Belleville Stormwater Management System

2025 Annual Report

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1. Introduction

The City of Belleville's Consolidated Linear Infrastructure (CLI) Environmental Compliance Approval (ECA) for the Belleville Stormwater Management System (No. 151-S701) establishes reporting requirements, including the submission of an annual performance report to Ontario's Ministry of the Environment, Conservation and Parks (MECP) by April 30 of each year[1]. The CLI-ECA is administered by the MECP and is issued under the Environmental Protection Act to fulfill the requirements of the Ontario Water Resources Act[2]. The CLI-ECA serves as the regulatory authorization and establishes the conditions under which the City may operate, maintain, and alter the stormwater management system in Belleville. This report has been prepared to satisfy the requirements of Schedule E, Section 5 of the CLI-ECA and will be made available to the public on the City's website.

2. Stormwater Management System Overview

The Belleville Stormwater Management (SWM) System is a network of pipes, appurtenances, treatment facilities, pumping station and outfalls that convey runoff from developed areas in the municipality to receiving watercourses. The municipal boundary is primarily situated in the Moira River watershed, which drains to the Bay of Quinte. The municipal stormwater system is owned and operated by the Corporation of the City of Belleville and consists of more than 172 km of storm sewers and ditches, 53 SWM facilities (wet and dry stormwater management ponds, oil/grit separators, filter swales) and 1 pumping station.

3. Monitoring and Analysis

Schedule E, Section 5.2.2 of the CLI-ECA requires that the annual report include a summary of all required monitoring data, if applicable, along with an interpretation of the data and an overview of the condition and operational performance of the system and any adverse effects on the natural environment. This is addressed in sections 3.1 to 3.3 below.

Schedule E, Section 5.2.3 of the CLI-ECA requires a summary and interpretation of environmental trends based on all monitoring information and data for the previous five (5) years. As of this reporting, only three (3) years of data have been compiled in relation to the CLI-ECA and therefore an interpretation of trends is not yet possible.

3.1. Sampling at College Street East Wet Pond

In 2025, samples were collected as required per Schedule E, section 10.1 System Specific Conditions at the College Street East Wet Pond (CSE). The requirement was to sample after three storm events of 10 mm or greater in a 24-hour period at the inlet and outlet of the pond; sampling during the spring, summer, and fall where possible. Required parameters to be sampled include:

- Total suspended solids (TSS)

- Total phosphorus (TP)
- Oil and grease (petroleum hydrocarbons)
- Heavy metals, including
    - Mercury (Hg)
    - Lead (Pb)
    - Manganese (Mn)
    - Cadmium (Cd)
    - Zinc (Zn)
    - Copper (Cu)
    - Iron (Fe)
    - Chromium (Cr)

Four sets of samples were collected: one each in April, May, August and October covering the spring, summer and fall time periods. Sampling is required at both the inlet and outlet of the pond *after* an event is finished. In 2025, staff also sampled the inlet during the first few hours of a rain event to capture the 'first flush'. This is when runoff entering the storm facility will typically have higher concentrations of sediment and pollutants. This additional sampling was done to better assess pollutant removal and overall pond performance.

Results from the sampling are shown in Table 1. Generally, concentrations of the parameters sampled are at low concentrations. Sample concentrations that fall below the detection limit of the laboratory are denoted by 'ND' in Table 1.

Table 1: Analytical results from sampling conducted at CSE.

Parameter	Units	Event Start Date	Inlet Concentration (First Flush)	Inlet Concentration (Post Event)	Outlet Concentration (Post Event)
Cadmium	mg/L	**03-Apr-25**	0.000014	0.000013	0.000013
Cadmium	mg/L	**01-May-25**	0.000004	0.000012	0.000022
Cadmium	mg/L	**19-Aug-25**	0.000003	0.000004	0.000040
Cadmium	mg/L	**22-Oct-25**	0.000034	0.000010	0.000007
Chromium	mg/L	**03-Apr-25**	0.00063	0.0009	0.00108
Chromium	mg/L	**01-May-25**	0.00061	0.00072	0.00036
Chromium	mg/L	**19-Aug-25**	0.0002	0.00047	0.00033
Chromium	mg/L	**22-Oct-25**	0.0028	0.00035	0.00043
Copper	mg/L	**03-Apr-25**	0.001	0.001	0.001
Copper	mg/L	**01-May-25**	0.001	0.001	0.001
Copper	mg/L	**19-Aug-25**	ND	0.001	ND
Copper	mg/L	**22-Oct-25**	0.006	ND	ND
Iron	mg/L	**03-Apr-25**	0.186	0.385	0.265
Iron	mg/L	**01-May-25**	0.127	0.337	0.107
Iron	mg/L	**19-Aug-25**	0.096	0.147	0.073
Iron	mg/L	**22-Oct-25**	1.1	0.019	0.167
Lead	mg/L	**03-Apr-25**	0.00021	0.00045	0.00033
Lead	mg/L	**01-May-25**	0.00071	0.00108	0.00085
Lead	mg/L	**19-Aug-25**	ND	0.00019	0.00013

Parameter	Units	Event Start Date	Inlet Concentration (First Flush)	Inlet Concentration (Post Event)	Outlet Concentration (Post Event)
Lead	mg/L	**22-Oct-25**	0.00235	0.00049	0.00044
Manganese	mg/L	**03-Apr-25**	0.0272	0.024	0.0275
Manganese	mg/L	**01-May-25**	0.0215	0.0417	0.0152
Manganese	mg/L	**19-Aug-25**	0.00802	0.00877	0.0121
Manganese	mg/L	**22-Oct-25**	0.0434	0.00249	0.0157
Mercury	mg/L	**03-Apr-25**	ND	ND	ND
Mercury	mg/L	**01-May-25**	ND	ND	ND
Mercury	mg/L	**19-Aug-25**	ND	ND	ND
Mercury	mg/L	**22-Oct-25**	ND	ND	0.00001
Oil & Grease (total)	mg/L	**03-Apr-25**	ND	ND	ND
Oil & Grease (total)	mg/L	**01-May-25**	ND	ND	ND
Oil & Grease (total)	mg/L	**19-Aug-25**	ND	ND	ND
Oil & Grease (total)	mg/L	**22-Oct-25**	ND	ND	ND
Phosphorus	mg/L	**03-Apr-25**	0.034	0.021	0.02
Phosphorus	mg/L	**01-May-25**	0.027	0.026	0.015
Phosphorus	mg/L	**19-Aug-25**	0.017	0.021	0.017
Phosphorus	mg/L	**22-Oct-25**	0.19	0.005	0.016
TSS	mg/L	**03-Apr-25**	5	10	12
TSS	mg/L	**01-May-25**	2	10	7
TSS	mg/L	**19-Aug-25**	3	5	4
TSS	mg/L	**22-Oct-25**	80	8	8
Zinc	mg/L	**03-Apr-25**	0.007	0.01	0.02
Zinc	mg/L	**01-May-25**	0.004	0.008	0.024
Zinc	mg/L	**19-Aug-25**	ND	0.005	0.017
Zinc	mg/L	**22-Oct-25**	0.046	0.004	0.004

3.2. Analysis of Sample Results

3.2.1. Overall Water Quality

There are no prescribed concentration limits for parameters of interest in effluent from the stormwater management facility. However, analytical results may be compared to Ontario's Provincial Water Quality Objectives (PWQOs), which are established by the Ministry of the Environment, Conservation and Parks (MECP) as guidelines for protecting and maintaining surface water quality in receiving water bodies such as lakes and rivers [3]. Although the PWQOs are not specifically intended for application to stormwater management facilities, they provide useful benchmarks for interpreting water quality conditions and contextualizing the results presented in Table 1.

When examining concentrations of parameters for which a PWQO exists[1], the quality of effluent from the facility is better than the PWQO in all but one case. During the May 1 rain event, the concentration of zinc at the facility's outlet exceeded the PWQO by a negligible amount as shown in Table 2. Sample concentrations that fall below the laboratory detection limit are denoted by 'ND'. Overall, the sample results indicate that the facility is effectively treating stormwater for quality control purposes.

Table 2: Sampling results compared to Provincial Water Quality Objectives at CSE.

Parameter	Units	Event Start Date	Post-Event Outlet Concentration	PWQO
Cadmium	mg/L	**03-Apr-25**	0.000013	0.0002
Cadmium	mg/L	**01-May-25**	0.000022	0.0002
Cadmium	mg/L	**19-Aug-25**	0.000040	0.0002
Cadmium	mg/L	**22-Oct-25**	0.000007	0.0002
Chromium	mg/L	**03-Apr-25**	0.00108	0.00495
Chromium	mg/L	**01-May-25**	0.00036	0.00495
Chromium	mg/L	**19-Aug-25**	0.00033	0.00495
Chromium	mg/L	**22-Oct-25**	0.00043	0.00495
Copper[2]	mg/L	**03-Apr-25**	0.001	0.005
Copper	mg/L	**01-May-25**	0.001	0.005
Copper	mg/L	**19-Aug-25**	ND	0.005
Copper	mg/L	**22-Oct-25**	ND	0.005
Iron	mg/L	**03-Apr-25**	0.265	0.3
Iron	mg/L	**01-May-25**	0.107	0.3
Iron	mg/L	**19-Aug-25**	0.073	0.3
Iron	mg/L	**22-Oct-25**	0.167	0.3
Lead[3]	mg/L	**03-Apr-25**	0.00033	0.005
Lead	mg/L	**01-May-25**	0.00085	0.005
Lead	mg/L	**19-Aug-25**	0.00013	0.005
Lead	mg/L	**22-Oct-25**	0.00044	0.005
Phosphorus	mg/L	**03-Apr-25**	0.02	0.03
Phosphorus	mg/L	**01-May-25**	0.015	0.03
Phosphorus	mg/L	**19-Aug-25**	0.017	0.03
Phosphorus	mg/L	**22-Oct-25**	0.016	0.03
Zinc	mg/L	**03-Apr-25**	0.02	0.02
Zinc	mg/L	**01-May-25**	0.024	0.02

[1] Manganese, Mercury, Oil & Grease and TSS do not have an associated PWQO and were omitted from Table 2.
[2] Average hardness as CaCO3 (mg/L) for CSE storm pond is 203.7 (i.e. >20 mg/L); therefore, interim PWQO of 0.005 mg/L was used to analyze copper results.
[3] Average hardness as CaCO3 (mg/L) for CSE storm pond is 203.7 (i.e. >80 mg/L); therefore, interim PWQO of 0.005 mg/L was used to analyze lead results.

Parameter	Units	Event Start Date	Post-Event Outlet Concentration	PWQO
Zinc	mg/L	**19-Aug-25**	0.017	0.02
Zinc	mg/L	**22-Oct-25**	0.004	0.02

3.2.2. Removal of Sediment and Pollutants

The October 22 event (17 mm rainfall) is a strong indicator of system performance. Despite elevated influent concentrations, this event demonstrated strong overall reductions for all parameters with concentrations at detectable levels, confirming effective settling and treatment.

Visual inspections throughout the year also raised no concerns. There was no observable sheen of oil or grease noted during precipitation events and no deficiencies were noted during quarterly inspections of the pond which included a visual assessment of vegetation, sediment accumulation and the condition of the inlet and outlet.

The MECP is expected to release monitoring guidelines for stormwater systems. City staff will adapt sampling methodologies to these guidelines when they are made available.

3.3. Other Required Monitoring

There was no other required monitoring in 2025. It is anticipated that monitoring as part of future operations will be informed by the MECP's guidelines.

4. Operations and Maintenance

Schedule E, section 5.2.4, 5.2.5, and 5.2.6 of the CLI-ECA requires that the annual report include a summary of operating issues and corrective actions taken, inspections, maintenance and repairs carried out on parts of the system, as well as calibration and maintenance carried out on monitoring equipment.

4.1. Inspections, Operating Issues and Corrective Actions

4.1.1. SWM Facilities

The Operations & Maintenance (O&M) Manual recommends that each pond be inspected after every significant storm event (consisting of rainfall depth of 25mm or greater), and at a minimum of once per year. Inspection recommendations for filter swales are similar.

Inlets and outlets at several stormwater management (SWM) facilities were inspected following storm events exceeding 25 mm, as well as after storm events of lesser volume. All SWM facilities were inspected at least once in 2025, with most facilities inspected on a quarterly basis. Potential issues identified during inspections and site visits were documented and follow-up actions were undertaken by operations staff as required.

Significant operating issues requiring corrective action were identified at three storm ponds. At Putman 1 and 2 storm ponds, debris obstructing the outlet pipes was cleared to reduce elevated water levels, and an abandoned beaver hut on the north side of Putman 1, opposite the outlet, was removed. At Millennium storm pond, phragmites around the southwest inlet were cleared to restore proper flow.

The O&M Manual recommends oil/grit separators (OGS) be inspected on a regular basis. In 2025, all OGSs were inspected and the majority of those requiring sediment, oil or debris removals were cleaned.

4.1.2. Cannifton Road Pumping Station

The Cannifton Road pumping station was undergoing upgrades in 2025 with care and control the responsibility of the contractor until November 14, 2025. Prior to the City assuming the facility, the contractor performed commissioning of all equipment to ensure it operated as designed. An O&M Manual was prepared for the upgraded station. There were no significant operating issues at the pumping station in 2025.

4.2. Maintenance and Repairs

The City's maintenance program for the stormwater system consists of two types of maintenance: reactive maintenance and preventative maintenance (also known as proactive maintenance).

The following **reactive** maintenance activities were performed in 2025:

- Pipe repairs (mains and catchbasin leads)
- Pipe replacement (mains and catchbasin leads)
- Pipe blockage removal (mains and catchbasin leads)
- Pipe flushing (catchbasin leads)
- Maintenance hole and catchbasin repairs
- Catchbasin replacement
- Maintenance hole and catchbasin frame and cover adjustments
- Weed and brush removal at stormwater management ponds
- Grass cutting at stormwater management ponds
- Oil/grit separator cleanout
- Catch basin cleaning

The following **preventative** maintenance activities were performed in 2025:

- CCTV inspection of mains (program)
- Generator testing at pump station
- Routine inspections of stormwater management ponds
- Inspections of outfalls
- Routine inspections of oil/grit separators

- Catch basin cleaning

Larger maintenance and repair projects are scheduled through the annual budget process and implemented through consultants and contractors. Larger projects completed in 2025 are covered in Section 8: Actions to Improve and Correct Performance.

4.3. Calibration of Monitoring Equipment

Monitoring is conducted via grab samples sent to a lab for analysis. There was no monitoring equipment within the Authorized System requiring calibration or maintenance during the reporting period.

5. Summary of Complaints

Schedule E, section 5.2.7 of the CLI-ECA includes the requirement for a summary of any complaints received during the reporting period and steps taken to address them. Typically, few customer complaints are received about the stormwater management system. In 2025, one complaint was received regarding flooding inside a building. City staff excavated the area and found the storm main had broken and become fully blocked over time. The pipe was repaired.

6. Alterations to the Authorized System

Schedule E, section 5.2.8 requires a summary of all alterations to the system within the reporting period that are authorized by the ECA, including a list of alterations that pose a Significant Drinking Water Threat.

In 2025, there were 2 alterations placed into service that were authorized under this CLI ECA. One was a storm sewer extension, and one was a refurbishment of a stormwater pumping station. None of the alterations posed a Significant Drinking Water Threat.

7. Spills and Abnormal Discharge Events

Schedule E, section 5.2.9 requires a summary of all spills or abnormal discharge events.

On July 2, 2025, a flail mower ruptured a hydraulic line, causing hydraulic oil to spill into a catch basin and a section of storm main. Most of the fluid was contained before it entered the system. Staff placed absorbent pads in the catch basin and installed one containment boom in the affected storm main and another in the downstream maintenance hole. An environmental remediation contractor also cleaned the catch basin and the affected section of storm main and reported the spill to the MECP's Spills Action Center (SAC).

8. Actions to Improve and Correct Performance

Schedule E, sections 5.2.10 and 5.2.11 of the CLI-ECA require that the Annual Report include a summary of actions taken to improve or correct performance of any aspect of the authorized system and the status of actions for the previous reporting year. Table 3 provides a summary of actions taken in 2025 and Table 4 summarizes the status of 2024 actions.

Table 3: Summary of Actions Taken to Improve or Correct Performance in 2025.

Summary of Effort/Project	Description
SWM Pond Cleanout	A tender was awarded to remove sediment at the Stanley Park Pond 3. The cleanout work was completed late in 2025, and the final vegetation restorations will be completed in the spring of 2026.
Catch Basin Cleanouts	A sewer service company cleaned out catch basins leading to City-owned oil and grit separators to aid in preventing property damage, protecting the environment, and maintaining the efficiency and longevity of the infrastructure.
Stormsewer Main Inspection	A section of stormsewer main with ongoing capacity issues was inspected for defects using CCTV. No defects were noted during the inspection and investigation into possible corrective actions is ongoing.
SWM Signage	The installation of new signage to meet CLI-ECA requirements was completed by July 25, 2025.

Table 4 provides a summary of the Status of Actions from the previous reporting year (Jan. 1, 2024, to Dec. 31, 2024).

Table 4: Summary of Status of Actions from Previous Reporting Year (2024).

Summary of Effort/Project	Description	Status of Actions from 2024
SWM Pond Cleanout and Repairs	Liner repairs were largely completed at the CME 1-2 stormwater management pond in 2024 with outstanding items and deficiency corrections expected in 2025.	Despite efforts, some deficiencies remain and work is ongoing.
Pumping Station Upgrades	Upgrades to the Cannifton Road stormwater pumping station, including the replacement of pumps, floats, controls and generator commenced in August 2024.	Upgrades completed in 2025. Prior to the City assuming the facility, contractor performed commissioning of all equipment to ensure it operated as designed.

Summary of Effort/Project	Description	Status of Actions from 2024
OGS to minimize impact of spills	In 2024, leaked fuel from a spill entered a catch basin on private property connected to a storm sewer. The fuel eventually made its way to a Provincially Significant Wetland. The City engaged a consultant to design an oil/grit separator to protect the wetland from future spills.	The contract was issued in 2025 with installation to take place in 2026.

9. Summary and Conclusions

Overall, the stormwater management system is operating effectively, supported by ongoing monitoring, regular inspections, maintenance activities, and planned upgrades. Continued improvements are anticipated as implementation of the CLI-ECA progresses.

10. References

[1] “Environmental Compliance Approval For a Municipal Stormwater Management System: ECA No. 151-S701, Issue 5.” Ontario Ministry of the Environment, Conservation and Parks, Dec. 19, 2025.

[2] “Municipal Consolidated Linear Infrastructure Environmental Compliance Approvals.” Ontario Ministry of the Environment, Conservation and Parks, Sep. 24, 2024. Accessed: Apr. 21, 2026. [Online]. Available: https://www.ontario.ca/page/municipal-consolidated-linear-infrastructure-environmental-compliance-approvals

[3] "Water management: policies, guidelines, provincial water quality objectives." Ontario Ministry of the Environment, Conservation and Parks, Aug. 16, 2021. Accessed: Apr. 21, 2026. [Online]. Available: https://www.ontario.ca/page/water-management-policies-guidelines-provincial-water-quality-objectives