



Office of the Commissioner  
Environmental Services Department

## MEMORANDUM

To: Members of Committee of the Whole

From: Erin Mahoney, M. Eng.  
Commissioner of Environmental Services

Date: March 19, 2021

Re: 2020 Research and Innovation Update

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This memo provides an update to Council on research activities undertaken by Environmental Services in 2020 to support water, wastewater, waste management, forestry, and energy conservation program delivery, as well as efforts undertaken to advance digital innovation.

Success of Environmental Services approach to research is based on:

- Improving processes and services by anticipating future regulatory changes and mitigating potential challenges
- Strong partnerships with industry, academia, and funding agencies
- Leveraging funding from partners that produces a substantial multiplier effect for York Region's investments in research
- Increasing York Region's sector profile and reputation

Having established itself as a reliable research partner, York Region joined the Canadian Water Network's COVID wastewater coalition in 2020. In collaboration with leading scientists from the Universities of Waterloo and Ottawa, this work has led to the development of methods to test for COVID-19 in wastewater. By the end of 2020, the Provincial government invested over \$12 million in a COVID-19 wastewater surveillance initiative to determine how wastewater surveillance can be used in conjunction with clinical data as a tool to inform a public health response. Environmental Services also leverages the relationships built through such partnerships to gain expert advice outside the boundaries of the formal research.

Environmental Services continues to grow its strong partnerships with industry and academia, while leveraging third-party funding to advance efficient delivery of our services. Working with the University of Toronto Drinking Water Research Group, York Region has leveraged \$400,000 in funding through the Natural Sciences and Engineering Research Council in partnership with eight other municipalities to study a range of emerging issues, including new methods to optimize treatment for improved water quality.

## **York Region recognized for Industry Leading Research**

The department's approach to research and partnerships is increasing York Region's industry and leadership profile. York Region received the 2020 Ontario Waterworks Association Water Efficiency Award for its Water Reuse Demonstration Project, which was conducted in the Town of Georgina. York Region was also among the first municipalities in Ontario to reach out to academic laboratories to assist them in developing methods for the detection of COVID-19 in wastewater, with ongoing monitoring at several locations across the Region. Further, York Region funded research projects have been published in peer-reviewed science journals and industry publications.

## **Research enables informed decision making and leads industry practices**

Research and innovation initiatives have and will continue to improve facility and field operations, asset management programs and inform design of future infrastructure. Staff engagement with industry experts has created opportunities to modify practices to meet and inform regulatory requirements, as well as develop new programs and tools to anticipate needs and challenges the industry faces.

Research being led by Environmental Services aligns with the Region's Strategic Plan objectives and is organized under the following areas of impact:

- **Public Health**, through surveillance of wastewater as an indicator of COVID-19 in York Region
- **Safe Drinking Water**, by improving the treatment of our drinking water, and anticipating future threats to drinking water
- **Wastewater Treatment**, by better characterizing the prevalence and fate of substances of concern and exploring wastewater re-use options
- **Climate Change action**, by testing new and innovative ways to reduce greenhouse gas emissions in operations and facilities
- **Healthy Forests**, by protecting York Region tree canopy from invasive species, supporting its rich biodiversity, and providing a healthy environment for residents
- **Minimizing Waste**, by researching innovative methods to help York Region residents reduce and reuse waste materials and promoting a circular economy

- **Digital Innovation**, through improved analysis and analytics to enhance efficiency and insights

Key areas of research conducted in 2020 are outlined in Table 1 below. Additional research highlights from 2020 are outlined in Attachment 1.

**Table 1**  
Examples of Projects conducted in 2020

<b>Theme</b>	<b>Example Research</b>	<b>Partners</b>
<b>Public Health</b>	<p><b>COVID-19 Wastewater Surveillance</b></p> <p>Environmental Services and York Region Public Health joined the Canada Water Network’s Ontario Wastewater Surveillance Initiative to provide wastewater samples and advance COVID-19 detection in wastewater. The Province has invested \$12 million into a Provincial COVID-19 surveillance initiative, part of global efforts to use wastewater surveillance in conjunction with clinical data to inform a targeted public health response.</p>	Canadian Water Network, Water Research Foundation, Universities of Waterloo, and Ottawa, Province of Ontario, Public Health Ontario Public Health Agency of Canada, Peel Region, and several Ontario municipalities
<b>Safe Drinking Water</b>	<p><b>Cyanotoxin control strategies in drinking water</b></p> <p>Research evaluated effectiveness of granular activated carbon to remove cyanotoxins, as well as development of monitoring tools for improved response to harmful algal blooms growing in proximity to water intakes.</p>	Drinking Water Research Group, Hamilton, Union Water, Durham, Niagara
<b>Wastewater Treatment</b>	<p><b>Use of micronutrients to reduce odour</b></p> <p>Research on the use of micronutrients to reduce odour and biosolid generation at the Holland Landing lagoons.</p>	Internal Research
<b>Climate Change Action</b>	<p><b>Energy Efficient Design of York Region bus facility</b></p> <p>Ongoing project will integrate stringent energy efficiency standards into the expansion of a regional bus storage, repair, and operations facility.</p>	Internal Research
<b>Healthy Forests</b>	<p><b>Urban soil improvement</b></p> <p>Research to improve survivability of trees planted in the Region’s road right-of-way.</p>	Vineland Research and Innovation Centre

Theme	Example Research	Partners
<b>Minimizing Waste and Circular Economy</b>	<p><b>Food waste grinder project</b></p> <p>Research to evaluate impacts of food waste grinders in a multi-unit residential building. Organics/food waste diversion, wastewater usage/content and greenhouse gas impact will be analyzed before and after the usage of food waste grinders.</p>	<p>University of Waterloo (GHD &amp; Ontario Clean Water Agency are subcontractors), Markham Inter-Church Committee for Affordable Housing (MICAH), AET Group Inc., City of Markham</p>
<b>Digital Innovation</b>	<p><b>Definition of a Smart Utility: How to Be a Digital Utility and the Framework for an Intelligent Water System</b></p> <p>Research to guide transformation to a digital utility, which will help staff leverage data and technology to improve our business capabilities.</p>	<p>Water Research Foundation, Stantec, City of Toronto and several United States Utilities</p>

Environmental Services' strategic partnerships with regulators and agencies, industry experts, consultants, public utilities, and universities, continues to enable the development and implementation of innovative solutions to complex problems. Research and partnerships enable us to leverage a greater pool of funds and expertise to achieve more meaningful research outcomes, manage risk effectively and maximize the value of the Region's financial and staff contributions.

Per:   
 Erin Mahoney, M. Eng.  
 Commissioner of Environmental Services

  
 Bruce Macgregor  
 Chief Administrative Officer

Attachment (1)  
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