastructure

City Utilities operators investigate complaints and address the root cause.

Table 10: Summary of WWC System Complaints Received During the Reporting Year

Number of Complaints	Complaint Type	Typical Course of Action
3	Odour	Address root cause
142	Various Issues (details in section 2.4.2)	Investigate cause

2.6 Alterations and/or Modifications to the WWC System

An alteration applies to minor change within the WWC system, whereas a modification is for more significant changes within the WWC system. In accordance with the CLI-

ECA, **Table 11** provides a summary of the alterations or modifications completed in 2025, with the appropriate SS1 and/or SS2 form(s) submitted for Record of Future Alterations. Applications for projects 25-14, 25-23, and 25-24 were received and approved in 2025, however these projects did not start in 2025.

Table 11: Summary of Alterations and Modifications to the WWC System

Municipality	Project Name / Number	Project Description	SDWT* (Yes/No)
Waterloo	Vista Hills Subdivision – Stage 5 / 25-02	Subdivision	No
Waterloo	176-178 Woolwich St. / 25-14	Sanitary Sewer Extension	No
Waterloo	Fountain St. / 25-23	Reconstruction	No
Waterloo	Shakespear Dr. / 25-24	Reconstruction	No

*SDWT - Significant Drinking Water Threat

2.7 Overflows and Spills

There were no incidents of overflows or spills occurring in 2025.

2.8 Efforts to Reduce Overflows and Spills

The City of Waterloo's WWC system has the capacity to deal with the existing inflow demands. From a preventive standpoint, the wet wells at all SPS's are monitored 24/7 and response initiated when in alarm state.

Construction of two additional SPS's in the north-western area of the city is scheduled to be completed in 2027 and 2028-2029, to address growth within the City of Waterloo.

2.9 Public Reporting Approach; Including Proactive Efforts

Public reporting is conducted through various means of social media platforms which include emergency situations. The Annual Performance Report is posted on the City of Waterloo website.