2024 Annual Performance Report – Stormwater (CLI-ECA 076-S701)

Submitted to:
Rachel Whyte, P.Eng, Infrastructure & Asset Project Manager
City of Welland
60 East Main Street
Welland, ON L3B 3X4

Submitted by:
GEI Consultants Canada Ltd.
1266 South Service Road, Unit C31
Stoney Creek, ON L8E 5R9
905-643-6688

April 30, 2025
Project No. 2407034

Table of Contents

List of Tables

List of Figures

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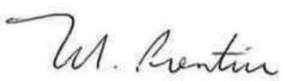
PREPARED BY:
GEI Consultants Canada Ltd.



Marjorie Prentice, P.Eng.
Project Engineer

PREPARED BY:
GEI Consultants Canada Ltd.

Danielle Anders, M.A.Sc., P.Eng.
Senior Project Manager

1. Introduction

The following summarizes the performance of the City of Welland's Stormwater Management System from July 1 to December 31, 2024, in accordance with Consolidated Linear Infrastructure Environmental Compliance Approval (CLI-ECA) #076-S701, Schedule E, Section 5.2, issued June 23, 2023. Annual reports include operational details, environmental impacts, and alterations to the system.

This is the first performance report for the stormwater system; as per CLI-ECA requirements, it only covers activities for the latter part of the year. Subsequent reports will cover the entire previous year.

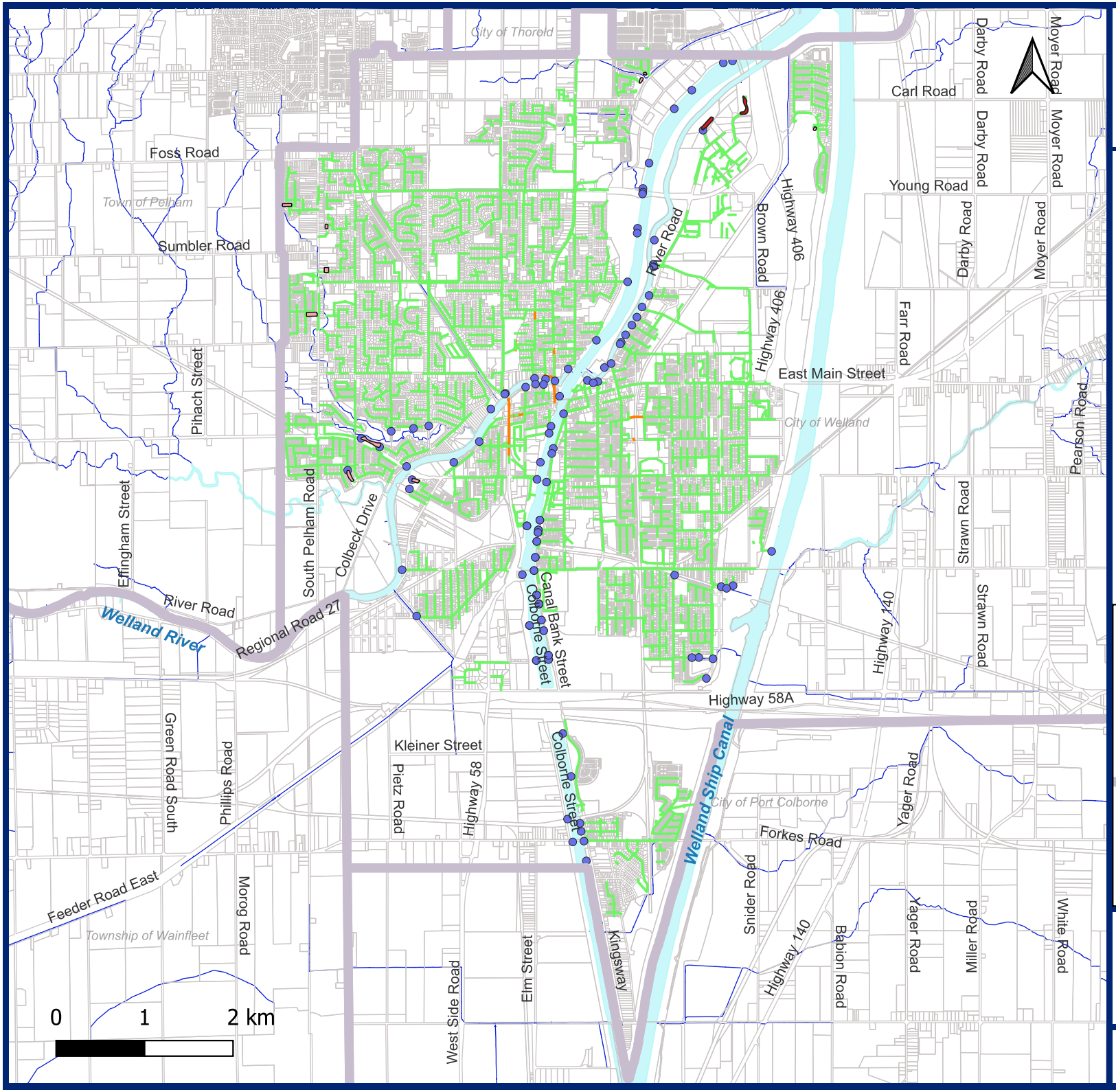
This report is submitted to the Ministry of the Environment, Conservation and Parks (MECP) and will be posted on the City's website by June 1, 2025.

1.1. Stormwater System Description

Stormwater, consisting of rain and/or snowmelt, can either infiltrate into the ground or be conveyed to a drainage route as surface runoff. To reduce the risk of property flooding and improve runoff water quality, the City of Welland maintains a stormwater management system. The system serves the Central Welland River and South Niagara Falls watersheds, an area of 81 square kilometres within the City boundary, and comprises a network of roughly 175 km of storm sewer pipes that convey runoff from developed urban areas to nearby watercourses. In some parts of the system, the storm flow enters a stormwater management facility (ponds or oil and grit separators) where some pollutants can settle before runoff enters a waterway. The system also includes an extensive network of swales, ditches, and culverts for conveyance of surface flow.

The City was originally serviced by a combined sewer system that conveyed both sanitary and storm flows directly to the Welland River. Construction of the Welland Wastewater Treatment Plant enabled sanitary flow to be cleaned before discharge. Separation of the combined system began in the 1960s, creating distinct sanitary and storm systems. A few combined sewers remain in service (about 2 kilometres in total length), as illustrated in **Figure 1-1**.

Many homes still have foundation drains and roof drains (downspouts) that are connected to the municipal sanitary system. These drains should ideally be disconnected from the sanitary system and instead discharged as surface runoff. The City is working to encourage residents to remove these improper connections through the Sewage Water Alleviation Program (SWAP), which offers up to $6,000 in subsidies for disconnection work. Removing these private infrastructure stormwater connections will help reduce the number of basement flooding incidents, the frequency of sewage overflows, and costs associated with operation of the sanitary system and treatment plant.



CITY OF Welland

Annual Performance Report

Active Sewer Outfalls
- Storm system
- Stormwater Mgmnt Pond

Welland Sewer Mains
- Storm system
- Combined system
- Watercourse
- Assessment Parcel
- Municipal Boundary

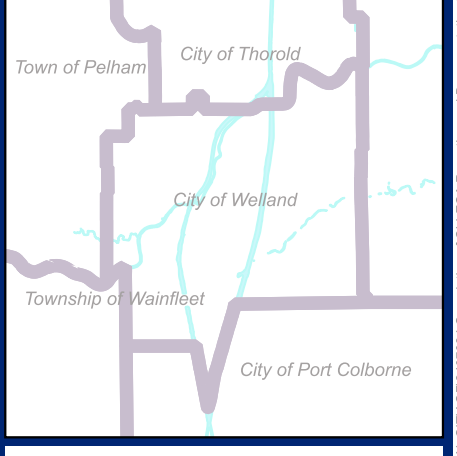


Figure 1-1

City of Welland
Storm Sewer System

GEI Consultants

April 2025
2407034
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1.2. System Components

The City's stormwater management system, as defined in CLI-ECA 076-S701, includes 176 kilometres of storm sewers, 13 stormwater management ponds, and 16 oil and grit separators (OGSs).

Not specifically enumerated in the CLI-ECA are 3,931 storm maintenance holes, 6,481 catch basins, 59 storm outfalls, and 22 kilometres of culverts:

- Maintenance holes provide access to the storm sewer pipes.
- Catch basins direct surface runoff into the storm sewers.
- Outfalls are the points from which storm sewers discharge to waterways.
- Culverts convey stormwater beneath roads, walkways, and driveways.

All these assets are subjected to some level of inspection and maintenance to support the performance of the system and minimize risks to the natural environment.

2. Previous Action Items

The City's stormwater management system is designed to mitigate the risk of flooding and property damage within the urban area and improve water quality where possible. Separation of the City's remaining combined sewer areas continues to be a priority. The City's 20-year capital plan is summarized in **Table 2-1** and will address some of these issues.

Table 2-1: Stormwater System Capital Priorities

No.	Recommended Actions	Action Status
1	Reduce inflow and infiltration (I&I) in Lincoln-Coventry area and Ontario South to facilitate decommissioning of L-site overflows and facilitate growth.	I&I Investigation study complete. Remediation activities are ongoing.
2	Continue long-term annual investments in system rehabilitation and replacement based on the City's Asset Management Plan and known priority areas.	Asset Management Plan is reviewed and revised as required; capital budget and forecast are based on AMP needs as well as operational needs, results of studies, etc.
4	Complete sewer separation – King St, private storm connections should be removed	Not started. Exact project scope to be determined.
5	Complete sewer separation - Niagara/Shotwell/Fell	Mostly complete. Small section of sewer remains to be separated.
6	Complete sewer separation - PCD South	Project cannot start until West Main Regional Trunk is complete.
7	Complete sewer separation - Niagara South	Scheduled to be completed with regional bridge construction on Niagara Street (2027).
8	Implement Downspout Inspection Program for direct connections to sanitary system.	Ongoing through Sewage Water Alleviation Program (SWAP).

3. System Monitoring

The MECP is expected to release guidelines for development of stormwater system monitoring plans. These monitoring plans will include procedures to verify that the stormwater system is operating as designed and to assess environmental impacts of the system on the City's waterways. Water quality conditions within the system and receiving waters will be characterized based on various chemical, physical, and biological parameters. It may be possible to identify environmental trends once the City has accumulated a critical volume of such data, and these trends can be used to direct future management practices for the system.

3.1. Spills and Abnormal Discharge Events

There are 16 locations within the sanitary sewer system that are designed to overflow to the storm sewer system during intense wet weather. These sewers primarily discharge to the Welland River, with several ultimately flowing to the Welland Canal. The quantity and quality of these discharges are either monitored or simulated using computer models. Details of this work are summarized in the *2024 Wastewater Annual Performance Report* (April 16, 2025), also posted on the City's website.

Public Works staff responded to two reported spills in the system between July 1 and December 31, 2024.

Table 3-1: Summary of Spills

Activity	Work Orders
Water/Sewer Environmental Spills	2

4. System Condition & Performance

The Public Works staff that maintain and operate the stormwater management system keep the system functioning properly as intended. Contractors are hired as needed to perform any work that requires specialized equipment or training.

4.1. Condition Overview

The average age of the storm sewer system is roughly 47 years, with many segments approaching the end of their expected service lives. Closed-circuit television (CCTV) inspections show that most of the City's storm sewer pipes are in fair to poor condition. Where CCTV inspections are not available, pipe condition is estimated based on age and expected service life. The City continues to upgrade the storm management system through capital design and construction projects. Preventive maintenance and rehabilitation activities can help to extend asset life prior to future more extensive upgrades.

4.2. Performance Overview

The City is currently preparing a Stormwater System Operations and Maintenance Manual that aligns with the requirements of CLI-ECA 076-S701, section 3.2, and has undertaken various projects to improve the performance of its stormwater management system.

In 2017, the City completed a review of its stormwater management ponds and oil/grit separators ("stormceptors") to assess their performance and identify remediation needs. The review identified stormceptors that were most in need of attention and investment. Six of the City's stormceptors were subsequently cleaned in 2022, including units at Classic Avenue, Thorold Road, the Welland Sports Centre (South), the Community Wellness Centre (North), Notre Dame School, and the Smith Street & Chippawa Street intersection. The City is in the process of developing and implementing a robust stormceptor maintenance and inspection program.

The City is currently undertaking detailed design for cleaning and maintenance of storm ponds at the Towpath Village (north and south), Michael Estates, and Coyle Creek Estates subdivisions.

5. System Calibration, Maintenance, Inspection & Repair

Insufficient maintenance of infrastructure can decrease asset performance, cause premature infrastructure failures, and increase asset lifecycle costs. In a stormwater management system, insufficient maintenance can effectively reduce the system's capacity. This may lead to potential storm system backups, possible overland flooding, and increased inflow and infiltration to the wastewater system, which in turn can increase the volume and frequency of system overflows and/or the occurrence of basement flooding. Proactive inspection and upkeep of the system is preferred over reactive responses to system failures or disruptions.

The following sections provide an overview of inspection, maintenance, and repair activities that were completed within the stormwater management system in the latter half of 2024.

5.1. Calibration Activities

Flow monitors are deployed in the system for specific investigations. These instruments are calibrated annually to verify their continued accuracy and suitability. Equipment is tested by third-party contractors as per manufacturer specifications.

5.2. Maintenance Activities

The City uses CityWorks software to manage work orders for maintenance activities. Planned maintenance is scheduled based on recommended best practices and staff experience. Various unplanned maintenance activities also occur and are tracked using this system.

Public Works staff focus their efforts on clearing blockages within the system to maintain capacity for storm runoff. A summary of maintenance related work orders from late 2024 is shown in **Table 5-1**.

Table 5-1: Summary of Maintenance Activities (July 1 – Dec 31, 2024)

Activity	Work Orders
Storm Main Flushing	2
Storm Maintenance Hole Cleaning	1
Storm Catchbasin (Rear-Yard) Maintenance	1
Storm Catchbasin Rear Yard Cleaning/Clearing	1
Storm Catchbasin Cleaning/Clearing	39
Storm Lateral Cleaning/Clearing	3
Storm Lateral Flushing	2
Storm Pond Brush Cutting	1

5.3. Inspection Activities

Regular inspection activities are essential for detecting and addressing issues in the system. Public Works staff inspect assets to identify operational issues and investigate problems that may arise. For example, staff may use a closed-circuit television (CCTV) camera to inspect a storm sewer lateral in response to a reported blockage.

Table 5-2 shows inspection activities from July to December of 2024.

Table 5-2: Summary of Inspection Activities (July 1 – Dec 31, 2024)

Activity	Work Orders
Storm Catchbasin Inspection	5
Storm Lateral CCTV Inspection	4

The City hires a contractor to perform an annual storm sewer flushing and inspection program. The City uses a risk-based assessment process to identify and prioritize the assets most in need of flushing and inspection. Using this risk-based approach, pipes that are in worsening condition or that are more critical for overall system performance are reviewed more frequently than pipes that are in good condition or that offer more minor service. The contractor uses CCTV cameras to assess pipe condition and identify structural or operational deficiencies. These deficiencies are prioritized for rehabilitation through sewer relining, open cut repair, or other measures.

5.4. Repair Activities

Deficiencies identified through inspection are repaired on a priority basis. Public Works staff complete most standard repairs, such as pipe spot repair, storm lateral repair, catch basin frame and lid repair or replacement, maintenance hole frame and cover installation, and parging repairs. Repairs requiring specialized equipment or training are typically completed by a contractor.

Table 5-3 summarizes repair activities from the latter half of 2024.

Table 5-3: Summary of Repair Activities (July 1 – Dec 31, 2024)

Activity	Work Orders
Storm Main Repair	1
Maintenance Hole Repair/Replace	6
Storm Catchbasin Repair	16
Storm Catchbasin Lead Repair	2
Storm Catchbasin Installation	5
Unclassified Labour	1

6. Customer Relations

Complaints or requests for service from the public are useful as a metric of system performance and can help in identifying deficiencies that might otherwise go unnoticed. Residents may report issues such as odours, flooding, suspected sewer blockages, damaged infrastructure, construction-related problems, or spills. In each case, the issue is logged, investigated, and resolved if possible.

Public Works did not receive any storm system-related complaints in 2024. If a complaint is received, Public Works staff visit the location to investigate, address the issue to the best of their abilities, and respond to the complainant regarding the outcome.

7. System Alterations

Table 7-1 summarizes the City's recent capital projects that involved alterations to the municipal stormwater management system.

Table 7-1: Alterations to the Authorized Stormwater Management System

Project Name	Project Description	File Year
Development - Forks Road Bridge Replacement	New storm sewer system at the intersection of Colborne Street and Forks Road collects external drainage from two (2) existing 300mm diameter sewers at the northeast corner and from the south from existing roadside ditches (both sides of Colborne Street). Stormwater is treated by a new oil grit separator and outlets to the canal at the southeast corner of the intersection.	2023
Development - Dain East Phase 2, 3 & 4 Subdivision	Installation of new storm sewers, sanitary sewers, and watermain.	2023
Development - Superior Street Subdivision	Installation of new storm sewers, sanitary sewers, and watermain on Superior Street, Michigan Street, and Bay Avenue.	2023
Development - 201 Ontario Road Sanitary Sewer Extension	Proposed storm and sanitary connection for new development at 201 Ontario Road, including the extension of existing sanitary and storm sewers on Ontario Road.	2023
Development - Canal Bank Street - Dain City	The construction of new storm sewers and watermain on Canal Bank Street, as part of a road reconstruction and new road alignment.	2023
Capital - ENG 2021-24 Fourth, Fifth, and Sixth Street Sanitary Sewer Replacement	The construction of new storm and sanitary sewers on Canal Bank Street, Fourth Street, Fifth Street, Sixth Street, Rice Lane and Patsy Avenue.	2024
Development - Dain West Phase 1 Subdivision	Installation of new storm sewers, sanitary sewers, watermain, and construction of a stormwater management pond.	2024
Development - Harvest Oak Extension Subdivision	Installation of new storm sewers, sanitary sewers, and watermain.	2024
Development - Murdoch Estates Phase 2 Subdivision	Installation of new storm sewers, sanitary sewers, watermain, construction of a dry pond, and realignment of Draper's Creek by constructing a new channel on the development lands.	2024