

# **The Regional Municipality of York**

Committee of the Whole  
Environmental Services  
April 4, 2019

Report of the Commissioner of Environmental Services

## **Direct Purchase of Sanitary Sewer Flow Monitoring Devices for the Inflow and Infiltration Reduction Program**

### **1. Recommendations**

It is recommended that:

1. Council authorize the direct purchase of sanitary sewer flow monitoring devices, associated equipment and replacement parts for the Inflow and Infiltration Reduction Program to ADS Environmental Technologies Inc. (ADS), pursuant to the provisions of the Purchasing Bylaw, for a term of five years commencing on June 1, 2019 and ending on May 31, 2024 at an upset limit cost of \$866,776.10, excluding HST.
2. Council authorize the Commissioner of Environmental Services to execute the necessary agreements.

### **2. Summary**

This report seeks Council approval of a direct purchase agreement with ADS for the purchase of sanitary sewer flow monitoring devices, associated equipment and replacement parts required to continue with the Inflow and Infiltration Reduction Program. Council approval is required for this direct purchase for two reasons as described below.

First, under Section 10.1(a) of the Purchasing Bylaw, any direct purchase that exceeds \$150,000 requires Council approval provided that, in the opinion of the Commissioner, the compatibility of the purchase with existing equipment, facilities or service is the paramount consideration, which is in fact the case. Second, Section 18.1(a) of the Purchasing Bylaw requires Council approval where the aggregate term of the contract for goods or services exceeds five years. If this direct purchase is approved, because ADS is already the incumbent supplier of the flow monitoring equipment, the aggregate term will exceed five years.

## Key Points:

- A direct purchase contract with ADS is recommended to purchase flow monitoring equipment from 2019 to 2024 in the amount of \$866,776.10, excluding HST, with compatibility of replacement parts and new equipment being the paramount consideration.
- The Region currently manages 293 sanitary sewer flow monitoring devices (supplied and serviced by ADS) installed throughout the local and Regional sanitary sewer systems. Current monitoring locations are shown in Attachment 1. Data collected from these meters help guide work to reduce inflow and infiltration.
- Through a competitive procurement process on [June 27, 2013](#), Council authorized a contract award for the supply and delivery of flow monitoring devices and associated equipment. ADS was the successful bidder with the highest total evaluation score and lowest cost. This contract expires on May 30, 2019.
- As part of the Program's asset management analysis, 100 new flow monitoring devices, associated equipment and replacement parts are required over the next five years to maintain the existing monitoring network and continue with the Program mandate. Thirty five per cent of the total cost is related to the purchase of new devices with the balance being associated equipment and replacement parts for the existing meters.
- Equipment and services supplied by ADS throughout the contract have exceeded the Region's performance requirements, ensuring that quality data is obtained from the devices with minimal downtime.
- Staff have negotiated with ADS to obtain discounted pricing for the additional devices and replacement parts. The discounted pricing, along with costs avoided by maintaining consistency within the fleet, equate to approximately \$70,000 in savings annually, providing good value to the Region.

## 3. Background

### **Ongoing monitoring of sanitary sewer flow is required to find and remove inflow and infiltration from the Region's sewers**

On [February 17, 2011](#), Council approved the first Inflow and Infiltration Reduction Strategy (Strategy), developed in partnership with local municipalities under Condition 8 of the Southeast Collector Sanitary Sewer Individual Environmental Assessment approval. The Strategy was last updated in March 2016.

The condition of approval requires the Region and its local municipalities to find and remove 40 million litres per day of inflow and infiltration from the York Durham Sewage System by 2031. Continuous monitoring of sanitary sewer flow is critical to efficiently plan and implement the Program to achieve this requirement.

A summary of Program successes to the end of 2017 was reported to Council on [January 25, 2018](#).

## **More than 19 million litres per day of inflow and infiltration have been removed from the wastewater conveyance system**

Inflow and infiltration reduction is a requirement from the Province. It is also critical to achieving the Region's sustainability objectives. Removing extraneous sewer flows improves system resiliency, helps address capacity constraints and bottlenecks, reduces energy consumption and associated costs, and allows efficient use of capital while improving the level of service to the public.

Consistent and reliable sewer flow data is the key to success of the Inflow and Infiltration Reduction Program. Some examples of the beneficial uses of monitoring data include:

- Inflow and infiltration reduction quantities are reported to the Province annually, demonstrating progress toward the 2031 regulatory target. For example, a defect with estimated flows of 5.6 million litres per day was identified through the review and monitoring of sewer flow data and creek level data collected from the ADS monitoring devices during a rainfall storm event on June 23, 2017.
- Validation of inflow and infiltration reduction initiatives led by developers as part of the Inflow and Infiltration Developer Funded Projects. Several million litres per day have been removed from the system to date, as estimated from the flow monitoring data. With these flows removed from the system, additional planned growth was able to take place with no additional Regional or local municipal investment in capital infrastructure.
- Locating sources of inflow and infiltration that are stressing the operation of local municipal and Regional pumping facilities, stretching capacity of built infrastructure. This allows planned growth to take place in an efficient way. For example, unusually high flows at a local pumping station were located using the 2018 sewer flow and level monitoring data. This allowed the local municipality to concentrate on resolving the problem. Flows are currently being monitored to validate and quantify the success of the work.

More than 19 million litres per day of flow related to inflow and infiltration have been removed from the system to date, representing more than 48 per cent of the 2031 target. For context, 19 million litres per day is equivalent to the daily flow for approximately 20,000 homes. Removing infiltration and inflow allows Environmental Services to “infrastructure stretch” our built capital and optimize the use of capacity in our wastewater infrastructure.

## **Sewer flow analysis supports inflow and infiltration reduction programming, system capacity planning and asset management**

The Flow Monitoring Program is a long-term effort to track inflow and infiltration reductions for annual reporting to the Ministry of the Environment, Conservation and Parks (MECP). Flow data collected under the Program also supports wastewater system capacity planning and renewal programs at the Region. More specifically, sanitary sewer flow data collected by the Region is used to:

- **Assess levels of inflow and infiltration** in local and Regional systems during and after major rainfall or snowmelt events.
- **Calibrate the Region's All-Pipes hydraulic model** which can then be used to assess inflow and infiltration, plan remedial works and evaluate system capacity.
- **Create inflow and infiltration priority maps** annually for each local municipality to help inform local remedial work planning.
- **Investigate physical deficiencies** in the local and Regional sanitary sewer systems.
- **Measure pre and post rehabilitation flows** to track inflow and infiltration reductions in local and Regional systems.
- **Assess progress** towards meeting interim and ultimate inflow and infiltration reduction targets, as mandated by the Province; and
- **Evaluate opportunities to defer capital projects (infrastructure) and advance capacity** to developers participating in Developer-funded Inflow and Infiltration Reduction Projects.

### **York Region has successfully used ADS supplied flow monitoring devices since 2013**

On April 18, 2013 a request for proposal (RFP-13-44) was issued by the Region for the delivery of 300 flow monitors and associated equipment (such as sensors, batteries, antennas and other hardware). ADS was the successful bidder with the highest total evaluation score and lowest cost.

Council authorized award of the contract to ADS on [June 27, 2013](#). Since that time, the Region has successfully used the supplied flow monitoring equipment for the Inflow and Infiltration Reduction Program. The devices have met performance requirements set out in the contract and continue to perform throughout their expected lifespan, while maintaining low failure rates.

Ensuring nearly all sewer flow responses to major rainfall and snowmelt events are captured provides key insights into the location and extent of inflow and infiltration and is critical to guide remedial efforts and help manage system capacity. The flow monitoring devices have provided continuous good quality data with 95 per cent accuracy.

## **New contract required to purchase flow monitoring devices for program continuity**

The Region must procure new sanitary sewer flow monitors, associated equipment and replacement parts to maintain the existing flow monitoring network and ensure continuity of data collection to meet mandated requirements of the Inflow and Infiltration Reduction Program. With the existing ADS contract expiring on May 31, 2019, a new procurement is required.

### **4. Analysis**

#### **Continued use of ADS supplied flow monitoring devices will maximize remaining service life of existing equipment and eliminate technical incompatibilities**

Based on an asset management evaluation of the Region's existing flow monitoring devices, the following is recommended:

- Full replacement of 100 devices over the next five years (approximately 20 per year) and;
- Switch-out of consumable parts in the remaining devices, as needed.

This proactive approach will maximize the service life of existing equipment and optimize future capital expenditures.

A direct purchase contract with ADS will ensure seamless management of the existing network of sanitary sewer flow monitoring devices, continuous data collection, preservation of data quality and upload settings, reuse of supporting hardware, and elimination of staff retraining.

#### **ADS is an industry leader with a proven track record of safe, accurate and technologically advanced monitoring equipment**

ADS is one of only a few of industry vendors capable of supplying flow monitoring devices that are both intrinsically safe (i.e. safe from ignition in the presence of sewer gases) and compliant with the Canadian Electrical Code. ADS supplied equipment has a proven track record of meeting the Region's safety requirements based on the past five years of use in the local and Regional sewer systems. Consistently high measurement accuracy (95 per cent) has also been proven through the Region's use of these flow monitoring devices over the past several years.

ADS has further demonstrated its leadership in the industry by offering an array of monitoring devices with multiple sensor technologies, allowing for selection of fit-for-purpose monitoring options that can withstand challenging conditions such as sewer pipe surcharges. ADS has

continued to stay abreast with technology advancements and has offered the Region proactive equipment upgrades at competitive rates.

ADS has been providing water and wastewater flow monitoring products and services for over 40 years and supplies equipment to many municipalities with large diameter sewers throughout Ontario, including City of Toronto, Region of Peel, Region of Halton, and City of Ottawa.

### **Maintaining consistency with existing equipment through a direct purchase with ADS is estimated to provide an annual cost savings of \$70,000**

While the Region originally procured monitoring devices from ADS through a competitive bid process, with the contract expiring in May 2019, staff have discussed potential terms of a direct purchase contract with ADS. Incorporating the discounts off the equipment purchased and avoiding additional costs in operating and maintaining a fleet of devices from multiple vendors, staff estimate an annual cost savings of \$70,000 can be realized.

### **Inflow and infiltration monitoring and reduction efforts support the Region's Strategic Plan priorities**

The recommended direct purchase with ADS supports the priorities of the Corporate Strategic Plan to deliver trusted and efficient services, build sustainable communities and protect the environment. Reliable and continuous sanitary sewer flow data collection is critical for the Region to achieve its regulatory inflow and infiltration reduction targets, sustain existing sewer infrastructure and reclaim servicing capacity to permit planned growth.

Flow monitoring data collected as part of the Inflow and Infiltration Reduction Program uses a sharable data platform, supporting the Region's priority of maintaining an open and transparent government. Specifically, data collected through the Program is shared across the Environmental Services Department, with our local municipal partners, and consultants working on behalf of the Region and local municipalities, supporting various water and wastewater-related initiatives.

## **5. Financial**

Region-wide monitoring of sanitary sewer flows is integral to the Inflow and Infiltration Reduction Program aiming to identify and reduce extraneous sewer flows, recovering capacity in the system and meeting regulatory requirements. As inflow and infiltration is removed, sewage system capacity is unlocked to permit planned growth while optimizing infrastructure investments and recovering associated development charges.

Based on the Program's asset management analysis, a review of technical compatibility benefits, discounted pricing negotiated with ADS and a pricing comparison with the competing vendor bid in 2013, costs for supply and delivery of the proposed monitoring

equipment represent good value for money and will save the Region an estimated \$70,000 annually.

The 100 flow meters included in the proposed procurement represent approximately 35 per cent of the total cost with the balance of the procurement associated with consumable and upgradable materials, such as sensors, batteries, antennas, etc., which will be used as spare parts to replace components in the existing flow meters.

The proposed direct purchase of ADS supplied flow monitoring equipment will cost the Region \$866,776.10, excluding HST, over the next five years. This asset management investment represents a small fraction of the 2018 wastewater system asset replacement value of \$4.3 billion.

Funding for this purchase is included in the approved 10-year Capital Budget approved by Council in February 2019.

## **6. Local Impact**

Local municipalities are key partners in the Region's flow monitoring efforts and have been involved in developing the Inflow and Infiltration Reduction Strategy to ensure local objectives are met. Continued participation by all nine local municipalities is required to meet MECP requirements and ensure successful implementation of the Strategy.

Over the past five years, staff have analyzed flow monitoring data to measure efficacy of initiatives led by developers as part of Developer-funded Inflow and Infiltration Reduction Projects. Information obtained through analysis provide staff with tools to evaluate future development proposals, ensuring mutually beneficial outcomes, while minimizing risks to the conveyance system. In appropriate circumstances and where bottlenecks exist in the conveyance system, Developer-funded Inflow and Infiltration Reduction Projects can help address capacity constraints, allowing planned growth with minimal Regional or local municipal investment.

The majority of the Region's flow monitoring devices are installed in the local sanitary sewer systems and provide wastewater flow data to local municipal staff on an ongoing and annual basis to support efficient implementation of local inflow and infiltration reduction initiatives. Some of this local remediation work has been funded by the Region.

## **7. Conclusion**

A direct purchase agreement with ADS for the supply and delivery of sanitary sewer flow monitoring devices and associated equipment will ensure cost-effective delivery of flow monitoring under the Inflow and Infiltration Reduction Program, required by the Provincial condition of approval for the Southeast Collector Sanitary Sewer Individual Environmental Assessment.

Flow monitoring supports other critical business functions including climate change, conservation programs, system and financial sustainability, and ensures continued service delivery meeting customer expectations. Risks related to capacity constraints, energy consumption and operating performance of Regional wastewater facilities are also optimized.

It is recommended that Council authorize the direct purchase to ADS ensuring compatibility with existing monitoring devices and data management tools, as well as providing cost savings to the Region.

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For more information on this report, please contact James Steele, Director, Infrastructure Asset Management, Environmental services at 1-877-464-9675 ext. 73018. Accessible formats or communication supports are available upon request.

Recommended by:

**Erin Mahoney, M. Eng.**  
Commissioner of Environmental Services

Approved for Submission:

**Bruce Macgregor**  
Chief Administrative Officer

March 22, 2019  
Attachments (1)  
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