



Subject: Update on Inflow and Infiltration Activities
To: Council
From: Public Works Department

Report Number: 2022-65

Meeting Date: April 12, 2022

Recommendation:

That Public Works Department Report 2022-65 be received for information.

Purpose:

This report has been prepared, as requested, to provide Council with an update of the activities that have been taken to address inflow and infiltration (I&I) into the City's wastewater collection system to-date.

Background:

At a special meeting on February 17, 2021, Barbara Robinson from Norton Engineering provided a presentation entitled "Inflow and Infiltration in Sanitary Sewers". The purpose of the presentation was to provide an educational opportunity for Council and to help explain the impact of inflow and infiltration (I&I) on the City's wastewater flows to the Region's wastewater treatment plant. I&I is otherwise clean storm water or groundwater that gets into the sanitary system. I&I enters the sanitary sewer through a variety of pathways, some intentional, some not:

- Infiltration of groundwater through cracks, unsealed pipe joints and other defects in the underground pipe network, including the sewer mains, manholes and sewer laterals (sewer laterals are the private-side pipes that connect to the sewer main)
- Inflow of water from inadvertent cross-connections with the storm sewer system or from surface drainage in through manhole lids
- Inflow of water from private-side sources including rooftop drainage (downspouts) and foundation drainage (connected weeping tile or sump pumps)

Rainfall and lake levels have a direct impact on the amount of I&I that enters the wastewater collection system each year. In 2019 and 2020, very high lake levels

contributed to some of the highest wastewater volumes ever being received at the Region's wastewater treatment facility. This has directly impacted the City's Water/Wastewater budget and rates.

Discussion:

Since Ms. Robinson's presentation in February 2021, staff have been actively seeking ways to identify and reduce the amount of I&I entering the wastewater collection system and ensure that there is funding available to assist in these efforts. Below is a summary of the activities undertaken to-date, and the status of those activities.

Completed:

- Refinement of the Urban Stormwater Boundary and Municipal Drains within the urban area to ensure properties are correctly billed the annual stormwater fee.
- Purchase of a GoPro camera and accessories and completion of maintenance hole inspection training with the Town of Fort Erie.
- Completion of approximately 200 maintenance hole inspections, identification of 20 deficiencies.
- Following the July 17th, 2021, rainfall event, City staff met with Region staff to discuss the surcharging in the system. An enhanced communication process was developed for when the Omer pumping station high level alarm is triggered in the Region's Supervisory Control and Data Acquisition (SCADA) system. When this occurs, City Operational staff can monitor the level of wastewater on Bartok Avenue and bypass pump, if necessary, to reduce the chances of basement flooding.
- CCTV inspection of the sanitary sewers in the following areas:
 - from Bartok, down Elm to the Omer pumping station – no obvious defects
 - First, Second, Third and Sheba – some defects identified, scheduled for repair
 - Janet Street – no obvious defects
- Rented a six-inch trash pump with a float system and installed at the Neff Street stormwater outfall to prevent flooding during storm events.
- Stormwater sewer design for the Clarke Area (designed in 2013).

In progress:

- Wastewater and Stormwater Infrastructure Needs Studies (INS) were started in December 2021 and are anticipated to be complete in June 2022. The INS will identify infrastructure gaps, and staff will field verify any areas noted by the consultant.
- Completion of the last CCTV inspection cycle (there are 5 inspection cycles, one completed annually) of the sanitary collection system (South of Main St W to Killaly St W, from the Canal to intersection of Hwy 3 and Killaly St W, Coronation Dr and Merritt Pkwy N and S, Queen St and Paul St).
- Submitted an application for Consolidated Linear Infrastructure Environmental Compliance Approvals (CLI-ECAs) for the sanitary collection system and the stormwater system, as required by the Ministry of Environment, Conservation and Parks. The City should receive the CLI-ECAs before the end of 2022.
- Ordered two 6" trash pumps – one for the Neff Street stormwater outfall and one for the Bartok area when bypass pumping is required (24–30-week delivery).
- Completion of door-to-door inspections of homes in the Omer area that were not inspected in 2010; disconnection of any identified connections that would be contributing flows during rainfall events area. Received \$110K in Wet Weather Funding from Niagara Region. Estimated project completion is October 2022.
- Transitioning on-road stormwater system responsibility from Roads to Water/Wastewater.
- Evaluation of remediation options for the Neff Street stormwater outfall.
- In the 2022 water/wastewater budget, Council approved water service and sewer lateral replacement grants. These grants could help not only reduce the inflow and infiltration into the sanitary collection system, but they can also help reduce water loss.
- Applied for \$350K in Wet Weather Funding from Niagara Region to complete the Clarke Area Inflow and Infiltration Reduction Program.
- Applied for a \$100,000 grant from the Intact Insurance Municipal Climate Resiliency Fund. If this grant is received, homeowners affected by the July 17th storm event will have the first opportunity to apply for the following:
 - Free Home Flood Protection Assessment (\$500 value)

- \$500 grant to complete upgrades identified in the assessment report to protect homes from sewage back up/flooding
 - \$500 grant to install or replace a back water valve.
- Applied for \$400K through the federal Disaster Mitigation and Adaptation Fund to remediate sanitary sewer assets (pipes and maintenance holes) in the Clarke area sewershed.

Future:

- Issue a request for proposal (RFP) to evaluate alternative stormwater management options and conduct a pilot study for some sites. Focused on an area within the Omer Area where 25 connections (i.e. sump pumps) were previously identified, however the storm system is not adequate to take the sump pump flows. Received \$110K in Wet Weather Funding from Niagara Region.
- Together with Niagara Region, issue a request for quotation to complete flow monitoring in the sanitary collection system, and an RFP to complete a Pollution Prevention Control Plan (PPCP) and sewer model for the sanitary collection system. Estimated completion in 2025. Received \$125K in Wet Weather Funding from Niagara Region.
- Together with the Town of Fort Erie, issue a tender for Smart Cover flow monitor devices. 12 units will be ordered, 10 will be portable and 2 will be permanently installed – one in the sanitary manhole on Bartok and one at the manhole on Omer just outside the Region's pumping station. The permanent locations will be set up to alarm, so City Staff won't have to rely on the Region for notification if Omer is surcharged. Staff will also collect important data that will help with understanding how surcharging at Omer affects the sanitary sewer system at Bartok. Portable units will be deployed in focus areas to help determine I&I rates and monitor the success of remediation programs.
- Issue a tender to complete mainline sewer repairs and manhole repairs in the Omer, Steele, Arena and Rosemount North pumping stations. Received \$90K in Wet Weather Funding from Niagara Region.
- Public awareness campaign about I&I will roll out to residents over the next few months. This is to educate homeowners about inflow and infiltration, how it negatively affects the sanitary sewers and what they can do to help the situation. Although individuals may not be directly affected, their actions could impact their neighbours, and inflow and infiltration directly impact the wastewater rates.

- Continue to collaborate with Niagara Region Wastewater group to identify focus areas within the sanitary collection system and help monitor success in reducing I&I.
 - Continue to investigate and apply for funding opportunities
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Financial Implications:

Any financial implications identified during the various studies that are being undertaken will be brought to Council during annual budget deliberations or within separate reports.

Public Engagement:

Various public education campaigns and notifications are part of the various I&I programs.

Strategic Plan Alignment:

The initiative contained within this report supports the following pillar(s) of the strategic plan:

- Service and Simplicity - Quality and Innovative Delivery of Customer Services
 - City-Wide Investments in Infrastructure and Recreational/Cultural Spaces
 - Governance: Communications, Engagement, and Decision-Making
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Conclusion:

Recognizing the impact inflow and infiltration has on the wastewater rates, staff have completed, initiated and/or planned many tasks in an effort to address and reduce I&I. Various funding avenues have also been utilized, and continue to be explored, in an effort to reduce the burden of these tasks and projects on ratepayers. Inflow and infiltration is a complex issue and, while results may not be immediately apparent, continued focus and monitoring over time will track the success of the efforts of this multipronged approach to I&I reduction.

Respectfully submitted,

Darlene Suddard
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Report Approval:

All reports reviewed and approved by the Department Director and the City Treasurer when relevant. Final review and approval by the Chief Administrative Officer.