



MEMORANDUM

TO: Members of Committee of the Whole

FROM: Erin Mahoney, Commissioner of Environmental Services

DATE: December 8, 2017

RE: 2017 Report on Source Water Protection Implementation

This memo provides Council with the Report (Attachment 1) that summarizes York Region's efforts in 2017 to implement source water protection. Copies of this report are provided for information to all members of Council. Those Council members participating as Conservation Authority Board members will also receive copies of this report at upcoming Source Protection Authority meetings. The report summarizes information to be submitted to the Toronto and Region Source Protection Authority and the Lakes Simcoe and Couchiching/Black River Source Protection Authority on February 1, 2018, as required under section 81 of the *Clean Water Act*, 2006.

The 2017 report summarizes the Region's work to implement a number of requirements in the Source Protection Plans to address potential threats to Regional drinking water supplies. The Region of Peel, City of Toronto and Ministry of Environment and Climate Change are undertaking similar work to safeguard Lake Ontario intakes, where approximately ninety per cent of our drinking water originates.

Erin Mahoney, M. Eng.
Commissioner, Environmental Services

SL/sl

Attachment

Copy to: Dr. Karim Kurji, Medical Officer of Health, Community and Health Services, Public Health Katherine Chislett, Commissioner, Community and Health Services

Dino Basso, Commissioner, Corporate Services

Valerie Shuttleworth, Chief Planner, Planning and Economic Development, Corporate Services

#7930424

SOURCE WATER PROTECTION IMPLEMENTATION







SOURCE WATER PROTECTION | MPLEMENTATION ANNUAL REPORT

Table Of Contents

- **5** Introduction
- 8 Managing Existing Threats and Growth
- 23 Collaborating within York Region
- **25** Focusing on Agriculture
- 25 Incentives Provided to Businesses and Farms
- **26** Inspections Completed at Businesses with Risk Management Plans
- 26 Protecting Lake Ontario Sources of Drinking Water
- **26** Incorporating Source Protection Plan Policies into the Regional Official Plan
- 27 Including Climate Change in Source Protection
- **28** Helping Local Municipalities Implement Source Water Protection Requirements
- **29** Education and Outreach
- **30** Adding New Wells
- **30** Moving Forward in 2018
- **32** Appendix





Introduction

This sixth annual report summarizes information requested from the Risk Management Official by the Source Protection Authorities, as required under section 81 of the Clean Water Act, 2006 (the Act).

The Source Protection Authorities will receive the information in the format they have requested by February 1, 2018. This information may also be requested by the Director of the Ministry of the Environment and Climate Change (the Ministry). The report outlines activities undertaken by York Region in 2017 to protect municipal drinking water sources. Source Protection is one component of the multi-barrier approach to ensure clean and safe drinking water. The comprehensive multi-barrier approach used by York Region also includes operator training, water treatment (see Figure 1), extensive monitoring and testing, as well as emergency preparedness.



Figure 1 - Water Treatment is an Important Component of the Multi-barrier Approach







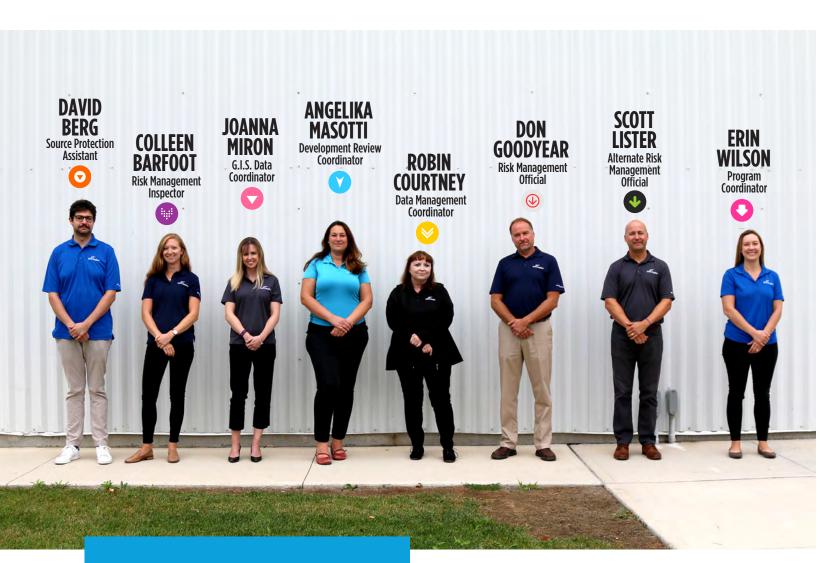






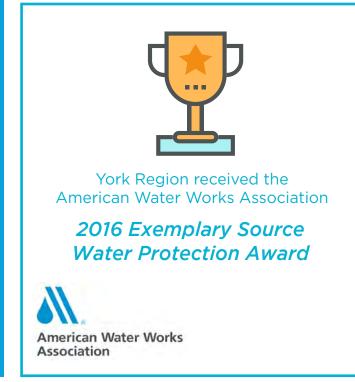






2017 was a productive year for Source Water Protection staff. Risk Management Plan negotiation with businesses, farmers and institutions to manage existing threats is ahead of schedule and the impact to these groups has been minimal. Continued collaboration with the Province and Conservation Authorities played an important part in this success (see Figure 2).

Staff also worked in collaboration with Planning and Economic Development, local municipalities, and developers to ensure new development continued to occur without significant impacts to drinking water sources, or developer's budgets and timelines.



PARTNERSHIPS

Figure 2 - Our Partners Play an Important Part in the Success of Our Program



















Ministry of the Environment and Climate Change



Ministry of Agriculture, **Food and Rural Affairs**







PARTNERS

OPERATIONS, MAINTENANCE AND MONITORING PLANNING AND ECONOMIC DEVELOPMENT TRANSPORTATION SERVICES

KEEPING OUR WATER SAFE YORK.CA 7 6 SOURCE WATER PROTECTION IMPLEMENTATION 2017 ANNUAL REPORT



Town of Richmond Hill

City of Markham

Managing Existing Threats

York Region continued to work with a number of businesses and farmers to verify and manage threat activities at their sites. Verification work in 2017 removed seven sites with potential drinking water threats. In total 157 sites have been confirmed, 544 have been removed, with 37 remaining to be verified (see Figure 3). This includes sites in Bradford and Durham since three wellhead protection areas extend beyond York Region's boundary (see Figure 6).

Figure 3 - Summary of Risk Management Efforts for Existing Threats in York Region



In 2017, Region staff continued developing Risk Management Plans for sites with threats, including evaluating existing practices and identifying potential gaps in drinking water protection (see Figure 4). In 2017, Risk Management Plans were completed for six farms, one institution and 16 businesses. There are now a total of 81 Risk Management Plans in place. A detailed breakdown of the risk management work completed in each local municipality (with the exception of the Towns of Richmond Hill and Georgina, and the City of Markham which have no significant threats) is shown in Figures 7 - 12. A template developed by the Region was used to make the risk management plan process less onerous for businesses and farmers. Regional staff completed or assisted with completing Risk Management Plans using the template. In 2017 inspections were completed at 19 sites with previously completed Risk Management Plans for a total of 54 completed to date (see Figure 16). Information related to the Source Protection Program is managed in the Regional data management system.

Farmers and business owners in York Region are good environmental stewards. When negotiating Risk Management Plans, staff continue to find that sites with confirmed threats already have many of the appropriate measures in place to manage chemicals, such as Dense Non-Aqueous Phase Liquids (e.g. dry cleaning and automotive degreasing chemicals) and, in the case of farms, nutrients and pesticides. Risk Management Plans include maintaining the existing risk management measures in place and implementing new risk management measures to address small gaps identified. Additional risk management measures typically include secondary containment for chemicals, more substantial spill response equipment, a spill response plan and annual spill response training for staff. Some examples of risk management measures implemented in the Region are shown in Figure 17. External safety contractors were consulted to recommend appropriate spill containment equipment for confirmed sites.

Figure 4 - Illustrative Example of Collaboration Between a Business and Regional Municipality on a Risk Management Plan

Judy



Judy's business is located within a vulnerable zone around a York Region drinking water supply well.









York Region Source Protection staff determine a Risk Management Plan is required to mitigate the risk of certain on-site chemicals from spilling and potentially contaminating groundwater.





A Risk Management Plan is agreed to between Judy and the York Region Risk Management Official.



Risk Management Measures are implemented as part of the Risk Management Plan requirements.







The Incentive Funding Program is used to offset the cost of any required Risk Management Measures to be implemented.



A follow-up Risk Management Plan Inspection is conducted to ensure all Risk Management Measures are implemented.



Managing Threats From New Development Protecting Water Quality

One of the objectives of York Region's source protection program is to work with Conservation Authorities, local municipalities and other Regional departments to ensure new development considers source protection vulnerable areas. Two hundred and seventy-nine development applications within vulnerable areas were reviewed by York Region in 2017 to ensure growth is compatible with drinking water protection (see Figure 5). Source Water Impact Assessment and Mitigation Plans established under the Official Plan mitigate source protection concerns beyond the requirement of the Act. In 2017, three Source Water Impact Assessment and Mitigation Plan was approved for a site in a wellhead protection area. In order to inform proponents of source protection requirements, information was provided for 250 sites in vulnerable areas to ensure growth is compatible with drinking water protection before applications were submitted. Furthermore, staff reviewed hydrogeological reports for three development sites to ensure on-site dewatering would not interfere with municipal water supplies.



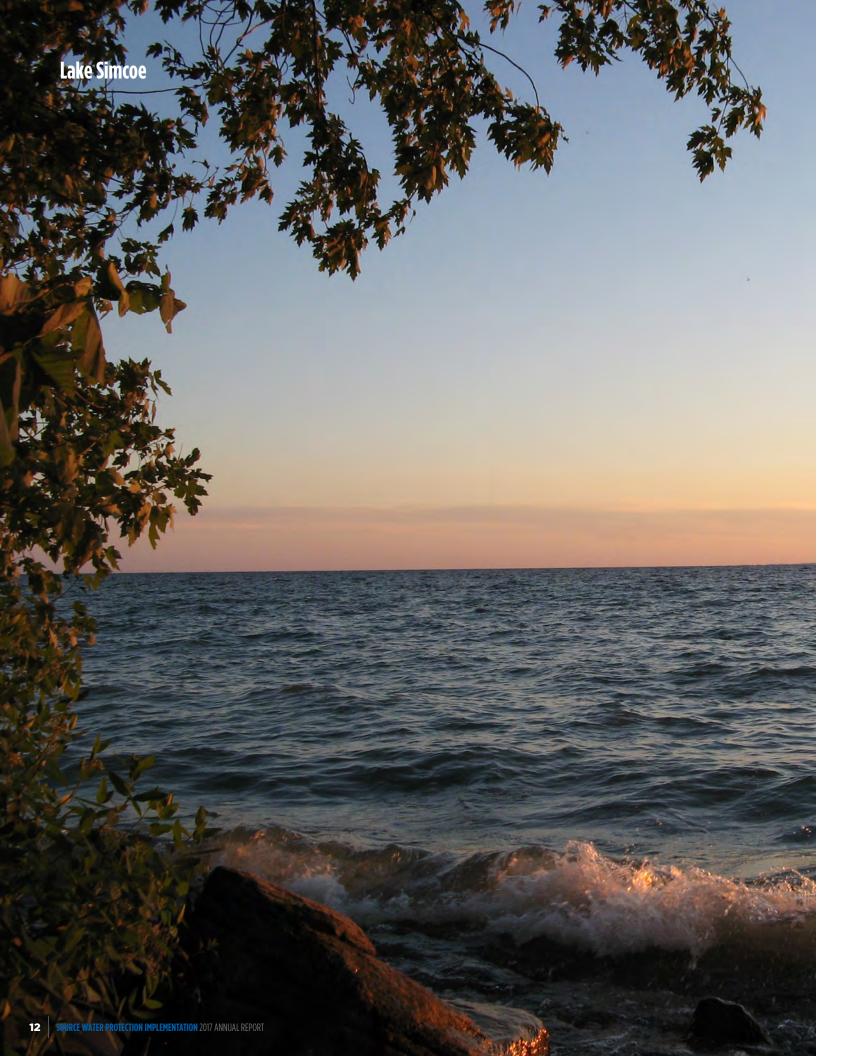
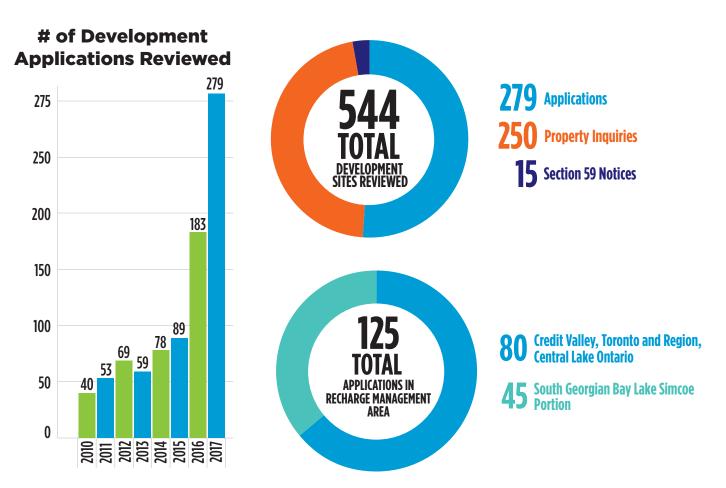


Figure 5 - Summary of Management Efforts for New Development



The Act requires a section 59 notice for developments near municipal wells to determine if an application has the potential to introduce a new threat to drinking water. A notice is required before planning and building applications can be deemed complete. Fifteen notices were issued by York Region in 2017. A total of 28 notices have been issued to date. The interaction between Source Water Protection staff and development proponents resulted in proactive refinement to development proposals to eliminate policy conflicts and ensure appropriate development in vulnerable areas.

Protecting Water Quantity

In addition to requirements for protecting groundwater quality, Source Protection Plans include requirements for protecting the quantity of groundwater available for municipal water sources in the Recharge Management Area (see Figure 6). Recharge policies require local municipalities to ensure new major developments do not reduce the amount of water that infiltrates into the ground. The Ministry of Environment and Climate Change is required to ensure new permits to take water do not impact municipal wells.

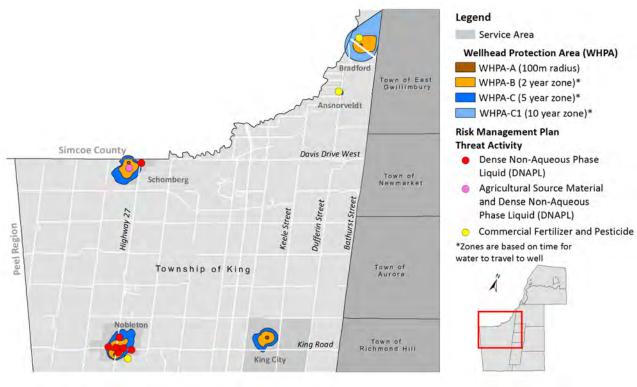
Recharge maintenance policies are being implemented jointly by local municipalities as the front lines of planning approval, and Conservation Authorities who provide technical assessment of the development proposal and associated water balance. If all options have been explored and on-site recharge maintenance is not feasible there is the option to transfer outstanding water balance requirements to an alternate site within the Recharge Management Area, through the use of off-site compensation. One site in the Town of Newmarket required off-site compensation in 2017.

FIGURE 6 York Region Source Protection Areas

Legend Intake Protection Zone Intake Protection Zone 1 Intake Protection Zone 2 Wellhead Protection Area (WHPA) WHPA-A (100m radius) WHPA-B (2 year zone)* Town of Georgina WHPA-C (5 year zone)* WHPA-C1 (10 year zone)* WHPA-Q (Recharge Management Area) *Zones are based on time for water to travel to well Queensville Town of East Gwillimbury Bradford Mount Albert **Holland Landing** Simcoe County Newmarket Schomberg Ballantrae 00 Township of King Town of Town of Whitchurch-Stouffville Aurora Nobleton King City Town of Richmond Hill 0 City of Vaughan City of Markham

City of Toronto

FIGURE 7 TOWNSHIP OF **King**



Managing Existing Threats



Managing Growth



FIGURE 8 Newmarket





Managing Existing Threats

270 Threat Sites Removed

26 Completed Risk Management Plans

15 Outstanding Risk Management Plans

11 To Be Verifie

4 Managed By Provincial Approval



Managing Growth ——

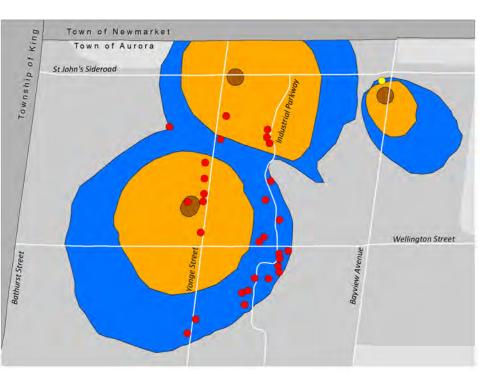
19 Applications

50 Property Inquiries

4 Section 59 Notices



Legend Service Area Wellhead Protection Area (WHPA) WHPA-A (100m radius) WHPA-B (2 year zone)* WHPA-C (5 year zone)* Risk Management Plan Threat Activity Dense Non-Aqueous Phase Liquid (DNAPL) Commercial Fertilizer and Pesticide *Zones are based on time for water to travel to well



Managing Existing Threats

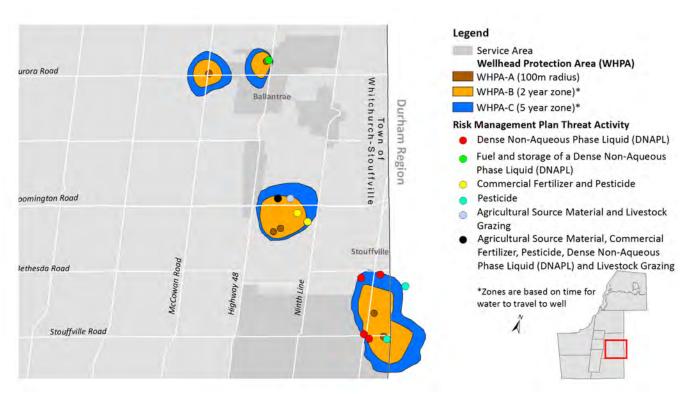


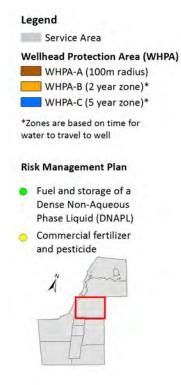
Managing Growth

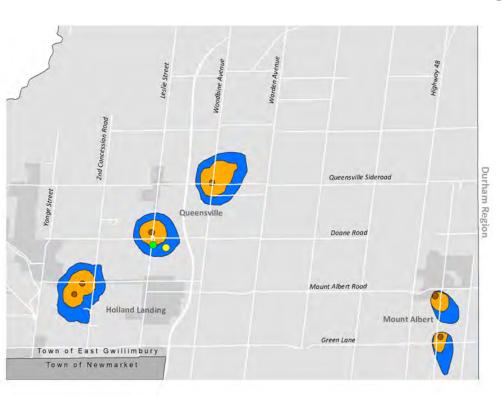


FIGURE 10 Whitchurch-Stouffville

FIGURE 11 TOWN OF East Gwillimbury







Managing Existing Threats

30 Threat Sites Removed

11 Completed Risk Management Plans

9 Outstanding Risk Management Plans

To Be Verified

Managed By Provincial Approval



Managing Existing Threats



26 Threat Sites Removed

2 Completed Risk Management Plans

7 Outstanding Risk Management Plans

To Be Verified

2 Managed By Provincial Approval

Managing Growth

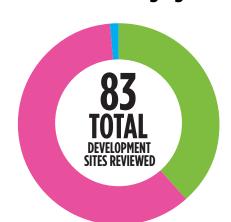
17 Applications

26 Property Inquiries

Section 59 Notice



Managing Growth



32 Applications

50 Property Inquiries

Section 59 Notice

FIGURE 12 Vaughan











3 Property Inquiries

Section 59 Notice



FIGURE 13 Richmond Hill







FIGURE 15 Markham



Managing Growth



"I, along with my brother Jan, farm 1,200 acres in the Whitchurch-Stouffville area. We got involved in the Source Water Protection program because we have three different parcels that we farm that are in close proximity to Regional Wells. We maintain best management practices for fertilizer and pesticide application to land to help protect the natural environment. We soil test for two reasons, one being there is no room for inefficiencies in agriculture so we certainly don't want to over fertilize, and secondly for the good of the environment. Being good environmental stewards helps us protect drinking water sources for the next generation."

Rodney King

Farmer, Town of Whitchurch-Stouffville





Figure 16 - Risk Management Plan Inspection

Collaborating within York Region

One Water is a new concept that looks at reducing the burden on water sources and infrastructure. The concept was a key component introduced in the 2016 Water and Wastewater Master Plan update and is critical to achieving York Region's Vision 2051, which foresees water conservation and reuse as fundamental elements of the Region's Water system. The One Water Action Plan focuses on bringing together existing programs within the department that support One Water with new opportunities that promote integrated water resource planning and innovation.

An important aspect of the One Water Action Plan is to manage our own growth to ensure we do not pose a risk to sources of drinking water. As an example of this, Source Protection staff worked in collaboration with Property Services on recharge management requirements for a proposed site that will store snow and have an Emergency Medical Services building. Staff also worked together on managing salt use at Regionally owned properties.

Environmental Services staff collaborated to prepare an update to a provincial approval (drinking water system licence). The update is required for a production well that has a significant drinking water threat, and will include risk management measures already in place for the handling and storage of fuel at the site.

Environmental Services staff continued to collaborate to share information on industrial sewer users in wellhead protection areas. Enforcement of the Sewer Use bylaw helps protect the Region's drinking water sources by protecting assets, such as sewers, and by providing information on chemical use and storage in industrial facilities.

Figure 17 - Risk Management Measures Implemented



Threat: Handling of chemicals

Mitigation: Secondary containment





Threat: Chemical storage

Mitigation: Spill response equipment





Threat: Hazardous chemical use

Mitigation: Environmentally friendly alternative





Threat: Unsecured waste oil storage outdoors

Mitigation: Indoor storage with secondary containment





Threat: Chemical pesticide & fertilizer use

Mitigation:
Avoid commercial fertilizer use in designated areas



Focusing on Agriculture

A presentation on Source Protection was made by staff to farmers at the Ontario Soil and Crop Improvement Association's 2017 Annual General Meeting on January 9. Source Water Protection staff engaged with an expert at the Ontario Ministry of Agriculture, Food and Rural Affairs who provided training on nutrient management, and assisted in developing Risk Management Plans for farmers.

Incentives Provided to Businesses

Incentive programs have been instrumental in encouraging businesses to make changes to protect municipal drinking water sources. In 2017, over \$43,000 was spent to implement risk management measures outlined in approved Risk Management Plans within York Region. This Council endorsed incentive program expedited timelines for implementing risk management measures. Twenty of the 23 Risk Management Plans approved in 2017 required minor new risk management measures, and were covered in full by the incentive program at a total cost of approximately \$2,000. The remaining three Plans requiring more significant measures were funded at 85 per cent of the total cost of the measures to a maximum of \$25,000. In 2017, staff worked with a pharmaceutical operation to implement risk management measures (see Figure 18). York Region provided the maximum amount of funding allowed under the program with the owner contributing over \$12,000 to the project.



Figure 18 - Example of a New Risk Management Measure for Spill Containment (Spill Control Station)

Inspections Completed at Businesses with Risk Management Plans

Follow-up inspections authorized under Part IV of the Act are conducted within two years to ensure Risk Management Plans are effectively implemented and all risk management measures have been executed. Failure to implement the plans can lead to formal enforcement action by York Region. This can include, if necessary, the issuance of orders to complete work and to pay for any work completed by the Risk Management Official. Out of 19 inspections completed in 2017 for the Risk Management Plans, five sites had not fully implemented the required risk management measures, and required corrective actions. Corrective actions were subsequently initiated without any formal enforcement and included the following:

- Confirmation of staff training on risk management measures and spill response plan
- Posting of spill response equipment signage
- Replacement of misplaced spill response equipment

Protecting Lake Ontario Sources of Drinking Water

As a member of the Credit Valley, Toronto and Region, and Central Lake Ontario Source Protection Committee, York Region has worked to ensure policies in the Source Protection Plan protect the Region's main source of drinking water - Lake Ontario. In particular, the Region has supported re-establishment of a Lake Ontario Collaborative Group whose focus is implementing Source Protection Plan policies to protect this source of drinking water. Spill prevention, contingency and emergency response plans for sites with significant threats are required through various Source Protection Plan policies. Although the majority of Lake Ontario policies in the Source Protection Plan must be implemented by the Ministry, there are sewage policies that impact York Region. Regional staff continued to liaise with Durham Region staff to review Environmental Compliance Approvals and operating procedures for sewer infrastructure near Lake Ontario to ensure appropriate measures are in place to prevent releases. The Duffin Creek Water Pollution Control Plant, jointly owned and operated by the Regional Municipalities of York and Durham, has one of the highest quality effluents of all the large wastewater plants discharging to the open waters of Lake Ontario. Furthermore, unlike most other comparable plants, the Duffin Creek Plant provides full treatment of all wastewater flows even during extreme high flow rainfall events.

Incorporating Source Protection Plan Policies into the Regional Official Plan

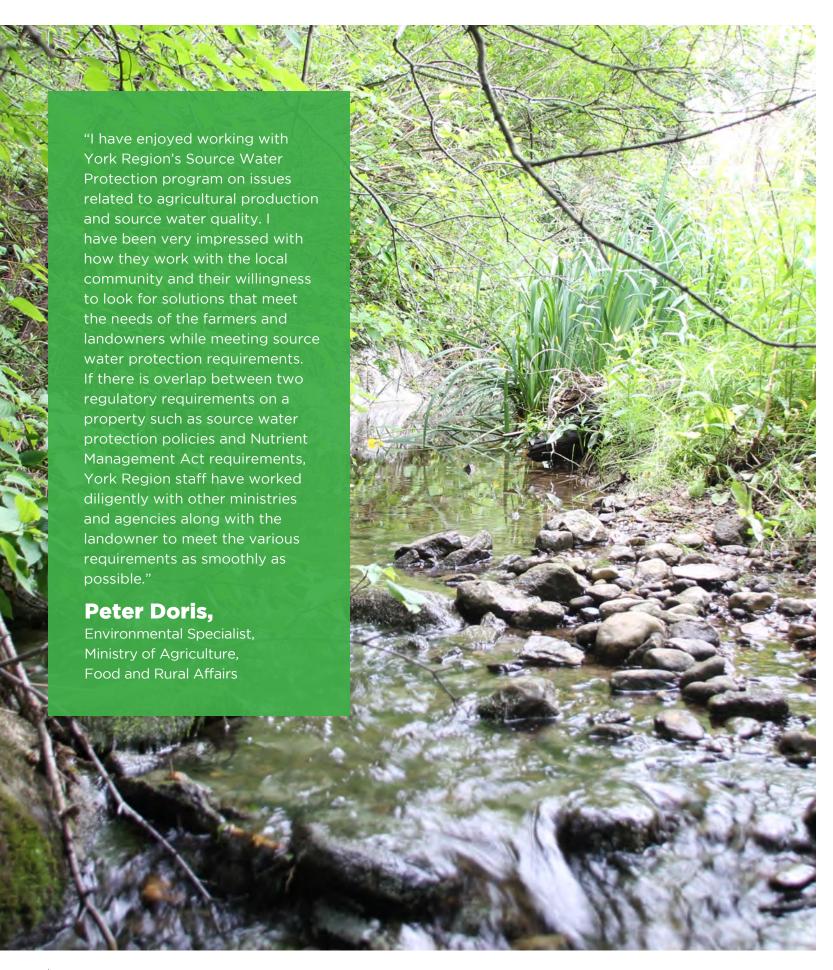
A conformity exercise is underway to integrate Source Protection Plan policies into the York Region Official Plan. The two Source Protection Plans affecting York Region contain very similar policies, as a result conformity will likely be addressed through a single set of Regional Official Plan policies. It is anticipated that a draft amended Regional Official Plan will be released for public comment in late 2019.



Including Climate Change in Source Protection

As part of the Source Water Protection process a water quantity risk assessment was completed in York Region. Computer models were used to predict long-term viability of water supplies considering growth in (groundwater) demand from population expansion, reduction in recharge related to development, and drought due to climate change. The technical assessment indicated that Regional wells could meet demand under all of the scenarios tested. Impacts to "other water users", however, were predicted under the extreme drought scenario, resulting in a 'moderate risk' assignment, and inclusion of Source Protection Plan policies to prevent future risks to water quantity.

Policies require groundwater recharge to be maintained for future development and ensure future groundwater taking does not impair municipal water supplies within the vulnerable area. Additionally, in 2017 staff implemented a procedure to redistribute water taking from susceptible wells to more resilient wells during a drought. Interconnectivity of the supply system allowed for this redistribution, which has been modeled and is predicted to mitigate impacts of extreme drought due to climate change.



Helping Local Municipalities Implement Source Water Protection Requirements

Collaboration with our local municipalities is instrumental in implementing source protection across the Region.

Provincial Implementation Funding

Four local municipalities in York Region (the Towns of Georgina, East Gwillimbury, Whitchurch-Stouffville and the Township of King) received provincial funding for source protection implementation. York Region facilitated a working group for these municipalities to collaborate and develop consistent approaches to implementation. Outcomes from those provincially funded efforts (e.g. refined template policies for Official Plan and Zoning Bylaw amendments, education and outreach materials, municipal staff onboarding materials) were shared across York Region.

Planning Conformity

The Town of Georgina completed their Official Plan update in 2016. In 2017 the Region continued to work with the Town of East Gwillimbury and City of Markham, as well as the Township of King on updates to their Official Plans. The Towns of Richmond Hill and Whitchurch-Stouffville began drafting their updates in 2017 and 2016, respectively. The City of Vaughan and the Town of Aurora will start updating their Official Plans in 2018, while the Town of Newmarket will be completing a comprehensive update at a later date.

The Township of King has also implemented the municipal working group's zoning template to successfully bring Nobleton, King City and Schomberg's bylaws into conformity with the applicable Source Protection Plan. The Towns of Richmond Hill, Whitchurch-Stouffville, East Gwillimbury and Newmarket have initiated updates to their zoning bylaws.

Local Municipal Septic Inspections

Local municipalities have been working since 2012 to complete septic inspections at sites near municipal wells by late January 2017 as prescribed under the *Building Code Act, 1992*. Four of the six municipalities required to complete inspections (Township of King, City of Vaughan, Town of Aurora and Town of Newmarket) have inspected all of the sites. Only two out of 42 of these inspections were not in compliance and required a replacement septic system and a repair to a system. The Town of Whitchurch-Stouffville has completed the majority of their inspections and is working to complete the remainder as soon as possible. The remaining municipality (Town of East Gwillimbury) plans to complete the required inspections in 2018.

Education and Outreach

In 2017 York Region updated its Source Protection information on its website and developed new banners to educate the public (refer to Figure 19).

Figure 19 - Banners Created for Public Education and Outreach



York Region staff performed source protection outreach through a number of related campaigns including Water Is, Water for Tomorrow and I Don't Flush. In 2017 the Water Is campaign continued to promote the message of the value of our water and importance of York Region's entire water system.

Water for Tomorrow includes a broad range of water education programs that inform the public about water conservation, water protection, and our urban water system. In 2017, education and outreach staff attended 36 community events, delivered presentations to approximately 1,000 youth from nine school/community groups, engaged over 4,000 participants in the York Children's Water festival, and produced and distributed 15,000 copies of the Water for Tomorrow student calendar throughout York Region. Staff also continued to maintain nine water-efficient demonstration gardens throughout the Region. Additionally, staff supported the design of a new water efficient garden and landscape space to be installed by the end of 2017 at the Thornhill Community Centre in Markham.

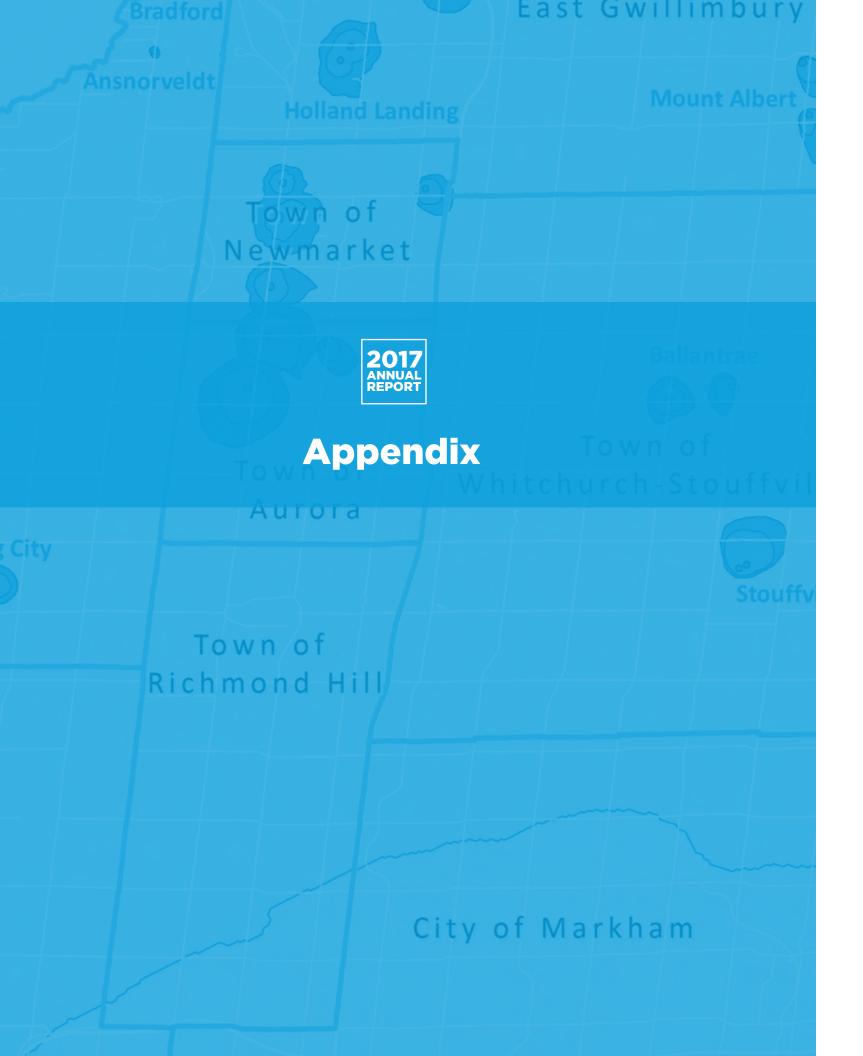
Under the Fusion Gardening pilot project, staff continued to monitor water consumption data and landscape changes in both the pilot area (Kleinburg) and control areas. Staff have maintained three retail partnerships to advance program messaging, delivered a targeted marketing and outreach campaign and continued to develop educational materials for retail staff and residents. Staff have also partnered with Peel Region and Landscape Ontario to develop the Fusion Landscape Professional Training and Certification program which took place in Fall 2017.

Adding New Wells

In 2017 a Class Environmental Assessment was completed to add a new well in East Gwillimbury (on Green Lane between Yonge St. and 2nd Concession - outside of existing wellhead protection areas), and a new well located in Aurora (at St. John's Sideroad and Old Yonge St. - within 15m of an existing well). These replacement wells will result in the redistribution of the current taking from older lower producing wells to the new wells. Minimal change is anticipated to the wellhead protection areas in the vicinity of the Aurora well. Changes associated with the Green Lane wellhead protection area are likely to result in new sites with potential threats, which was considered in the Environmental Assessment. The applicable local municipalities and the Lakes Simcoe and Couchiching / Black River Source Protection Authority have been made aware of these changes and potential minimal impacts to development near the wells.

Moving Forward in 2018

Plans for the Source Protection Program in 2018 include reviewing development proposals in vulnerable areas, establishing twenty or more new Risk Management Plans, completing twelve inspections of risk management measures established in Risk Management Plans, verifying at least twenty sites with potential drinking water threats, and completing best practice education for sites within vulnerable areas that do not require a Risk Management Plan. Staff will continue collaborating with Lakes Simcoe and Couchiching / Black River Source Protection Authority technical staff on the process to add two new wells to the system. York Region will begin delineation of wellhead protection areas, groundwater vulnerability assessments, and threats assessment and verification for these two new production wells.



Definitions

Clean Water Act, 2006 Inspections - The Act provides risk management inspectors and officials with the power to enter property for the purpose of preparing reports, such as annual progress reports. As well, risk management inspectors may enter property for inspection purposes and risk management officials may enter property for the purpose of causing ordered work to be done.

Dense Non-Aqueous Phase Liquid (DNAPL): Chemicals that are both denser than water and do not readily dissolve in water. Due to these traits, DNAPLs tend to sink below the water table and only stop when they reach impenetrable bedrock. This makes them difficult to locate and clean up. Examples of DNAPL's include dry cleaning and automotive degreasers, paint strippers, and adhesives.

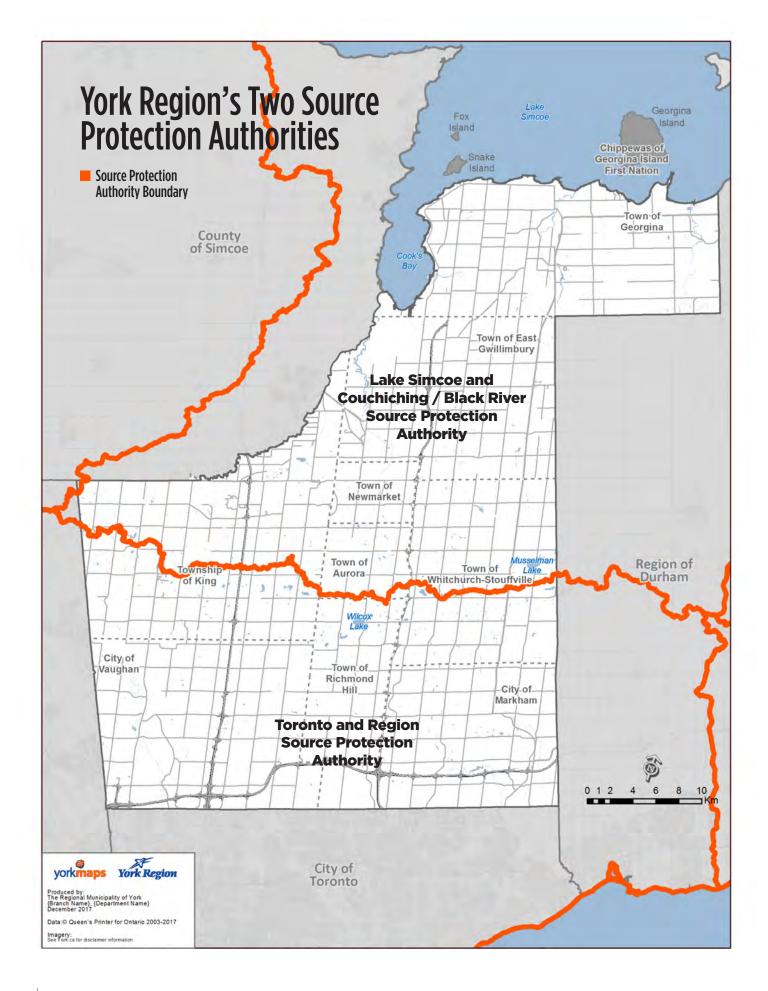
Off-Site Compensation - Source protection plans require the proponent to demonstrate that their projects will maintain the estimated pre-development groundwater recharge through a hydrogeological study and water balance. For those sites where pre-development recharge cannot be maintained, recharge compensation on another site may be considered.

Provincial Approval - a prescribed instrument that is an existing, regulatory tool under a specific piece of provincial legislation (e.g. Environmental Compliance Approvals).

Section 59 Notice - Under Section 59 of the Act a notice must be issued by York Region before a planning and/or building application can be deemed complete by a local municipality for development near municipal wells. This is to make sure the development does not propose an activity that may be prohibited or require a risk management plan under the Source Protection Plan.

Source Protection Authority - There are several Source Protection Regions across the Province (e.g. South Georgian Bay Lake Simcoe). Each one may be broken down into several Source Protection Areas (e.g. Lake Simcoe and Couchiching/ Black River, Nottawasaga Valley). The Source Protection Authority is responsible for requirements under the Act in that area (see map below).

Wellhead Protection Area (WHPA) - The surface and subsurface area surrounding a well or wells that supplies a municipal system through which contaminants may move through and eventually reach the well or wells.



SOURCE WATER PROTECTION IMPLEMENTATION



The Regional Municipality of York Environmental Services Department Administrative Centre - 2nd Floor 1-877-464-9675 york.ca

Accessible formats or communication supports are available upon request.

