

Belleville Sewage Collection System

2024 Annual Report



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1. Introduction

The City of Belleville’s Consolidated Linear Infrastructure (CLI) Environmental Compliance Approval (ECA) for the Belleville Sewage Collection System lays out reporting requirements including an annual performance report submitted to the MECP by March 31st each year [1]. The CLI-ECA is administered by Ontario’s Ministry of the Environment, Conservation and Parks (MECP). It is issued under the Environmental Protection Act to fulfill requirements of the Ontario Water Resources Act [2]. It is the City’s permission and set of conditions for operating, maintaining, and altering the sewage collection system in Belleville. This report has been created to satisfy the requirement in Schedule E, section 4 of the CLI-ECA and will be made available to the public on the City’s website.

2. Background Information

The Belleville Sewage Collection System is a Class III wastewater facility. The system is owned and operated by the Corporation of the City of Belleville and consists of approximately 225 km of sewers and 13 sewage pumping stations. Two of these pumping stations are operated on the City’s behalf by the Ontario Clean Water Agency (OCWA) and are reported on by OCWA in a separate annual report submitted to the MECP. The entire system drains to the Belleville Water Pollution Control Plant, operated under ECA # 1053-CX4QPN, which provides secondary treatment and disinfection prior to discharge.

Table 1: System Information

CLI-ECA Number	151-W601
System Owner	The Corporation of the City of Belleville
Certificate of Classification [3]	1459
Facility Class [3]	III

The sewage pumping stations (SPS) in the sanitary system are:

- West Moira SPS
- Forest Hill SPS
- Symington SPS
- Moira Lea SPS
- Millennium SPS
- Sherwood SPS
- Bridge Street West SPS
- Avonlough SPS
- College Street East SPS
- Cascade SPS
- Cannifton Road Small Bore System
- Dundas/Palmer SPS (OCWA)
- Front Street SPS (OCWA)

3. Monitoring and Analysis

Schedule E, Section 4.6.3 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 conclusions drawn from this about the need for future modifications to the system or operations.

Currently, there are few requirements for monitoring in the sewage collection system. 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 4.6.4 and 4.6.5 of the CLI-ECA requires that the annual report include a summary of operating issues and corrective actions taken, as well as calibration, maintenance and repairs carried out on parts of the system.

Operations can be generally considered as split between sewage pumping stations and sanitary mains.

4.1. Sewage Pumping Stations

Sewage pumping station (SPS) maintenance is conducted on a scheduled basis and in response to alarms or noted deficiencies.

4.1.1. Operating Issues and Corrective Actions

Each SPS is monitored continuously for alarms and operators are notified when there is an issue. Operators check for and troubleshoot or repair issues when responding to alarms and while conducting regularly scheduled checks.

In 2024, there were 34 alarm calls for pumping stations and 20 regularly scheduled checks that resulted in corrective actions. The majority of alarm calls were simple, requiring an inspection of the station, minor adjustment, and alarm reset. This includes various power failures and level alarms requiring a reset. Events from alarm responses or from regularly scheduled checks, that required a corrective action to resolve, are described in Appendix 1.

4.1.2. Calibration, Maintenance and Repairs

Each pumping station is checked on at least a weekly basis. Operators complete checks and perform maintenance on pumps, floats, alarms, levels, and similar items. Flow meter calibration is conducted by a third-party contractor. Flow meter calibration was completed on June 13, 2024. Other maintenance and repairs are described in Appendix 1 and Section 6.

Larger maintenance projects are scheduled through the capital budget process and implemented through consultants and contractors. None were completed in 2024.

4.2. Sanitary Mains

Sanitary mains and appurtenances are maintained both on a scheduled basis and in response to customer requests and complaints.

4.2.1. *Operating Issues and Corrective Actions*

There were no significant operating issues for sanitary mains in 2024. Staff responded to 217 customer requests related to service laterals. These requests are normally received from customers concerned about a backup or unusual odours, and result in investigation by staff. Where possible, the lateral is rodded to restore flow. When this is not possible, or there is damage, then repair or replacement is scheduled. Occasionally the issue can be related to a blockage in the sanitary main, in which case operators flush the main to reinstate the flow.

4.2.2. *Calibration, Maintenance and Repairs*

Handheld analysis equipment is calibrated by staff as recommended by the manufacturer, or before each use. This includes a pH probe, and a dissolved oxygen probe. There are no flow meters or other equipment installed in sanitary sewer mains that require calibration.

Maintenance is both planned and unplanned. In 2024, this included:

- Repair and replacement of maintenance hole frames and covers.
- Annual sewer flushing program, covering approximately 25% of the sanitary system.
- Flushing blockages.
- Flushing known problem areas for blockages.
- Customer requests for lateral rodding and repair.
- CCTV video inspection of sanitary mains (see section 7.2.1).

5. Customer Feedback

Schedule E, section 4.6.6 of the CLI-ECA requires that the annual report include a summary of any complaints received related to the Sewage Works and steps taken to address them. Most customer service requests are received initially as odour complaints or sewage backup complaints. These are discussed in Section 4.2.1.

6. Alterations to the Authorized System

Schedule E, section 4.6.7 of the CLI-ECA requires that the annual report include a summary of all alterations to the Authorized System, including a list of alterations that pose a Significant Drinking Water Threat.

Three alterations were approved and completed in the sewage collection system in 2024. At Forest Hill SPS, existing compressor motors were replaced with new three-phase power motors to prevent surges and prolong the life of the motors. This was documented through a Form SS2. Two sanitary sewer extensions were placed into service that were authorized under this CLI ECA, as documented through Form SS1s.

There were no alterations to the system posing a Significant Drinking Water Threat in 2024.

7. Collection System Overflows and Mitigation

Schedule E, sections 4.6.8 and 4.6.9 of the CLI-ECA require that the annual report include a summary of all collection system overflows and spills of sewage, as well as efforts made to reduce overflows, spills, and bypasses.

7.1. Overflows and Spills of Sewage

There were no collection system overflows during the reporting period.

Sanitary maintenance holes within close proximity to one another surcharged during a storm event on July 31, 2024 resulting in a discharge of sewage from the structures. The spill was reported to the Spills Action Centre and the City’s Water Treatment Plant was also informed. Details of the spill event are captured in Table 2.

Table 2: Summary of Sewage Spill Event

Item	Details
Volume	Approx. 308 m ³ (James St.), approx. 60 m ³ (Mary St.)
Duration	190 minutes
Sample Results	Biochemical oxygen demand (BOD): 14 mg/L Total suspended solids (TSS): 138 mg/L Total phosphorus (TP): 1.11 mg/L Total Kjeldahl nitrogen (TKN): 5.9 N mg/L E. Coli: No Data: Overgrown with E. coli
Disinfection, if any	No disinfection. Catch basins were vacuumed and roads were swept.
Adverse impact(s) and corrective action(s), if any	No adverse impacts noted

7.2. Efforts to Reduce Overflows, Bypasses, and Spills

7.2.1. Completed and Planned Projects

In 2024, approximately \$130,000 was allocated to assess the condition of 8 kilometers (approximately 4%) of the sanitary sewer system through CCTV inspections. In 2025, approximately \$300,000 has been allocated for planned CCTV inspections to assess the condition of an additional 15 kilometers (approximately 7%) of the sanitary sewer system. Inspection results will be incorporated into asset management planning and help inform where to direct capital spending on sewer rehabilitation and replacement projects in future years. It is expected that this work can help reduce bypass volumes at the Belleville Water Pollution Control Plant by identifying possible inflow/infiltration areas.

Also completed in 2024 was a targeted inflow and infiltration investigation of approximately 9% of the Dundas/Palmer Sewage Pumping Station catchment area. Through the study a remedial

action plan was developed with solutions to aid in the reduction of unwanted inflow and infiltration. The remedial action plan recommendations will be considered for future implementation. As a result of the success of this study consideration will be given to development of a future annual inflow and infiltration program. This could aid in identifying other inflow and infiltration problem areas throughout the City's sanitary sewer collection system that can be targeted to help reduce overflows, bypasses, and spills.

The 2024 and 2025 capital budget allocation for wastewater main structural relining is \$3 million, with work expected in 2025. The relining program is intended to rehabilitate pipes before they fail, extend their anticipated useful service life by 50 years and reduce infiltration. The areas proposed for relining have been selected based on the City's Asset Management Plan and condition data obtained from annual CCTV video inspections.

In 2024, Murney Street was reconstructed, which resulted in the elimination of approximately 220 metres of a combined sewer. The cost for the work to eliminate the combined sewer by installing a new storm sewer and appurtenances was approximately \$180,000. A further \$175,000 has been allocated for design work associated with the Isabel Street reconstruction project which will result in the elimination of approximately 150 metres of a combined sewer. The combined sewer, which conveys both storm water and sanitary sewage in the same pipe, will be replaced with new separate storm and sanitary sewers reducing the risk of overflows during wet weather events.

7.2.2. Details of the Establishment and Maintenance of a PPCP

Budget was approved for assistance in the implementation of the stormwater and sanitary sewer CLI-ECAs. One of the intended outcomes of the project, which is expected to conclude in 2026, is to update the PPCP in accordance with Schedule E, Section 8.2.2 of the CLI-ECA.

7.2.3. Conformance with Procedure F-5-1 and F-5-5

Conformance with Procedure F-5-1 and F-5-5 will be assessed through the City's ongoing CLI-ECA implementation project. This report is due in 2025.

7.2.4. Public Reporting

Work to reduce overflows, bypasses and spills is normally reported to the public through council meetings and the published minutes of these meetings as budgets are approved and contracts are awarded.

8. Summary and Conclusions

In 2024, staff successfully responded to a variety of operational issues at sewage pumping stations and in the collection system to prevent negative impacts to people, property, and the environment. This included over 200 customer service calls to rod and repair sewer services, and over 30 responses to pumping station alarms. Overall, the system operates effectively, and significant work is planned for the next several years to fully implement the requirements of the CLI-ECA.

9. References

- [1] “Environmental Compliance Approval For a Municipal Sewage Collection System, ECA Number: 151-W601, Issue Number: 4.” Ontario Ministry of the Environment, Conservation and Parks, Dec. 19, 2024.
- [2] “Municipal Consolidated Linear Infrastructure Environmental Compliance Approvals.” Ontario Ministry of the Environment, Conservation and Parks, Sep. 24, 2024. Accessed: Mar. 13, 2025. [Online]. Available: <https://www.ontario.ca/page/municipal-consolidated-linear-infrastructure-environmental-compliance-approvals>
- [3] “Certificate of Classification, Belleville Wastewater Collection, Certificate Number 1459.” Ontario Ministry of the Environment, Conservation and Parks, May 01, 2013.
- [4] “Analysis and Selection of Wastewater Flowrates and Constituent Loadings,” in *Wastewater Engineering Treatment and Reuse*, 4th ed., Metcalf & Eddy Inc., McGraw Hill, 2003, p. 1819.

Appendix 1 Sewage Pumping Station Operating Issues and Corrective Actions

Date	Sewage Pumping Station	Issue	Corrective Action
1/17/2024	Forest Hill	Breaker tripped for #2 motor and well not cycling.	Reset breaker and changed relay for electrode.
1/28/2024	Cannifton Small Bore System	High water alarm.	Plugged in submersible pump to help lower the water level.
1/31/2024	Bridge Street West	Alarm received for power failure.	Power restored, reset alarm.
2/6/2024	Symington	Electrode grounding out. System in failsafe mode.	Added grease control.
2/7/2024	Symington	Electrode grounding out. System in failsafe mode.	Cleaned/repositioned the grounding rod.
2/20/2024	Millennium	Fence damaged.	New fence post installed and fence to be repaired.
3/4/2024	Millennium	Faulty disconnect breaker on pump #1.	Disconnect breaker replaced by electrician.
3/4/2024	Forest Hill	Faulty contactor for pump #2. Motor #1 not working and needs to be replaced.	Contactor for pump #2 replaced.
3/7/2024	Symington	Audible air leak detected. Solenoid stuck in open position. Bad relay in the controller.	Relay replaced and tested station.
3/15/2024	Cascade	Low-level Alarm. Pump #1 running continuously.	Pump turned off until level back to normal. Pump turned back into auto position and operating normally.
3/17/2024	Cascade	Low-level Alarm. Pump #1 running continuously.	Pump turned off until level back to normal. Rags removed from floats and electrical cables. Pump turned back into auto position and operating normally.

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4/3/2024	Symington	Power failure alarm. Generator running.	Power restored.
4/3/2024	Moira Lea	Power failure alarm.	Power restored.
4/7/2024	Sherwood	Power failure alarm.	Checked wells/manholes and reset alarms.
4/26/2024	Sherwood	Faulty rad for generator.	Rad replaced and generator tested.
5/7/2024	Forest Hill	Motor #1 not working.	Replacing motor and controls.
5/8/2024	Forest Hill	Motor #1 not working.	Motor and controls replaced.
5/28/2024	Cascade	Low level alarm.	Pump 1 running. Shut off pump and station filled up. Pump 1 shut off once reached assigned level.
5/29/2024	Cascade	Battery on generator is dead.	Battery replaced. Tested and ran generator.
6/4/2024	Cascade	Faulty sensor in wet well.	New sensor installed.
6/5/2024	Cascade	Faulty floats.	Floats replaced with multiranger and pressure transmitter.
6/10/2024	Symington	Power failure alarm.	Alarm reset.
6/10/2024	Forest Hill	Power failure alarm.	Alarm reset.
6/10/2024	College Street East	Power failure alarm.	Generator running.
7/3/2024	West Moira	Power failure alarm.	Alarm reset.
7/3/2024	Sherwood	Power failure alarm.	Alarm reset.
7/3/2024	Millennium	Pump failure alarm.	Pump restore. Both pumps operating.
7/10/2024	Avonlough	Power failure alarm.	Power restored.
7/20/2024	Millennium	7 pump fails reported and 9 low level alarms.	Well checked. Wiped off transducer. Pumps checked and alarms reset.
7/22/2024	Millennium	Faulty low level lock- out float.	Float replaced.
8/2/2024	Moira Lea	Low level alarm. Pumps not running, breaker tripped. Loose lug on one phase of breaker.	Electrician tightened loose lug.
8/11/2024	West Moira	Power failure alarm.	Alarm reset.

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8/11/2024	Sherwood	Power failure alarm.	Generator fuel checked. Well level and pumps checked. Alarm reset.
8/17/2024	Avonlough	Power failure alarm.	Generator checked. Well checked. Alarm reset.
8/31/2024	Moira Lea	Power failure alarm.	Station checked, alarms reset.
8/31/2024	Millennium	Power failure alarm.	Station checked, alarms reset.
9/16/2024	Millennium	Pump fail and low level issues.	Changed Multiranger.
9/18/2024	Millennium	High level and pump fail alarm.	Transducer replaced. Readings and station back to normal.
9/23/2024	Millennium	Level control malfunctioning.	Temporary level control installed.
9/25/2024	Avonlough	Pole light malfunctioning.	New GFI installed on outside pole light, in working condition.
9/25/2024	Moira Lea	Faulty floats.	New multiranger and pressure sensor transducer installed.
10/1/2024	Forest Hill	Communication error alarm.	Reset alarm.
10/1/2024	Millennium	Pump and power fail alarms. Power fault in pump #1.	Pump #1 isolated and turned off.
10/2/2024	Millennium	Faulty contactor for pump 2.	Contactor replaced.
10/9/2024	Avonlough	Power failure alarm.	Alarm reset.
10/13/2024	Bridge Street West	Power failure alarm.	Pumps checked on hand reset to auto. Alarm reset.
10/13/2024	Bridge Street West	Power failure, generator run and low level alarm.	Alarm reset.
10/13/2024	Bridge Street West	Power failure, generator run and low level alarm.	Pumps checked on hand reset to auto. Alarm reset.
10/15/2024	Millennium	Pump #1 not operational.	New sulzer pump installed to replace Pump #1.
11/5/2024	Bridge Street West	Power failure alarm.	Station restored.
12/11/2024	West Moira	Power failure alarm.	Alarm reset.
12/11/2024	West Moira	Power failure alarm.	Alarm reset.

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12/12/2024	Sherwood	Communication error alarm.	Station inspected, in normal operation.
12/22/2024	Avonlough	Temperature alarm.	Alarm reset. Installed micro furnace to raise temperature.