



Staff Report

Operations

Report To: Special Committee of the Whole
Meeting Date: June 27, 2022
Report Number: CSOPS.22.059
Title: Inflow and Infiltration Reduction Strategy
Prepared by: Shawn Carey, Director of Operations

A. Recommendations

THAT Council receive Staff Report CSOPS.22.059, entitled "Inflow and Infiltration Reduction Strategy";

AND THAT Council direct Staff to develop an Inflow and Infiltration Residential Rebate Program and associated funding source.

B. Overview

Staff have developed a framework for a comprehensive assessment aimed at reducing inflow and infiltration (I&I) which enters the Town's wastewater collection system. The proposed Inflow and Infiltration Reduction Strategy focuses on 5 key components to ensure continuous improvement and effective implementation.

C. Background

What is Inflow & Infiltration?

The Town's sewer system is comprised of two parts: storm sewers and sanitary sewers. Storm sewers collect stormwater such as excess water from rainfall, snowmelt or run off and properly manage it before discharging it to lakes and streams. Sanitary sewers carry wastewater to treatment plants for processing before returning to the environment.

Inflow and infiltration is the term used when water that should be entering the storm sewer makes its way into a sanitary sewer. Inflow happens when stormwater enters the sewage system through sump pumps or downspouts still connected to the sewage system instead of the storm sewer. Infiltration happens when water or groundwater from beneath the earth's surface enters the sewage system through damage or defects such as holes and cracks in manholes and sewer pipes.

Why Focus on It?

Sanitary sewer systems are designed to carry wastewater from toilets, washing machines, sinks or showers in homes or businesses to wastewater treatment locations. When an excess of water enters the system, such as during a major rainstorm, it can cause the system to overload and sewage backups or overflows to occur.

Inflow and infiltration is costly because overflows can back up into basements of homes and businesses, into roads and the natural environment. I&I also puts a strain on the entire wastewater system. Treatment facilities must treat a higher volume of water flow, resulting in increased operating, maintenance and capital expenses. I&I also takes up valuable capacity at facilities requiring costly system upgrades sooner if the problem continues.

Inflow and infiltration is an issue because it reduces the capacity of the sewage system leaving less water for existing residents and future population growth. It can also make sewage treatment less efficient as the sewage is diluted by water. This may increase the cost to residents because sewage treatment plants will then be required to treat a higher volume of flow. Inflow and infiltration may also cause sewage overflows and backups.

Managing stormwater is a large concern for municipalities especially as extreme rainfall events continue to become more frequent and intense and mid-winter snowmelts become more common place. Increased rainfall and significant wet weather events can be taxing on a municipal sanitary sewage collection system and its ability to effectively pump, store and treat wastewater. The impacts of this increased rainfall are compounded by the fact that many residents have downspouts or sump pump/floor drains that are illegally connected to the sanitary system. These systems discharge directly into the wastewater collection system and can cause sewage back up during extreme rainfall or wet weather events.

In response to these changing conditions and the need to find solutions to addressing inflow and infiltration, the Town is undertaking a number of capital projects designed to reduce and fix leaky infrastructure. In addition, Staff are in the process of developing an Inflow and Infiltration Reduction Strategy that will include specific measure to address this issue. A vital component of the Strategy will be the inclusion of a proposed program that provides rebates to qualifying Town residents for disconnecting illegal downspouts, sump pumps and foundation connects to the sanitary sewer connection. The proposed program would cover a percentage of the costs associated with the disconnection. This will help residents protect their home from potential back-ups and reduce impacts to the Town's wastewater infrastructure.

Further information on Inflow and Infiltration can be found on the Town's website at

www.thebluemountains.ca/resident-services/water-sewer-services/inflow-infiltration

D. Analysis

Staff have developed a high level I&I Reduction Strategy to guide the Town's actions and next steps towards addressing the issue across a number of departments. The 5 components of the Strategy are discussed below and in further detail in Attachment 1.

Information Gathering

A key component is understanding what information we currently have, how to collection new data, identifying gaps and where to store it. The Town has undertaken studies in the past such as the 2014 Inflow and Infiltration Study, a 2019 Needs Assessment and new sanitary model that identified locations with high I&I rates and provided remediation strategies to address them. This information is extremely useful and serves as an excellent baseline to move forward from. The proposed I&I Reduction Strategy will utilize this information to inform capital projects and focus efforts on private plumbing locations.

The Town is also in the process of establishing an I&I Flow Monitoring Program and has recently initiated the Town wide Wastewater Collection Master Plan which will provide vital information to help focus our efforts. In addition, Staff have recently installed 5 weather stations at key locations throughout the wastewater collection system to improve our understanding of the relationship between wet weather / rainfall events and wastewater flow.

Staff across a number of departments will be trained on how to identify I&I sources both on private and town-owned infrastructure including the creation of a GIS database where this information will be stored and tracked. This will assist staff in focusing our education and compliance efforts and in monitoring and reporting progress.

Standards

There are a number of new and innovative practices being undertaken by other jurisdictions that are being included as requirements and standards when designing and constructing sanitary systems. Staff will be including a number of new requirements in the updated Engineering Standards to address construction techniques, materials and testing. In addition, staff will be including a focused I&I Strategy for all new capital infrastructure projects that involve sanitary systems including field testing requirements, etc.

Education and Compliance

Public involvement and understanding the effects of I&I is vital to the success of the program. Town staff will be working with various property owners to understand what an illegal connection is, help identify these types of connections, why it is important to them as homeowners to fix the issue/s and, what they can do to resolve the illegal connections. Continued involvement and collaboration with property owners will be required to ensure the strategy is a success. A number of deliverables including training of Town staff is including in Attachment 1.

Execution

Key to success of the proposed strategy is shifting from a “Plan to Plan” philosophy to a “Plan to Execute” mindset. Attachment 1 provides a detailed project schedule for each of the 5 components of the strategy. Work has commenced in 2022 and staff have developed specific targets relative to each.

Annual Monitoring & Reporting

Staff are proposing an Annual I&I Reduction Report to be provided to Council and posted to the Town’s I&I website. The intent of the report is to provide updates on actions taken, progress in reduction, opportunities and challenges, and the key areas of focus for the following fiscal year.

The I&I Reduction Strategy will use an adaptive management approach meaning that as new information becomes available staff will make the necessary adjustments and integrate them into the strategy. This will be an evolving strategy with a focus on continuous improvement. It is important to emphasize that I&I rates will never equal zero and that a continued focus will be required. However, we need to improve our efforts to reduce I&I to an acceptable level based on industry standards and best practices.

Next Steps

Inflow & Infiltration Residential Rebate Program

Severe rain events can overwhelm the Town’s wastewater systems, especially in older neighborhoods where the systems were not designed and constructed up to today’s standards. To further protect properties and Town infrastructure, Staff are recommending the creation and implementation of an Inflow & Infiltration Residential Rebate Program. The program would offer financial support for property owners to make certain improvements to their private plumbing system to help prevent basement flooding and to reduce the extraneous inflow to the Town’s wastewater collection and treatment system. A number of municipalities have rebate programs they offer to their residents to help incentivize reduction strategies.

The rebate program would assist homeowners to comply with the Sewer Use Bylaw and would include a number of eligible protection measures and associated rebate rates, an application process (including a retroactive rebate), and funding source.

With Council direction, Staff will bring forward a future report to outline the details of the program.

E. Strategic Priorities

1. Communication and Engagement

We will enhance communications and engagement between Town Staff, Town residents and stakeholders

2. Organizational Excellence

We will continually seek out ways to improve the internal organization of Town Staff and the management of Town assets.

3. Community

We will protect and enhance the community feel and the character of the Town, while ensuring the responsible use of resources and restoration of nature.

4. Quality of Life

We will foster a high quality of life for full-time and part-time residents of all ages and stages, while welcoming visitors.

F. Environmental Impacts

A reduction in I&I will reduce: the need for additional treatment at the wastewater treatment facilities; power consumption needs at sanitary collection and treatment facilities; reduce the volume of effluent that is discharged to the receiving waterbody; and, the potential for sewage backups and overflows.

G. Financial Impacts

The I&I Reduction Strategy is currently being funded and implemented by various approved studies and capital projects. Based on Council direction, staff will bring forward a future Staff Report with details and recommendations on the proposed I&I Resident Rebate Program.

H. In Consultation With

Sam Dinsmore, Deputy Treasurer/Manager of Accounting & Budgets

Tim Murawsky, Manager of Building Services & Chief Building Official

Brent Rolufs, Manager of Capital Projects

Allison Kershaw, Manager of Water & Wastewater Services

I. Public Engagement

The topic of this Staff Report has not been the subject of a Public Meeting and/or a Public Information Centre as neither a Public Meeting nor a Public Information Centre are required. However, any comments regarding this report should be submitted to Shawn Carey, Director of Operations directorops@thebluemountains.ca.

J. Attached

1. Attachment 1 – Inflow and Infiltration Reduction Strategy Presentation

Respectfully submitted,

Shawn Carey
Director of Operations

For more information, please contact:
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Report Approval Details

Document Title:	CSOPS.22.059 Inflow and Infiltration Reduction Strategy.docx
Attachments:	- Attachment 1 Inflow and Infiltration Reduction Strategy Presentation.pdf
Final Approval Date:	Jun 16, 2022

This report and all of its attachments were approved and signed as outlined below:

Shawn Carey - Jun 16, 2022 - 4:06 PM