



**City of Kingston Wastewater Collection System  
2023 ANNUAL REPORT**

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## 1 EXECUTIVE SUMMARY

The City of Kingston Wastewater Collection System operates under Ministry of the Environment, Conservation and Parks (MECP), Consolidated Linear Infrastructure Environmental Compliance Approval (CLI ECA) number 018-W601.

In October 2022 the above mentioned CLI ECA was approved by the MECP. Utilities Kingston requested an approval for surrogate sampling in March 2023, which was approved. The CLI ECA is a new format for collection system ECAs and is a single approval for all the components of the sewage works in The City of Kingston's sewage collection system. The approval of the CLI ECA included the revocation of all previous ECA's for the collection system infrastructure.

Previously a report was prepared for several Pumping Stations as required by their individual ECAs. This report is the first annual report for the entire City of Kingston Wastewater Collection System.

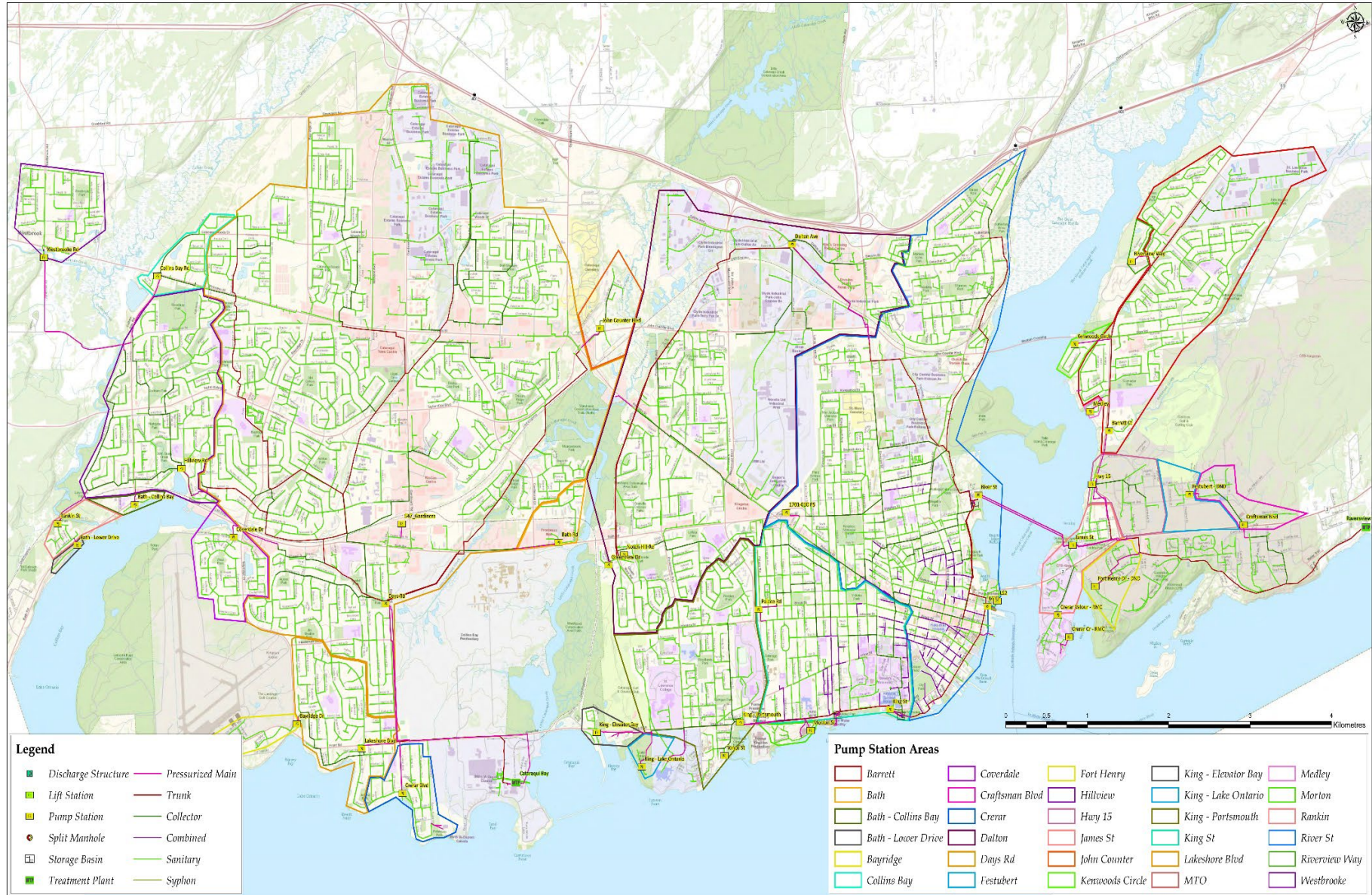
In 2023 the West Collection system received and moved 10,478,205 m<sup>3</sup> of wastewater to the Cataraqui Bay Wastewater Treatment Plant (WWTP). The Central and East Collection system received and moved 22,375,448 m<sup>3</sup> of wastewater to the Ravensview WWTP. The Cana Collection system received and moved 22,841 m<sup>3</sup> of wastewater to the Cana WWTP.

The collection system had several wet weather overflow events which totaled 6,134.82 m<sup>3</sup>. The collection system had four spills to the environment from pumping stations due to equipment malfunctions totaling 904.4 m<sup>3</sup>. The overflow and spill locations are listed in Tables 1 and 2 respectively.

## 2 SYSTEM DESCRIPTION

The City of Kingston Wastewater Collection System collects and transmits sewage to 1 of 3 WWTPs, depending on the pump station area. The collection system consists of 474.0km of gravity sewers (including 42.8km of trunk sewers, 50.7km of collector sewers and 381.0km of local sewers) and includes 18km of combined sewers but excludes the approximately 38,384 active service laterals to the property line. The collection system also contains 29 sewage pumping stations (PS), 3 combined sewer overflow tanks, 6 combined sewage retention tanks, and 29.0km of forcemains, with final discharge into one of 3 wastewater treatment plants including Ravensview, Cataraqui Bay, and Cana.

Figure 1 – City of Kingston Collection System Major Infrastructure



**DOCUMENT:**

City of Kingston Wastewater Collection System Annual Report

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### 3 OPERATION

Adequate staffing as well as preventative maintenance and regular equipment inspections allowed operational problems to be diagnosed quickly and corrective actions to be taken immediately. Non flushable materials such as wipes, and grease continue to be more prominent in the sewer system resulting in some operational and maintenance challenges. Utilities Kingston continues to implement a public education program to help customers become more aware of what materials should not be flushed down the sewers. This program has included radio and newspaper campaigns, social media campaigns such as Twitter and Facebook, bill stuffers, information on back of parking tickets, and bus information signs. This has been an ongoing campaign for many years with positive results. During the summer of 2023 staff worked to educate owners of grease traps within our system on how to properly maintain their equipment. Pamphlets describing the importance of appropriate grease trap maintenance and how it impacts our system were delivered to many restaurants across the city.

Staff encountered operational problems at several pumping stations across the system that were a result of grease build up. These problems ranged from instruments becoming plugged to floats being caught up in the grease. Third party contractors were brought in several times throughout the year to clean wet wells and remove the grease and other non-flushable items as required. There were several power related problems at several stations, some of which caused spills to the environment. Staff adjusted alarms and replaced generator testing equipment as a response to these spills. Collins Bay Road Sewage Pump Station has had ongoing issues with infiltration and excessive gravel accumulation in the wet well. Staff are working to collect CCTV footage and complete spot checks to locate the source of the large increase in flow during wet weather events.

### 4 SYSTEM FLOWS

The City of Kingston wastewater collection system transported 32,853,653 m<sup>3</sup> of sewage to the Ravensview and Cataraqui Bay WWTPs. The Cana system collected and transported 22,841 m<sup>3</sup> of sewage to the Cana WWTP. The concentration of the raw influent into the three WWTP's increases as the volume of flow decreases. The flow into each plant also increases as the number of wet weather events increase. The increased flow during the wet season, as well as the differences in concentrations that correlate to changes in volumes indicates there is likely ground water infiltration or illegal sump connections in the systems.

### 5 BYPASS & OVERFLOW SUMMARY

The collection system had several wet weather overflow events which totaled 6,134.82 m<sup>3</sup> for 2023. The surrogate loading rates from these overflow events are listed in Table 3. There were 4 spills to the environment from the collection system at Pumping Stations totaling 904.4 m<sup>3</sup>. The loading rates for the spills are in Table 4. The overflow locations are listed in Table 1. None of the collection system overflows or spills were disinfected, and no adverse impacts were noted. Staff, and third-party contractors checked for, and cleaned up any debris, and garbage after each event. The number of overflows, and the volume of overflows was dramatically reduced in 2023 compared to 2022. This year Utilities Kingston completed the separation of storm and sanitary sewers on Gore St. and removed PCP#24. The rainfall events in 2023 were much less severe than in 2022, and that coupled with the efforts to separate storm and sanitary sewers has led to the reduced overflow volumes. Utilities Kingston released and maintains a real-time overflow map in 2017. This map displays overflow locations and lets you know if an overflow has occurred within the past 48 hours.

## 6 OVERFLOW REDUCTION EFFORTS

The City of Kingston and Utilities Kingston have been working to reduce the number of combined sewers, both sanitary and storm water in the same pipe, within the collection system. As described above, the Gore St. project was completed in 2023 with a construction cost of \$713,028.62. Another two large, combined sewer separation projects are to be started in 2024 and 2025 respectively. The 2024 project is to include combined sewer separation of: two blocks of Victoria St., one block of Earl St., one block of Collingwood St., one block of Couper St., and two blocks of Union St. The estimated budget forecast for the 2024 construction is \$1.93 million. These projects will lead to reduced overflows of the collection system in wet weather events.

## 7 POLLUTION PREVENTION CONTROL PROGRAM

The Utilities Kingston Pollution Prevention and Control Plan (PPCP) was developed in 2017 and is set to be updated in 2025. The PPCP focuses on combined sewer separation to reduce the number of overflows from our facilities in the future. As discussed above, the Gore St. project was completed in 2023, which removed an overflow point that historically has been the source of many overflows. There were no specific timelines produced for the 2017 version of the PPCP. The City of Kingston and Utilities Kingston remain dedicated to completing sewer separations within our collection system in preparation for future population growth.

Utilities Kingston is working to meet the objectives set out in procedures F-5-1, and F-5-5, which describe the treatment requirements for municipal sanitary, and combined sewage systems. The City of Kingston Wastewater Collection System meets all of the minimum controls required by these procedures. Many projects have been completed bringing our system closer to meeting all of the objectives. These projects have reduced the frequency, and quantity of system overflows over the past several years. The proposed future combined sewer separation projects, and targeted sanitary sewer upgrades will continue to bring our systems closer to meeting the objectives set out in these procedures.

## 8 CALIBRATIONS

Many of the pumping stations have flow meters installed which helps to investigate inflow and infiltration, as well as any operational problems that may occur. Third party contractors calibrated all facility flow meters. One flow meter in the collection system failed the calibration and will need to be replaced in 2024. Calibration records are available upon request.

## 9 MAINTENANCE

Staff continue to use our preventative maintenance program in accordance with manufacturer's recommendations.

### **Additional Maintenance completed this year:**

- Infrared scans of high voltage electrical was performed at Pumping Stations throughout the City.
- Equipment and motors had routine vibration monitoring conducted.
- The air relief valve at Bath Rd. PS failed and was rebuilt.
- The Bath-Collins Bay station had all check valves and isolation valves replaced.
- River St. PS had a pump rebuilt by the manufacturer.
- River St. PS bar screen maintenance to track and wheels.
- River St. PS Generator #2 service and maintenance completed.
- Overflow flap valve replaced on Morton St. PS overflow pipe to prevent lake water from entering station.

## 10 CAPITAL WORKS

The major highlights for capital works were:

- Significant progress was made on the construction of the new Days Rd. PS and decommissioning of the old station has begun.
- Westbrook PS had new level sensors and instrumentation installed.
- Crerar PS had a new flow meter installed.
- Palace Rd. PS had a new flow meter installed.

## 11 COMPLAINTS

In the 2023 reporting year, there were a number of complaints from residents regarding the system. There were nine (9) odour complaints connected to the new construction of the Days Road pumping station. These complaints spanned from June to October. The station was under the control of the contractor, constructing the new facility. However, Utilities Kingston operations staff investigated the complaints and inspected the odour control unit at the facility regularly to ensure it was functioning and being properly maintained. Additional filters have been purchased for the odour control unit at the facility, and staff continue to monitor the system.

There were seven (7) odour complaints regarding the collection system, these include sewage odours noted in residences and businesses. Staff responded and investigated all of these complaints. Responses to these complaints included, inspecting infrastructure upstream and downstream of the complaint, installing dishes in manholes to reduce the chance of sewer gasses being released, jetting and cleaning pipes, and inspecting lines with a camera.

Staff responded to fifty-one (51) complaints about lateral and main collection system backups. Operations staff worked with property owners and tenants at each site to locate and confirm the source of the backup. The majority of the sewer backups were caused by non-flushable materials, tree root growth, or deformed or degraded pipes. 17 of the 51 complaints were related to private infrastructure (i.e., the homeowner or business owner's sewer lateral on their property). Staff worked to relieve these backups using different methods. Crews rodded lines, performed camera work to identify and locate the issue, used jet trucks to clear blockages and to return the collection system to good working order. Operators also proactively flush known problem sewers, in order to maintain the integrity of the collection system.

For further information about this report or any questions regarding accessibility, contact Tim Bourne at [tbourne@utilitieskingston.com](mailto:tbourne@utilitieskingston.com) or call 613-546-1181 Ext 2190.



## 12 ANNUAL OVERFLOW SUMMARY

**Table 1 – Annual Overflow Summary**

<b>PCP #</b>	<b>Location</b>	<b>Number of Events</b>	<b>Volume (m3)</b>
1	Orchard-Emma Martin CSO	0	0.00
2	535 Rideau Belle Park Trunk	0	0.00
5	Dalton Ave PS	0	0.00
14	Barrack St E of King St	0	0.00
22	William St W of Ontario St	1	41.86
23	Earl St W of Ontario St	4	186.62
24	Gore St W of Ontario St	0	0.00
25	Lower Union W of Ontario St	3	396.65
26	West St S of King St	1	472.00
28	King St (O'Kill) PS	0	0.00
34	Helen St at Mack St	0	0.00
35	Palace Rd PS	0	0.00
41	Morton St PS	0	0.00
43	King-Portsmouth PS	0	0.00
48	West end of Sherwood Dr	0	0.00
50	South end of Parkway	0	0.00
51	Clarence St W of King St	1	450.16
52	Raglan Rd at Rideau St	1	161.45
53	Union St at Division St	1	0.02
55	King-George CSO	1	2507.80
56	King-Collingwood CSO	2	1166.63
57	Crerar PS	1	0.00
65	535 Rideau Belle Park Local	2	751.64
68	Quebec St at Barrie St	0	0.00
69	Greenview Dr PS	0	0.00
70	Carlisle St at Chestnut St	0	0.00
74	Barrett Court	0	0.00
79	Riverview Way PS	0	0.00
N/A	<b>Total</b>	<b>18</b>	<b>6134.82</b>

### 13 ANNUAL SPILL SUMMARY

**Table 2 – Annual Spill Summary**

PCP #	Location	Number of Events	Volume (m3)
1	Orchard-Emma Martin CSO	0	0.00
2	535 Rideau Belle Park Trunk	0	0.00
5	Dalton Ave PS	0	0.00
14	Barrack St E of King St	0	0.00
22	William St W of Ontario St	0	0.00
23	Earl St W of Ontario St	0	0.00
24	Gore St W of Ontario St	0	0.00
25	Lower Union W of Ontario St	0	0.00
26	West St S of King St	0	0.00
28	King St (O'Kill) PS	0	0.00
34	Helen St at Mack St	0	0.00
35	Palace Rd PS	0	0.00
41	Morton St PS	0	0.00
43	King-Portsmouth PS	1	574.00
48	West end of Sherwood Dr	0	0.00
50	South end of Parkway	0	0.00
51	Clarence St W of King St	0	0.00
52	Raglan Rd at Rideau St	0	0.00
53	Union St at Division St	0	0.00
55	King-George CSO	0	0.00
56	King-Collingwood CSO	0	0.00
57	Crerar PS	1	242.20
65	535 Rideau Belle Park Local	0	0.00
68	Quebec St at Barrie St	0	0.00
69	Greenview Dr PS	0	0.00
70	Carlisle St at Chestnut St	0	0.00
74	Barrett Court	3	88.20
76	Ravensview Wastewater Treatment Plant	0	0.00
79	Riverview Way PS	0	0.00
N/A	Total	5	904.40

### 14 OVERFLOW LOADING RATE

**Table 3 – Overflow Loading Rate**

Date	Location	Duration	Volume (m3)	BOD (kg)	TP (kg)	TSS (kg)	TKN (kg)	E.Coli
August 10 2023	PCP 23 Earl St	0:05	0.34	0.02	0.00	0.02	0.00	189,236
August 7 2023	PCP 26 West St	0:30	472.00	29.74	0.36	29.26	2.50	189,236
August 7 2023	PCP 65 Rideau Belle Park	0:40	685.49	43.19	0.53	42.50	3.63	189,236
August 7 2023	PCP 53 Union St	0:15	0.02	0.00	0.00	0.00	0.00	189,236
August 7 2023	PCP 52 Raglan Rd	0:40	161.45	10.17	0.12	10.01	0.86	189,236
August 7 2023	PCP 51 Clarence St	0:40	450.16	28.36	0.35	27.91	2.39	189,236
August 7 2023	PCP 25 Lower Union	0:55	348.74	21.97	0.27	21.62	1.85	189,236
August 7 2023	PCP 23 Earl St	0:40	181.46	11.43	0.14	11.25	0.96	189,236
August 7 2023	PCP 22 William St	0:25	41.86	2.64	0.03	2.60	0.22	189,236
August 3 2023	PCP 65 Rideau Belle Park	0:15	66.15	4.17	0.05	4.10	0.35	189,236
July 27 2023	PCP 25 Lower Union	2:00	24.91	1.57	0.02	1.54	0.13	189,236
July 27 2023	PCP 23 Earl St	0:10	0.82	0.05	0.00	0.05	0.00	189,236
April 5 2023	PCP 25 Lower Union	0:10	23.00	1.45	0.02	1.43	0.12	189,236
April 5 2023	PCP 23 Earl St	0:10	4.00	0.25	0.00	0.25	0.02	189,236

## 15 SPILL LOADING RATES

Table 4 – Spill Loading Rates

Date	Location	Duration	Volume (m3)	BOD (kg)	TP (kg)	TSS (kg)	TKN (kg)
February 22 2023	PCP 74 Barrett Ct	0:25	47	0.00	0.00	0.00	0.00
June 3 2023	PCP 74 Barrett Ct	0:20	25.5	2.32	0.14	4.08	2.08
April 10 2023	PCP 43 Portsmouth Ave	2:30	574	3.88	0.27	10.66	2.40
April 30 2023	PCP 57 Crerar Blvd	15:35	242.2	1.70	1.09	6.66	N/A
June 3 2023	PCP 74 Barrett Ct	0:20	25.5	2.32	0.14	4.08	2.08
December 27 2023	PCP 74 Barrett Ct	0:15	15.7	3.08	0.13	6.44	0.99