Clause 8 in Report No. 4 of Committee of the Whole was adopted, without amendment, by the Council of The Regional Municipality of York at its meeting held on March 24, 2016.

8

2015 Drinking Water Systems Report

Committee of the Whole recommends:

1. Receipt of the presentation by Roy Huetl, Director, Operations Maintenance and Monitoring and David Szeptycki, Head of Strategy, Liaison and Policy Implementation.

2. Adoption of the following recommendation contained in the report dated February 4, 2016 from the Commissioner of Environmental Services:

    1. The Regional Clerk circulate this report to the Clerks of the local municipalities and the Ontario Chief Drinking Water Inspector (Ministry of the Environment and Climate Change).

Report dated February 4, 2016 from the Commissioner of Environmental Services now follows:

1. Recommendation

It is recommended that:

1. The Regional Clerk circulate this report to the Clerks of the local municipalities and the Ontario Chief Drinking Water Inspector (Ministry of the Environment and Climate Change).

2. Purpose

York Region's 2015 Drinking Water Systems Report and associated attachments fulfill reporting requirements of the Drinking Water Systems regulation and helps Council meet Statutory Standard of Care requirements in the *Safe Drinking Water Act, 2002*.

3. Background

Legislation mandates system owners report annually on drinking water systems to Council and the public

All municipal drinking water systems are mandated to report drinking water quality and quantity information under the *Safe Drinking Water Act*, *2002*. This report and attachments, along with reports posted on www.york.ca/drinkingwater fulfill the Region's annual regulatory reporting obligations.

Annual Report provides Council with information required to exercise due diligence and meet Standard of Care requirements

Municipal Councillors have an important role to play in ensuring York Region drinking water systems provide safe, high quality drinking water. As a result of the Walkerton tragedy in which seven people died and thousands became ill from contaminated water, the Province developed the *Safe Drinking Water Act, 2002* to reduce the chance of a similar incident occurring. Section 19 of the Act clarifies the legal responsibility held by people with decision-making authority over municipal drinking water systems by outlining a Statutory Standard of Care. The Act specifically requires these individuals to exercise a level of care, diligence and skill with regard to a municipal drinking water system that a reasonably prudent person would be expected to exercise in a similar situation.

This report summarizes water quality and capacity results for 2015. In addition, this report describes major drinking water system expenses incurred, identifies any instances where sample results were reported to the Province as adverse and summarizes corrective actions taken. As part of this report, staff have provided Attachment 1 – 2015 Drinking Water Systems Report, which outlines raw water descriptions and treatment methods for individual water systems. Combined, these reports help Council members meet their Standard of Care requirements for York Region's drinking water systems.

Medical Officer of Health oversight role on drinking water strengthened post-Walkerton

Based on the Walkerton tragedy, Justice O'Connor recommended that the local Medical Officers of Health play a key role in ensuring drinking water is safe. To reinforce their role, the Province included notification provisions under the *Safe Drinking Water Act*, *2002*. This requires owners of drinking water systems and laboratories analyzing drinking water samples to notify the Ministry of the Environment and Climate Change (the Ministry) and the Medical Officer of Health of adverse results.

The Medical Officer of Health assesses any potential health impact from an adverse water quality result and, where necessary, may direct the owner of a drinking water system to take corrective actions beyond what is prescribed by the regulations. In the event of a water emergency, there will be close cooperation between the local Medical Officer of Health, the operating authority, and the Ministry to allow for effective communication with the public to protect public health. Environmental Services and Public Health maintain a 24/7 on-call response to potential water quality issues.

Integrated Management System helps mitigate risks associated with providing drinking water

Under the *Safe Drinking Water Act, 2002*, all municipal water systems in Ontario must have a Drinking Water Quality Management Standard in place. The Standard was a recommendation from the Walkerton Inquiry designed to protect public health by achieving consistent practices in managing and operating water systems. York Region received International Organization for Standardization (ISO) 9001 registration in 2001 for its drinking water systems and Drinking Water Quality Management Standard (DWQMS) accreditation in 2009. These systems assist York Region in meeting the needs of customers and other stakeholders, while continually monitoring and improving quality. The 2015 Integrated Management System Report (also on this agenda) provides detailed insight into this system and how it helps York Region provide safe drinking water.

4. Analysis and Options

York Region ranked first in the Greater Toronto Area in the Ontario Chief Drinking Water Inspector's Annual Report 2014-2015 for water quality

Ontario's Chief Drinking Water Inspector releases an annual report rating for drinking water systems. Reporting timelines are based on the Province's previous fiscal year - April 1, 2014 to March 31, 2015.

For the Chief Drinking Water Inspector's Annual Report 2014-2015, York Region achieved a compliance score on Ministry inspections of 99.09 per cent and a score of 99.99 per cent on samples meeting provincial water quality standards as shown in Table 1. City of Toronto and Peel Region, who provide drinking water to York Region, also received high scores in the Chief Drinking Water Inspector's Annual Report.

Individual drinking water system performance summaries for York Region's subsystems can be found in Attachment 1 – 2015 Drinking Water Systems Report.

Table 1
Ministry of Environment and Climate Change Inspection Ratings for Four Greater Toronto Area Municipalities*

Municipality	2013-14 Inspection Rating (%)	2014-15 Inspection Rating (%)	2013-14 Drinking Water Quality (% Tests Meeting Standards)	2014-15 Drinking Water Quality (% Tests Meeting Standards)
York Region	99.96	99.09	99.99	99.99
Durham Region	99.73	98.49	99.95	99.95
Peel Region	98.21	98.17	99.94	99.99
City of Toronto	97.93	100.00	99.75	99.45

*Note: Average scores for all systems within regional jurisdiction.

York Region's drinking water systems operated within the monthly average flow, maximum daily withdrawal, and allowable daily withdrawal limits set out in Permits to Take Water in 2015

York Region continues to maintain compliance with the *Safe Drinking Water Act, 2002* and its regulations along with terms and conditions of the Region's Permits to Take Water and Intra-Basin Transfer agreement. York Region has secured sufficient drinking water capacity for the Region's growing population. In 2015, all of York Region's drinking water systems operated within the monthly average flow, maximum daily withdrawal, and allowable daily withdrawal limits set out in Permits to Take Water issued by the Ministry. Maximum permitted volumes in these long-term agreements have been set to allow increased annual quantities required to service forecasted population growth to 2031 and beyond.

York Region operates a range of treatment methods to meet the unique needs of each water system. Descriptions of water supplies, treatment methods, quantity of water provided and available capacity for each water system can be found in Attachment 1 – 2015 Drinking Water Systems Report. Drinking water systems in York Region are diligently monitored and contingencies such as automatic shut-offs in the event a parameter falls outside the normal range help to mitigate drinking water quality risks.

York Region compliance efforts focus on reducing potential risks to drinking water quality

As part of reporting requirements under the *Safe Drinking Water Act*, *2002* the Region must note any known incidents of non-compliance with the Act, its regulations, approval, drinking water works permit or municipal drinking water license for the reporting period and describe related corrective actions taken.

York Region's Integrated Management System provides a framework to support identifying and correcting adverse results or operational events reported to applicable regulatory agencies, including the Ministry and the Medical Officer of Health. Adverse conditions do not necessarily indicate a danger to public health, but indicate that a parameter has fallen outside of a regulated operating range which may require operational investigation.

In 2015, York Region complied with the terms and conditions of all drinking water system permits, licenses, and Permits to Take Water, with the exception of the incidents summarized below and also detailed in Attachment 2 (summary of water sampling results), Attachment 3 (summary of system performance results) and Attachment 4 (summary of results from 2015 Ministry inspections). None of these incidents represented a risk to public health and corrective actions have since been instituted.

99.98 per cent of tests performed in 2015 required no corrective action and confirm York Region's track record of providing high quality drinking water

York Region conducts a comprehensive sampling program. A significant number of regulated water quality parameters are tested by analyzers that continuously monitor drinking water quality. Staff have been working to optimize the program to focus the greatest effort on monitoring parameters with the greatest risk to public safety. These optimization efforts have resulted in efficiencies in testing protocols. In 2015, 18,692 tests were performed to measure water quality. A total of three adverse events, representing 0.02 per cent of tests performed in 2015, are summarized with respective corrective actions in Attachment 2. Two of these adverse results were sodium related as outlined in Table 2. Sodium levels measured in these instances are within the typical range observed at a number of Region groundwater wells and are indicative of groundwater conditions in the Region. Levels were not significantly above the reporting threshold and do not pose a risk to public health, but are reported to help those on low sodium diets effectively manage and monitor their sodium intake. Where a coliform adverse result was identified, water was resampled and results confirmed no coliforms, meeting regulated levels.

Table 2
Summary of 2015 Reported
Adverse Water Quality Parameter Results

Parameter	Number of Events	Total Samples
Sodium	2	68
Coliforms	1	3,139
Other Parameters	0	15,485
Total	**3**	**18,692***

*Adverse results in Table 2 relate to laboratory testing. 99.98 per cent of samples fell within the optimal range. None of these adverse events represented a risk to public health.

Water systems are designed to track water quality and shut down production in the event of any potential issues

In addition to the sampling program, some parameters, including chlorine, are continuously monitored. There are 250 analyzers constantly monitoring regulated parameters, creating approximately 26 million records per year. As summarized in Table 3, there were 29 system performance events in 2015 related to continuous monitoring. These adverse events represent approximately 0.0001 per cent of recorded levels in 2015.

Table 3
Summary of 2015 Reported
Adverse System Performance Events

Parameter	Number of Events
Chlorine	25
Fluoride	2
System Pressure	2
Total	**29***

*Adverse results in Table 3 relate to continuously monitored parameters. 99.9999 per cent of readings fell within the optimal range. None of these adverse events represented a risk to public health.

Twenty-five of these adverse events were related to chlorine. Following each instance, grab samples were taken, which indicated that chlorine levels were within the regulated range. Eight of these events were due to chlorine analyzer malfunctions. Seven other events were due to minor operation issues such as booster pump failures, which were quickly addressed. A further eight chlorine adverse events were related to optimizing operation of the Glenway re-

chloramination facility in Newmarket, which was brought into service in 2015. Two of these events were reported as a due diligence measure.

Both adverse incidents related to fluoride were due to analyzer malfunctions. An additional two adverse events were related to system pressure; this is not a regulated parameter, but staff reported these events as a due diligence measure.

These adverse events had no impact on human health and safety because automated monitoring systems detected the situation and shut down production until staff arrived on site to initiate corrective actions. In each of these instances, Public Health was notified as required on adverses and consulted on corrective actions to be taken to ensure public health and safety. Further details on these adverse events and respective corrective actions are provided in Attachment 3.

No incidents represented a risk to public health and safety

York Region is required to report all adverse incidents to the Ministry of the Environment and Climate Change and the local Medical Officer of Health whenever a prescribed adverse incident is discovered. No incidents in 2015 represented a risk to public health and safety. These events also assist in identifying potential operational concerns that can be addressed before they result in actual impacts to drinking water quality. Environmental Services and Public Health continually collaborate on water quality management to ensure that drinking water is kept clean and safe.

Procedures have been updated to improve tracking of sampling and help ensure that all samples are captured

In January 2015, regulatory samples at the Ballantrae/Musselman's Lake and Mount Albert drinking water systems were scheduled to be collected for nitrate and nitrite. Sampling bottles and documentation were misplaced and required samples were not taken within the regulated timeframe for the first quarter of 2015. While performing quality assurance/control on lab results in March 2015, staff discovered the missed samples and immediately collected samples for analysis. All results fell within regulated limits. Staff have taken a number of corrective actions to help reduce the risk of missed samples in the future. These include scheduling all samples through work orders in Maximo software, scheduling reminders for Operators, requiring Operators to confirm the number of bottles match the work order, and re-training Operators on sampling procedures. These corrective actions have been communicated to the Ministry.

Ministry inspections resulted in high overall inspection ratings and confirm the strength of the Region's system of audits and monitoring systems

In addition to self-monitoring and auditing performed by York Region, the Ministry performs inspections of York Region drinking water facilities. Inspection ratings reported in this section are for the previous calendar year, January 1, 2015 to December 31, 2015.

In 2015, the Ministry performed 13 inspections, which resulted in two non-compliance incidents and zero best practice recommendations. Both non-compliance findings were related to the missed regulatory samples outlined above, which staff reviewed and implemented corrective actions to help prevent reoccurrence in the future.

York Region participated in a self-reporting pilot for Ministry inspections

In an effort to update inspection protocols and explore resource efficiencies, the Ministry partnered with York Region to conduct a self-reporting inspection pilot. The Georgina Water Treatment Plant was selected as a suitable site for the pilot. As part of this pilot, York Region compliance auditors performed the inspection tasks of the Ministry inspector. Once completed, results were audited by the Ministry inspector. The inspection achieved a 100 per cent compliance score and speaks to the confidence that the Province has in its top performing drinking water authorities.

Partnering on a self-inspection pilot was a valuable opportunity to improve efficiencies for both parties and encourage future collaboration to modernize the inspection process. Participating in this pilot gave staff insight into how a self-reporting program could potentially be implemented by the Province, while better understanding the logistical and resource implications. The experience also helped staff better understand provincial compliance priorities, which has resulted in heightened due diligence practices.

Drinking water report is being released as part of open data initiative

Open data is the release of easy to access government data for use in new and innovative ways. Open data increases transparency, promotes understanding of government and fosters greater trust by proactively making data broadly available. It helps to raise the profile of regional government as a self-serve trusted source of data.

York Region is releasing data from Drinking Water Systems Reports to allow the public to use the data in a form that best suits their needs. This data can be accessed at: www.york.ca/opendata.

Link to key Council-approved plans

York Region's 2015 Drinking Water Systems Report provides Council with an overview of York Region's drinking water systems status, capacity, and quality for the year. Drinking water inspection and sampling results consistently demonstrate that York Region is a municipal leader in providing clean, safe drinking water to its residents.

York Region's drinking water systems' capabilities and quality align with the Region's 2015 to 2019 Strategic Plan objective of optimizing critical infrastructure system capacity and making it easier to access Regional information and services.

5. Financial Implications

York Region spent $13 million in 2015 to maintain and improve drinking water systems

York Region delivers high quality drinking water in a safe and efficient manner. Effective asset management, including infrastructure maintenance, is critical to the Region's ability to deliver services that are safe, reliable and efficient, while sustaining our growing communities.

Ontario Regulation 170/03 requires water utility owners to "describe any major expenses incurred during the period covered by the report to install, repair or replace required equipment." In 2015, York Region spent nearly $13 million installing, repairing or replacing equipment used to treat, store and deliver safe drinking water. A description of these expenditures is included in Table 4. These costs are funded through the rate-supported Environmental Services water budget as approved annually by Council.

Table 4
Summary of Major Expenditures for the Drinking Water System in 2015

Drinking Water System	Repair or Replacement Activity	Expenditures
Ansnorveldt	General maintenance and repair	$26,481
Aurora – York Drinking Water System	Rechloramination upgrades to Aurora South Reservoir	$1,636,115
Ballantrae/Musselman's Lake	Elevated tank upgrades	$25,166
Georgina – Keswick	Keswick Water Treatment Plant upgrades including power, filter upgrades and chlorination room retrofit. West Park Reservoir and Deer park Elevated Tank re-coating and upgrades	$5,737,338
Georgina – Sutton	General maintenance and repair	$355,651
Holland Landing – York Drinking Water System	Holland Landing West Elevated Tank and Sherwood Forest Pumping Station upgrades	$223,739
King City – York Drinking Water System	General maintenance and repair	$22,779
Kleinburg – York Drinking Water System	Chloramination upgrades to wells providing backup supply	$1,006,821
Mount Albert	Elevated tank upgrades	$25,687
Newmarket – York Drinking Water System	Electrical upgrades to Wells 13 and 16 along with installation of flow meter	$1,263,330
Nobleton	Elevated tank recoating and upgrades	$53,757
Queensville – York Drinking Water System	General maintenance and repair	$11,311
Schomberg	Elevated tank upgrades	$78,313
Stouffville – York Drinking Water System	Elevated tank upgrades	$108,010
York Drinking Water System Distribution	Upgrades to Bayview Pumping Station, York Peel Feedermain repairs, replacing watermains	$2,379,098
Total		**$12,953,596**

6. Local Municipal Impact

York Region's drinking water systems are operated to meet applicable regulatory compliance requirements prescribed through applicable legislation. Meeting these regulatory requirements assists the Region in delivery of safe and sustainable supply of drinking water to its nine local municipalities.

York Region owns approximately nine per cent of linear assets in the total water distribution system while local municipalities own the remainder of the system. Collaboration is a key factor to ensure that drinking water quality is maintained. York Region and local municipal staff have been working together to establish best management practices for enhanced maintenance of the water distribution system to further ensure quality standards are maintained.

Copies of the Ministry of the Environment and Climate Change's Section 11 reporting forms were provided to local municipalities to meet the February 28 deadline. Copies of this report and attachments will also be provided to local municipal staff following Council approval.

7. Conclusion

This Council report (including all attachments) along with Section 11 reporting forms (posted on www.york.ca/drinkingwater) satisfies reporting requirements under the *Safe Drinking Water Act, 2002*. Attachments contained in this report also provide detailed information on the Region's drinking water systems required to support Council by demonstrating aspects of due diligence under Statutory Standard of Care requirements.

Findings from the 2015 reporting year continue to demonstrate the high performance of York Region's drinking water systems, which are subject to strict regulations implemented by the Province of Ontario to keep drinking water clean and safe. This report demonstrates the Region's commitment to operational excellence through continuous improvement, while also fulfilling our obligation to communicate performance to Council, stakeholders, and the public.

For more information on this report, please contact David Szeptycki, Head of Strategy, Liaison, and Policy Implementation at (905) 830-4444 at ext. 75723 or Roy Huetl, Director of Operations, Maintenance, and Monitoring at ext. 75323.

The Senior Management Group has reviewed this report.

February 4, 2016

Attachments

6596783

Accessible formats or communication supports are available upon request

Attachment 1

2015 Drinking Water Systems Report

Keeping our water safe

York Region

Accessible formats or communication supports are available upon request. Please contact us by email at environmentalservices@york.ca or by phone at 1-877-464-9675

A copy of this report is available at the Environmental Services Department counter located at the York Region Administrative Centre or online at york.ca

Table of Contents

Introduction

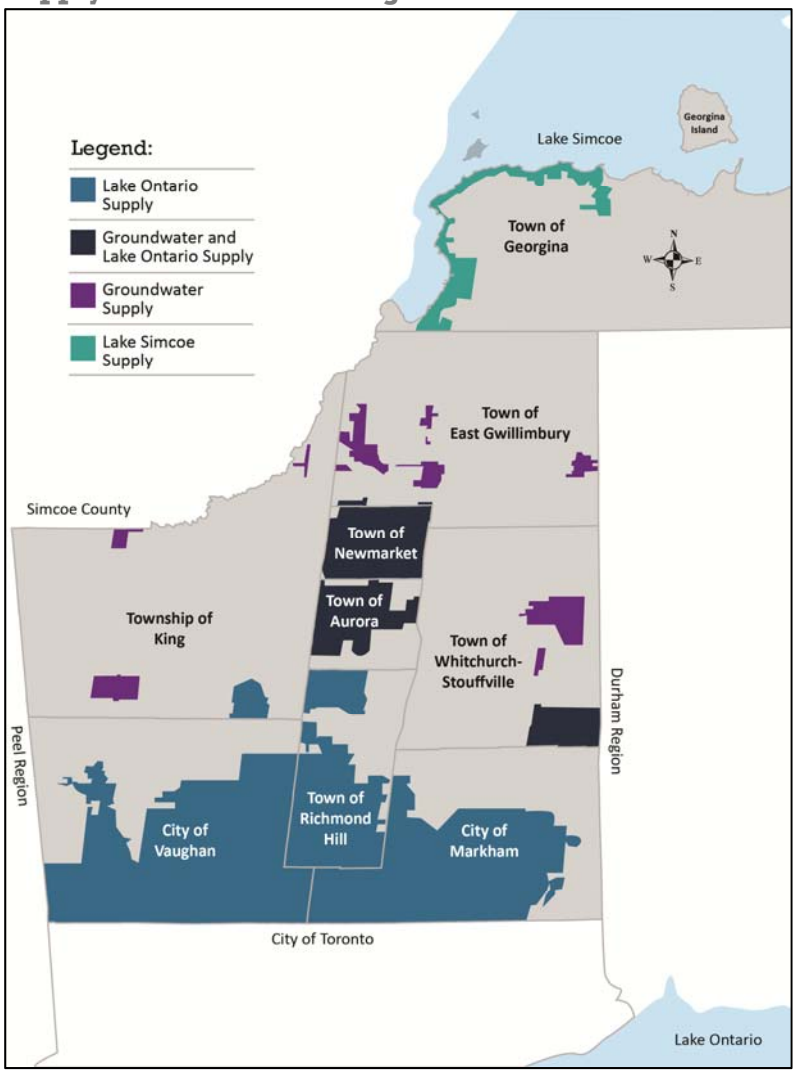
York Region is responsible for the supply, production, treatment, storage and transmission of drinking water to its nine municipalities: Town of Aurora, Town of East Gwillimbury, Town of Georgina, Township of King, City of Markham, Town of Newmarket, Town of Richmond Hill, City of Vaughan, and Town of Whitchurch-Stouffville. These local municipalities are responsible for distributing drinking water to residential, industrial, commercial and institutional customers within their communities.

York Region's drinking water sources include (Figure 1):

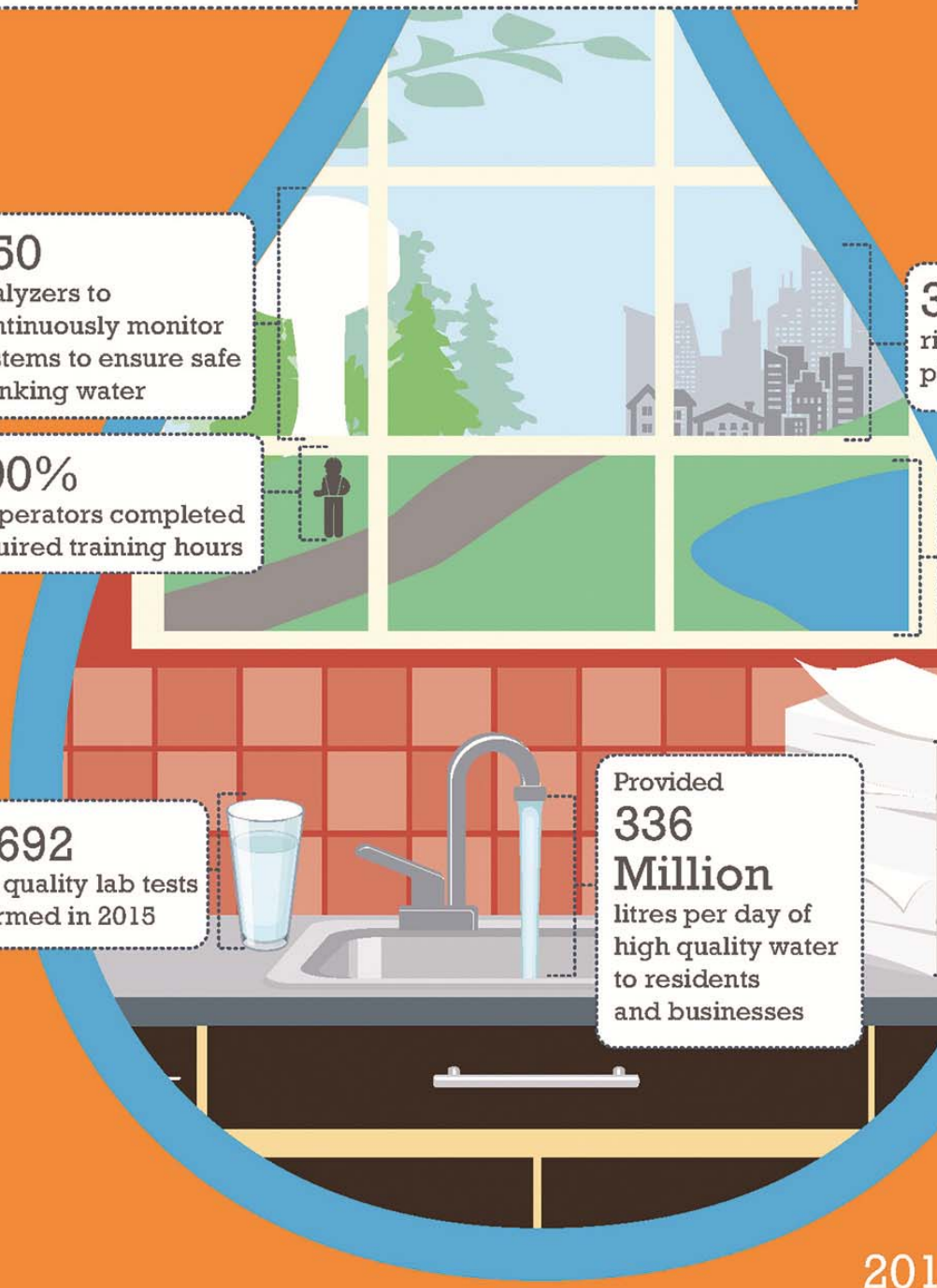
- Groundwater drawn from Regional aquifers
- Surface water drawn from Lake Ontario (provided through agreements with the City of Toronto and the Regional Municipality of Peel (Peel Region))
- Surface water drawn from Lake Simcoe

To provide residents and businesses with safe uninterrupted drinking water supply, York Region operates and maintains three water treatment plants, 44 storage facilities (elevated tanks and reservoirs), 41 production wells and more than 346 kilometres of transmission mains. York Region is also committed to effective wastewater treatment to protect sources of drinking water and maintains seven water resource recovery facilities, 19 sewage pumping stations, two wastewater equalization tanks and more than 318 kilometres of sewer mains.

Figure 1 – Water Supply Sources in York Region



Keeping Our Drinking Water Safe



250
analyzers to continuously monitor systems to ensure safe drinking water

34
risk management plans in place

100%
of operators completed required training hours

2
approved source protection plans

18,692
water quality lab tests performed in 2015

Provided
336 Million
litres per day of high quality water to residents and businesses

26 Million
records generated to ensure optimal system performance

2015 Results

Meeting and Exceeding Our Requirements

All municipal drinking water systems are mandated to report drinking water quality and quantity information under the *Safe Drinking Water Act*, *2002*. An annual report to Council, along with reports posted on york.ca/drinkingwater fulfill the Region's annual regulatory reporting obligations.

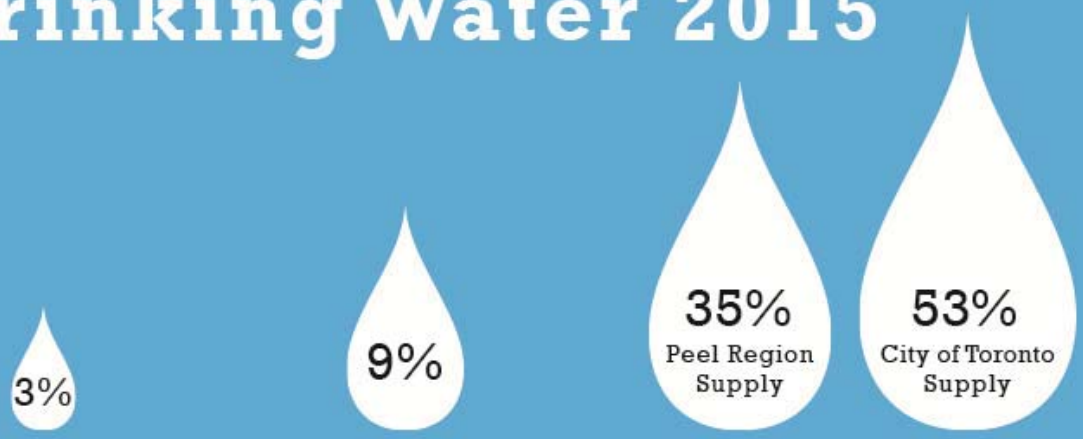
York Region is passionate about treating water to a high standard of quality because there is only one water. Proactive risk management is carried out every day by:

- Following a multi-barrier approach to ensure drinking water is kept clean, safe and reliable
- Complying with legislation to provide high-quality drinking water
- Planning and constructing infrastructure to meet the needs of a growing Region
- Maintaining supplemental water capacity through well systems to help reduce the risk of service interruptions
- Implementing innovative, progressive programs and securing strategic partnerships with industry and research leaders to drive innovation
- Operating and maintaining drinking water quality by completing thousands of tests and using highly sophisticated real-time monitoring to help ensure that drinking water meets quality standards
- Maintaining robust training programs, ensuring operators continue to achieve excellence in delivering drinking water
- Maintaining an integrated management system to monitor compliance and drive continuous improvement, including the Drinking Water Quality Management Standard, ISO 9001 registration, and performing audits to proactively manage risk

In 2015, all of York Region's Drinking Water Systems operated within the monthly average flow, maximum daily withdrawal and allowable daily withdrawal limits as set out in Permits to Take Water issued by the Ministry of the Environment and Climate Change.

York Region uses continuous monitoring for critical processes and conducts a comprehensive sampling program exceeding regulatory requirements. In 2015, 18,692 tests were performed on water quality samples, which resulted in three adverse results or a 0.02 per cent defect rate for all samples collected. In addition to the sampling program, continuous monitoring of some critical parameters, including chlorine residual, is performed. Two hundred and fifty analyzers are monitored on a continuous basis resulting in approximately 26 million records. There were 29 adverse results related to system performance events from this monitoring, representing approximately 0.001 per cent of all monitoring results. Adverse results are reported as required by the *Safe Drinking Water Act, 2002*. An adverse event does not necessarily indicate that drinking water is unsafe; it indicates a parameter has fallen outside of a regulated operating range and corrective action must be taken. None of these incidents posed a health threat or resulted in a service interruption to residents.

Sources of York Region Drinking Water 2015



Number of tests performed and adverse events reported on submitted water samples taken in 2015

total number of tests performed 18,692

6,631 organic 45%

8,592 micro 28%

3,469 inorganic 27%

3 adverse 0.02%

total water delivered = 123 billion litres

Multi-Barrier Approach Helps Protect Drinking Water

York Region has built a multi-barrier approach to help ensure safe operation of drinking water systems. The multi-barrier approach is an internationally recognized system of procedures, processes and tools, which create a series of barriers that operate collectively to prevent contamination and provide high-quality drinking water. This approach is closely aligned with a "One Water" philosophy adopted by a number of industry leaders, which recognizes the same water is cycled throughout all uses on earth and must be protected at all points in the water cycle.

The multi-barrier approach treats drinking water as a series of systems, helping to ensure water is protected from source to tap and back to source. Barriers ensuring safe, clean drinking water can be classified into the three broad categories below:

Processes to Treat and Manage Water

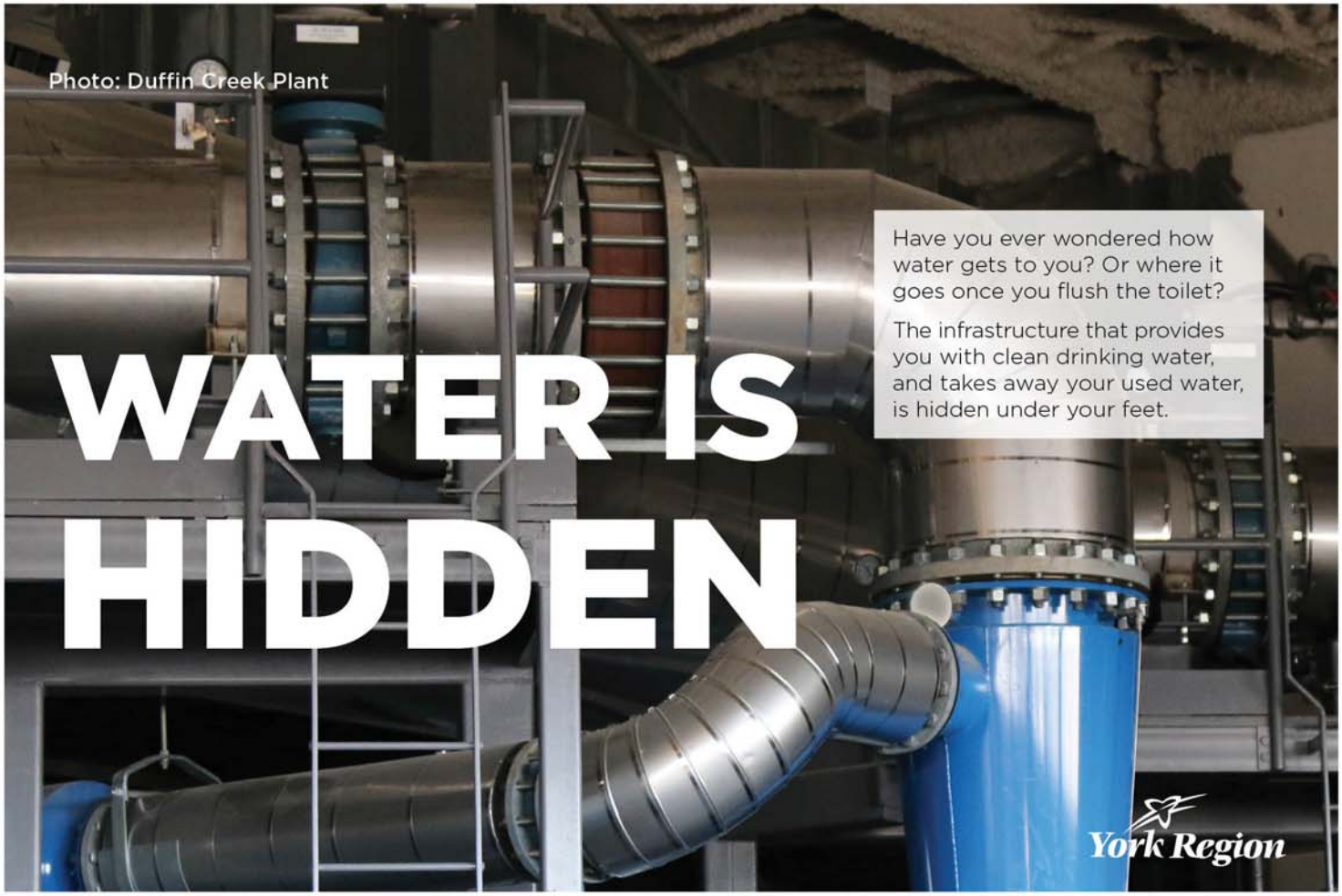
- ✓ **Sourcewater Protection** – Protecting sources of drinking water is key to continued delivery of high-quality drinking water. York Region is working to implement the source protection plans for both South Georgian Bay Lake Simcoe and Credit Valley, Toronto and Central Lake Ontario to help protect our raw water sources of drinking water.
- ✓ **Robust Water Treatment** – Helps ensure drinking water meets regulatory requirements on a continual basis, often using multiple steps to treat drinking water, eliminate pathogens and provide safe, clean drinking water to our customers.
- ✓ **Secure Water Distribution Network** – Once water is treated, it is distributed to customers in a manner that ensures quality is maintained all the way to the tap. York Region works actively with local municipalities, City of Toronto and Peel Region to ensure the security and integrity of the distribution system.
- ✓ **Effective Wastewater Treatment** – Wastewater is any water that leaves through a drain. It is collected and treated to remove contaminants before being returned to the environment. York Region is a leader in wastewater treatment with advanced treatment technologies and performance monitoring at facilities.

System Oversight

- ✓ **Monitoring and Testing** – Ensuring water quality is maintained from source to tap by monitoring processes and water quality through sophisticated continuous monitoring and lab tests. York Region gathered 26 million continuous monitoring records and 18,692 lab test results in 2015 to help ensure drinking water is clean and safe.
- ✓ **Management and Oversight** – Oversight of standards through integrated management systems, which help maintain guidelines and standards through defined processes and staff oversight.

Policy and Development:

- ✓ **Public Awareness** – Education on how to protect sources of drinking water and the quality of our drinking water. The Region performs outreach in a number of ways, including promotional campaigns and outreach activities.
- ✓ **Legislative and Policy Frameworks** – Provincial legislation and regulations that drinking water and wastewater are required to meet such as the *Safe Drinking Water Act, 2002*.
- ✓ **Guidelines, Standards, and Objectives** – High level tools that help provide direction on operation of processes to treat and manage drinking water. York Region is accredited under the Provincial Drinking Water Quality Management Standard and is also registered to ISO 9001 and 14001.
- ✓ **Research, Science, and Technology** – Advancement in science to help better understand the quality of water and technology to improve processes that treat and manage water. York Region continues to optimize our treatment processes by collaborating with external government partners and university researchers.



WATER IS HIDDEN

Have you ever wondered how water gets to you? Or where it goes once you flush the toilet?

The infrastructure that provides you with clean drinking water, and takes away your used water, is hidden under your feet.

York Region

Clean, affordable and convenient.

Underground, out in Lake Simcoe and Lake Ontario, and across our vast region, a complex and integrated system operates 24 hours a day, 365 days a year, to ensure our water is safe, reliable, clean, affordable and convenient.

Here's a glimpse of what this system looks like...

Learn more about the hidden water system and the people who make it work. For more information, videos and stories, visit **york.ca/wateris**

York Region

Keeping our water safe

Summary of Water Provided to Communities in York Region

York Region is the wholesale supplier of water to its nine local municipalities and is responsible for the supply, production, treatment, storage and transmission of water. Local municipalities own and operate the local distribution systems delivering water from Regional water transmission mains to homes, businesses and schools in the local communities. York Region operates a dynamic and integrated water system to effectively meet the needs of customers. Based on operational strategies, individual sources are used at varying rates throughout the year to optimize use of water resources. Table 1 is a quick reference tool to find out which Regional drinking water system services your local community.

Table 1 – Quick Reference: Drinking Water Systems and Communities Served

Local Community	Local Municipal Water Distributor	Drinking Water System (Source)	Page
Ansnorveldt	King Township	Ansnorveldt Drinking Water System (Groundwater)	8
Aurora	Town of Aurora	York Drinking Water System (Lake Ontario & Groundwater)	24
Ballantrae	Town of Whitchurch-Stouffville	Ballantrae/Musselman's Lake Drinking Water System (Groundwater)	10
Holland Landing	Town of East Gwillimbury	York Drinking Water System (Lake Ontario & Groundwater)	26
Keswick	Town of Georgina	Georgina Water System (Lake Simcoe)	40
King City	King Township	York Drinking Water System (Lake Ontario)	28
Kleinburg	City of Vaughan	York Drinking Water System (Lake Ontario)	30
Lakeside Communities	Town of Georgina	Georgina Water System (Lake Simcoe)	38
Maple	City of Vaughan	York Drinking Water System (Lake Ontario)	18
Markham	City of Markham	York Drinking Water System (Lake Ontario)	18
Mount Albert	Town of East Gwillimbury	Mount Albert Drinking Water System (Groundwater)	12
Musselman's Lake	Town of Whitchurch-Stouffville	Ballantrae/Musselman's Lake Drinking Water System (Groundwater)	10
Newmarket	Town of Newmarket	York Drinking Water System (Lake Ontario & Groundwater)	32
Nobleton	King Township	Nobleton Drinking Water System	14
Queensville	Town of East Gwillimbury	York Drinking Water System (Lake Ontario & Groundwater)	34
Richmond Hill	Town of Richmond Hill	York Drinking Water System (Lake Ontario)	18
Schomberg	King Township	Schomberg Drinking Water System (Groundwater)	16
Sharon	Town of East Gwillimbury	York Drinking Water System (Lake Ontario & Groundwater)	22
Stouffville	Town of Whitchurch-Stouffville	York Drinking Water System (Lake Ontario & Groundwater)	36
Sutton	Town of Georgina	Georgina Water System (Lake Simcoe)	38
Vaughan	City of Vaughan	York Drinking Water System (Lake Ontario)	18
Woodbridge	City of Vaughan	York Drinking Water System (Lake Ontario)	18

Ansnorveldt [groundwater]

Drinking Water System

Ansnorveldt is a rural community located on Dufferin Street, north of Highway #9 in the Township of King. The community is largely based on the agricultural industry and is centrally located in the Holland Marsh.

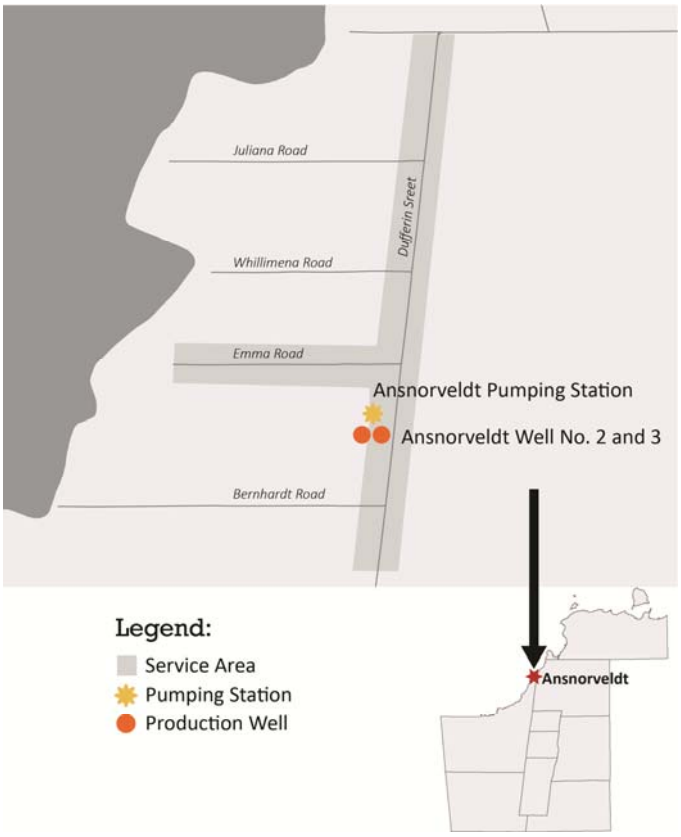
Raw Water Source Description

Water is supplied by two wells and services fewer than 100 homes, a school, church and a library. Water withdrawal is regulated by a Permit to Take Water issued by the Ministry of the Environment and Climate Change.

Wells are screened in the deep aquifer. Groundwater quality meets the Ontario Drinking Water Quality Standard. Aesthetic parameters like iron and operational parameters like hardness fall outside the optimal operating range, which is common in deep aquifers in York Region. Staff use raw water test results to determine the best water treatment.

Water Treatment

Water treatment for the Ansnorveldt wells is comprised of the addition of sodium hypochlorite for disinfection. Water from the wells is combined, treated and pumped into a concrete reservoir. High lift pumps deliver water to the distribution system. Treatment processes are monitored by online analyzers equipped with alarms and lockouts to alert operational staff of conditions requiring attention.



Summary of Approvals and Permits

Municipal Drinking Water License Number:	013-108
Issue Number:	Issue 4
Issue Date:	January 27, 2015
Expiry Date:	January 26, 2020
Renewal Date:	July 27, 2019
Drinking Water Works Permit Number:	013-208
Issue Number:	Issue 3
Issue Date:	January 27, 2015
Permit To Take Water Number:	8037-94XPXR
Issue Date:	March 15, 2013
Expiry Date:	March 31, 2021
Operational Plan Number:	013-408
Financial Plan Number:	013-301A
MOECC Waterworks Number:	260002213
System Classification:	Water Distribution and Supply II

Ansnorveldt Drinking Water System Performance Summary:

[hpc] Heterotrophic Plate Count (microbial test for general level of bacteria)

RAW	208 samples	0 e-coli results	0 total coliforms	n/a hpc samples	n/a hpc results
TREATED	104 samples	0 e-coli results	0 total coliforms	52 hpc samples	0 to 2 hpc results

Average Treated Water Concentration (mg/L)	41 sodium	117 hardness	0.24 fluoride

- Turbidity (Treated)
  8,760 samples (continuously monitored)
  ranged 0.007 to 5.004 ntu [min. to max.]
- Chlorine (Free)
  8,760 samples (continuously monitored)
  ranged 1.10 to 2.72 mg/L [min. to max.]

Permitted and Actual Maximum Daily Withdrawal from the Ansnorveldt Production Wells for January 1 to December 31, 2015

Location	Permitted Daily Withdrawal (litres)	Actual Maximum Daily Withdrawal (litres)	Number of Days Operating at Peak Capacity (May to October)	Number of Days Operating at Peak Capacity (Annual)
Well 2	184,320	91,594 Jul. 2, 2015	0	0
Well 3	115,200	43,000 Jul. 2, 2015	0	0

Permitted and Actual Maximum Annual Withdrawal from Production Wells for January 1 – December 31, 2015

Actual Annual Withdrawal	Annual Permitted Withdrawal	Percentage of Permitted Annual Withdrawal
16,242,656 litres	109,324,800 litres	15 per cent

System Monthly Average Flow (litres per day)

January 38,010	February 44,090	March 45,591	April 49,212	May 59,448	June 61,602
July 55,804	August 43,593	September 38,191	October 33,583	November 30,539	December 34,353

Ballantrae/Musselman's Lake

[groundwater]

Drinking Water System

York Region operates three wells and one elevated tank servicing the community of Ballantrae/Musselman's Lake in the Town of Whitchurch-Stouffville. Water withdrawal from each of the wells is regulated by a Permit to Take Water issued by the Ministry of the Environment and Climate Change.

Raw Water Source Description

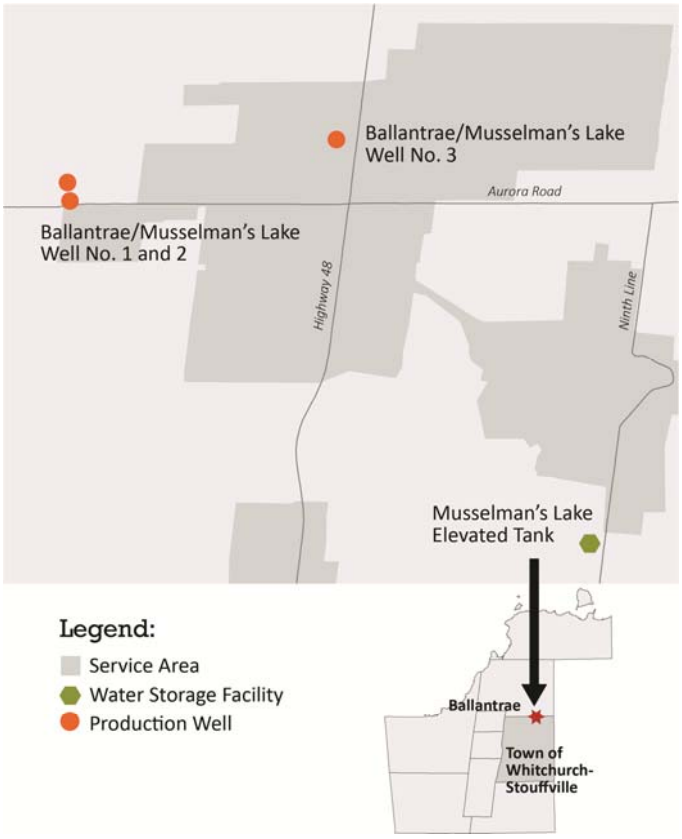
Wells are screened in the deep aquifer. Groundwater quality meets the Ontario Drinking Water Quality Standard. Aesthetic parameters like iron and operational parameters like hardness fall outside the optimal operating range, which is common in deep aquifers in York Region. Staff use raw water test results to determine the best water treatment.

Water Treatment

Water from the Ballantrae/Musselman's Lake wells is treated by adding sodium hypochlorite at Wells 1 and 2 and chlorine gas at Well 3 for disinfection and sodium silicate to sequester iron to reduce potential staining of plumbing fixtures and laundry.

Treatment processes throughout the facility are monitored by online analyzers equipped with alarms and lockouts to alert operational staff of conditions requiring attention.

Water pumped from the wells receives treatment before it enters the distribution system. There is currently one storage tank servicing the community of Ballantrae/Musselman's Lake.



Summary of Approvals and Permits

Municipal Drinking Water	
License Number:	013-106
Issue Number:	Issue 5
Issue Date:	January 27, 2015
Expiry Date:	January 26, 2020
Renewal Date:	July 27, 2019
Drinking Water Works Permit	
Number:	013-206
Issue Number:	Issue 3
Issue Date:	January 27, 2015
Permit To Take Water Number:	2030-8KDJCG
Issue Date:	August 3, 2012
Expiry Date:	March 31, 2016
Operational Plan Number:	013-406
Financial Plan Number:	013-301A
MOECC Waterworks Number:	220008658
System Classification:	Water Distribution and Supply II

Ballantrae/Musselman's Lake Drinking Water System Performance Summary:

[hpc] Heterotrophic Plate Count
(microbial test for general level of bacteria)

RAW	312 samples	0 e-coli results	0 total coliforms	n/a hpc samples	n/a hpc results
TREATED	208 samples	0 e-coli results	0 total coliforms	104 hpc samples	0 to 13 hpc results

Average Treated Water Concentration (mg/L)	10 sodium	179 hardness	0.07 fluoride

- Turbidity (Treated)
  8,760 samples (continuously monitored)
  ranged 0.016 to 5.007 ntu [min. to max.]
- Chlorine (Free)
  8,760 samples (continuously monitored)
  ranged 0.31 to 2.45 mg/L [min. to max.]

Permitted and Actual Maximum Daily Withdrawal from the Ballantrae/Musselman's Lake Production Wells for January 1 to December 31, 2015

Location	Permitted Daily Withdrawal (litres)	Actual Maximum Daily Withdrawal (litres)	Number of Days Operating at Peak Capacity (May to October)	Number of Days Operating at Peak Capacity (Annual)
Well 1	2,617,920	1,533,000 Dec. 5, 2015	0	0
Well 2	2,617,920	1,251,000 Jul. 30, 2015	0	0
Well 3	2,617,920	1,400,000 Sept. 30, 2015	0	0
Well 1, 2 + 3	4,580,000	2,800,000 Jul. 29, 2015	0	0

Permitted and Actual Maximum Annual Withdrawal from Production Wells for January 1 – December 31, 2015

Actual Annual Withdrawal	Annual Permitted Withdrawal	Percentage of Permitted Annual Withdrawal
419,290,000 litres	1,671,700,000 litres	25 per cent

System Monthly Average Flow (litres per day)

January 902,000	February 876,821	March 815,935	April 924,100	May 1,397,710	June 1,292,600
July 1,769,935	August 1,693,452	September 1,442,600	October 976,710	November 809,467	December 853,161

Mount Albert [groundwater]

Drinking Water System

York Region operates three production wells servicing the community of Mount Albert in the Town of East Gwillimbury. Water withdrawal from each of the wells is regulated by a Permit to Take Water, issued by the Ministry of the Environment and Climate Change.

Raw Water Source Description

Wells are screened in the deep aquifer. Groundwater quality meets the Ontario Drinking Water Quality Standard. Aesthetic parameters like iron and operational parameters like hardness fall outside the optimal operating range, which is common in deep aquifers in York Region. Staff use raw water test results to determine the best water treatment.

Water Treatment

Water is treated for the Mount Albert wells prior to entry into the distribution system by adding sodium hypochlorite for Wells 1 and 2 and chlorine gas for Well 3 for disinfection. Sodium silicate is added following chlorination to sequester iron to reduce potential staining of plumbing fixtures and laundry.

Treatment processes throughout the facility are monitored by online analyzers equipped with alarms and lockouts to alert operational staff of conditions requiring attention.

There are currently two elevated tanks servicing the community of Mount Albert.

Summary of Approvals and Permits

Municipal Drinking Water License Number:	013-103
Issue Number:	Issue 3
Issue Date:	January 27, 2015
Expiry Date:	January 26, 2020
Renewal Date:	July 27, 2019
Drinking Water Works Permit Number:	013-203
Issue Number:	Issue 3
Issue Date:	January 27, 2015
Permit To Take Water Number:	0050-7FCMMY
Issue Date:	June 9, 2008
Expiry Date:	March 31, 2018
Operational Plan Number:	013-403
Financial Plan Number:	013-301A
MOECC Waterworks Number:	220006543
System Classification:	Water Distribution and Supply II

Mount Albert Drinking Water System Performance Summary:

[hpc] Heterotrophic Plate Count
(microbial test for general level of bacteria)

RAW	312 samples	0 e-coli results	0 total coliforms	n/a hpc samples	n/a hpc results
TREATED	208 samples	0 e-coli results	0 total coliforms	104 hpc samples	0 to 150 hpc results

Average Treated Water Concentration (mg/L)	12 sodium	314 hardness	0.06 fluoride

- Turbidity (Treated)
  8,760 samples (continuously monitored)
  ranged 0.030 to 5.008 ntu [min. to max.]
- Chlorine (Free)
  8,760 samples (continuously monitored)
  ranged 0.30 to 3.14 mg/L [min. to max.]

Permitted and Actual Maximum Daily Withdrawal from the Mount Albert Production Wells for January 1 to December 31, 2015

Location	Permitted Daily Withdrawal (litres)	Actual Maximum Daily Withdrawal (litres)	Number of Days Operating at Peak Capacity (May to October)	Number of Days Operating at Peak Capacity (Annual)
Well 1	3,273,120	1,188,000 Sept. 1, 2015	0	0
Well 2	3,273,120	1,355,000 Aug. 26, 2015	0	0
Well 3	3,273,120	1,405,000 Aug. 22, 2015	0	0
Well 1, 2 + 3	4,990,000	2,429,000 Sept. 1, 2015	0	0

Permitted and Actual Maximum Annual Withdrawal from Production Wells for January 1 – December 31, 2015

Actual Annual Withdrawal	Annual Permitted Withdrawal	Percentage of Permitted Annual Withdrawal
381,522,000	litres 1,821,350,000 litres	21 per cent

System Monthly Average Flow (litres per day)

January 958,742	February 958,143	March 973,581	April 1,062,133	May 1,136,968	June 1,070,767
July 1,252,677	August 1,122,387	September 1,079,100	October 980,290	November 936,933	December 1,002,000

Nobleton [groundwater]

Drinking Water System

York Region currently operates three wells servicing the community of Nobleton in the Township of King. Water withdrawal from each of the wells is regulated by a Permit to Take Water, issued by the Ministry of the Environment and Climate Change.

Well No. 5 came online in 2015 to help provide adequate standby capacity to service growth anticipated in the community.

Raw Water Source Description

Wells are screened in the deep aquifer. Groundwater quality meets the Ontario Drinking Water Quality Standard. Aesthetic parameters like iron and operational parameters like hardness fall outside the optimal operating range, which is common in deep aquifers in York Region. Staff use raw water test results to determine the best water treatment.

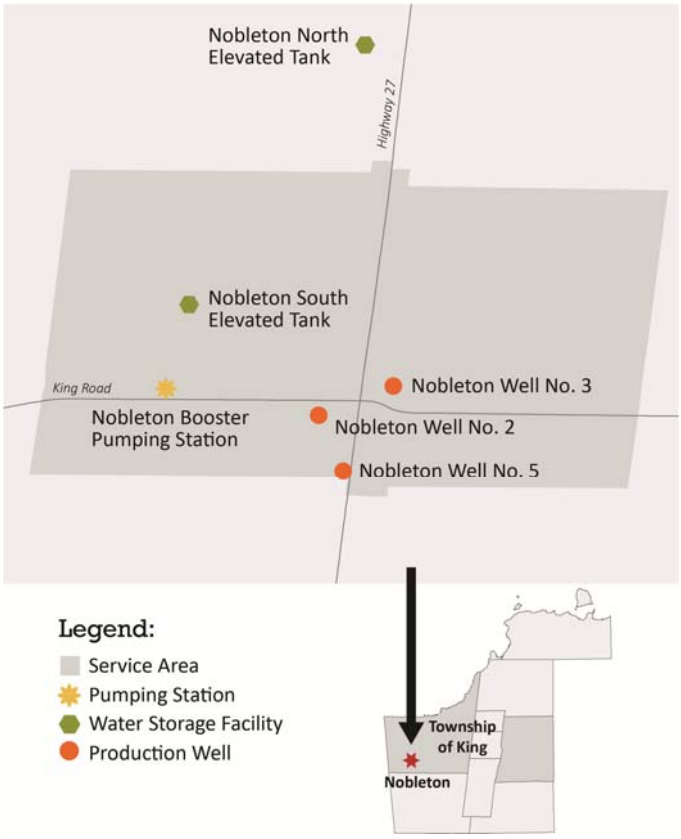
Water Treatment

Water pumped from the wells receives treatment before it enters the distribution system. Water treatment for Wells No. 2 and No. 5 includes the addition of chlorine gas for disinfection, while Well 3 uses sodium hypochlorite.

Sodium silicate is added to the treatment process to reduce potential staining of plumbing fixtures and laundry.

Treatment processes are monitored by online analyzers equipped with alarms and lockouts to alert operational staff of conditions requiring attention.

Following treatment, water enters the distribution system and is stored in two elevated tanks.



Summary of Approvals and Permits

Municipal Drinking Water License Number:	013-105
Issue Number:	Issue 4
Issue Date:	July 3, 2015
Expiry Date:	January 26, 2020
Renewal Date:	July 27, 2019
Drinking Water Works Permit Number:	013-205
Issue Number:	Issue 5
Issue Date:	July 3, 2015
Permit To Take Water Number:	0550-9PPRJ9
Issue Date:	October 14, 2014
Expiry Date:	December 31, 2019
Operational Plan Number:	013-405
Financial Plan Number:	013-301A
MOECC Waterworks Number:	220002306
System Classification:	Water Distribution and Supply II

Nobleton Drinking Water System Performance Summary:

[hpc] Heterotrophic Plate Count
(microbial test for general level of bacteria)

RAW	297 samples	0 e-coli results	0 to 22 total coliforms	13 hpc samples	0 to 280 hpc results
TREATED	262 samples	0 e-coli results	0 total coliforms	131 hpc samples	0 to 24 hpc results

Average Treated Water Concentration (mg/L)	17 sodium	266 hardness	0.13 fluoride

- Turbidity (Treated)
  8,760 samples (continuously monitored)
  ranged 0.022 to 5.004 ntu [min. to max.]
- Chlorine (Free)
  8,760 samples (continuously monitored)
  ranged 0.53 to 2.49 mg/L [min. to max.]

Permitted and Actual Maximum Daily Withdrawal from the Nobleton Production Wells for January 1 to December 31, 2015

Location	Permitted Daily Withdrawal (litres)	Actual Maximum Daily Withdrawal (litres)	Number of Days Operating at Peak Capacity (May to October)*	Number of Days Operating at Peak Capacity (Annual)*
Well 2	1,964,000	1,595,688 Jan. 17, 2015	0	1
Well 3	2,496,000	1,589,250 Sept. 5, 2015	0	0
Well 5	2,496,000	1,884,650 Aug. 10, 2015	0	0
Well 2, 3 + 5	4,460,000	3,482,338 Aug. 10, 2015	0	0

* Wells are considered to be operating at peak capacity if withdrawal is within 80 per cent of permitted capacity.

Permitted and Actual Maximum Annual Withdrawal from Production Wells for January 1 – December 31, 2015

Actual Annual Withdrawal	Annual Permitted Withdrawal	Percentage of Permitted Annual Withdrawal
501,821,745 litres	1,627,900,000 litres	31 per cent

System Monthly Average Flow (litres per day)

January 1,284,865	February 1,187,188	March 1,181,718	April 1,156,973	May 1,475,938	June 1,345,907
July 1,864,446	August 1,681,739	September 1,626,351	October 1,313,720	November 1,213,425	December 1,142,763

Schomberg [groundwater]

Drinking Water System

York Region operates a groundwater treatment plant supplied by three wells servicing the community of Schomberg in the Township of King. Water withdrawal from each of the wells is regulated by a Permit to Take Water issued by the Ministry of the Environment and Climate Change.

Raw Water Source Description

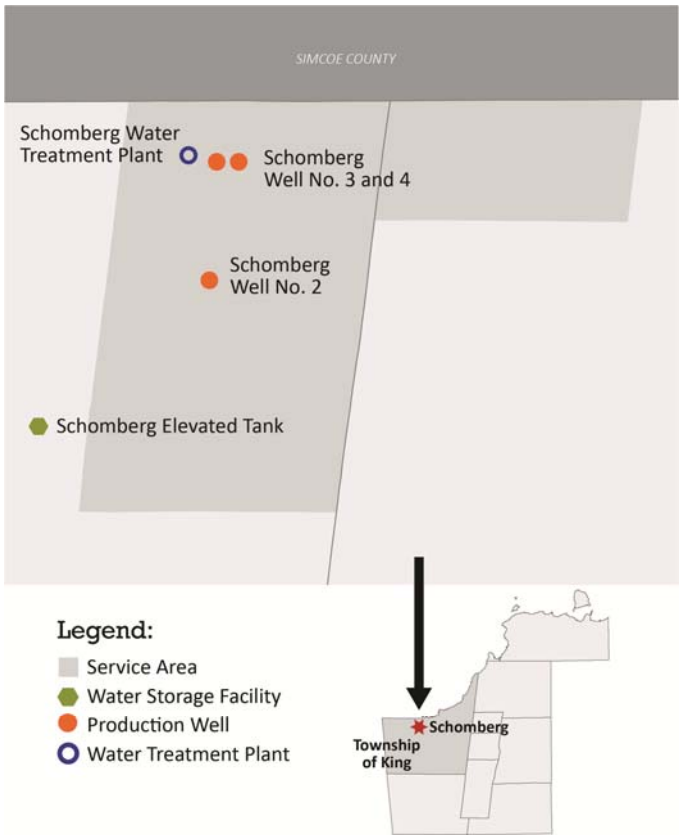
Wells are screened in the deep aquifer. Groundwater quality meets the Ontario Drinking Water Quality Standard. Aesthetic parameters like iron and manganese along with operational parameters like hardness fall outside the optimal operating range. Staff use raw water test results to determine the best water treatment.

Water Treatment

Schomberg Water Treatment Plant includes three production wells, which pump into the treatment plant where water is stripped of naturally occurring methane and treated with potassium permanganate to remove iron and manganese. Water is disinfected using ultraviolet light and chlorine. Naturally occurring ammonia is used in the treatment process to provide chloramination as a secondary disinfectant for the distribution system.

Treatment processes throughout the facility are monitored by online analyzers equipped with alarms and lockouts to alert operational staff of conditions requiring attention.

Following treatment, water enters the distribution system and is stored in one elevated tank currently servicing the community of Schomberg.



Summary of Approvals and Permits

Municipal Drinking Water License Number:	**013-110**
Issue Number:	Issue 4
Issue Date:	January 27, 2015
Expiry Date:	January 26, 2020
Renewal Date:	July 27, 2019
Drinking Water Works Permit Number:	013-210
Issue Number:	Issue 3
Issue Date:	January 27, 2015
Permit To Take Water Number:	0706-7E8T5G
Issue Date:	June 3, 2008
Expiry Date:	April 30, 2018
Operational Plan Number:	013-410
Financial Plan Number:	013-301A
MOECC Waterworks Number:	220004901
System Classification:	Water Treatment II

Schomberg Drinking Water System Performance Summary:

[hpc] Heterotrophic Plate Count (microbial test for general level of bacteria)

RAW	312 samples	0 e-coli results	0 total coliforms	n/a hpc samples	n/a hpc results
TREATED	104 samples	0 e-coli results	0 total coliforms	52 hpc samples	0 to 1 hpc results

Average Treated Water Concentration (mg/L)	19 sodium	279 hardness	0.16 fluoride

- Turbidity (Treated)
  8,760 samples (continuously monitored)
  ranged 0.098 to 5.000 ntu[min. to max.]
- Chlorine (Combined)
  8,760 samples (continuously monitored)
  ranged 0.00 to 2.96 mg/L [min. to max.]

Permitted and Actual Maximum Daily Withdrawal from the Schomberg Production Wells for January 1 to December 31, 2015

Location	Permitted Daily Withdrawal (litres)	Actual Maximum Daily Withdrawal (litres)	Number of Days Operating at Peak Capacity (May to October)	Number of Days Operating at Peak Capacity (Annual)
Well 2	1,636,560	78,000 Mar. 5, 2015	0	0
Well 3	2,290,000	1,717,800 Jan. 20, 2015	0	0
Well 4	1,507,680	1,179,900 Jun. 4, 2015	0	0

Permitted and Actual Maximum Annual Withdrawal from Production Wells for January 1 – December 31, 2015

Actual Annual Withdrawal	Annual Permitted Withdrawal	Percentage of Permitted Annual Withdrawal
512,687,600 litres	1,983,497,600 litres	26 per cent

System Monthly Average Flow (litres per day)

January 1,315,300	February 1,337,782	March 1,318,584	April 1,326,390	May 1,350,335	June 1,339,023
July 1,529,794	August 1,413,223	September 1,465,173	October 1,459,484	November 1,533,353	December 1,462,039

York [surface water – Lake Ontario]

Drinking Water System

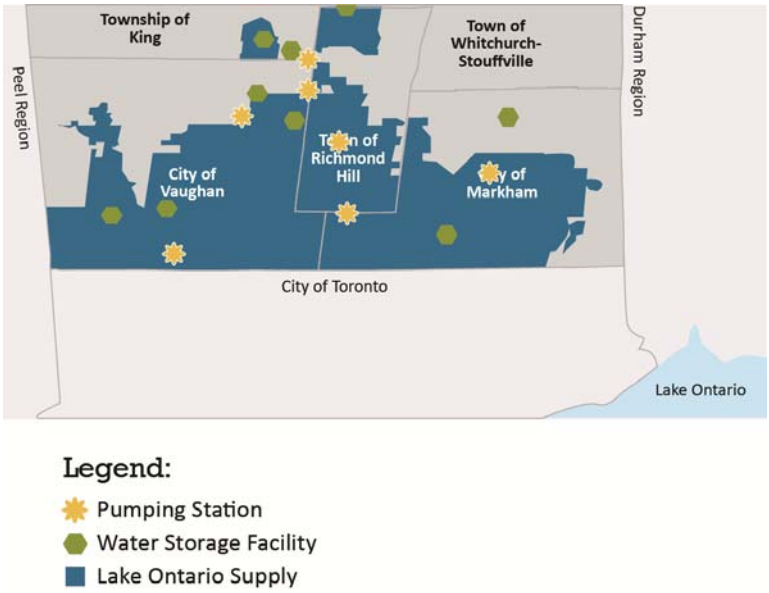
The York Drinking Water System (surface water) consists of pumping stations, storage facilities and large diameter water transmission mains required to transmit water between pumping stations and storage facilities.

York Region services the southern end of the Region (City of Markham, Town of Richmond Hill and the City of Vaughan) exclusively with surface water from Lake Ontario, supplied by the City of Toronto and Peel Region. Blue areas on the map are serviced exclusively by lake water.

Water Treatment
Lake-Based Supply: Water supplied to the local municipalities from the York Drinking Water System is sourced from Lake Ontario. Raw water is treated by the City of Toronto or Peel Region and enters through York Region's transmission system. There is no further treatment performed by York Region as the water travels to local municipal distribution systems.

Toronto Water Supplied to York Region
For the agreement between the City of Toronto and York Region (Toronto/York Water Supply Agreement) York Region budgeted a maximum of 502,680,000 litres per day for 2015.

The average volume of water supplied from Toronto to the York Drinking Water System for the reporting period was 176,975,784 litres per day. The system operated at 35 per cent of the budgeted volume and remained within the maximum limit established in the operating agreement.



Peel Region Water Supplied to York Region
For the agreement between Peel Region and York Region (York/Peel Water Supply Agreement), York Region budgeted a maximum of 195,182,000 litres per day for 2015.

The average volume of water supplied from Peel Region to the York Drinking Water System for the reporting period was 117,805,534 litres per day. The system operated at 60 per cent of the budgeted volume and remained within the maximum limit established in the operating agreement.

Accommodating Future Growth
York Region currently transfers volumes that are below the maximum quantities permitted under these agreements. Maximum permitted volumes have been set to allow for annual increases required to service forecasted population growth to 2031.

WATER IS MOVING

Our Water: An Epic Journey

Where does our water come from and how does it get to our taps? The system that makes it happen is huge, hidden and fascinating. Here's a glimpse of how it works.

York Region provides drinking water to an estimated 1.1 million residents. More than 85 per cent of our water comes from Lake Ontario; the rest, from Lake Simcoe and groundwater. Before it reaches our taps, water is treated to make it safe to drink. Depending on where you live, drinking water might travel more than 80 kilometres to get to you.

At the heart of our water distribution system are massive pumps, moving millions of litres of drinking water from treatment plants through watermains and large distribution pipes within the system. Through this vast underground network, water is driven upward over hills into special storage tanks and water towers.

Water towers play a vital role in our drinking water system. They equalize pressure, provide large volumes of water for fire-fighting and provide an emergency supply if needed. Water towers hold up to 7,550 cubic metres of water, about as much as three Olympic-size swimming pools.

From the lake – to a pumping station – to a water tower – to your taps, our water goes on an epic journey through a complex system that is rarely seen. We've taken videos that will open the door to our underground world. We think you'll be amazed.

Visit york.ca/wateris

Learn more about the hidden water system and the people who make it work. For more information, videos and stories, visit **york.ca/wateris**

York Region

Keeping our water safe

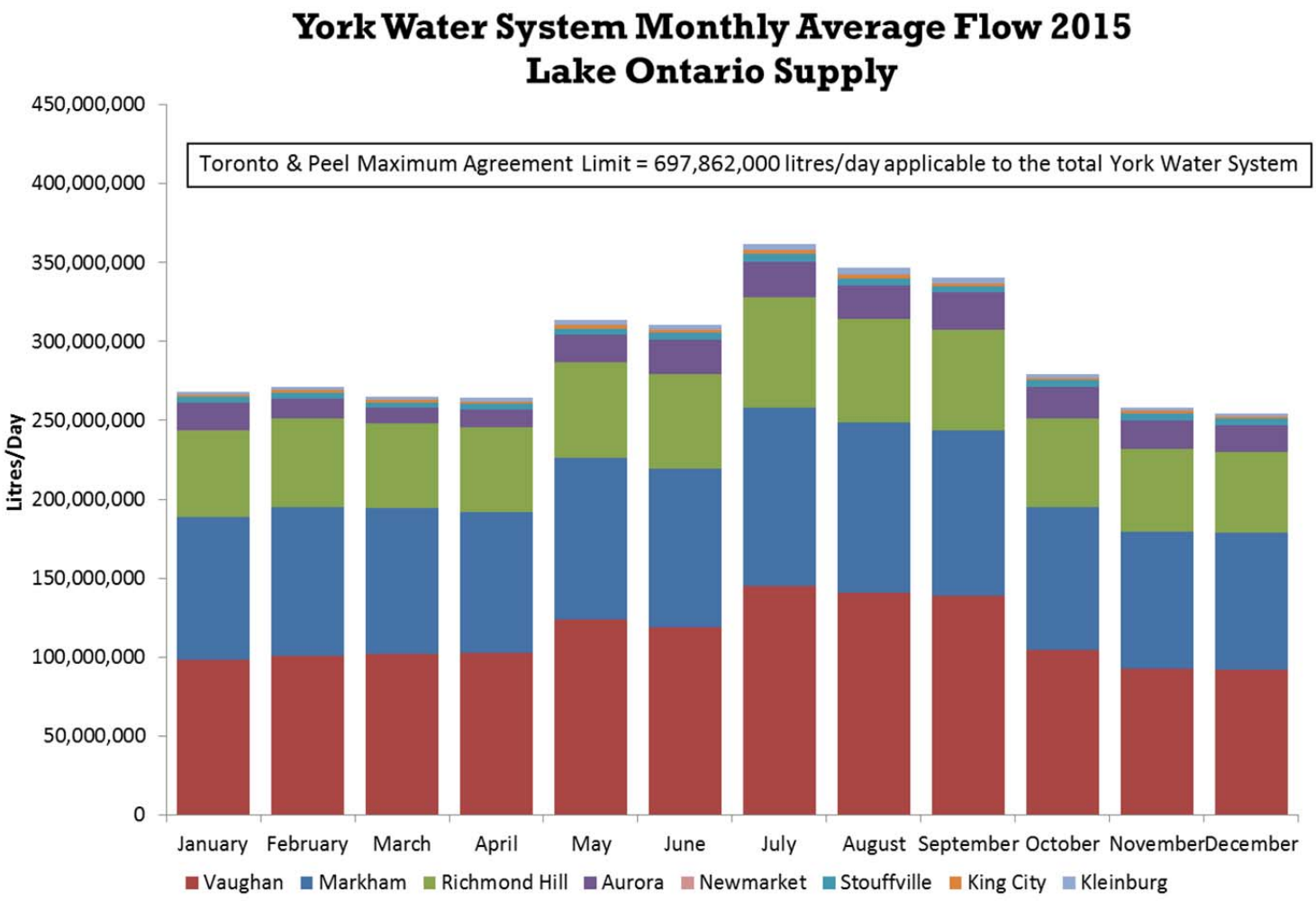
York Drinking Water System Performance Summary:

[hpc] Heterotrophic Plate Count
(microbial test for general level of bacteria)

TREATED	1263 samples	0 e-coli results	0-1 total coliforms	293 hpc samples	0 to 180 hpc results

Average Treated Water Concentration (mg/L)	19 sodium	123 hardness	0.57 fluoride

- Turbidity (Treated)
  N/A
- Chlorine (Free)
  1,189 samples
  ranged 0.09 to 2.44 mg/L [min. to max.]




GUARDIAN
JEN RYAN: Sewer use bylaw enforcement officer, nature lover, mother of two boys and Water Hero.
Jen guards against pollution by hunting it down at the source. She works to stop the nasties, before they go down the drain.
York Region
WATER HERO
York Region
#wateris
Keeping our water safe

York [surface + groundwater]

Drinking Water System

The York Drinking Water System (blended surface and ground water) consists of wells, pumping stations, storage facilities and large diameter water transmission mains. The York Drinking Water System supplies water to the Towns of Aurora, East Gwillimbury, Newmarket and Whitchurch-Stouffville.

Surface water is blended with groundwater within the York Drinking Water System. Township of King and Community of Kleinburg have been converted to lake water only, but continue to maintain wells for backup supply. The description of each groundwater source within the York Drinking Water System is provided in the following sections of the report.

Water Treatment

Lake-Based Supply: The majority of the water supplied to the local municipalities from the York Drinking Water System is sourced from Lake Ontario. Raw water is treated by the City of Toronto or Peel Region and enters through York Region's transmission system. No further treatment is performed by York Region as the water travels to the local municipal distribution systems, however some of the water storage facilities in Aurora and Newmarket have the ability to chloraminate water if required. Fluoride is not added to the York Drinking Water System groundwater supply, however the City of Toronto and Peel Region add fluoride to lake-based water supplies.

Groundwater Supply: Groundwater in the York Drinking Water System is treated and blended with the lake-based water supplied by City of Toronto and Peel Region. To ensure the treatment processes for groundwater are consistent with the lake-based water, the groundwater wells in the York Drinking Water System are treated with a combination of

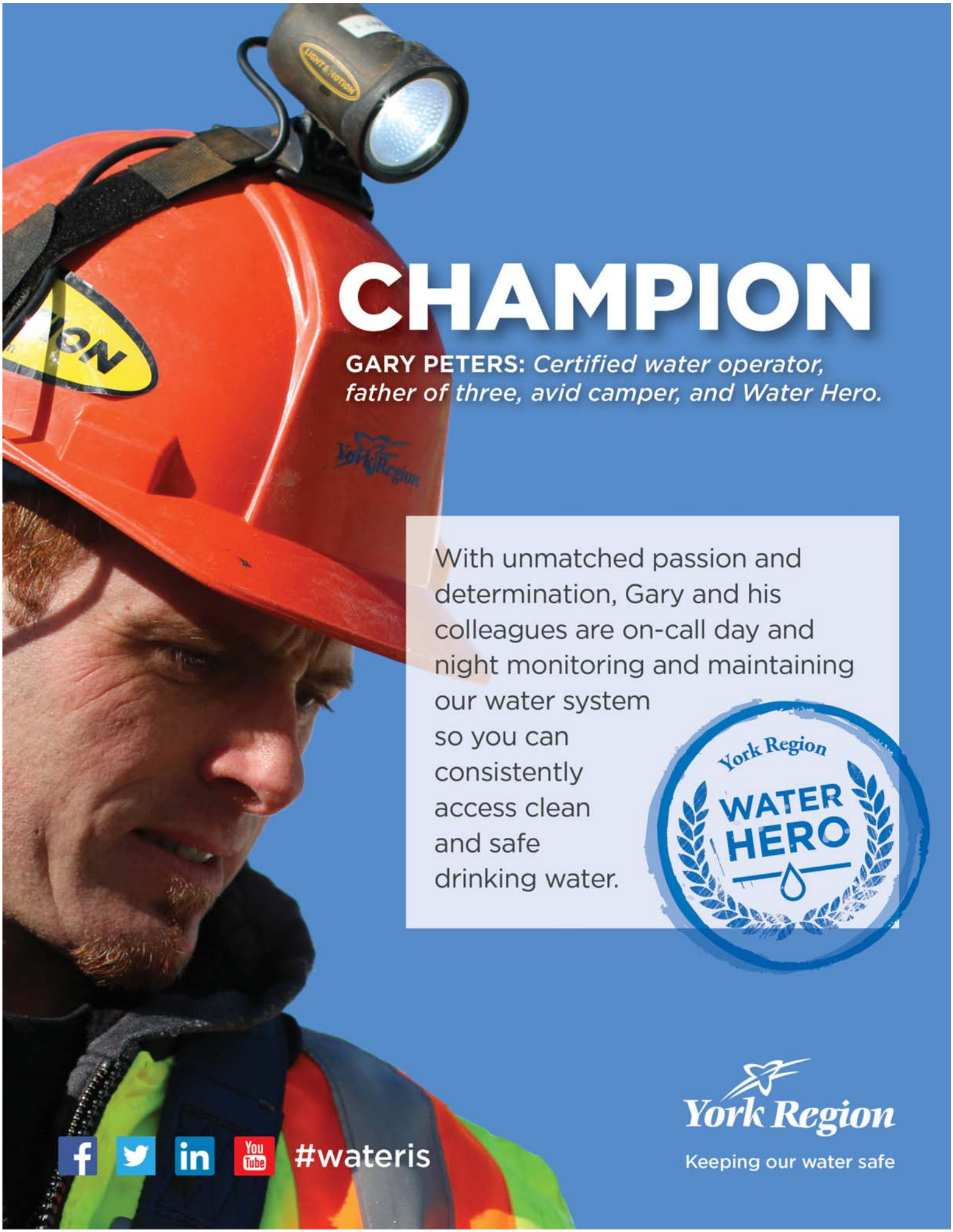
Water Treatment (continued)

chlorine and ammonia to form chloramine, a secondary disinfectant.

Sodium silicate is added to the treatment process to reduce potential staining of plumbing fixtures and laundry. Treatment processes throughout facilities are monitored by online analyzers which are equipped with alarms and lockouts to alert operational staff of conditions requiring attention. Treatment is consistent for all groundwater supply systems in the York Drinking Water System unless otherwise indicated in the following sections.

Summary of Approvals and Permits

The amount of lake-based water withdrawn for the York Drinking Water System is limited to the amounts set within the long-term water supply agreements in place with Peel Region and the City of Toronto (please see page 18). Water withdrawal from each of the groundwater wells in the York Drinking Water System is regulated by a Permit to Take Water issued by the Ministry of the Environment and Climate Change for the Yonge Street Aquifer as a whole.


CHAMPION
GARY PETERS: Certified water operator, father of three, avid camper, and Water Hero.
With unmatched passion and determination, Gary and his colleagues are on-call day and night monitoring and maintaining our water system so you can consistently access clean and safe drinking water.
York Region
WATER HERO
#wateris
York Region
Keeping our water safe

Aurora [surface + groundwater]

Drinking Water Sub-system
York Drinking Water System

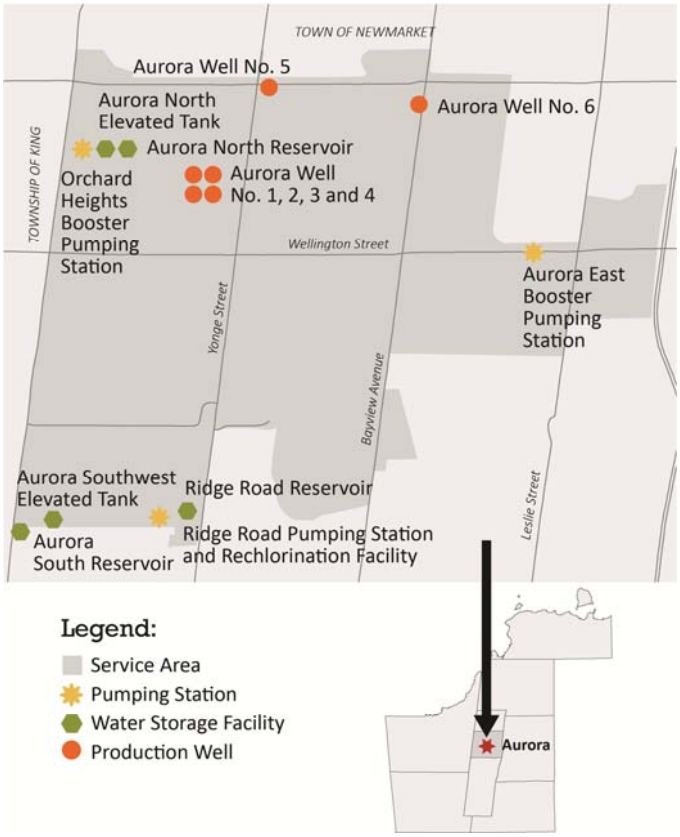
York Region operates six wells in the Town of Aurora that draw water from the Yonge Street Aquifer. Water withdrawal from each of the wells is regulated by a Permit to Take Water issued by the Ministry of the Environment and Climate Change. The Aurora wells are part of an interconnecting system between Aurora, East Gwillimbury, Newmarket and the York Drinking Water System.

York Region supplements groundwater supply in Aurora with lake-based water. The intent is to manage demand on the aquifer and provide additional security by having a second supply source.

Raw Water Source Description
Wells are mostly screened in the deep aquifer. Groundwater quality meets the Ontario Drinking Water Quality Standard. Aesthetic parameters like iron and operational parameters like hardness fall outside the optimal operating range, which is common in deep aquifers in York Region. Staff use raw water test results to determine the best water treatment.

Water Treatment
Well water is treated with a combination of chlorine and ammonia to form chloramine. Sodium silicate is also added to reduce potential staining of plumbing fixtures and laundry. Treatment processes throughout the well system are monitored by online analyzers equipped with alarms and lockouts to alert operational staff of conditions requiring attention.

Currently, there are three reservoirs and two elevated tanks servicing Town of Aurora.



Summary of Approvals and Permits

Municipal Drinking Water License Number:	013-101
Issue Number:	Issue 5
Issue Date:	January 27, 2015
Expiry Date:	January 26, 2020
Renewal Date:	July 27, 2019
Drinking Water Works Permit Number:	013-201
Issue Number:	Issue 8
Issue Date:	June 11, 2015
Permit To Take Water Number:	6728-9NLQ2F
Issue Date:	September 12,2014
Expiry Date:	December 31, 2023
Operational Plan Number:	013-401
Financial Plan Number:	013-301A
MOECC Waterworks Number:	220002440
System Classification:	Water Distribution and Supply III

Aurora Drinking Water System Performance Summary:

[hpc] Heterotrophic Plate Count
(microbial test for general level of bacteria)

RAW	590 samples	0 e-coli results	0 to 8 total coliforms	n/a hpc samples	n/a hpc results
TREATED	295 samples	0 e-coli results	0 total coliforms	148 hpc samples	0 to 12 hpc results

Average Treated Water Concentration (mg/L)	20 sodium	135 hardness	0.51 fluoride

- Turbidity (Treated)
  8,760 samples (continuously monitored)
  ranged 0.022 to 5.008 ntu [min. to max.]
- Chlorine (Combined)
  8,760 samples (continuously monitored)
  ranged 0.50 to 3.60 mg/L [min. to max.]

Permitted and Actual Maximum Daily Withdrawal from the Aurora Production Wells for January 1 to December 31, 2015

Location	Permitted Daily Withdrawal (litres)	Actual Maximum Daily Withdrawal (litres)	Number of Days Operating at Peak Capacity (May to October)*	Number of Days Operating at Peak Capacity (Annual)*
Well 1	3,273,120	2,812,000 Aug. 26, 2015	16	16
Well 2	5,891,760	5,172,000 Mar. 10, 2015	2	4
Well 3	5,237,136	4,752,000 Mar. 10, 2015	5	9
Well 4	7,855,632	5,377,000 Mar. 8, 2015	0	0
Well 5	5,891,760	4,862,000 Jun. 30, 2015	2	2
Well 6	3,469,536	1,687,000 May 1, 2015	0	0

* Wells are considered to be operating at peak capacity if withdrawal is within 80 per cent of permitted capacity.

Permitted and Actual Maximum Annual Withdrawal from Production Wells for January 1 – December 31, 2015

Actual Annual Withdrawal	Annual Permitted Withdrawal	Percentage of Permitted Annual Withdrawal
3,933,540,000 litres	11,540,914,560 litres	34 per cent

System Monthly Average Flow (litres per day)

January	February	March	April	May	June
8,785,097	10,866,179	13,137,710	10,256,600	10,104,484	10,659,567
July	**August**	**September**	**October**	**November**	**December**
13,020,194	11,998,065	10,599,167	10,379,290	9,904,133	9,565,581

Holland Landing [surface + groundwater]

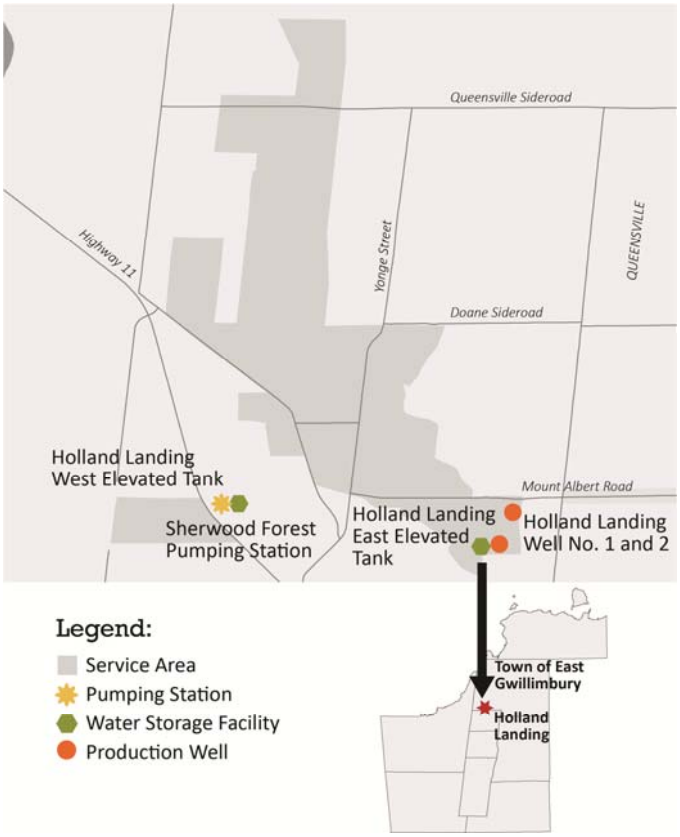
Drinking Water Sub-system
York Drinking Water System

York Region operates two wells servicing the community of Holland Landing in the Town of East Gwillimbury. Holland Landing wells draw water from the Yonge Street Aquifer. These wells are part of an interconnecting system between Aurora, East Gwillimbury, Newmarket and the York Drinking Water System. Water withdrawal from each of the wells is regulated by a Permit to Take Water issued by the Ministry of the Environment and Climate Change.

Raw Water Source Description
Wells are mostly screened in the deep aquifer. Groundwater quality meets the Ontario Drinking Water Quality Standard. Aesthetic parameters like iron and operational parameters like hardness fall outside the optimal operating range, which is common in deep aquifers in York Region. Staff use raw water test results to determine the best water treatment.

Water Treatment
Well water is treated with a combination of chlorine and ammonia to form chloramine. Sodium silicate is also added to reduce potential staining of plumbing fixtures and laundry. Treatment processes throughout the system are monitored by online analyzers equipped with alarms and lockouts to alert operational staff of conditions requiring attention.

Currently, there are two elevated tanks servicing the community of Holland Landing.



Summary of Approvals and Permits

Municipal Drinking Water License Number:	013-101
Issue Number:	Issue 5
Issue Date:	January 27, 2015
Expiry Date:	January 26, 2020
Renewal Date:	July 27, 2019
Drinking Water Works Permit Number:	013-201
Issue Number:	Issue 8
Issue Date:	June 11, 2015
Permit To Take Water Number:	6728-9NLQ2F
Issue Date:	September 12, 2014
Expiry Date:	December 31, 2023
Operational Plan Number:	013-401
Financial Plan Number:	013-301A
MOECC Waterworks Number:	220004046
System Classification:	Water Distribution and Supply III

Holland Landing Drinking Water System Performance Summary:

[hpc] Heterotrophic Plate Count
(microbial test for general level of bacteria)

RAW	208 samples	0 e-coli results	0 total coliforms	n/a hpc samples	n/a hpc results
TREATED	208 samples	0 e-coli results	0 total coliforms	104 hpc samples	0 to 14 hpc results

Average Treated Water Concentration (mg/L)	21 sodium	169 hardness	0.21 fluoride

- Turbidity (Treated)
  8,760 samples (continuously monitored)
  ranged 0.021 to 3.898 ntu [min. to max.]
- Chlorine (Combined)
  8,760 samples (continuously monitored)
  ranged 0.39 to 2.87 mg/L [min. to max.]

Permitted and Actual Maximum Daily Withdrawal from the Holland Landing Production Wells for January 1 to December 31, 2015

Location	Permitted Daily Withdrawal (litres)	Actual Maximum Daily Withdrawal (litres)	Number of Days Operating at Peak Capacity (May to October)	Number of Days Operating at Peak Capacity (Annual)
Well 1	2,291,184	1,372,000 Sept. 21, 2015	0	0
Well 2	3,600,432	2,169,750 Sept. 21, 2015	0	0

Permitted and Actual Maximum Annual Withdrawal from Production Wells for January 1 – December 31, 2015

Actual Annual Withdrawal	Annual Permitted Withdrawal	Percentage of Permitted Annual Withdrawal
387,569,500 litres	2,150,439,840 litres	18 per cent

System Monthly Average Flow (litres per day)

January 1,131,669	February 1,013,188	March 966,927	April 1,093,242	May 1,121,452	June 962,042
July 1,113,597	August 985,274	September 1,270,700	October 1,208,726	November 843,750	December 1,024,234

King City [surface + groundwater/backup supply]

Drinking Water Sub-system
York Drinking Water System

In 2015, the community of King City received 100 per cent Lake Ontario water. York Region operates two wells in King City in the Township of King as a backup water supply.

The groundwater system has been upgraded to a chloramination system, allowing the groundwater wells to blend with the current lake-based source and provide a backup supply to be used if emergency capacity is required. Groundwater withdrawal from each of the wells is regulated by a Permit to Take Water issued by the Ministry of the Environment and Climate Change.

Raw Water Source Description
Wells are screened in the deep aquifer. Groundwater quality meets the Ontario Drinking Water Quality Standard. Aesthetic parameters like iron and operational parameters like hardness fall outside the optimal operating range, which is common in deep aquifers in York Region. Staff use raw water test results to determine the best water treatment.

Water Treatment
If King City wells are used for emergency capacity, water will be treated with a combination of chlorine and ammonia to form chloramine. Sodium silicate is added to reduce potential staining of plumbing fixtures and laundry. Treatment processes throughout the system are monitored by online analyzers equipped with alarms and lockouts to alert operational staff to conditions requiring attention.

Currently, there are two elevated tanks servicing the community of King City.

Summary of Approvals and Permits

Municipal Drinking Water	
License Number:	013-101
Issue Number:	Issue 5
Issue Date:	January 27, 2015
Expiry Date:	January 26, 2020
Renewal Date:	July 27, 2019
Drinking Water Works Permit	
Number:	013-201
Issue Number:	Issue 8
Issue Date:	June 11, 2015
Permit To Take Water Number:	1407-9MRQYL
Issue Date:	September 5, 2014
Expiry Date:	December 31, 2024
Operational Plan Number:	013-407
Financial Plan Number:	013-301A
MOECC Waterworks Number:	220002299
System Classification:	Water Distribution and Supply II

King City Drinking Water System Performance Summary:

[hpc] Heterotrophic Plate Count
(microbial test for general level of bacteria)

RAW	202 samples	0 e-coli results	0 total coliforms	n/a hpc samples	n/a hpc results
TREATED	n/a samples	n/a e-coli results	n/a total coliforms	n/a hpc samples	n/a hpc results

Average Treated Water Concentration (mg/L)*	n/a sodium	n/a hardness	n/a fluoride

* Samples were taken only for raw water. King City wells are on standby only to be used to provide emergency capacity, as a result no samples were required for treated water.

- Turbidity (Treated)
  0 samples*
- Chlorine (Combined)
  0 samples*

Permitted and Actual Maximum Daily Withdrawal from the King City Production Wells for January 1 to December 31, 2015

Location	Permitted Daily Withdrawal (litres)	Actual Maximum Daily Withdrawal (litres)	Number of Days Operating at Peak Capacity (May to October)	Number of Days Operating at Peak Capacity (Annual)
Well 3*	1,963,915	36,188 Oct. 20, 2015	0	0
Well 4*	2,618,554	104,400 Jun. 17, 2015	0	0

* Well 3 and 4 maximum daily withdrawals are a result of running the wells to collect raw water regulatory samples. Both wells are on standby and the King City drinking water system is supplied with the City of Toronto and Peel Region lake-based water supply.

Permitted and Actual Maximum Annual Withdrawal from Production Wells for January 1 – December 31, 2015

Actual Annual Withdrawal	Annual Permitted Withdrawal	Percentage of Permitted Annual Withdrawal
1,592,437 litres	1,672,601,185 litres	0 per cent

System Monthly Average Flow (litres per day)

January 5,371	February 1,507	March 2,800	April 3,120	May 3,756	June 10,717
July 1,870	August 2,330	September 5,561	October 3,849	November 3,993	December 7,396

Kleinburg

[surface + groundwater/backup supply]

Drinking Water Sub-system
York Drinking Water System

In 2015, the community of Kleinburg received 100 per cent Lake Ontario water. York Region operates two wells in the community of Kleinburg in the City of Vaughan as a backup supply only. Water withdrawal from each of the wells is regulated by a Permit to Take Water issued by the Ministry of the Environment and Climate Change.

The groundwater system is being upgraded to a chloramination system to allow the groundwater to blend with the current lake based source and provide a backup supply to be used in the event emergency capacity is required.

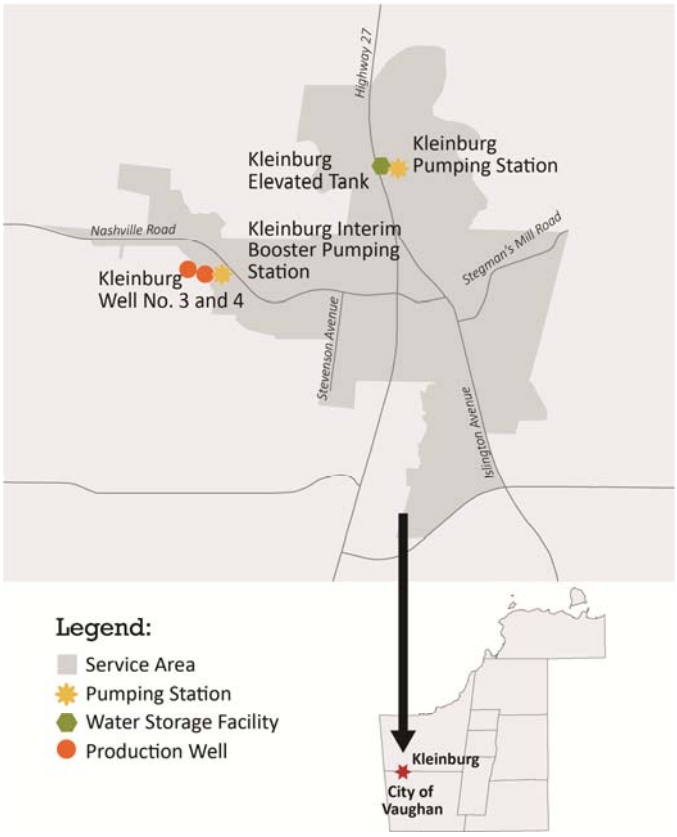
Raw Water Source Description

Wells are screened in the deep aquifers. Groundwater quality meets the Ontario Drinking Water Quality Standard. Aesthetic parameters like iron and operational parameters like hardness fall outside the optimal operating range, which is common in deep aquifers in York Region. Staff use raw water test results to determine the best water treatment.

Water Treatment

If Kleinburg wells are used for emergency capacity, well water is treated with a combination of chlorine and ammonia to form chloramine. Sodium silicate is added to reduce potential staining of plumbing fixtures and laundry. Treatment processes throughout the system are monitored by online analyzers equipped with alarms and lockouts to alert operational staff of conditions requiring attention.

Water enters the distribution system and is stored in the one elevated tank currently servicing the community of Kleinburg.



Summary of Approvals and Permits

Municipal Drinking Water License Number:	013-101
Issue Number:	Issue 5
Issue Date:	January 27, 2015
Expiry Date:	January 26, 2020
Renewal Date:	July 27, 2019
Drinking Water Works Permit Number:	013-201
Issue Number:	Issue 8
Issue Date:	June 11, 2015
Permit To Take Water Number:	2485-9W8KUW
Issue Date:	May 29, 2015
Expiry Date:	May 31, 2020
Operational Plan Number:	013-407
Financial Plan Number:	013-301A
MOECC Waterworks Number:	220002360
System Classification:	Water Distribution and Supply II

Kleinburg Drinking Water System Performance Summary:

[hpc] Heterotrophic Plate Count
(microbial test for general level of bacteria)

RAW	106 samples	0 e-coli results	0 total coliforms	n/a hpc samples	n/a hpc results
TREATED	n/a samples	n/a e-coli results	n/a total coliforms	n/a hpc samples	n/a hpc results

Average Treated Water Concentration (mg/L)*	n/a sodium	n/a hardness	n/a fluoride

* Samples were taken only for raw water. Kleinburg wells are on standby only to be used to provide emergency capacity, as a result no samples were required for treated water.

- Turbidity (Treated)
  0 samples*
- Chlorine (Free)
  0 samples*

Permitted and Actual Maximum Daily Withdrawal from the Kleinburg Production Wells for January 1 to December 31, 2015

Location	Permitted Daily Withdrawal (litres)	Actual Maximum Daily Withdrawal (litres)	Number of Days Operating at Peak Capacity (May to October)	Number of Days Operating at Peak Capacity (Annual)
Well 3 + 4*	5,237,000	583,900 Jun. 17, 2015	0	0

* Well 3 and 4 maximum daily withdrawals are a result of running the wells to collect raw water regulatory samples. Both wells are on standby and the Kleinburg drinking water system is supplied with the City of Toronto and Peel Region lake-based water supply.

Permitted and Actual Maximum Annual Withdrawal from Production Wells for January 1 – December 31, 2015

Actual Annual Withdrawal	Annual Permitted Withdrawal	Percentage of Permitted Annual Withdrawal
2,536,000 litres	1,911,505,000 litres	0 per cent

System Monthly Average Flow (litres per day)

January 7,742	February 17,429	March 11,361	April 8,530	May 8,261	June 24,530
July 6,706	August** 0	September** 0	October** 0	November** 0	December** 0

**Kleinburg wells were shut down for second half of the year to perform system upgrades

Newmarket [surface + groundwater]

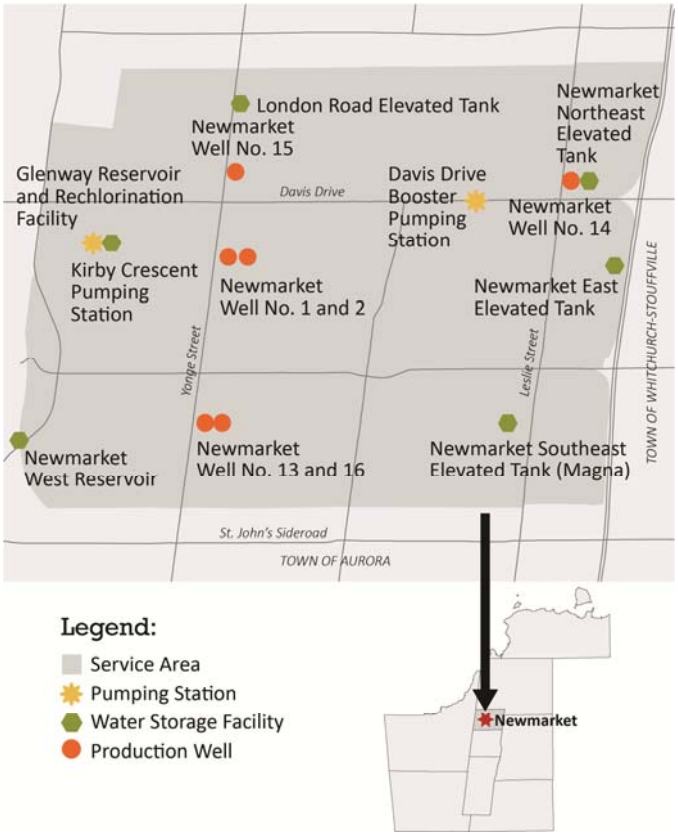
Drinking Water Sub-system
York Drinking Water System

York Region currently operates six wells in the Town of Newmarket, which draw water from the Yonge Street Aquifer. Well 14 is only used as backup, if required. Water withdrawal from each of the wells is regulated by a Permit to Take Water issued by the Ministry of the Environment and Climate Change. Newmarket wells are part of an interconnecting system between the Towns of Aurora, East Gwillimbury, Newmarket and the York Drinking Water System.

Raw Water Source Description
Wells are screened in deep aquifers. Groundwater quality meets the Ontario Drinking Water Quality Standard. Aesthetic parameters like iron and operational parameters like hardness fall outside the optimal operating range, which is common in deep aquifers in York Region. Staff use raw water test results to determine the best water treatment.

Water Treatment
Well water is treated with a combination of chlorine and ammonia to form chloramine. Sodium silicate is also added to reduce potential staining of plumbing fixtures and laundry. Treatment processes throughout the system are monitored by online analyzers, which are equipped with alarms and lockouts to alert operational staff to conditions requiring attention. In 2015, the Glenway reservoir rechloramination facility was brought online. System maintenance was performed after commissioning, which led to a number of system performance events. None of these events posed a threat to public health.

Currently, there are two reservoirs and four elevated tanks servicing the community of Newmarket.



Summary of Approvals and Permits

Municipal Drinking Water License Number:	013-101
Issue Number:	Issue 5
Issue Date:	January 27, 2015
Expiry Date:	January 26, 2020
Renewal Date:	July 27, 2019
Drinking Water Works Permit Number:	013-201
Issue Number:	Issue 8
Issue Date:	June 11, 2015
Permit To Take Water Number:	6728-9NLQ2F
Issue Date:	September 12, 2014
Expiry Date:	December 31, 2023
Operational Plan Number:	013-401
Financial Plan Number:	013-301A
MOECC Waterworks Number:	220002413
System Classification:	Water Distribution and Supply III

Newmarket Drinking Water System Performance Summary:

[hpc] Heterotrophic Plate Count
(microbial test for general level of bacteria)

RAW	520 samples	0 e-coli results	0 to 1 total coliforms	n/a hpc samples	n/a hpc results
TREATED	312 samples	0 e-coli results	0 total coliforms	156 hpc samples	0 to 18 hpc results

Average Treated Water Concentration (mg/L)	17 sodium	169 hardness	0.29 fluoride

- Turbidity (Treated)
  8,760 samples (continuously monitored)
  ranged 0.003 to 4.997 ntu [min. to max.]
- Chlorine (Combined)
  8,760 samples (continuously monitored)
  ranged 0.00 to 2.95 mg/L [min. to max.]

Permitted and Actual Maximum Daily Withdrawal from the Newmarket Production Wells for January 1 to December 31, 2015

Location	Permitted Daily Withdrawal (litres)	Actual Maximum Daily Withdrawal (litres)	Number of Days Operating at Peak Capacity (May to October)*	Number of Days Operating at Peak Capacity (Annual)*
Well 1	2,291,184	1,763,250 Feb. 15, 2015	0	0
Well 2	4,582,512	4,324,000 Feb. 11, 2015	1	6
Well 13	5,891,760	5,184,250 Feb. 10, 2015	0	5
Well 14**	2,291,184	24,760 Apr. 8, 2015	0	0
Well 15	3,273,120	2,481,000 Oct. 21, 2015	0	0
Well 16	5,629,824	5,219,063 Feb. 11, 2015	1	4

* Wells are considered to be operating at peak capacity if withdrawal is within 80 per cent of permitted capacity.
** Well 14 maximum daily withdrawal due to running the well to collect raw water regulatory samples.

Permitted and Actual Maximum Annual Withdrawal from Production Wells for January 1 – December 31, 2015

Actual Annual Withdrawal	Annual Permitted Withdrawal	Percentage of Permitted Annual Withdrawal
2,608,622,719 litres	8,745,248,160 litres	30 per cent

System Monthly Average Flow (litres per day)

January 4,637,440	February 11,326,887	March 12,070,768	April 11,807,859	May 12,066,079	June 4,757,517
July 5,427,696	August 5,495,093	September 5,340,442	October 4,796,509	November 3,868,196	December 4,485,206

Queensville

[surface + groundwater]

Drinking Water Sub-system
York Drinking Water System

York Region operates four wells in the community of Queensville in the Town of East Gwillimbury. Water withdrawal from each of the wells is regulated by a Permit to Take Water issued by the Ministry of the Environment and Climate Change. These wells supply water to the residents of Sharon, Queensville, Holland Landing and Newmarket. Queensville wells draw water from the Yonge Street Aquifer complex and are part of an interconnected drinking water system between the Towns of Aurora, East Gwillimbury, Newmarket and the York Drinking Water System.

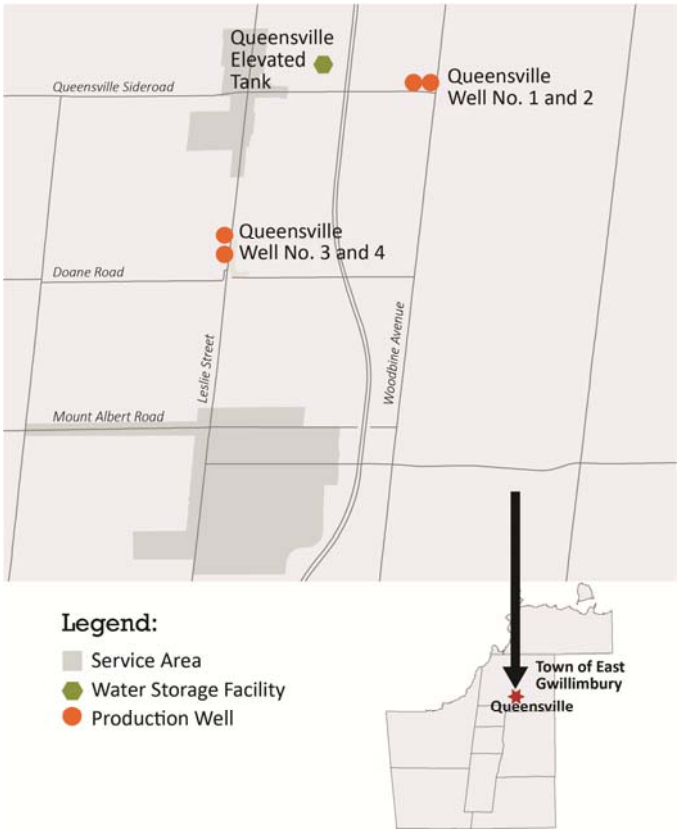
Raw Water Source Description

Wells are screened in deep aquifers. Groundwater quality meets the Ontario Drinking Water Quality Standard. Aesthetic parameters like iron and operational parameters like hardness fall outside the optimal operating range, which is common in deep aquifers in York Region. Staff use raw water test results to determine the best water treatment.

Water Treatment

Well water is treated with a combination of chlorine and ammonia to form chloramine. Sodium silicate is also added to reduce potential staining of plumbing fixtures and laundry. Treatment processes throughout the facility are monitored by online analyzers which are equipped with alarms and lockouts to alert operational staff to conditions requiring attention.

Currently, there is one elevated tank servicing the communities of Queensville and Sharon. Queensville Elevated tank was brought online in early 2014 to replace the elevated tank in Sharon, which was decommissioned in late 2014.



Summary of Approvals and Permits

Municipal Drinking Water	
License Number:	013-101
Issue Number:	Issue 5
Issue Date:	January 27, 2015
Expiry Date:	January 26, 2020
Renewal Date:	July 27, 2019
Drinking Water Works Permit	
Number:	013-201
Issue Number:	Issue 8
Issue Date:	June 11, 2015
Permit To Take Water Number:	6728-9NLQ2F
Issue Date:	September 12, 2014
Expiry Date:	December 31, 2023
Operational Plan Number:	013-401
Financial Plan Number:	013-301A
MOECC Waterworks Number:	260001955
System Classification:	Water Distribution and Supply III

Queensville Drinking Water System Performance Summary:

[hpc] Heterotrophic Plate Count
(microbial test for general level of bacteria)

RAW	406 samples	0 e-coli results	0 to 1 total coliforms	n/a hpc samples	n/a hpc results
TREATED	206 samples	0 e-coli results	0 total coliforms	103 hpc samples	0 to 42 hpc results

Average Treated Water Concentration (mg/L)	18 sodium	174 hardness	0.20 fluoride

- Turbidity (Treated)
  8,760 samples (continuously monitored)
  ranged 0.001 to 5.001 ntu [min. to max.]
- Chlorine (Combined)
  8,760 samples (continuously monitored)
  ranged 0.26 to 2.98 mg/L [min. to max.]

Permitted and Actual Maximum Daily Withdrawal from the Queensville Production Wells for January 1 to December 31, 2015

Location	Permitted Daily Withdrawal (litres)	Actual Maximum Daily Withdrawal (litres)	Number of Days Operating at Peak Capacity (May to October)	Number of Days Operating at Peak Capacity (Annual)
Well 1	6,546,384	4,631,000 Jul. 28, 2015	0	0
Well 2	6,546,384	3,865,000 May 28, 2015	0	0
Well 3	6,546,384	4,972,000 Oct. 1, 2015	0	0
Well 4	6,546,384	4,450,000 Jan. 11, 2015	0	0

Permitted and Actual Maximum Annual Withdrawal from Production Wells for January 1 – December 31, 2015

Actual Annual Withdrawal	Annual Permitted Withdrawal	Percentage of Permitted Annual Withdrawal
1,646,749,000 litres	9,557,720,640 litres	17 per cent

System Monthly Average Flow (litres per day)

January 5,543,597	February 3,262,571	March 2,403,097	April 2,515,767	May 3,489,887	June 4,882,367
July 5,254,000	August 5,930,323	September 5,171,033	October 4,809,903	November 5,091,400	December 5,652,419

Stouffville [surface + groundwater]

Drinking Water Sub-system
York Drinking Water System

York Region operates five wells servicing the community of Stouffville. Water withdrawal from each of the wells is regulated by a Permit to Take Water issued by the Ministry of the Environment and Climate Change. Groundwater supply is supplemented with lake-based water.

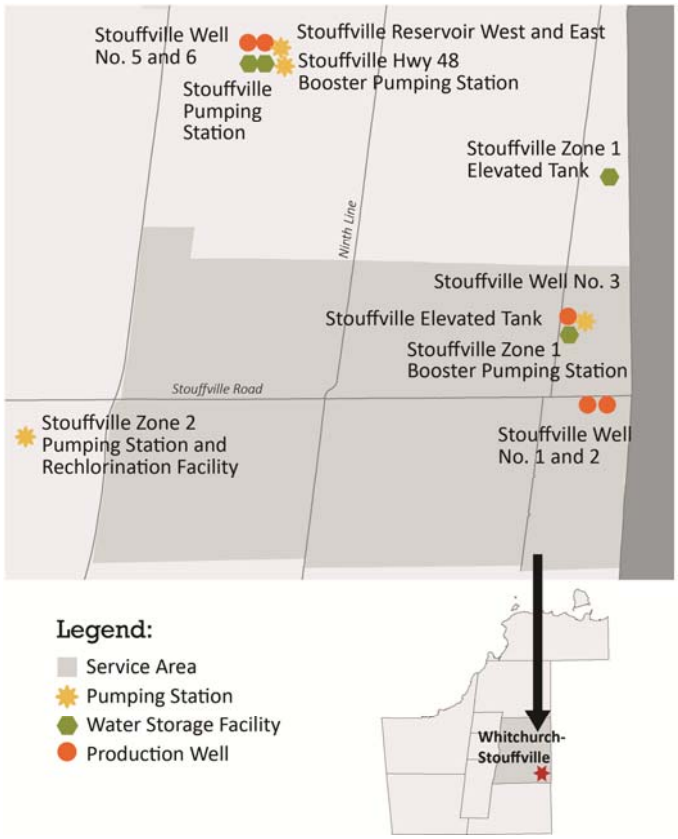
Raw Water Source Description

Wells are screened in two separate aquifers: shallow and deep aquifers. Groundwater quality meets the Ontario Drinking Water Quality Standard. Groundwater in the shallow aquifer wells (Wells No. 3, 5 and 6) show higher chloride, sulphate and sodium concentrations in comparison to Wells No. 1 and 2, which are in the deep aquifer. Shallow groundwater in York Region typically has higher concentrations due in part to impacts from the surrounding land use activities. Concentrations remain within safe limits and trends are monitored on an ongoing basis. Aesthetic parameters like iron and operational parameters like hardness fall outside the optimal operating range, which is common in deep aquifers in York Region. Staff uses raw water test results to determine the best water treatment.

Water Treatment

Stouffville Wells No. 5 and 6 are classified as Groundwater Under Direct Influence (GUDI) wells. Water treatment for Stouffville wells includes the addition of chlorine for disinfection. At Wells No. 5 and 6, an ultraviolet light system achieves primary disinfection of the raw water prior to addition of chlorine to maintain residual levels. At the Zone 2 pumping station, treated lake-based water from Toronto gets converted from chloramine to free chlorine. Treatment processes throughout the system are continuously monitored and are equipped with alarms and automatic lockouts.

Currently, there are two reservoirs and two elevated tanks servicing Stouffville.



Summary of Approvals and Permits

Municipal Drinking Water License Number:	013-101
Issue Number:	Issue 5
Issue Date:	January 27, 2015
Expiry Date:	January 26, 2020
Renewal Date:	July 27, 2019
Drinking Water Works Permit Number:	013-201
Issue Number:	Issue 8
Issue Date:	June 11, 2015
Permit To Take Water Number:	7104-986FSJ
Issue Date:	July 12, 2013
Expiry Date:	March 31, 2017
Operational Plan Number:	013-401
Financial Plan Number:	013-301A
MOECC Waterworks Number:	220002333
System Classification:	Water Distribution and Supply III, Water Treatment I

Stouffville Drinking Water System Performance Summary:

[hpc] Heterotrophic Plate Count
(microbial test for general level of bacteria)

RAW	512 samples	0 e-coli results	0 total coliforms	n/a hpc samples	n/a hpc results
TREATED	302 samples	0 e-coli results	0 total coliforms	151 hpc samples	0 to 6 hpc results

Average Treated Water Concentration (mg/L)	38 sodium	333 hardness	0.08 fluoride

- Turbidity (Treated)
  8,760 samples (continuously monitored)
  ranged 0.000 to 5.003 ntu [min. to max.]
- Chlorine (Free)
  8,760 samples (continuously monitored)
  ranged 0.00 to 3.00 mg/L [min. to max.]

Permitted and Actual Maximum Daily Withdrawal from the Stouffville Production Wells for January 1 to December 31, 2015

Location	Permitted Daily Withdrawal (litres)	Actual Maximum Daily Withdrawal (litres)	Number of Days Operating at Peak Capacity (May to October)	Number of Days Operating at Peak Capacity (Annual)
Well 1	2,946,240	1,919,500 Sept. 28, 2015	0	0
Well 2	2,946,240	1,838,500 Jul. 19, 2015	0	0
Well 3	2,946,240	2,045,500 Jul. 29, 2015	0	0
Well 5	3,110,400	1,414,800 Jul. 29, 2015	0	0
Well 6	2,289,600	1,392,800 Jul. 29, 2015	0	0

Permitted and Actual Maximum Annual Withdrawal from Production Wells for January 1 – December 31, 2015

Actual Annual Withdrawal	Annual Permitted Withdrawal	Percentage of Permitted Annual Withdrawal
1,384,379,450 litres	5,197,132,800 litres	27 per cent

System Monthly Average Flow (litres per day)

January 3,865,292	February 3,683,370	March 3,951,102	April 3,706,335	May 4,089,995	June 4,029,208
July 4,739,342	August 4,267,774	September 4,337,361	October 3,111,622	November 2,510,727	December 3,192,169

Georgina [surface water – Lake Simcoe]

Drinking Water System

Georgina Water Treatment Plant (WTP) provides water to Keswick, Lakeshore communities and Sutton. A one-metre diameter intake pipe extends 1.5 kilometres out into Lake Simcoe to a depth of 19 metres, a low lift pumping station then transfers the water to the treatment plant. Water withdrawal from the lake is regulated by a Permit to Take Water issued by the Ministry of the Environment and Climate Change.

Raw Water Source Description

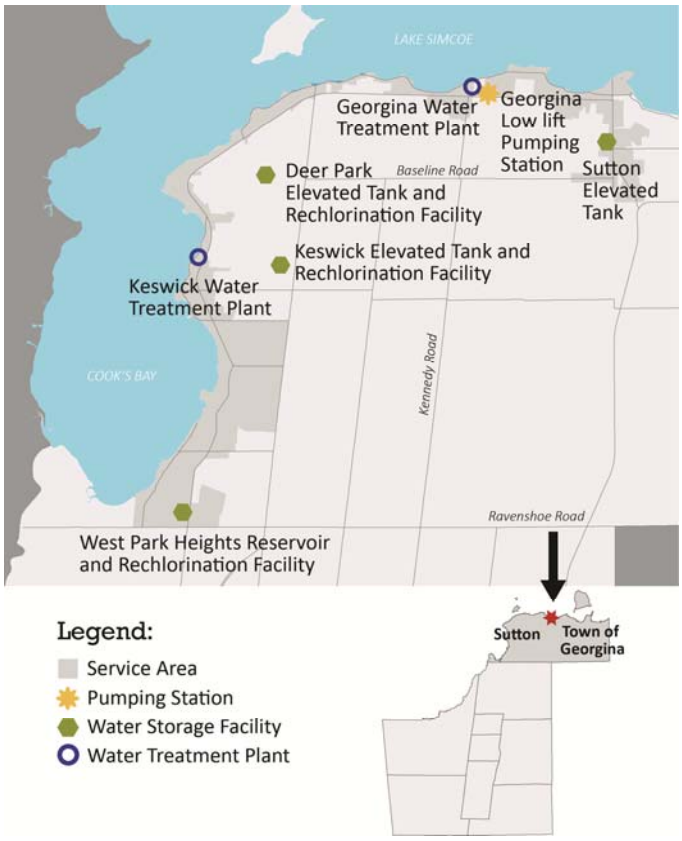
Supply for the Georgina WTP is Lake Simcoe. Local flora and fauna populations contribute to the occasional presence of coliforms or E.coli in the raw water supply. Lake Simcoe also tends to have higher levels of algae, which can occasionally create a musty taste and odour.

Water Treatment

Georgina WTP treatment processes:

- Chlorine injection and diffusion at the intake when water rises above 12 degrees Celsius to control zebra mussel growth
- Incoming water is initially screened to remove large objects
- Microfiltration treatment process (using membranes) removes suspended solids, Cryptosporidium, Giardia, as well as other potentially harmful parasites and bacteria
- Disinfection is accomplished by an ultraviolet light system and chlorine
- Granular activated carbon (GAC) improves taste and reduces odour

Treatment processes are monitored by online analyzers equipped with alarms and automatic lockouts. Fluoride is added for public health purposes. Water supplied from the Georgina WTP also feeds into Sutton and Keswick distribution systems. There is one storage tower servicing the community of Sutton, and two towers and one reservoir currently servicing Keswick and lakeshore communities.



Summary of Approvals and Permits

Municipal Drinking Water License Number:	013-104
Issue Number:	Issue 4
Issue Date:	January 27, 2015
Expiry Date:	January 26, 2020
Renewal Date:	July 27, 2019
Drinking Water Works Permit Number:	013-204
Issue Number:	Issue 3
Issue Date:	January 27, 2015
Permit To Take Water Number:	4523-8TGSMJ
Issue Date:	April 24, 2012
Expiry Date:	April 23, 2022
Operational Plan Number:	013-404
Financial Plan Number:	013-301A
MOECC Waterworks Number:	260026156
System Classification:	Water Treatment III

Georgina Drinking Water System Performance Summary:

[hpc] Heterotrophic Plate Count
(microbial test for general level of bacteria)

RAW	104 samples	0 to 1 e-coli results	0 to 60 total coliforms	n/a hpc samples	n/a hpc results
TREATED	104 samples	0 e-coli results	0 total coliforms	52 hpc samples	0 to 400 hpc results

Average Treated Water Concentration (mg/L)	27 sodium	144 hardness	0.6 fluoride

- Turbidity (Treated) 8,760 samples (continuously monitored) ranged 0.000 to 5.000 ntu [min. to max.]
- Turbidity (Raw) 8,760 samples (continuously monitored) ranged 0.005 to 9.997 ntu [min. to max.]
- Chlorine (Free) 8,760 samples (continuously monitored) ranged 0.00 to 5.00 mg/L [min. to max.]
- Fluoride 8,760 samples (continuously monitored) ranged 0.2 to 1.85 mg/L [min to max]

Permitted and Actual Maximum Daily Withdrawal from the Georgina Water Treatment Plant for January 1 to December 31, 2015

Location	Permitted Daily Withdrawal (litres)	Actual Maximum Daily Withdrawal (litres)	Number of Days Operating at Peak Capacity (May to October)	Number of Days Operating at Peak Capacity (Annual)
Water Treatment Plant	30,000,000*	13,813,000 Aug. 11, 2015	0	0

* Permitted Daily Withdrawal for the Georgina system based on municipal drinking water license limit of 30,000,000 litres/day; the permit to take water has a limit of 50,000,000 litres/day, to allow the facility to be expanded once demand increases

Permitted and Actual Maximum Annual Withdrawal from the Plant for January 1 – December 31, 2015

Actual Annual Withdrawal	Annual Permitted Withdrawal	Percentage of Permitted Annual Withdrawal
2,844,768,000 litres	10,950,000,000 litres	26 per cent

System Monthly Average Flow (litres per day)

January 5,336,774	February 5,721,536	March 5,473,452	April 5,875,100	May 9,266,742	June 8,784,700
July 10,030,710	August 9,466,258	September 9,217,667	October 8,257,968	November 8,089,900	December 7,800,806

Georgina [surface water – Lake Simcoe]

Drinking Water System
Keswick Drinking Water Sub-System

Keswick Water Treatment Plant (WTP) provides water to the community of Keswick. A 600-millimetre diameter intake pipe extends 365 metres into Cook's Bay and draws water from a depth of 8.5 metres. Water withdrawal is regulated by a Permit to Take Water issued by the Ministry of the Environment and Climate Change.

Raw Water Source Description

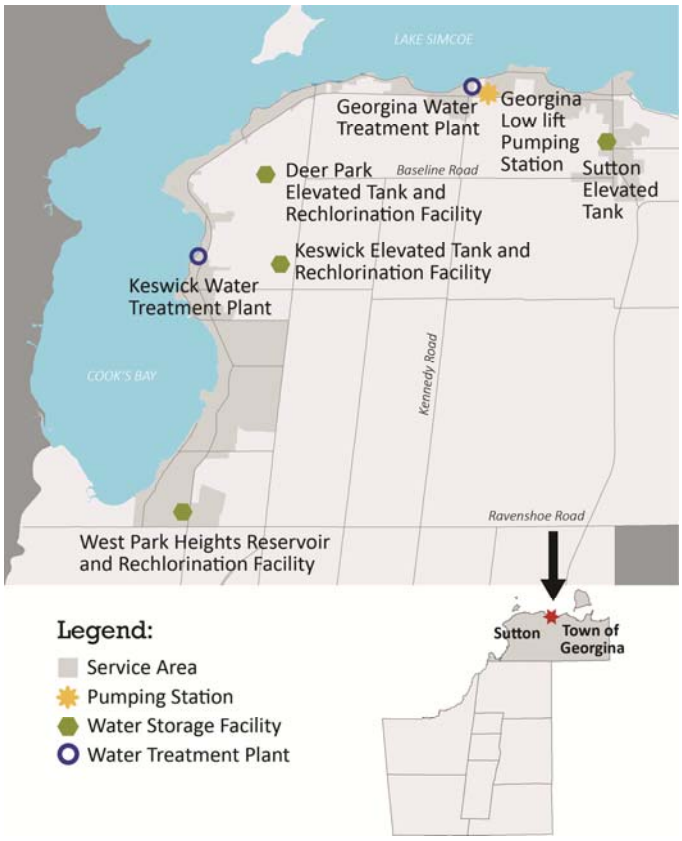
Supply for Keswick WTP is surface water from Cook's Bay, Lake Simcoe. Local flora and fauna populations contribute to the occasional presence of coliforms or E.coli in the raw water supply. Lake Simcoe also tends to have higher levels of algae, which can occasionally create a musty taste and odour.

Water Treatment

Keswick WTP treatment processes:

- Chlorine injection and diffusion at the intake when water rises above 12 degrees Celsius to control zebra mussel growth
- Incoming water is initially screened to remove large objects
- Carbon dioxide is added to adjust the pH for coagulation making suspended particles clump together and settle out in sedimentation tanks
- Granular activated carbon (GAC) improves taste and reduces odour
- Filtered water is disinfected using chlorine and fluoride is added prior to the water being pumped to the distribution system

Treatment processes are monitored by online analyzers equipped with alarms and automatic lockouts. In addition to the water treatment plant there are two storage towers and one reservoir currently servicing Keswick and lakeshore communities. This facility was offline for much of 2015 to perform facility upgrades expected to be commissioned in 2016. Water was supplied to Keswick by the Georgina WTP in 2015.



Summary of Approvals and Permits

Municipal Drinking Water License Number:	013-104
Issue Number:	Issue 4
Issue Date:	January 27, 2015
Expiry Date:	January 26, 2020
Renewal Date:	July 27, 2019
Drinking Water Works Permit Number:	013-204
Issue Number:	Issue 3
Issue Date:	January 27, 2015
Permit To Take Water Number:	8413-994JDQ
Issue Date:	August 8, 2013
Expiry Date:	October 30, 2023
Operational Plan Number:	013-404
Financial Plan Number:	013-301A
MOECC Waterworks Number:	210003280
System Classification:	Water Treatment III Water Distribution Subsystem III

Georgina (Keswick) Drinking Water System Performance Summary:

[hpc] Heterotrophic Plate Count
(microbial test for general level of bacteria)

RAW	32 samples	0 e-coli results	0 to 17 total coliforms	n/a hpc samples	n/a hpc results
TREATED	32 samples	0 e-coli results	0 total coliforms	16 hpc samples	0 to 1 hpc results

Average Treated Water Concentration (mg/L)	27 sodium	147 hardness	0.5 fluoride

- Turbidity (Treated) 8,760 samples (continuously monitored) ranged 0.000 to 3.000 ntu [min. to max.]
- Turbidity (Raw) 8,760 samples (continuously monitored) ranged 0.360 to 24.990 ntu [min. to max.]
- Chlorine (Free) 8,760 samples (continuously monitored) ranged 0.90 to 2.92 mg/L [min. to max.]
- Fluoride 8,760 samples (continuously monitored) ranged 0.19 to 1.05 mg/L [min to max]

Permitted and Actual Maximum Daily Withdrawal from the Keswick Water Treatment Plant for January 1 to December 31, 2015

Location	Permitted Daily Withdrawal (litres)	Actual Maximum Daily Withdrawal (litres)	Number of Days Operating at Peak Capacity (May to October)	Number of Days Operating at Peak Capacity (Annual)
Water Treatment Plant	16,240,000*	4,464,000 Jan. 16, 2015	0	0

* Permitted Daily Withdrawal for the Keswick system based on the Keswick municipal drinking water license limit of 16,240,000 litres/day; the permit to take water has a limit of 18,150,000 litres/day, to will allow the facility to be expanded once demand increases

Permitted and Actual Maximum Annual Withdrawal from the Plant for January 1 – December 31, 2015

Actual Annual Withdrawal	Annual Permitted Withdrawal	Percentage of Permitted Annual Withdrawal
291,291,000 litres	5,927,600,000 litres	5 per cent

* Water treatment facility was off-line for an extended period in 2015 to complete system upgrades.

System Monthly Average Flow (litres per day)

January 2,552,355	February 2,498,286	March 2,702,419	April 1,948,033	May 0	June 0
July 0	August 0	September 0	October 0	November 0	December 0

Glossary of Terms

Adverse Water Quality - specifically identified in Schedule 16 of Ontario Regulation 170/03.

Chloramination - use of both chlorine and ammonia to form chloramines used for secondary disinfection.

Free Chlorine Residual - amount of chlorine available for disinfection.

Cubic Metres per Day (m^3/d) - flow measurement, $1m^3$ = 1000 litres or 220 gallons.

Disinfection - effective destruction by chemical or physical processes of pathogenic organisms capable of causing disease.

Distribution System - water supply network consisting of: pipes, water transmission mains, valves, pumping stations, storage tanks and reservoirs that deliver water from a treatment plant or well to consumers. The Region operates a 'trunk' distribution system consisting of Regional water transmission mains, pumping stations, storage tanks and reservoirs within the system.

Drinking Water System (DWS) - Ministry of the Environment and Climate Change reference for regulated Municipal Drinking Water Systems.

Drinking Water Works Permit (DWWP) - permit to establish or alter a drinking water system

E. coli (EC) - bacteria found in fecal matter that may be washed into water by rain, snowmelt and other forms of precipitation. E. coli is a type of coliform, and its presence in water indicates contamination with sewage or animal wastes. It is an indicator of the possible presence of pathogenic bacteria.

Fluoride - added to drinking water as a means to decrease the incidence of tooth decay. Fluoride can also naturally occur in the environment. Where fluoride is added to drinking water, it is recommended the concentration be adjusted to 0.5 - 0.8 mg/L, the optimum level for control of tooth decay.

Granular Activated Carbon - used to help remove taste and odour causing compounds in drinking water.

Groundwater Under Direct Influence (GUDI) – Groundwater under direct influence of surface water. This is a provincial designation for wells that have a greater potential to be impacted by surface water and runoff. Although these wells are shallow, overlying sediments provide natural filtration capacity to sufficiently protect water quality.

Hardness - measures mineral content in water. The two minerals that are most responsible for hardness are calcium and magnesium carbonate. Water hardness can also result in scaling on pipes and appliances. Hardness levels between 80 and 100 mg/L are considered to provide an optimal balance. Water supplies with a hardness greater than 200 mg/L are considered poor but tolerable.

Heterotrophic Plate Count (HPC) - a microbiological test indicating general bacteria population. Results give an indication of overall water quality in drinking-water systems. HPC results should be used as a tool for monitoring the overall quality of the water, both immediately post-treatment and in the distribution system. Results within the range of 0-500 is considered optimal.

Inorganic Contaminants - such as salts and metals which can be naturally occurring or result from storm water run-off, wastewater discharged, oil and gas production, mining or agriculture.

Iron - may be present in groundwater as a result of mineral deposits and chemically reducing underground conditions. May also be present in surface waters as a result of anaerobic decay in sediments. Control of iron concentrations is required to avoid unpleasant colour and staining of fixtures and laundry.

Maximum Flow Rate - peak or highest flow recorded during a specific time period usually in a twenty-four (24) hour period.

Microbiological Contamination - such as viruses, bacteria or protozoa which may come from septic systems, livestock operations or wildlife.

Microfiltration Process - removes suspended solids, Cryptosporidium, as well as other potentially harmful parasites and bacteria. This membrane filtration process removes contaminants by passing water through a microporous membrane.

Glossary of Terms – continued

Microorganism - microscopic organism that cannot be seen without the aid of a microscope, including bacteria, protozoa, fungi, viruses and algae.

Milligram per Litre (mg/L) - measure of the concentration of a parameter in water, sometimes referred to as parts per million (ppm).

Ministry of the Environment and Climate Change (MOECC) - provincial regulatory agency responsible for overseeing and permitting the water and wastewater industry in Ontario

Medical Officer of Health (MOH) - responsible for providing direction to the Operating Authority in instances of adverse water quality instances ensures adequate responses are being followed and has the authority to issue boil water advisories and orders if necessary.

Municipal Drinking Water Licence (MDWL) - approvals framework for municipal residential drinking water systems requiring an owner to have a drinking water works permit, a permit to take water, an accepted operational plan, an accredited operating authority and a financial plan.

Nephelometric Turbidity Unit (NTU) - unit of measure for turbidity in a water sample.

Ontario Drinking Water Quality Standards (ODWQS) - Ontario Regulation 169/03 under the *Safe Drinking Water Act, 2002*. The ODWQS lists the maximum allowable concentrations for bacteriological, organic and inorganic parameters.

Organic Chemical Contaminants - includes synthetic and volatile organic chemicals, which are by-products of industrial processes, petroleum production, gas stations, urban storm water and septic systems.

pH- index of hydrogen ion activity, pH is defined as the negative logarithm of hydrogen ion concentration in moles per litre. A solution of pH from 0-6.9 is acidic, 7 is neutral, and 7.1-14 is alkaline.

Potassium Permanganate (KMnO4) - commonly used to treat drinking water for iron, manganese and sulfur odours.

Presence/Absence Test (P/A) – qualitative procedure used to determine the presence or absence of coliforms in water.

Raw Water - surface water or groundwater that is available as a source of drinking water but has not received any treatment.

Sodium - found naturally in surface and groundwater as it is present in most rocks and soils across southern Ontario. Sodium can make the water taste salty at certain levels. The aesthetic objective for sodium in drinking water is 200 mg/L at which it can be detected by a salty taste. The local Medical Officer of Health is notified when the sodium concentration exceeds 20 mg/L for those on sodium restricted diets.

Sodium Hypochlorite - used for disinfection in drinking water.

Sodium Silicate - used to sequester iron in drinking water (to reduce the potential for iron to stain plumbing fixtures and laundry).

Total Coliform (TC) - coliform group of bacteria is the most commonly used indicator of water quality. Total coliforms are a group of closely related bacteria that are usually free-living in the environment, but are also normally present in water contaminated with human and animal feces. With certain exceptions, they do not cause disease. Specifically, coliforms are used as a screen for fecal contamination as well as to determine the efficiency of treatment and the integrity of the water distribution system.

Treated Water - water entering the distribution system after the treatment is complete.

Turbidity - measure of relative clarity of a liquid, the presence of suspended matter or impurities that interfere with the clarity of the water. The more total suspended solids in the water, the cloudier it seems and the higher the turbidity.

Ultraviolet Disinfection (UV) - form of disinfection used in the water and wastewater industry, ultraviolet treatment uses the transmittance of ultraviolet irradiation to disrupt the genetic composition and inactivate waterborne pathogens.

For more information about this report please contact:
David Szeptycki
Head – Strategy, Liaison & Policy Implementation
Environmental Services Department
environmentalservices@york.ca
1-877-464-9675
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March 2016
eDocs Reference No. 6466942

Explanations on the health impacts of laboratory results of inorganic and organic parameters can be found in MOECC document#4449e01, *Technical Support Document for Ontario Drinking Water Quality Standards, Objectives and Guidelines*.
ontario.ca/document/technical-support-document-ontario-drinking-water-standards-objectives-and-guidelines

Environmental Services Department
17250 Yonge Street, Newmarket, Ontario, L3Y 6Z1
1-877-464-9675
york.ca

Attachment 2

Summary of Reported Adverse Water Quality Parameter Results in 2015

Location	Parameter	Event Date (2015)	Limit	Result	Corrective Action
Aurora Southwest ET	Total Coliforms	Jan 28	0 CFU* /100mL	Presence	Resample taken per regulations; result Absence of Total Coliforms.
Schomberg WTP High Lift	Sodium	Jan 28	20.0 mg/L	20.1 mg/L	Resample taken per regulations; result 19.6 mg/L, under the regulatory limit. Sodium concentrations are within the typical range observed at a number of Region groundwater wells and are indicative of groundwater conditions in the Region.
Nobleton Well 5 Treated	Sodium	Jul 15	20.0 mg/L	21.6 mg/L	Resample taken per regulations; result 21.1 mg/L. Sodium concentrations are within the typical range observed at a number of Region groundwater wells and are indicative of groundwater conditions in the Region.

*CFU = Colony Forming Unit

Attachment 3

Summary of Reported Adverse System Performance Events in 2015

Location	Parameter	Event Date (2015)	Limit	Result	Corrective Action
Newmarket Glenway Reservoir	Chlorine Residual Combined	Apr. 1	0.25 – 3.00 mg/L	3.48 mg/L	Increased chlorine residual occurred during commissioning of re-chloramination facility. Grab sample taken afterward with a result of 2.17 mg/L. As a result of ongoing commissioning challenges at Glenway, changes were made to facility setpoints and a number of preventative actions were initiated.
Newmarket Glenway Reservoir	Chlorine Residual Combined	Apr. 18	0.25 – 3.00 mg/L	3.15 mg/L	Increased chlorine residual occurred during commissioning of re-chloramination facility. Grab sample taken afterward with a result of 2.98 mg/L. Changes were made to facility setpoints and a number of preventative actions were continued in an effort to prevent recurrence.
Newmarket Glenway Reservoir	Chlorine Residual Combined	Apr. 20	0.25 – 3.00 mg/L	3.25 mg/L	Increased chlorine residual occurred during commissioning of re-chloramination facility. Grab sample taken afterward with a result of 2.98 mg/L. Changes were made to facility setpoints and a number of preventative actions were continued in an effort to prevent recurrence.
South Maple Reservoir	Chlorine Residual Combined	May 21	0.25 – 3.00 mg/L	3.21 mg/L	Analyzer maintenance performed. Grab sample taken afterward with a result of 2.72 mg/L.

*Reported as a due diligence measure

Location	Parameter	Event Date (2015)	Limit	Result	Corrective Action
Georgina Plant Discharge Header	Fluoride	June 5	1.5 mg/L	1.78 mg/L	Analyzer maintenance performed. Grab sample taken afterward with a result of 0.35 mg/L.
Newmarket Glenway Reservoir	Chlorine Residual Combined	June 15	0.25 – 3.00 mg/L	3.34 mg/L	Increased chlorine residual occurred during commissioning of re-chloramination facility. Grab sample taken afterward with a result of 2.84 mg/L. Continued to make changes to facility setpoints and additional preventative actions were continued in an effort to prevent recurrence.
Newmarket Glenway Reservoir	Chlorine Residual Combined	June 24	0.25 – 3.00 mg/L	3.00 mg/L	Increased chlorine residual occurred during commissioning of re-chloramination facility. Grab sample taken afterward with a result of 2.99 mg/L.* Continued to make changes to facility setpoints and a additional preventative actions were continued in an effort to prevent recurrence.
Newmarket Glenway Reservoir	Chlorine Residual Combined	June 24	0.25 – 3.00 mg/L	3.00 mg/L	Increased chlorine residual occurred during commissioning of re-chloramination facility. Grab sample taken afterward with a result of 2.99 mg/L.*
Newmarket Glenway Reservoir	Chlorine Residual Combined	June 27	0.25 – 3.00 mg/L	3.13 mg/L	Increased chlorine residual occurred during commissioning of re-chloramination facility. Grab sample taken afterward with a result of 2.57 mg/L.
Aurora Ridge Road Reservoir	Chlorine Residual Combined	July 6	0.25 – 3.00 mg/L	3.19 mg/L	Maintenance performed and facility restored normal operation. Grab sample taken afterward with a result of 1.80 mg/L.

*Not a regulatory requirement to report, reported as a due diligence measure

Location	Parameter	Event Date (2015)	Limit	Result	Corrective Action
Newmarket Glenway Reservoir	Chlorine Residual Combined	July 21	0.25 – 3.00 mg/L	3.53 mg/L	Increased chlorine residual occurred during commissioning of re-chloramination facility. Grab sample taken afterward with a result of 2.83 mg/L. As a result of ongoing commissioning challenges at Glenway, changes were made to facility setpoints and a number of preventative actions were implemented to prevent future occurrences.
Keswick West Park Heights Reservoir	Chlorine Residual Free	Aug. 8	0.05 – 4.00 mg/L	4.99 mg/L	Maintenance performed and facility restored normal operation. Grab sample taken afterward with a result of 0.89 mg/L.*
Nobleton Elevated Tank	System Pressure	Aug. 11	>20psi	11 psi	Corrective action taken to restore pressure.*
Georgina Plant Discharge Header	Fluoride	Aug. 28	1.5 mg/L	1.96 mg/L	Analyzer maintenance performed. Grab sample taken afterward with a result of 0.7 mg/L.
Queensville Elevated Tank	System Pressure	Sept. 11	>20psi	10 psi	Corrective action taken to restore pressure.*
Georgina Plant Discharge Header	Chlorine Residual Free	Sept. 13	0.05 – 4.00 mg/L	4.95 mg/L	Maintenance performed and facility restored normal operation. Grab sample taken afterward with a result of 0.89 mg/L.*
Keswick Woodbine Elevated Tank	Chlorine Residual Free	Sept. 16	0.05 – 4.00 mg/L	4.50 mg/L	Maintenance performed and facility restored normal operation. Grab sample taken afterward with a result of 1.23 mg/L.*

*Not a regulatory requirement to report, reported as a due diligence measure

Location	Parameter	Event Date (2015)	Limit	Result	Corrective Action
Georgina Plant Discharge Header	Chlorine Residual Free	Sept. 27	0.05 – 4.00 mg/L	5.00 mg/L	Maintenance performed and facility restored normal operation Grab sample taken afterward with a result of 1.30 mg/L.*
Markham Reservoir	Chlorine Residual Combined	Nov. 7	0.25 – 3.00 mg/L	0.24 mg/L	Adjustments performed and facility restored normal operation Grab sample taken afterward with a result of 1.00 mg/L.
Newmarket Glenway Reservoir	Chlorine Residual Combined	Nov. 23	0.25 – 3.00 mg/L	3.59 mg/L	Increased chlorine residual occurred during early operation of re-chloramination facility. Grab sample taken afterward with a result of 2.05 mg/L.
Nobleton North Elevated Tank	Chlorine Residual Free	Nov. 28	0.05 – 4.00 mg/L	3.62 mg/L	Maintenance performed and facility restored normal operation. Grab sample taken afterward with a result of 1.30 mg/L.*
Markham Pumping Station	Chlorine Residual Combined	Dec. 5	0.25 – 3.00 mg/L	0.18 mg/L	Analyzer maintenance performed Grab sample taken afterward with a result of 0.35 mg/L.
Markham Pumping Station	Chlorine Residual Combined	Dec. 6	0.25 – 3.00 mg/L	3.14 mg/L	Analyzer maintenance performed. Grab sample taken afterward with a result of 1.01 mg/L.
Milliken Elevated Tank	Chlorine Residual Combined	Dec. 10	0.25 – 3.00 mg/L	5.00 mg/L	Analyzer maintenance performed. Grab sample taken afterward with a result of 1.37 mg/L.
South Maple Pumping Station	Chlorine Residual Combined	Dec. 11	0.25 – 3.00 mg/L	3.05 mg/L	Analyzer maintenance performed. Grab sample taken afterward with a result of 1.91 mg/L.
Milliken Elevated Tank	Chlorine Residual Combined	Dec. 11	0.25 – 3.00 mg/L	6.00 mg/L	Analyzer maintenance performed. Grab sample taken afterward with a result of 1.28 mg/L.

*Not a regulatory requirement to report, reported as a due diligence measure

Location	Parameter	Event Date (2015)	Limit	Result	Corrective Action
Newmarket Well 1,2 Treated	Chlorine Residual Combined	Dec. 12	0.25 – 3.00 mg/L	0.22 mg/L	Wells were not in production, notified Town of Newmarket to collaboratively perform maintenance of the system Grab sample taken afterward with a result of 2.58 mg/L.
Stouffville Zone 2 Booster Pumping Station	Chlorine Residual Total	Dec. 12	n/a	>5.00 mg/L	Analyzer maintenance performed. Grab sample taken afterward with a result of 2.48 mg/L*. This is not a legislated requirement.
Queensville Well 3,4 Treated	Chlorine Residual Combined	Dec. 16	0.25 – 3.00 mg/L	3.10 mg/L	Chlorination system malfunctioned and locked out. Grab sample taken afterward with a result of 2.29 mg/L. Repairs made to chlorination system.
Queensville Well 3,4 Treated	Chlorine Residual Combined	Dec. 17	0.25 – 3.00 mg/L	3.10 mg/L	Adverse due to chlorine in line during start-up after repair. Adjustments were made and facility restored normal operation. Reported as due diligence as adverse condition had been reported within previous 24 hours. Grab sample taken afterward with a result of 1.82 mg/L.

*Not a regulatory requirement to report, reported as a due diligence measure

Attachment 4

Ministry of Environment and Climate Change Inspection Results Summary from January 1, 2015 to December 31, 2015

Drinking Water System	Rating	Findings	Corrective Action
Ansnorveldt	100%	None	N/A*
Ballantrae/ Musselman's Lake	97.88%	*Non-compliance*: Quarterly regulatory samples missed for nitrate and nitrite	Corrective actions taken to provide more robust notification and oversight of the sampling process. Changes made to procedure and operators re-trained.
Ballantrae/ Musselman's Lake	97.88%	*Non-compliance*: Quarterly regulatory samples missed for nitrate and nitrite	Corrective actions taken to provide more robust notification and oversight of the sampling process. Changes made to procedure and operators re-trained.
Georgina Drinking Water System – Georgina	100%	None	N/A*
Georgina Drinking Water System – Keswick	N/A	System not inspected in 2015 as treatment plant was offline to complete capital upgrades. Ministry will inspect in Q1 2016 aligning with the Ministry's reporting period of April 1 to March 31.	N/A*
Mount Albert	97.88%	*Non-compliance:* Quarterly regulatory samples missed for nitrate and nitrite	Corrective actions taken to provide more robust notification and oversight of the sampling process. Changes made to procedure and operators re-trained
Nobleton	100%	None	N/A*
Schomberg	100%	None	N/A*
York Drinking Water System – Aurora	100%	None	N/A*

*N/A = Not Applicable

Drinking Water System	Rating	Findings	Corrective Action
York Drinking Water System – Holland Landing	100%	None	N/A*
York Drinking Water System – King City	100%	None	N/A*
York Drinking Water System – Kleinburg	100%	None	N/A*
York Drinking Water System – Newmarket	100%	None	N/A*
York Drinking Water System – Queensville	100%	None	N/A*
York Drinking Water System – York Distribution	N/A	System was not inspected in 2015 per Ministry scheduling. Ministry will conduct the inspection in Q1 2016 aligning with the Ministry's annual reporting period of April 1 to March 31.	N/A*

*N/A = Not Applicable

York Region

Operational Excellence
for Water and Wastewater Services

Presentation to
Committee of the Whole

David Szeptycki and Roy Huetl

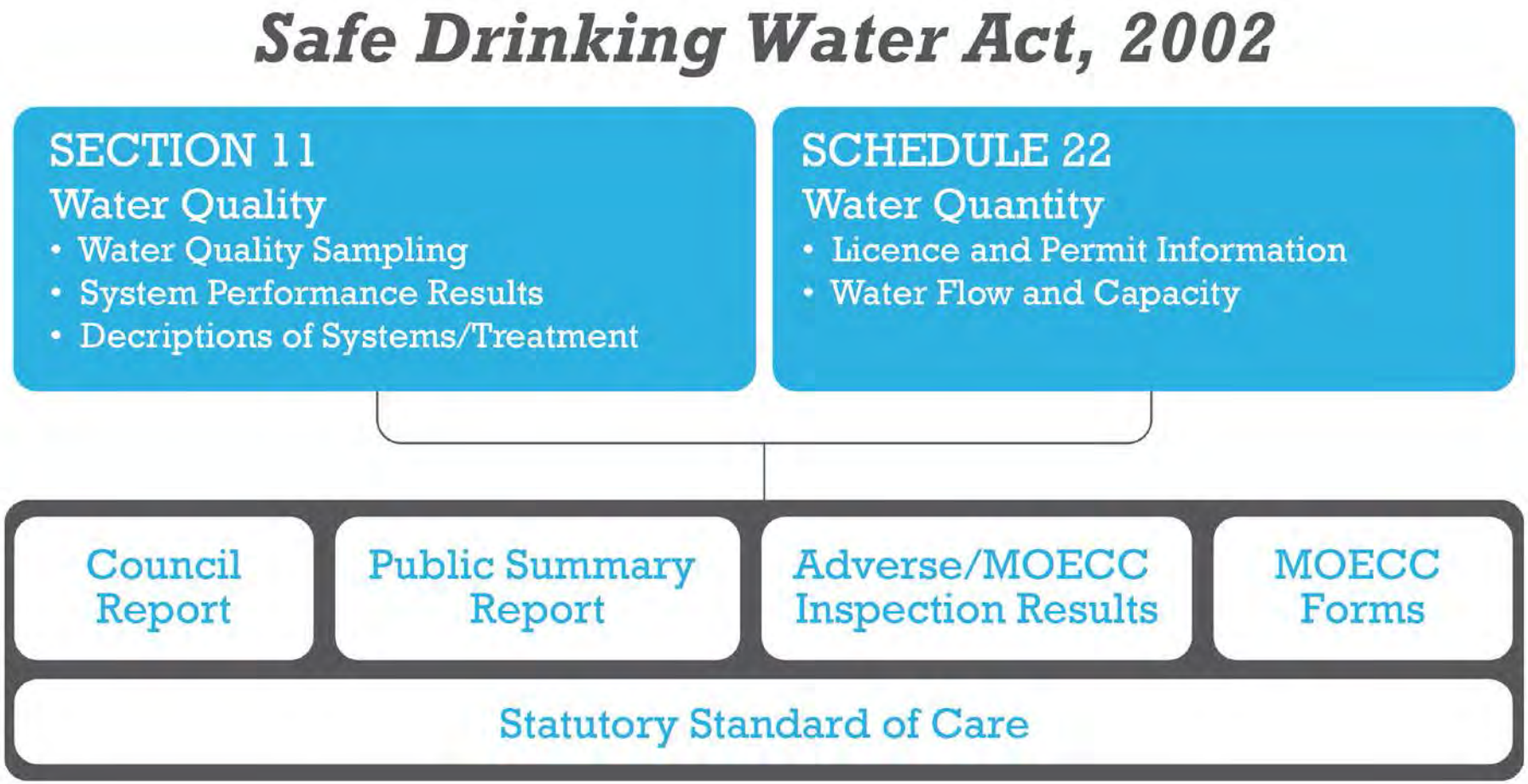
March 3, 2016

Overview

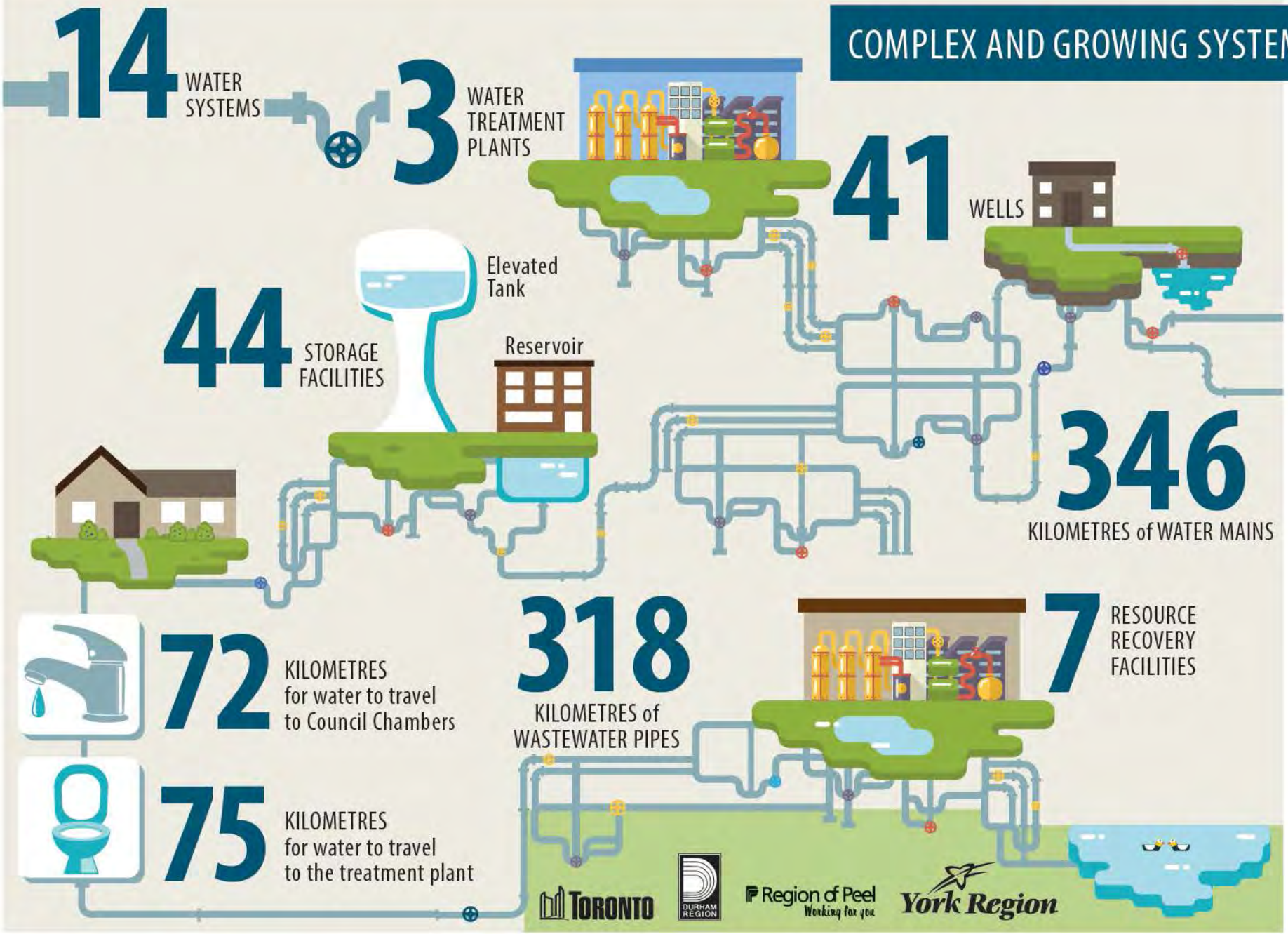
- Council responsibilities under Standard of Care
- Integrated Management System Update
- Summary of drinking water quality results for 2015
- Operations Maintenance and Monitoring Achievements

Providing high quality drinking water to our communities through programs designed to meet Ontario's regulatory requirements for drinking water

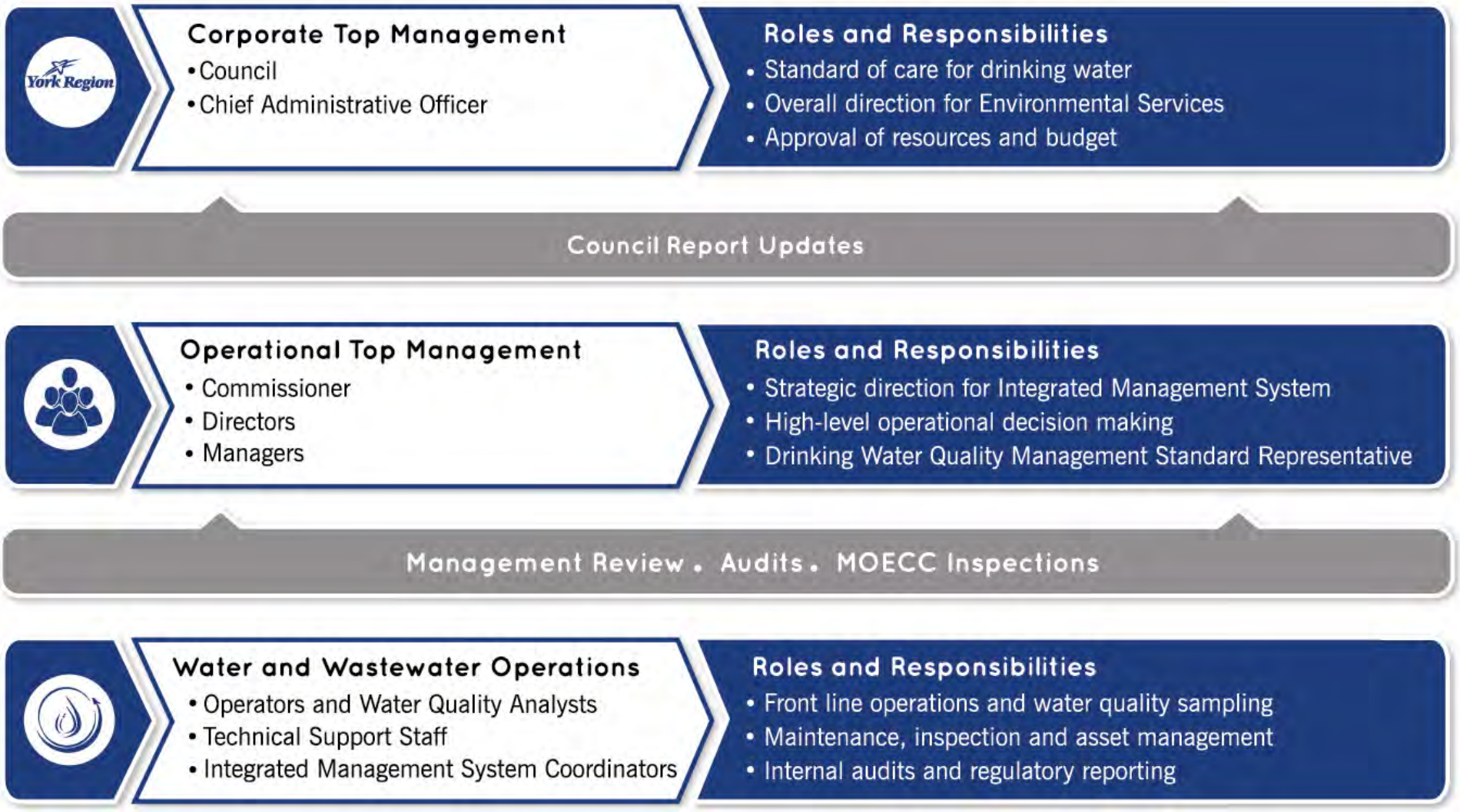
Meeting Annual Reporting Responsibilities



COMPLEX AND GROWING SYSTEM

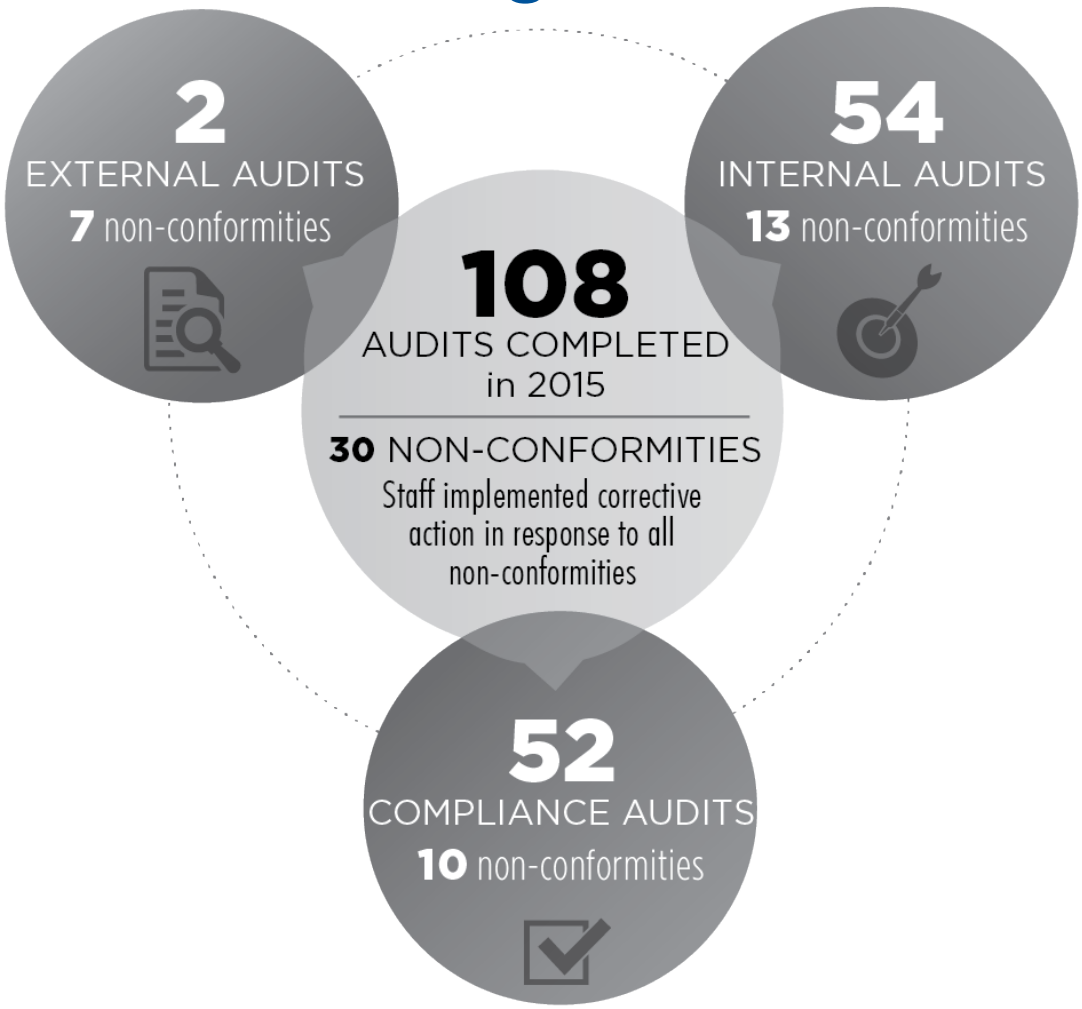


Integrated Management System (IMS) Update



DWQMS provides framework of accountability to deliver safe drinking water

Comprehensive Regional Audit Program

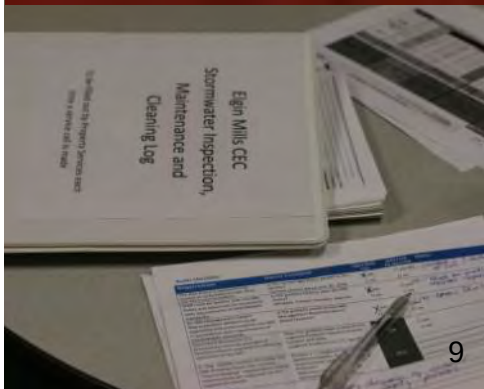


Integrated Management System is Council's safeguard to achieving Statutory Standard of Care responsibilities

Integrated Management System Framework Promotes Improvement

Continuous Improvement

- 2015 initiatives demonstrate system efficiencies and enhanced performance:
  - Completed 100% of scheduled audits
  - Delivered audit program enhancements
  - Achieved Compliance Auditor certification
  - Updated documentation to support 24/7 operations
  - Established multi-year implementation plan for Capital Planning and Delivery processes
- Looking ahead:
  - Updated ISO 9001 and ISO 14001 standards released in 2015
  - Updates to DWQMS expected in 2016



2015 Annual Drinking Water Systems Report

Number of tests performed and adverse events reported on submitted water samples taken in 2015

total number of tests performed 18,692

6,631
organic
45%

8,592
micro
28%

3,469
inorganic
27%

3
adverse
0.02%

total water delivered = 123 billion litres

Ontario Chief Drinking Water Inspector's Annual Reports 2013-2015

Municipality	Inspection Rating (%)		Water Quality Tests Meeting Standards (%)	
	2013 - 2014	2014 - 2015	2013 - 2014	2014 - 2015
York	**99.96**	**99.09**	**99.99**	**99.99**
Durham	99.73	98.49	99.95	99.95
Peel	98.21	98.17	99.94	99.99
Toronto	97.93	100.00	99.75	99.45

York Region achieved the top score in water quality samples in the Ontario Chief Drinking Water Inspector's report

MOECC Inspections – Water and Wastewater

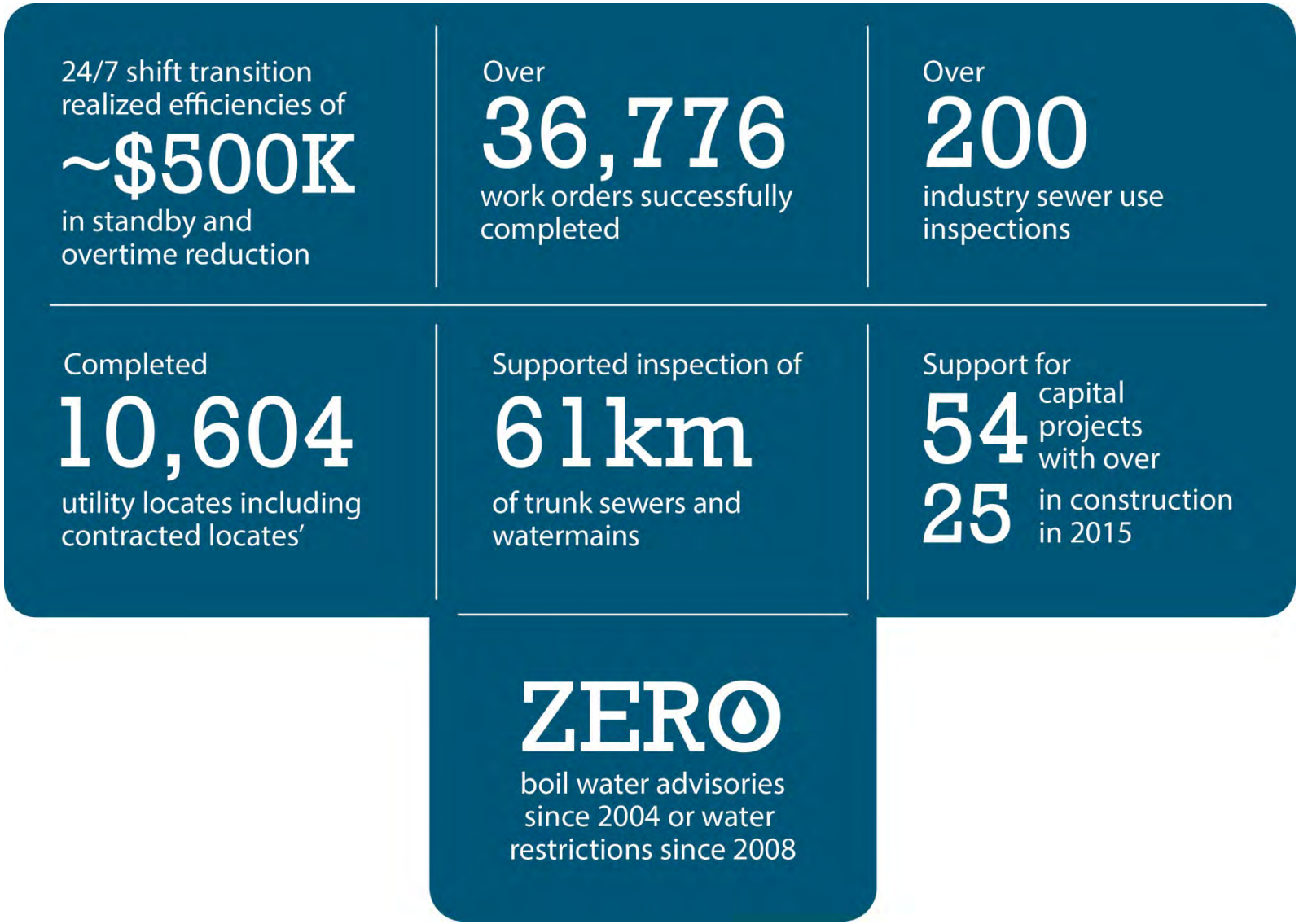
System	# MOECC Inspections Completed	# Non-Compliance Findings	# Best Practice Recommendations
Water	13	2	0
Wastewater	3	6	3

- Inspections resulted in high overall inspection ratings
- All non-compliance and best practice recommendations were followed up on with appropriate corrective actions including:
  - Additional notifications on sampling dates/requirements
  - Samples being managed through a central electronic system with record reconciliation
  - Operator training
  - Updated protocols and procedures

100% York Region's Drinking Water Systems operated within allowable flow and withdrawal limits set by MOECC issued Permits to Take Water

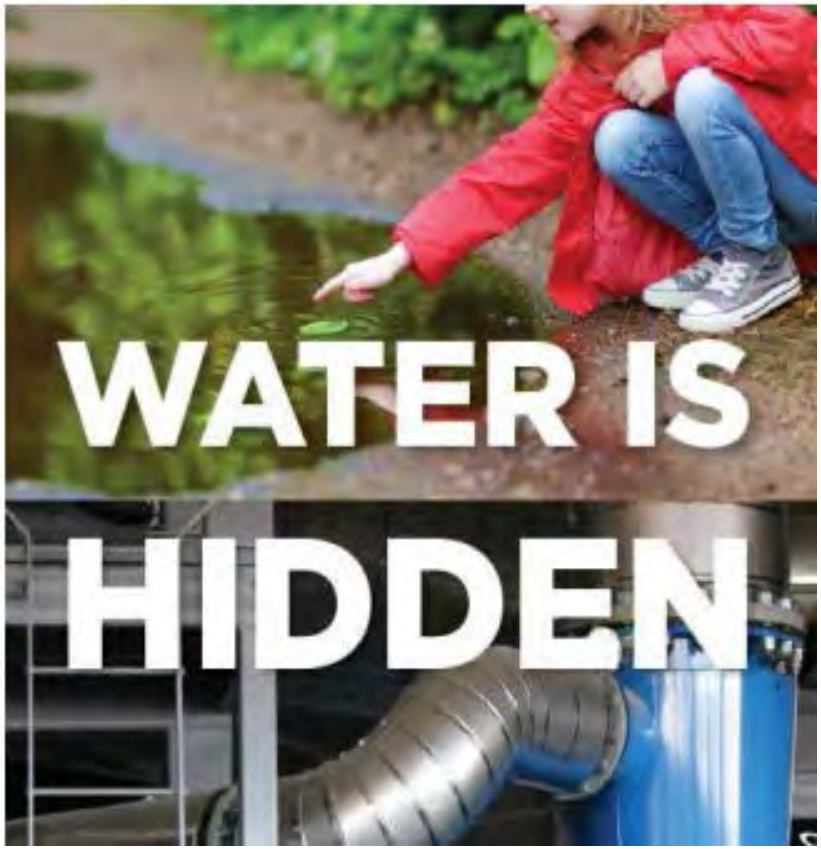
Operations Maintenance and Monitoring Achievements

Delivering Essential Services to Our Customers



Revealing Water Heroes

- Water and wastewater services are often viewed as ‘hidden’
- Water Is campaign highlighted people and infrastructure of York Region’s water

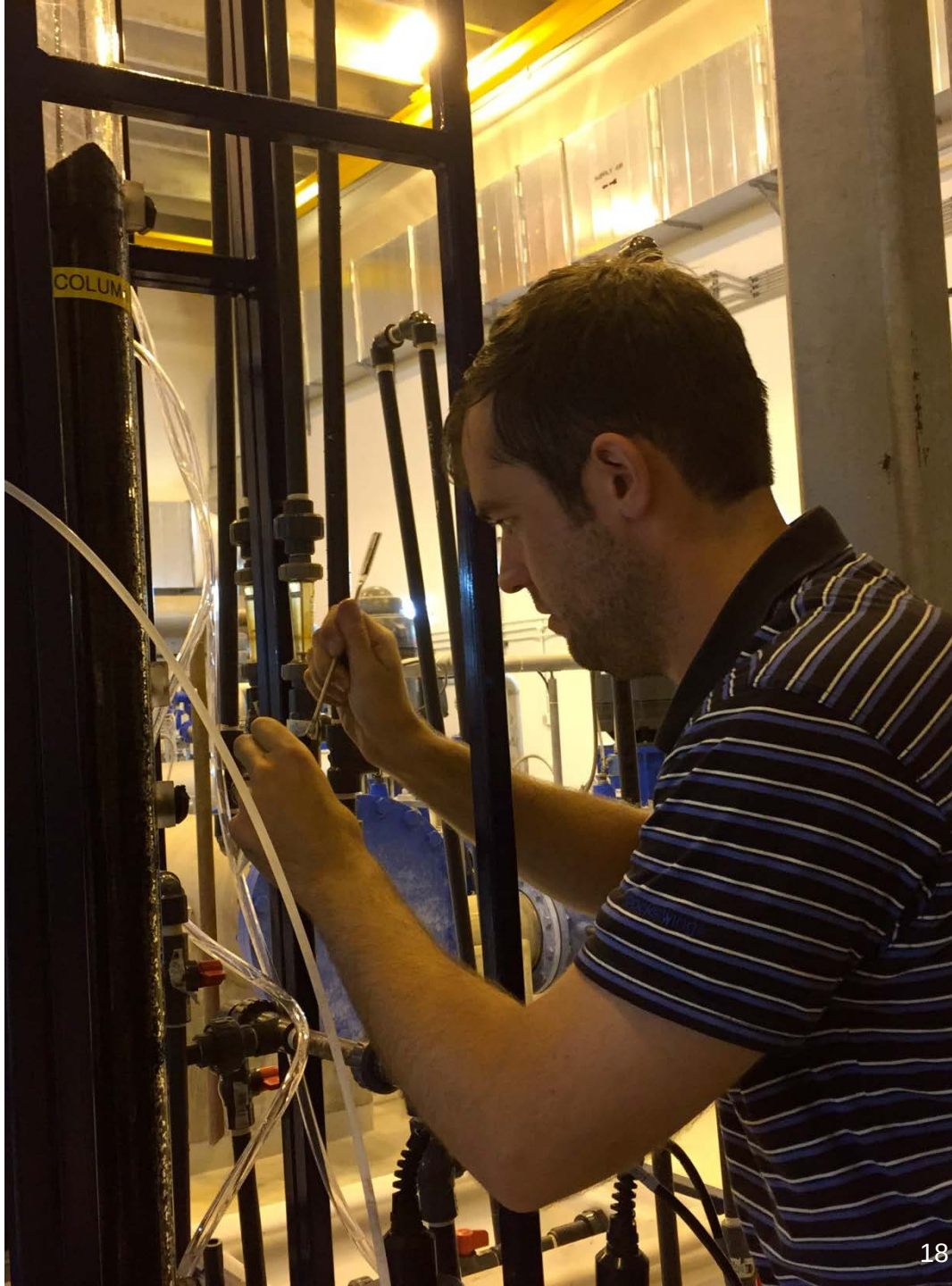


Operations Maintenance and Monitoring is responsible for maintaining assets valued over $5 billion

Water Hero Video Montage

Research Partnerships

- Key partnership with University of Toronto Drinking Water Research Group
- Participation on industry committees to leverage industry best practices
- Water summit hosted in 2015



UNIVERSITY OF TORONTO

DWRG
NSERC CHAIR IN DRINKING WATER RESEARCH

System Integration & Partnership

- Continued engagement with Ministry of Environment and Climate Change – working together to build system understanding
- Collaboration with local municipalities to develop operating strategies, data sharing and service level agreements

Partnerships facilitate seamless service delivery

"The most important health care provider in your community is the person who takes care of the water."

Bernadette Conant, Executive Director of Canadian Water Network