

# THE REGIONAL MUNICIPALITY OF YORK

Transportation and Works Committee  
June 17, 2009  
Report of the  
Commissioner of Environmental Services

## **A REGION-WIDE COMMITMENT TO ADDRESS INFLOW AND INFILTRATION AND CONSULTANT AWARD**

### **1. RECOMMENDATIONS**

It is recommended that:

1. Council endorse, in principle:
  - a) The York Region and Local Municipal Inflow and Infiltration Reduction Program goals.
  - b) Creation of standards for design, commissioning and inspection of sanitary sewer systems in new developments and for reconstruction.
  - c) Creation of a notification protocol to be implemented in case of large storms that could cause high inflow and infiltration.
2. The Regional Clerk forward a copy of this report to the Clerks of the nine local municipalities for Local Municipal Council endorsement.
3. Regional Council authorize retaining the consulting firm of AECOM Canada Ltd. to provide flow monitoring services not to exceed \$772,581.23, inclusive of GST for a period up to three years.

### **2. PURPOSE**

This report provides an update on the York Region and Local Municipal Inflow and Infiltration Reduction Program, and establishes goals and principles that will address both the long-term and short-term solutions to inflow and infiltration reduction. This report also seeks authorization to retain AECOM Canada Ltd. for continued flow monitoring. The purchasing by-law requires that proposals with a value greater than \$500,000 be awarded by Council.

The York Region and Local Municipal Inflow and Infiltration Reduction Program is a priority for York Region. Reduction of wet weather flows will help reduce operational costs and extend the life of the existing infrastructure.

### **3. BACKGROUND**

#### **York Region is committed to reducing existing and future inflow and infiltration entering our sanitary sewer collection and treatment systems**

York Region and all of the local municipalities have demonstrated a commitment to reducing inflow and infiltration in the sanitary sewers through the York Region and Local Municipal Inflow and Infiltration Reduction Program. York Region and local municipal staff have been meeting regularly over the past twelve months through a series of workshops to create and implement a results- oriented inflow and infiltration reduction program that fits the needs of all. Collaboration and communication are the cornerstones to the continued success of the program.

York Region is one of many Regional municipalities participating with the Ontario Municipal Benchmarking Initiative through the Water and Wastewater expert panel. York Region is also participating in the I-I Task Force with National Municipal Benchmarking Initiative.

### **4. ANALYSIS AND OPTIONS**

#### **Twelve months of data collection and analysis provide information needed to quantify and prioritize sites experiencing inflow and infiltration**

Since March 2008, over 120 flow meters and 26 rain gauges have been collecting data to locate and quantify the amount of inflow and infiltration entering the sanitary sewer system. The 120 areas covered represent approximately one third of local municipal systems in the Region. Staff from all local municipalities provided input to selecting preferred sites for the meters based on their first hand knowledge of their local sanitary sewer systems.

Wet weather during the summer of 2008 and large volumes of snow in the winter of 2008/09 provided a large amount of useful data for analysis. At least 16 significant rainfall events and three snow melt events have been captured and were used in the quantification of inflow and infiltration.

Findings from areas being monitored for an inflow and/or infiltration response to these wet weather events show that almost 50% of the sites have experienced significant responses to wet weather and snow melt with the breakdown of sites as follows:

- 36 areas (30%) have shown a high response and are classified as high priority.
- 22 areas (18%) have shown a medium response and are classified as medium priority.
- 63 areas (52%) have shown a low response and are classified as low priority.

Attachment 1 shows all of the areas that were monitored on local municipal sewer systems as well as the response to snow melt and wet weather events.

## Contract Award for Continued Flow Monitoring

In accordance with the Purchasing By-Law, a Request for Proposal (RFP) was issued and advertised nationally on biddingo.com. The scope of services identified in the RFP included continued flow monitoring at various locations throughout York Region for inflow and infiltration investigations and to support maintenance of the Region's wastewater hydraulic model.

The continued monitoring of wet weather events will help determine the success of the inflow and infiltration program as well as assist York Region and Local Municipalities with identifying strategies that will benefit the regional and local wastewater systems.

## Proposals were evaluated using the two envelope system

Four proposals were received and evaluated using the two envelope system with technical and financial information submitted in separate envelopes. Technical proposals were evaluated prior to any knowledge of financial information. Technical content was weighted at 70% since this project is mainly collection and review of data. Detailed data analysis will be performed under a separate existing contract for I-I program support. The Region's proposal evaluation team reviewed the four technical/management proposals based on the following criteria:

- Firm/project manager/key staff credentials, years of experience in project management and inflow/infiltration programs.
- Quality of references.
- Demonstrated understanding of Regional requirements.
- Ability to provide program efficiently and effectively.
- Quality of methodology and approach.
- Compliance with RFP.

The financial evaluation composed the remaining 30% of the total evaluation. Technical and financial results are summarized in Table 1 below. A technical score of 42 points, or 60% of the technical points was required to open the cost proposal.

**Table 1**  
Consultant Proposal Evaluation Summary

<b>Name of Company</b>	<b>Technical Score (70%)</b>	<b>Financial Score (30%)</b>	<b>Total Score (100%)</b>	<b>Total Price Inclusive of GST</b>
AECOM	55.40	30.00	85.40	\$772,581.23
Clarifica	44.00	17.05	61.05	\$1,359,288.00
Stantec	51.60	8.34	59.94	\$2,778,825.00
AMG	26.10	N/A	N/A	0

## **Proposals were evaluated resulting in AECOM Canada Ltd. with the highest score**

The firm with the highest score was AECOM Canada Ltd. Their proposal demonstrated a clear understanding of the project requirements as well as providing an experienced team committed to working with Regional and local municipal staff.

## **Inflow and Infiltration Reduction Program Goals have been produced collaboratively with local municipalities**

The Inflow and Infiltration Reduction Program is founded on a constructive working relationship that has developed between York Region, local municipalities and the consultant group. This I-I team of knowledgeable staff have demonstrated a commitment to the program through participation in workshops, response to I-I incidents and ongoing project work to characterize the source and extent of I-I throughout York Region.

Draft goals developed for the Inflow and Infiltration Reduction Program reflect the needs of both Regional and Local Municipal systems. The goals will function as a guide to ensure that all future work is performed and evaluated based on the same criteria and standards. A steering committee comprised of Regional and Local Municipal staff will be formed to select projects for testing and remediation and to ensure that all program goals and objectives are met.

The draft goals for Inflow and Infiltration Reduction include:

- Make inflow and infiltration reduction a priority
- Protect the environment by reducing inflow and infiltration
- Demonstrate stewardship of our infrastructure
- Develop funding models and mechanisms
- Demonstrate the effectiveness of inflow and infiltration reduction
- Develop education and outreach programs
- Develop a long-term Region-wide strategy for inflow and infiltration reduction

The goals and subsequent objectives will be finalized over the summer months and will be presented in fall 2009.

Based on the type of wet weather response seen at each location, one or more of the following sanitary sewer evaluation studies will be completed to find the source of infiltration and/or inflow.

- Manhole inspections
- Smoke testing
- Dye testing
- Closed circuit TV (CCTV) inspections on municipal sewers
- Closed circuit TV (CCTV) inspections on private laterals (connections to homes)
- Household inspections

Sanitary sewer evaluation studies will start in the summer of 2009 to narrow down the sources and potential remedies for inflow and infiltration. A set of selection criteria has been developed with Regional and Local Municipal staff to ensure that the selected sites provide a balance of activities, priorities and locations. There must also be an opportunity for quick wins and be useful as a model for future inflow and infiltration projects and be representative of typical problems with York Region.

York Region supports asset management and has programs in place to address inflow and infiltration and other issues on the Region's wastewater system. Manhole and CCTV inspections are an integral part of the Region's programs. Work on these programs is completed outside of the Regional and Local Municipal Inflow and Infiltration Reduction Program.

### **Reducing the sources of Inflow and Infiltration**

Benefits of the Inflow and Infiltration Reduction Program will be realized through remediation of problem areas. In some cases, this could be as simple as replacing faulty manhole covers, or disconnecting roof leaders that are connected to the sanitary sewer system. In many other cases remediation activities will require more extensive construction work such as:

- Replacing or rehabilitating defective sewer pipes, laterals and manholes
- Sealing cracks and holes in pipes and manholes
- Relining defective pipes
- Disconnecting cross-connected catch basin drains and footing drains
- Installing drainage systems that separate cross-connected sewers
- Plumbing upgrades in homes

Both small and large scale projects will be initiated through pilot remediation projects in selected sites throughout the Region. A set of selection criteria will be developed with Regional and Local Municipal staff to ensure that the selected projects provide quick wins, a balance of activities, priorities and locations. A process model for selection of pilot projects is being created with input from Regional and local municipal staff. A sample of this process is included (*see Attachment 2*).

### **Reducing Inflow and Infiltration from new development areas**

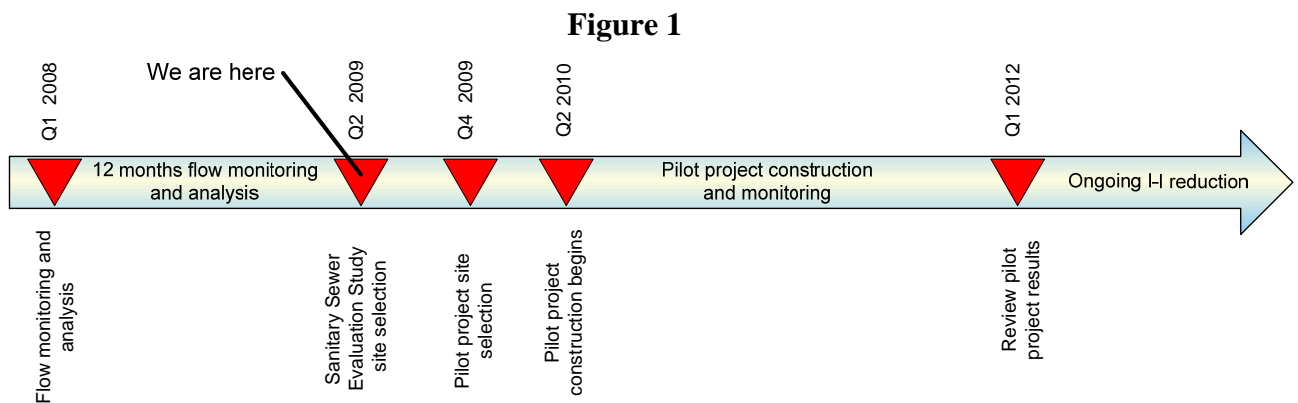
New sanitary sewers are designed and constructed according to guidelines provided by the Ministry of the Environment. In some instances, clean water flow has been observed entering the Regional Trunk Sewers that cannot be explained through regular household or business uses. For this reason, some new developments in the Region be monitored.

The American Society for Testing and Materials (ASTM) and Ontario Provincial Standards and Specifications (OPSS) has a number of different standard practices for infiltration and exfiltration acceptance testing of installed sewers. To ensure that new developments are constructed to a standard that will not allow inflow and infiltration to occur, a series of best practice guidelines and specifications for the design, construction

and commissioning of sanitary sewers in new developments will be developed with the local municipalities and implemented throughout the Region. The standards and guidelines will address both new connections to Regional and Local Municipal sewers (i.e. manholes and pipes) and sewer laterals installed for home connection. ASTM and OPSS standards will provide the basis for many of the recommended Region wide standards with supplementary guidelines developed as required.

### Inflow and Infiltration Program Timeline at a Glance

The York Region and Local Municipal Inflow and Infiltration Reduction Program has been in place for over a year. The timeline in Figure 1 shows key milestones achieved as well as a preview of the work yet to come.



## 5. FINANCIAL IMPLICATIONS

### Funding for the Regional and Local Municipal Inflow and Infiltration Reduction Program

Funding for continued flow monitoring for inflow and infiltration reduction and hydraulic model support is available in 2009, 2010 and 2011.

\$23 million has been allocated for the Inflow and Infiltration Reduction program in the 2009 10-year capital plan. The program will be funded 93% from development charges and 7% from wastewater rates. It is far more cost effective to reduce inflow and infiltration to gain sewer capacity than to construct new infrastructure. The Region has committed to fully funding this program through the study and pilot project stage to final full scale recommendations. A cost sharing strategy will be developed for additional remediation works if required.

Of the total \$23 million program budget, approximately \$1.5 million has been allocated for the sanitary sewer evaluation studies and approximately \$15 million has been

allocated for the pilot remediation projects. Other tasks included in the program budget include flow monitoring, data review and analysis and ongoing program support.

This York Region and Local Municipal Inflow and Infiltration Reduction Program will help reduce the operational costs at our wastewater pumping stations and treatment facilities and extend the life of the facilities by reducing the amount of wastewater flow during rainfall events and spring snowmelt.

### **Cost Benefit Analysis will assist in evaluating effectiveness of pilot remediation**

A key component in the review of pilot project results is an analysis of the costs and benefits associated with inflow and infiltration reduction. A tool will be developed to analyze inflow and infiltration data, pilot projection construction costs and potential operational savings to the local municipalities and the Region. This analysis will be used to identify which pilot projects are the most cost effective.

## **6. LOCAL MUNICIPAL IMPACT**

The combined Regional and local municipal wastewater network of sewers is comprised of well over 500 kilometres of pipe, with at least 75% of the system under the jurisdiction of the local municipalities. It's not surprising then that most of the inflow and infiltration related issues originate in local municipal systems. To effectively reduce the amount of inflow and infiltration entering the systems, the I-I reduction program must be a priority for both the Region and our nine local municipalities.

Although Regional funding is provided for the study and eventual pilot remediation of some inflow and infiltration sources, local municipal resources are also required to ensure program success. Inflow and infiltration reduction must be a priority across the Region in all nine local municipalities and will require local municipal resources to participate in the study and to remediate local municipal wastewater systems.

Additional sources of funding may be available for remediation of areas experiencing high inflow and/or infiltration. The Town of Aurora has been successful in acquiring funding through the Ontario - Building Canada Fund. Opportunities may exist for other York Region local municipalities to take advantage of the funding available through Building Canada Fund to further advance remediation of high priority inflow and infiltration sources beyond the pilot project stage.

Municipal contribution is encouraged through a variety of means, i.e. financial and staff resources. It is expected that approximately half or 25 of the priority catchments will have evaluation studies completed in 2009. Municipal staff will be required to manage the contractors used for sanitary sewer evaluation studies as work is completed on local sewer systems and in the next few years will need to be involved in implementation of the detailed remediation projects.

## 7. CONCLUSION

York Region is committed to reducing the amount of existing and future inflow and infiltration entering the collection and treatment systems. The York Region Inflow and Infiltration Reduction Program builds on this commitment through the coordinated efforts between York Region and the local municipalities. The program will result in the availability of more secure, cost effective sanitary conveyance and treatment to meet the needs of existing residents, businesses and to service future growth.

Environmental Services staff reviewed four proposals for the provision of continued flow monitoring for a three year period in accordance with Regional procedures and the Purchasing By-Law. It is recommended that the Region retain the firm with the highest score and lowest cost, AECOM Canada Ltd. at a cost not to exceed \$772,581.23.

For more information on this report, please contact Laura McDowell, Director Environmental Promotion and Protection Branch, Environmental Services at Ext. 5077.

The Senior Management Group has reviewed this report.

Recommended by:

Approved for Submission:

Erin Mahoney, M. Eng.  
Commissioner of Environmental Services

Bruce Macgregor  
Chief Administrative Officer

June 3, 2009

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Attachments (2)

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