York Region

LONG TERM

Water Conservation Strategy

Annual Report
March 31, 2017

AURORA · Town of East Gwillimbury · GEORGINA · KING · MARKHAM · Newmarket · Richmond Hill · VAUGHAN · Town of Whitchurch-Stouffville

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1.0 Purpose and Need for the Annual Report

On March 31st, 2010, the Ministry approved the Southeast Collector Trunk Sewer Individual Environmental Assessment (SEC IEA) subject to thirteen conditions (with seventy-four sub-conditions), including Condition 8 which refers to the Long Term Water Conservation Strategy and Inflow and Infiltration Reduction Strategy.

This report is the sixth annual report prepared to address Conditions 8.8 and 8.9 of the SEC IEA Minister's Conditions of Approvals, and Schedule B of the Permits to Take Water (PTTWs) regulating the Region's intra-basin transfer. It details the 2016 progress on implementation of the Long Term Water Conservation Strategy (LTWCS) submitted to the Ministry in accordance with Condition 8.

Progress made towards the implementation of water conservation initiatives, and annual intra-basin transfer volumes are presented in this report.

The Region will continue the preparation and submission of the annual reports to the Ministry until such date as the Regional Director indicates that updates are no longer required.

1.1 Comments and Feedback Received

On May 13th, 2016, the Central Region Director of the MOECC provided comments on the LTWCS Update dated March 31st, 2016 which included the annual update for 2015 progress. The 2016 Update documented the lessons learned from the implementation of the 2011 Strategy and the results of best-in-class review. The 2016 Update identified a suite of updated water conservation measures and programs, and emphasized an increase in water reuse. Comments received expressed that York Region continues to show strong leadership in promoting water conservation and "should be commended for its work to date on the implementation of the Strategy". A confirmation letter of satisfaction in accordance with Condition 8.10 of the Minister's Notice of Approval for the SEC IEA was also received.

2.0 Background

Centrally located in the Greater Toronto Area (GTA), York Region is one of the fastest growing regions in Canada. The Region is the only municipality in the GTA without direct access to Lake Ontario for its drinking water supply and, therefore, secures its water from water supply agreements with the City of Toronto and Peel Region (90 per cent), as well as from Lake Simcoe and groundwater sources (10 per cent). The population of the Region is currently 1.19 million and is projected to increase to about 1.8 million by 2041. Without conservation, demand for drinking water and wastewater treatment will increase significantly as the population grows.

2.1 Water Conservation and Sustainable Growth

As per Provincial direction through Places to Grow legislation, York Region's current Official Plan directs growth until 2031. The focus of the Region's Official Plan (YROP–2010) is to foster sustainable growth and create healthy, livable communities and a resilient natural environment.

Water supply and wastewater collection are significant Regional growth considerations. Integrating water infrastructure planning with water conservation programming is critical to meeting increases in water demands.

It is anticipated that a large portion of growth over the next decade or so will occur in greenfield areas, with an increasing amount of growth in the Urban Growth Centres and Regional Corridors in the form of high-rise development. While growth areas provide an ideal opportunity to design water efficient processes and storm management into new buildings, the sheer number of existing customers in York Region means that a significant effort must also be made to reduce the per capita demands of these customers.

The increasing water demands over time due to significant growth puts more pressure on the Region to deliver its water conservation programming. Reducing the amount of water loss and water wasted for non-potable uses, and adopting water reuse strategies should enable the Region to meet growth-related increases in water demand with minimal increase in water supply. This helps to ensure the sustainability of the Region's water supply system and long-term water savings across all sectors.

2.2 Current and Historical Water Conservation Programming

Since 1998, water conservation planning has been an integral part of the Region's long-term drinking water supply strategy. York Region has been ahead of the curve in water conservation programming. Over the past two decades, water saved in the Region is estimated at 26.4 million litres per day (equivalent to 10 ½ Olympic-sized swimming pools); this equates to water consumed daily by more than 132,000 people.

Much of these water savings are directly related to the Region's Water for Tomorrow (WFT) program. Additional savings were the result of the recent North American-wide improvements to the efficiency of plumbing fixtures and appliances, such as toilets, clothes washers, showerheads, and faucet aerators.

Prior to the development of the first LTWCS in 2010, York Region, like most other North American municipalities, focused much of their water conservation efforts on delivering broad-based (or rebate-based) programming. While the installation of efficient toilets and clothes washers have resulted in a significant reduction in per capita water demands since the early 2000s, with every efficient model installed, fewer and fewer inefficient fixtures remain. Furthermore, because of changes in the marketplace there are fewer inefficient plumbing fixtures and appliances being sold by retail outlets. For both of these reasons, fixture and appliance rebate programs have essentially "run their course".

There are also some inherent limitations with broad-based (non-targeted) programs, specifically:

- Variable uptake;
- Program participants are volunteers and, therefore, unlikely to be "water wasters";
- Difficulty of reaching high water users;
- Costly for the Region to deliver on a per capita basis; and
- Require continuous and increasing investments in the program with an ever-decreasing return in water savings.

Because of these limitations, the Region has shifted focus in recent years to developing marketplace-based programs that specifically target high water users. A market-based approach utilizes the marketplace as delivery agents for water conservation with the ultimate goal of generating transformative, sustained change.

These programs focus on removing barriers to customer participation and leveraging opportunities to internalize cost-effective water conservation to the degree that it becomes standard practice. Engaging the marketplace and developing strategic partnerships for the delivery of water conservation initiatives is not only more cost-effective, but also extends the scope and reach of Regional programs.

While it is difficult to quantify water savings in market-based transformation, the Region will continue to monitor and report on the overall residential per capita demand, which could provide an indication on the impact of market-based programming.

2.3 One Water: The Path to Sustainable Water Services

In this era of change—dynamic and evolving markets, increasing weather variability, fast emerging technology, population growth and changing demographics, and new development—a responsive and resilient water system is critical.

Figure 1: "One Water" Approach

"One Water" operationalizes the philosophy that there really only is "one" water on earth, with each molecule of this water being reused over and over thousands of times.

"One Water" is a holistic approach that considers the cross-functional nature of water management, including water conservation. Via "One Water", the Region is building on previous efforts to ensure water management programming is coordinated, innovative, complementary and responsive to change. How we grow as a Region impacts water use; evolution of the market to more efficient fixtures and appliances impacts water demand and influences future trends that in turn, impact capital planning. New water management technologies create opportunities for greater efficiencies on a system scale and make water reuse, energy capture and nutrient recovery viable.

"One Water" fosters integration and enables the Region to capitalize on significant cross functional opportunities. The LTWCS is an integral part of the "One Water" approach, as illustrated in **Figure 1**.

2.4 Water Saving Targets and Timelines

The 2011 Strategy envisions a residential water consumption rate of 150 litres per capita per day (LCD) by 2051. While per capita residential water demands have declined over the last decade due to the impact of Regional programs, an improvement in the efficiency of key water-using fixtures and appliances (e.g. toilets, clothes washers, showerheads), advancements in the Ontario Building Code, and a growing awareness of the importance of using our natural resources wisely, further savings are required if the Region is to reach its targets.

Table 1 summarizes target residential consumption rates that can be achieved over time if three water saving scenarios are implemented.

In 2015, York Region embarked on a big data initiative as improvements were made to the methodology for calculating LCD in the Water Consumption Database (WCD) (see section 4.8). These improvements ensured accuracy and consistency in the analysis of water billing data going forward. As such, the baseline year used for the water saving scenarios was changed from 2014 to 2015 to reflect the best available information.

Table 1: Residential Water Saving Targets and Timelines

Water Saving Scenarios	2015	2021	2031	2041	2051
	Residential Consumption Rate (LCD)				
Scenario 1 Regional Incentive Programs	200	192	185	179	173
Scenario 2 Regional Incentive Programs + Existing Provincial Programs and Legislation		190	183	176	170
Scenario 3 Regional Incentive Programs + Existing Provincial Programs and Legislation + Water Reuse and Provincial Guidance and Legislative Changes			180	165	150

3.0 Reporting of Water Demand to Date

In 2016, the per capita consumption was estimated to be 199 litres per day—down from the baseline water consumption rate of 200 litres per day in 2015. Through the continued implementation of the 2016 Strategy Update over the next few years, the Region remains on track to achieve the aspirational 2051 target consumption rate of 150 LCD (via scenario 3 in **Table 1**).

3.1 Water Demand by Sector

Through the enhanced development of the Water Consumption Database the Region has developed better analytics to estimate the water demand by sector, including residential, industrial, commercial and institutional (ICI), and non-revenue water.

Tracking water demand by sector provides a greater insight into how water demand is distributed among homes, businesses, and non-revenue uses—thus enabling the Region to better target its conservation programming. Based on municipal water billing data from the Water Consumption Database, estimated water demand by sector is summarized in **Table 2.**

Table 2: 2016 Water Demand by Sector

Sector	Total 2016 Demand (MLD)
Residential	215.4
- Single-Family Residential	165.6
- Multi-Residential	39.3
- Other Residential	10.5
Industrial, Commercial and Institutional	77.0
Other	0.7
Non-Revenue Water	50.2
Total Demand	**343**

Analysis of local municipal customer water consumption data, along with York Region supply data, indicates that the 2016 Regional demand breakdown is approximately 63 per cent for residential; 23 per cent for industrial, commercial and institutional; less than 1 per cent for other types of properties; and 15 per cent for non-revenue water.

3.2 Factors Affecting Water Demand

In addition to the Region's water conservation programs and initiatives (which are detailed in section 4.0), numerous factors such as weather, population growth, water rates and changes to the building code have an influence on water demands each year.

3.2.1 Weather Conditions

Weather plays a significant factor in the increase and decrease of water demands from year to year.

The summer of 2016 (June, July, and August) was record-breaking for the Region. With an average daily summer temperature of 22.7°C, it was the second-warmest summer on record (the warmest being the summer of 2005, which had an average daily temperature of 23.1°C). A total of 14 heat alerts and 8 extreme heat alerts were issued throughout the summer—almost double the amount issued in 2015 (8 and 4, respectively). Furthermore, August 2016 was the warmest August on record, and is tied with July 2011 as the single warmest month ever recorded in the Region. The total summer rainfall was 133 mm, making it the sixth-driest summer on record.

Due to the drier- and warmer-than-normal conditions, water-intensive activities (such as filling pools, turning on sprinklers, etc.) may have occurred more often. Consequently, a spike in consumption was observed during the summer months throughout the Region: the residential average summer consumption in 2016 was 807 L/day, compared to 2015's consumption of 750 L/day.

Table 3 below outlines weather statistics for the past three years in York Region.

Table 3: Weather Statistics for York Region, 2014–2016[1]

Year	Average Summer Temperature (°C)	Total Summer Rainfall (mm)	Total Cooling Degree Days (CDD)	Total Heating Degree Days (HDD)
2014	20.1	221.8	262	4,106
2015	20.0	246.2	349	3,769
2016	22.7	133.0	564	3,444

3.2.2 Population Growth

In the absence of a water conservation strategy, it is expected that water demand increases proportionally to population growth. This, however, has not been the case in York Region for nearly a decade.

Water demand gradually declined between 2010 and 2015 despite increases in York Region's population, proving that water conservation works. This trend of decreasing water demand with a growing population is expected to persist into the future as the Region continues to strive to meet its 150 LCD residential target. Changes to the Ontario Building Code, implementation of ICI water incentives for businesses, reduction of non-revenue water volume and continued delivery of education and outreach programs all play critical roles in maintaining the downward trend in water consumption.

[1] Obtained from toronto.weatherstats.ca

3.2.3 Water Rates

The Region charges each Local Municipality a uniform cost per cubic meter regardless of the volume of water purchased or time of year. Each of the local municipalities, in turn, is responsible for developing their own rate structure to bill their own customers. Because the Region charges its municipal customers based on a uniform rate, the revenue generated by water sales varies from year to year based on local weather conditions, i.e., higher water sales during years with hot dry summers, and lower water sales during years with cool wet summers.

As water rates in York Region increase, some residents may consider adopting water conservation practices. Numerous studies have shown price to be an important driver of demand for water in some service areas, with outside use generally more responsive than indoor use. Responsiveness varies widely with location, however, because of the impact of such factors as local climate, attitudes, incomes and the relative price of water.

Because most of the Region's water supply and wastewater costs are fixed, like many municipalities in Canada, the Region has had to implement major rate increases over the last several years to counteract significantly declining per capita water demands. **Table 4** and **Figure 2** summarize the Region's historical water rates since 2011 and future blended rates through to 2021, as endorsed by Regional Council in October 2015. Annual water rate increases are determined based on a detailed analysis of water demands, population growth, maintaining existing assets, day-to-day operations, and building reserves for future asset rehabilitation and replacement.

Since some of the costs associated with providing water services vary (e.g., energy required to pump and distribute water, chemical costs to treat water), reducing water demands will reduce operational costs and therefore, reduce the revenue needs of the municipality. As such, reducing peak demands helps keep water rate increases to a minimum and ensures that water remains affordable to all customers. Reducing water demands on a per capita basis will also enable a greater number of customers to be serviced with the same volume of water. In other words, saving water frees up existing supply to support growth.

Table 4: Regional Water Rates, 2011–2021[2]

Year	Water Rate ($/M^3)	Wastewater Rate ($/M^3)	Blended Rate ($/M^3)	Increase (%)
2011	0.6973	0.7900	1.49	-
2012	0.7512	0.8848	1.64	10
2013	0.8087	0.9910	1.80	10
2014	0.8697	1.1099	1.98	10
2015	0.9345	1.2431	2.18	10
2016	0.9582	1.4158	2.37	9
2017	-	-	2.59	9
2018	-	-	2.82	9
2019	-	-	3.07	9
2020	-	-	3.35	9
2021	-	-	3.45	2.9

[2] Rates from 2011 to 2016 obtained from the 2016 LTWCS Strategy Update. Rates for 2017 through to 2021 were approved by the Council of The Regional Municipality of York on October 8, 2015.

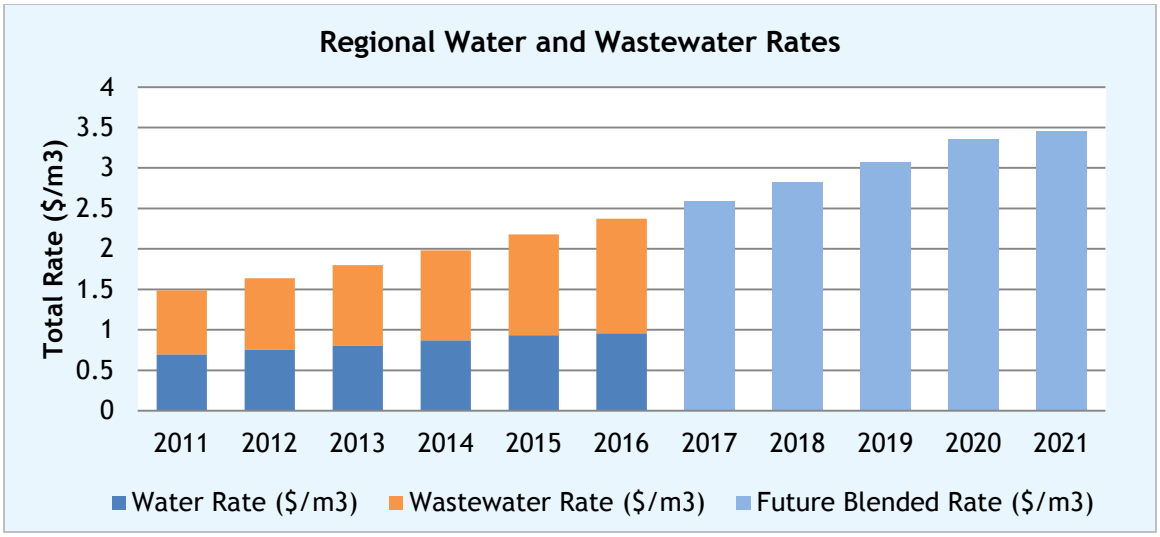


Figure 2: Regional Water and Wastewater Rates

3.2.4 Changes to the Building Code

Amendments to the Ontario Building Code play a crucial role in decreasing Regional water demands. York Region staff's previous participation in provincial sessions reviewing building code updates to advocate for the inclusion of water efficiency and water reuse contributed to changes to the Ontario Building Code, which became effective January 2014. The marketplace has since adopted these changes by moving toward water efficient fixtures and appliances.

In 2016 the Ministry of Municipal Affairs sought stakeholder and public input regarding changes to the Building Code that could improve energy efficiency and water conservation, in alignment with the Long-Term Affordable Housing Strategy and the Climate Change Action Plan. Proposed changes include mandating drain water heat recovery units in all new houses and clarifying water supply pipe size requirements; if approved, the changes would come into effect in July 2017 and January 2018, respectively.[3]

[3] Ontario. Ministry of Municipal Affairs (MMA). *Potential Changes to Ontario's Building Code: Fall 2016 Consultation.* Toronto: Queen's Printer for Ontario, 2016.

4.0 Summary of Programs and Achievements

As part of the integrated "One Water" strategy, York Region utilizes a market-based approach to deliver cost-effective and adaptive system-wide water conservation programming that generates long term, sustained water savings.

The Long Term Water Conservation Strategy report card shown in **Figure 3** highlights key water conservation programs and initiatives under this strategy. An overview of York Region's 2016 program activities and achievements is provided in **Table 5**; key programs and initiatives are elaborated on in subsequent sections.

The measures and programs identified herein include both existing and new initiatives. For ease of reference the measures and programs have been categorized as follows:

- Programs for the Industrial, Commercial, and Institutional (ICI) Sector
- Outdoor Peak Demand Reduction Strategy
- Education and Outreach
- Non-Revenue Water
- Residential New Development
- Water Reuse Strategy
- Advocacy
- Operational Strategies

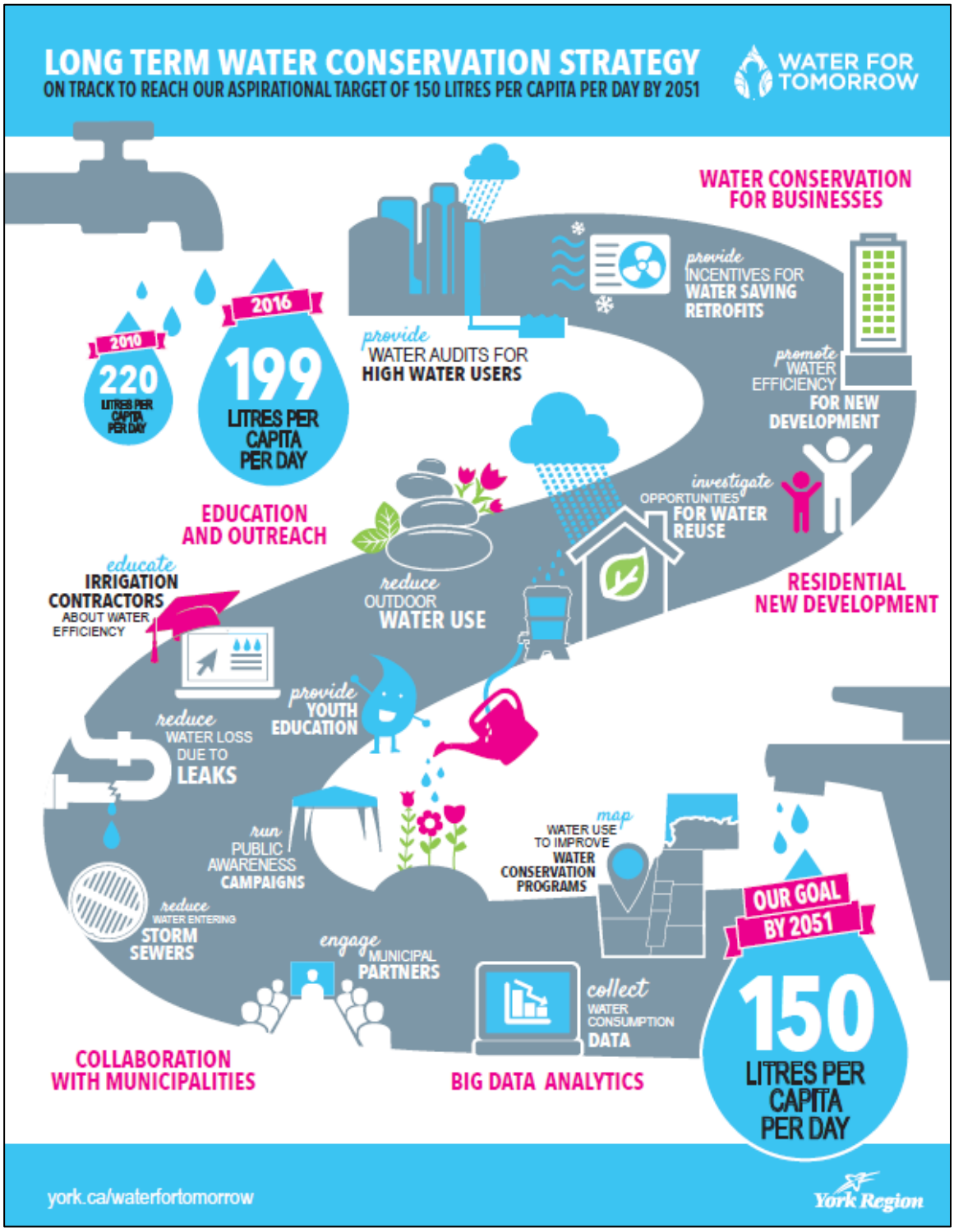


Figure 3: 2017 Report Card

Table 5: Long Term Water Conservation Strategy 2016 Achievements

Program Components	Tactics	Sector	2016 to 2021 Goals	Achievements
Programs for the Industrial, Commercial, and Institutional (ICI) Sector				
ICI Water Use and Wastewater Quality Consultations	Conduct facility consultations	ICI	Continue to offer program to ICI sector	Engaged in 10 facility ICI consultations this year. Cumulative audits to date is 37.
ICI Capacity Buyback	Complete post-audit and provide incentive	ICI	Continue to offer program to ICI sector	Completed a post-audit in 1 facility; cumulative to date is 6 facilities. Created a case study to highlight the results and success of the post-audit.
Once-Through Cooling (OTC) Replacement Pilot	Conduct water audits Post-audit for replacing once-through cooled equipment and provide incentive	Small and Medium-sized Enterprises	Launch the pilot	OTC pilot launched on September 14th at the ICI breakfast meeting.
Outdoor Peak Demand Reduction Strategy				
Water Smart Irrigation Professionals (WSIP)	Provide training and certification to contractors Provide incentives for assessments completed by certified contractors	Contractor All	Continue to offer program	The WSIP training program took place in April 2016 with 25 attendees. There are now 10 WSIP certified companies. Incentives for assessments and irrigation controllers were issued for 13 facilities.
Fusion Gardening® Pilot	Monitor residential landscape change Evaluate water savings	Residential All	Conduct annual evaluation of pilot	Obtained 2015 water consumption data and residential landscape photos. This information will be used for monitoring and tracking of the pilot.

Program Components	Tactics	Sector	2016 to 2021 Goals	Achievements
	Demonstration gardens	Residential and ICI	Install 2 to 3 demonstration gardens per year	Two gardens were installed in 2016.
	Retail partnerships	Residential	Maintain current partnerships and look for new opportunities	Four retail partnerships were established in 2016.
Education and Outreach				
"Water Is" Campaign	Education outreach	All	Continue education initiative	More than 2000 total page views on York.ca/wateris.
				More than 2000 "Water Heroes" and "What you Pay For" video views on YouTube.
				One advertorial in 11 newspapers, 4 languages (total circulation 442,447).
				Over 280,000 people reached with "Water Is" messaging on social media (Facebook, Twitter, YouTube).
				Banners with educational water messaging hung on the fencing of 15 York Region water assets (i.e. fencing of water towers, pumping stations, and wells).
				Articles on the "Water Is" campaign published in *Ontario Pipeline* and *Environmental Science & Engineering* magazines.

Program Components	Tactics	Sector	2016 to 2021 Goals	Achievements
				Presented on the "Water Is" campaign at the OWWA Conference and the Western Ontario Water Works Conference.
				More than 155,000 "How your water dollars are invested" brochures distributed to York Region residents.
				"Water Is Safe" decals adhered to seven water bottle refill stations in Georgina as part of the Healthy Kids Community Challenge.
Children's Water Festival	Student participation rate	School	Continue participation	4412 students and 661 teacher/supervisors attended
Student Education Initiatives	Education content	School	Continue education initiative	15 school presentations; almost 600 students and teachers engaged.
Water Efficiency Outreach to New Canadians	New Canadian participation rate	New Canadian	Continue initiative	Shared education messaging with TRCA staff. Supported one TRCA event.
Non-Revenue Water				
IWA Water Audit/Balance	Identify leakage in system	Local Municipalities	Coordinate audits with local municipalities	Received all 9 municipal IWA audits for 2015. Initiated a peer review project of municipal IWA water audits.

Program Components	Tactics	Sector	2016 to 2021 Goals	Achievements
Leak Detection Program	Minimize water leakage in system	Local Municipalities	Based on audit	Leak reduction evaluation for ILI values greater than 3. Exploring a water loss tracking tool for the local municipalities and York Region.
Residential New Development				
Sustainable Development through LEED® (high-rise development)	Estimated number of units constructed to standard	Multi-Family Residential	Continue to offer program	753 units out of 3,335 (23 per cent) apartments completed in 2016.
Servicing Incentive Program (SIP) (low-rise development)	Estimated number of units constructed to standard	Residential	Continue to offer program	1,160 units out of 4,403 (26 per cent) grade-related units completed in 2016.
Water Reuse Strategy				
Water Reuse	Development and research into water reuse applications	All	Initiate pilot	Retained consultant to conduct Water Reuse Research Demonstration Project. Received funding from RBC Blue Water for demo project. Initiated discussion on incorporating water reuse in the water conservation for businesses program.
Advocacy				
Water Conservation Advisory Committee	Coordinate the WCAC meeting	All	Coordinate committee meetings	Conducted 4 Water Conservation Advisory Committee meetings.
Water and Wastewater Liaison Committee	Coordinate the WWWLC meeting	Local Municipalities	Coordinate committee meetings	Conducted 3 Water and Wastewater Liaison Committee meetings.

Program Components	Tactics	Sector	2016 to 2021 Goals	Achievements
Operational Strategies				
Water Consumption Database (WCD)	Enhance accuracy and quality of billing data	York Region and Local Municipalities	Enhance functionality of Water Consumption Database	Continued to enhance data quality and functionality of the WCD. Implemented a GIS component allowing users to map water consumption, expanding on the current reporting capabilities. Results will be used to enhance water conservation programming.
	Collection of water billing data	Local Municipalities	Collection of 2016 water billing data for the 9 local municipalities	Collected all municipal billing data.
	Determine consumption by sector	All	Generate water consumption reports for ICI and residential sectors	Calculated water demand by sector in 2016; refer to section 3.0.
Tracking summer and winter water demand per capita	Comparing summer versus winter water demand	Residential	Analyze data	Analyzed 2016 water billing data and compared summer and winter consumption.
Identify high water users	Mapping high water users	All	Generate GIS heat maps for high water users	Completed detailed analysis; refer to section 4.8.2.1.
Energy-Water Nexus	Document and evaluate water/energy savings outcomes for specific programs and pilots	All	Document and evaluate 2016 water savings achieved	Completed program review. Tracking water and energy savings per applicable programs and projects.

Program Components	Tactics	Sector	2016 to 2021 Goals	Achievements
Program Evaluation	Improve tracking and reporting processes for programs and pilots	All	Evaluate current tracking frameworks and improve process to ensure correct data is captured and targets are being met	Completed program review for tracking and reporting purposes.
Support Water and Wastewater Master Plan	Alignment of water conservation objectives	Water and wastewater systems	Continue alignment with Master Plan	Water and Wastewater Master Plan updated in June 2016, and incorporated the 2016 Long Term Water Conservation Strategy.

4.1 Programs for the Industrial, Commercial, and Institutional (ICI) Sector

Industrial, commercial, and institutional (ICI) facilities are typically the largest individual consumers of water in York Region. As such, it is crucial for the Region to continue to provide water conservation programs and incentives targeted specifically at this sector.

In order to promote the water and money-saving programs available, a brochure (**Figure 4**) was developed (for the full brochure, see *Appendix C: Water Conservation Programs and Incentives for Businesses Brochure*). On September 14th, 2016, the Region hosted its annual ICI breakfast session at the Earth Rangers Centre for Sustainable Technology to introduce and discuss these programs with local businesses.

More information on programs and incentives for businesses can be found at www.york.ca/waterincentives.

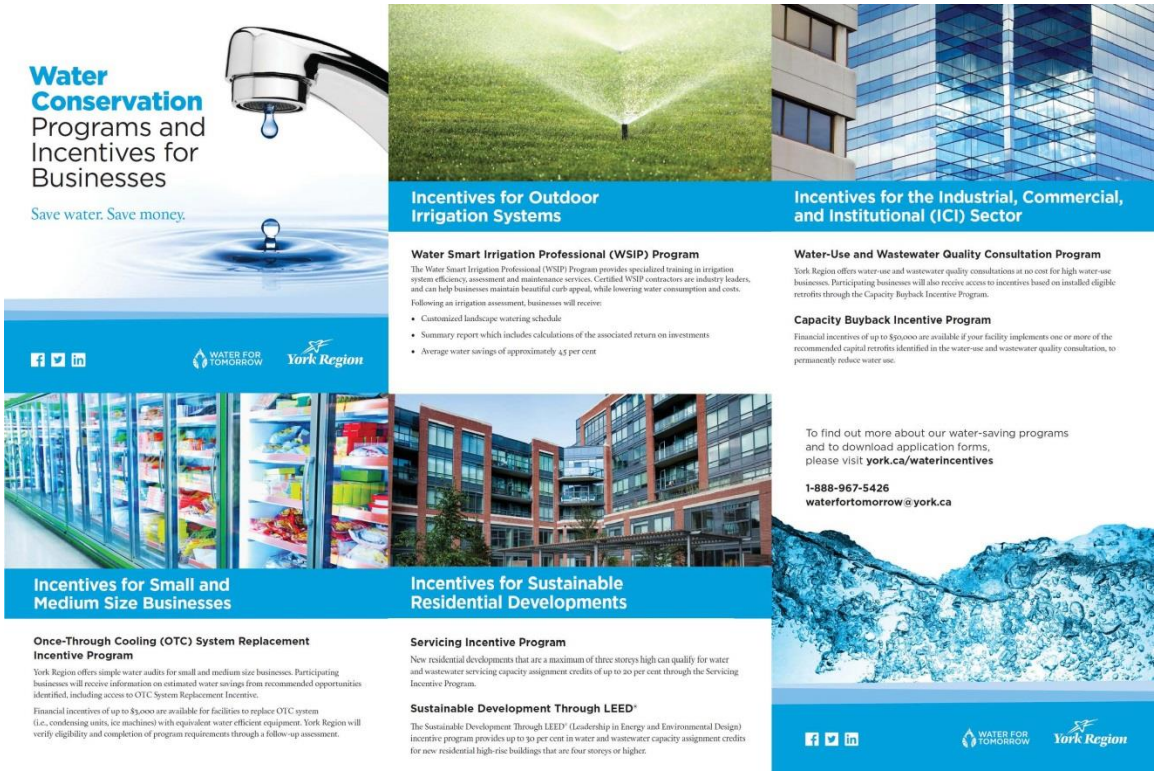


Figure 4: Water Conservation Programs and Incentives Brochure

4.1.1 ICI Water Use and Wastewater Quality Consultations

The LTWCS recommended the continuation of the ICI Water Use Consultation and Capacity Buyback Incentive Programs. These programs offer water audits at no cost to ICI facilities, and incentives if permanent water-saving retrofits or upgrades are implemented.

Capacity buyback programs are significantly more flexible than typical fixture rebate programs because payments are based on water savings versus the type of product that is installed. As such, ICI customers are free to consider all potential water conservation opportunities, including changes to equipment and processes, water reuse activities, indoor and outdoor water uses, etc., to achieve water savings.

The ICI Water Use Consultation program has been limited to 10 audits per year for large manufacturers as it requires in-depth water audits with monitoring, engineering analyses and reports. **Table 6** shows the breakdown of audits completed per municipality and their associated potential water savings.

Table 6: ICI Water Audits

Municipality	Number of Water Audits (2011–2016)	Potential Water Savings Identified (m^3/year)
Aurora	11	31,212
East Gwillimbury	6	1,705
King	10	14,996
Markham	20	53,558
Newmarket	17	43,864
Richmond Hill	24	251,381
Vaughan	86	293,766
Total	**174**	**690,482**

The 2016 Strategy emphasized water reuse as a critical component in achieving the aspirational target of 150 LCD by 2051. To enhance its current incentive program, York Region is considering incorporating water reuse into both the ICI Water Use Consultation and Capacity Buyback programs (as detailed in Section 4.6.2).

4.1.2 ICI Capacity Buyback

ICI participants who implement one or more of the recommended permanent water-saving retrofits are eligible for a Capacity Buyback incentive. The one-time incentive is $0.30 per litre of water saved per average day, or up to 50 per cent of the total capital cost of the retrofit to a maximum of $50,000.

In 2016, York Region partnered with the Toronto and Region Conservation Authority (TRCA) to assist and provide the audited ICI facilities with the resources they need for implementation as part of this program. One capacity buyback application was received from Salga Associates (a division of ABC Group Inc.), a manufacturer of blow-moulded plastic parts for the automotive industry, based in Vaughan.

The company's participation in York Region's Water Use and Wastewater Quality Consultation and Capacity Buyback Incentive programs has already resulted in a 15 per cent reduction in their total water consumption since 2014. By replacing five existing chillers with high-efficiency units, Salga was able to reduce its annual water consumption by more than 1,200 cubic metres, which equates to a savings of $4,300. Salga also received a water saving incentive of $1,049 from York Region, plus additional incentives for reducing electricity and natural gas consumption.

A case study for Salga Associates was developed (see *Appendix D: Salga Associates Case Study*) to highlight the success of the project and promote the business as one which is committed to water efficiency.

A similar case study was developed for Moscone Marble, a previous program participant (see *Appendix E: Moscone Marble Case Study*). The Vaughan-based tile and stone countertop manufacturer reduced its water consumption by more than 59,000 litres per day by collecting, treating, and reusing spent water in various process equipment. Moscone received an incentive of $17,750 from York Region for the water-saving retrofits under the Capacity Buyback Program.

4.1.3 Once-Through Cooling (OTC) Replacement Pilot

In September 2016, the Once-Through Cooling (OTC) System Replacement Incentive Program was launched. This program offers simple water audits to small and medium-sized businesses that use once-through cooled equipment (i.e. hotels, supermarkets, restaurants, offices etc.).

In late 2016, the Region began promoting the program to local industry-specific business associations. In 2017, the Region will continue promotion through social media and in local publications through collaborations with business associations and equipment vendors.

Once-through cooling systems use large volumes of water to remove heat from equipment, and then discharge this water directly to waste. Based on the uptake assumptions of the once-through cooling incentive, it is estimated that a 1 ton once-through cooled condensing unit uses more than 1,000,000 litres of water every year.

Once an audit is complete, a participating business will receive information on the recommended water saving opportunities and be provided with access to the OTC System Replacement Incentive.

Financial incentives of up to $3,000 are available for facilities to replace their once-through cooled equipment (i.e. condensing units, ice machines) with equivalent water efficient equipment. York Region will verify eligibility and completion of program requirements through a follow-up assessment. The program is estimated to achieve savings of 60,000 m^3 or more over the 3-year pilot period.

4.2 Outdoor Peak Demand Reduction Strategy

Extended periods of hot and dry weather generally lead to peak day water demands, which can be 150 per cent or more of the average winter day demand. Water supply facilities are designed to meet peak demands—demands that only occur for a few days each year—and landscape irrigation is a significant component of peak water demand.

In combination with targeted programming focused on high water users, the Region moved toward a market-based approach for the Outdoor Peak Demand Reduction Strategy. A market-based approach uses joint ventures with key community organizations and relevant service providers—landscape contractors, garden retailers, and automatic irrigation system contractors—and strategic incentives to cost effectively influence the water use of end users.

4.2.1 Water Smart Irrigation Professionals (WSIP)

The Water Smart Irrigation Professional (WSIP) program was piloted in 2014 and developed in partnership with Peel Region and Landscape Ontario. The certification program aims to educate irrigation contractors about the importance of water efficiency in irrigation systems and best practices. The goal of the WSIP program is to influence the marketplace by making efficient irrigation practices the new standard. This program educates participants on conducting assessments and adopting methodologies and techniques to reduce water use in irrigation.

In April 2016, Landscape Ontario hosted the annual 2-day training course in partnership with York Region and Peel Region; it was attended by 25 contractors. Training focused on water conservation principles, water efficient technology, soil-plant relationships and building sales skills to meaningfully promote water conserving assessments to clients. Participating contractors were also trained on using an auditing application, which facilitated calculating the clients' return on investment. The feedback received by participants was very positive, with many contractors beginning to realize new business opportunities. Participant feedback has been incorporated to redesign and deliver WSIP for its fourth year in 2017.

For a limited time, York Region and Peel Region are subsidizing the cost of the training for select contractors. Incentives are also available to irrigation contractors who conduct comprehensive irrigation system assessments in York Region or Peel Region using the methodology taught in training, completed over 4 years. **Table 7** summarizes the WSIP assessments completed and their associated potential water savings. The average water savings per facility varied depending on the irrigation area. Since 2015, the average annual water savings per square meter of irrigation area assessed is about 437 litres.

The incentive structure for ICI facilities is as follows:

- **$500.00 subsidy** upon completion of each initial comprehensive irrigation system assessment, and submittal of a detailed report to the Region where the assessment is conducted
- **$300.00 subsidy** in years 2, 3 and 4 of the program to complete follow-up assessments and submittal of a detailed report to the Region where the assessment is conducted
- **$600.00 subsidy** for the installation of a SMART controller OR **$1,000.00 subsidy** for the installation of a central controller

The incentive structure for residential properties is as follows:

- **$200.00 subsidy** upon completion of each initial comprehensive irrigation system assessment, and submittal of a detailed report to the Region where the assessment is conducted
- **$100.00 subsidy** in years 2, 3 and 4 of the program to complete follow-up assessments and submittal of a detailed report to the Region where the assessment is conducted
- **$200.00 subsidy** for the installation of a SMART controller, a central controller or a controller with monthly seasonal adjustment and rain sensor

Table 7: WSIP Assessments

Audit Year	Number of Assessments	Potential Water Savings Identified (m^3)	Weighted Average Water Savings per Facility (m^3/year)	Weighted Average Annual Water Savings per Square Meter of Irrigation Area (L/m^2)
2015	7	5,503.44	786.21	265
2016	20	22,325.81	1,116.29	498
Total	**27**	27,829.25	1,030.71	437

4.2.2 Fusion Gardening® Pilot Project

Fusion Gardening® combines beautiful landscapes, water efficiency and site specific stormwater management that match a resident's vision of their ideal landscape. It decreases the dependency on potable water for irrigation, while making better use of existing rainwater and stormwater onsite. There are two main areas of focus for Fusion: residential outreach, and market transformation through work with retailers and the service sector.

A marketing program was developed to introduce residents in the pilot area to the Fusion program. A variety of materials such as direct mail pieces, advertisements in magazines and targeted online ads were created (see *Appendix F: Fusion Gardening® Sample Marketing Material*).

In 2016, Region staff attended 2 community events and held an "Ask the Expert" night for residents in the spring. Partnerships with four local garden retailers were established. Training on the Fusion Gardening® program was completed at all retail partner locations and promotional materials have been developed for each partner.

The Fusion Landscape Professional Certification Program aims to achieve market transformation by making Fusion landscapes an industry standard. This training and certification program is currently being developed in partnership with Landscape Ontario and Peel Region. It aims to facilitate communication and collaboration between professionals involved in the design, installation, maintenance and irrigation of Fusion landscapes. Communication and cross-collaboration between these sectors is vital to the long-term success and function of Fusion landscapes. The first training session will take place in the fall of 2017.

In 2016, a monitoring and tracking process was refined to evaluate the Fusion Gardening® pilot. Two control areas have been selected within Vaughan. These two areas will not receive any promotional/educational material related to Fusion Gardening®, and will strictly be used to compare the annual water consumption following the implementation of the pilot project. A map showing the pilot area and the two control areas can be found in **Figure 5**. The Region currently monitors trends in outdoor water consumption (as retrieved from municipal billing data) and has a photographic record of front yards in all monitored areas. These photos will

help determine if and when homes convert to a Fusion landscape, and assess the health of Fusion plant material versus the health of non-Fusion plant material.

Impacts on stormwater are also being monitored in partnership with the TRCA. The demonstration garden at Starbucks was monitored to quantify the water conservation and stormwater runoff reduction benefits, and document operation and maintenance needs. The monitoring program was initiated in early May 2016 and concluded in November.

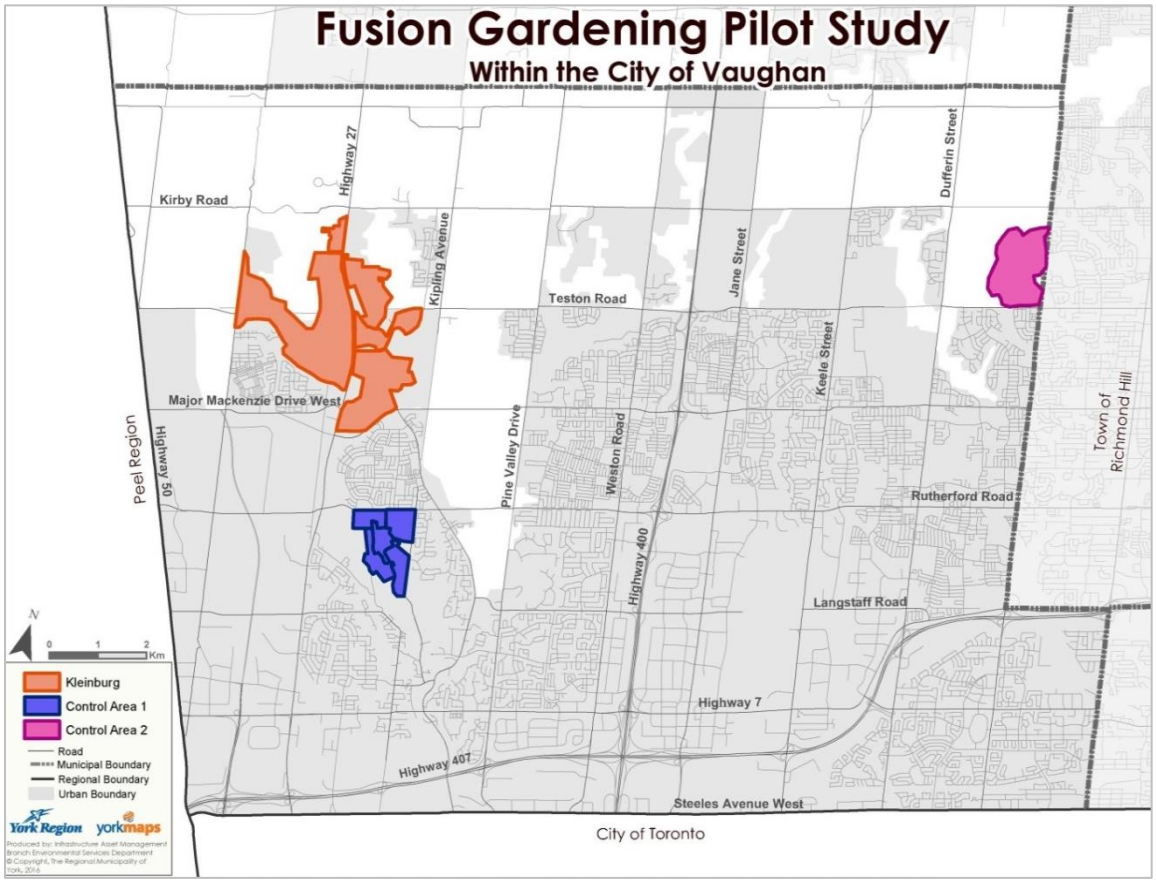


Figure 5: Fusion Gardening® Pilot Study Areas

4.2.2.1 Water Efficient Demonstration Gardens

A Fusion demonstration garden has been installed at one of the Fusion Gardening® retail partner locations. The garden features rain chains and is water-efficient.

A second demonstration garden, which showcases different low impact development features including permeable pavers and a bioswale, was installed this year at the East Gwillimbury Civic Centre. The garden was completed in partnership with the Town of East Gwillimbury, Lake Simcoe Region Conservation Authority, Environment Canada and York Region.

4.3 Education and Outreach

York Region continued to offer its successful education and outreach programs, including water efficient landscaping workshops and the York Children's Water Festival (see *Appendix G: York Region Children's Water Festival Invitation Poster*). Staff also developed and piloted an in-class Grade 5 water education program, which was launched in schools in 2014. The Region continued to conduct water conservation-related outreach, with over 721,000 touch points created in 2016 through newspaper advertorials, events, and social media platforms (**Figure 6**).

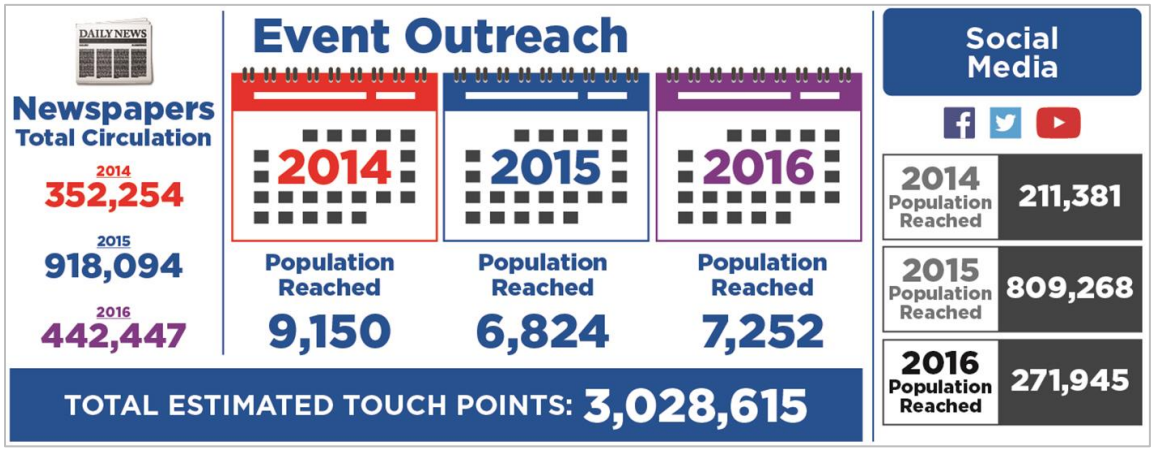
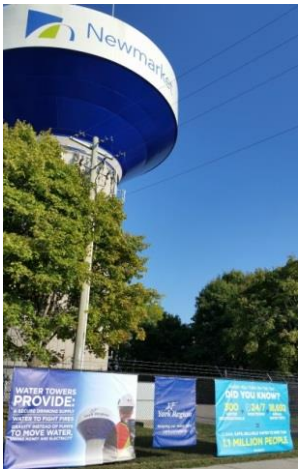


Figure 6: York Region Water Conservation Outreach Summary, 2014–2016

4.3.1 The "Water Is" Campaign

The "Water Is" public campaign continued throughout 2016 as York Region's water rates increased by nine per cent to its nine cities and towns. This campaign is a multi-year approach to increase public awareness and education on the many values of water. The goal is to help connect residents with the physical, spiritual and natural value of water and increase awareness of what goes into providing clean, safe, reliable and affordable drinking water.

This enhanced connection with water will:



- **Help** residents understand the role of public works (water and wastewater) and the value provided through water rates
- **Inspire** people to get involved with efforts to protect and improve the quality of groundwater, lakes and streams for now and for future generations
- **Empower** people to become leaders in their communities and advocates of water conservation, preservation and stewardship efforts
- **Encourage** people to improve water conservation efforts

4.3.2 Water Efficiency Outreach to New Canadians

In 2016, 1,358 new Canadians took part in 51 half-day environmental education programs at English as a Second Language (ESL) centres in York Region. These partnerships were delivered through the TRCA Multicultural Connections program in partnership with York Region. In addition, the Region worked with TRCA to build capacity to deliver similar programs in northern York Region. The Region is also working with LSRCA to add York Region information to their educational presentations and material.

In 2016, York Region staff attended 56 public outreach events and provided approximately 8,226 residents with a water conservation message. Many of these events targeted diverse audiences and allowed for participant input and ideas on water conservation through electronic surveys. This information will be used to better target our future campaigns towards new initiatives, rather than promoting practices already demonstrated by residents. Further opportunities to engage a multi-cultural audience are being explored.

4.4 Non-Revenue Water

York Region continues to offer distribution system leak detection support to their local municipalities using the International Water Association and American Water Works Association (IWA/AWWA) best practice methods.

The IWA Water Audit establishes the current levels of non-revenue water (NRW) and Infrastructure Leakage Index (ILI). Water audits conducted in each local municipality assess the level of non-revenue water and water loss (leakage) in each system. Once the audits are received they are reviewed by the Region and feedback is provided where necessary. The results are tracked and a trend analysis is completed to see how the values compare annually.

4.4.1 IWA Water Audit/Balance

Non-revenue water is defined as those components (apparent losses, real losses and unbilled authorized consumption) of the system input volume that are not billed and produce no revenue. It can be used for operations and maintenance of the water system as well as for emergency services, such as fire flow.

In 2015, municipally-led IWA water audits were performed; the audits were analyzed and non-revenue water numbers were provided to the Region in 2016. The 2015 non-revenue water per cent by volume of water supplied for each municipality is shown in **Table 8**.

Table 8: 2015 Non-Revenue Water Percentage by Volume of Water Supplied

Municipality	2015 Non-Revenue Water (%)
Aurora	15.0
East Gwillimbury	17.6
Georgina	16.2
King	26.6
Markham	11.2
Newmarket	15.7
Richmond Hill	12.8
Vaughan	18.7
Whitchurch-Stouffville	12.3
Weighted Average	**15.0**

The average non-revenue water for York Region as a whole is 15.0 per cent. This is lower than the estimated average non-revenue water for North America, which ranges from 20 to 25 per cent.[4]

4.4.2 Leak Detection Program

Infrastructure Leakage Index (ILI) is a performance indicator quantifying how well a distribution system is managed for the control of real losses (leakage) at the current operating pressure. Annual ILI values are tracked and a trend analysis is completed for each municipality. An ILI value of 1.0 is considered a "best managed" system. York Region is currently working with municipalities whose ILI values are greater than 3 to perform leak detection feasibility studies.

Table 9 on the following page shows the infrastructure leakage index measured by each municipality in 2015.

The Region also initiated an IWA Audit Peer Review Project. The purpose of this project was to provide municipalities with guidance and technical support to complete their 2015 audits. This project also included 2 half-day IWA Audit Refresher Workshops.

[4] Ress, Erin and Roberson, J. Alan. "The Financial and Policy Implications of Water Loss," *American Water Works Association* 108, no. 2 (2016): E77-E86.

Table 9: 2015 Infrastructure Leakage Index by Municipality

Municipality	Infrastructure Leakage Index
Aurora	1.56
East Gwillimbury	0.66
Georgina	1.40
King	3.04
Markham	1.75
Newmarket	1.88
Richmond Hill	1.90
Vaughan	3.48
Whitchurch-Stouffville	1.30

Another component of this project was to develop a water loss tracking tool. The purpose of this tool is for municipalities and the Region to report and track water loss activities (i.e. watermain flushing and breaks, tower draining) on a regular basis. It allows the user to enter details about the event, including activity description, start and end times, measurement method, water usage, etc. In addition to this tool, a summary report will be developed; this report will provide a high level analysis of the data and give an overview of water loss volumes.

4.5 Residential New Development

In 2016, staff continued to work with existing and new residential new development program applicants. Presentations were made to representatives of the local municipalities, the land development industry and the Water Conservation Advisory Committee. The Region organized a sustainable development education session on January 15th, 2016 at the York Region Administrative Centre for area municipal and Regional staff to raise awareness on climate change and risk mitigation. The session was attended by Regional and municipal staff, as well as representatives from the Lake Simcoe Region Conservation Authority (LSRCA), Toronto and Region Conservation Authority (TRCA), and the University of Waterloo.

4.5.1 Sustainable Development through LEED® (high-rise development)

In 2016, 753 units were constructed to Sustainable Development through LEED® program standards. This program offers up to 30 per cent additional servicing allocation credits to new residential buildings four storeys or higher in Regional and Local Centres and Corridors. To qualify for the credits, the developments must meet the program's sustainability requirements. Participating projects must obtain the third-party LEED® Canada for New Construction's Silver certification and achieve Council-approved criteria related to water conservation, wastewater flow reduction, transit-oriented design, and stormwater and waste management practices.

4.5.2 Servicing Incentive Program (SIP) (low-rise development)

In 2016, 1,160 homes were enrolled in the SIP program. SIP is designed for new residential developments up to three storeys in the Region. The program offers up to 20 per cent additional servicing allocation credits for projects meeting Council-approved water conservation and wastewater flow reduction requirements. All program-required elements must be verified by third-party professional engineers during construction and upon project completion.

4.6 Water Reuse Strategy

Water reclamation and reuse is defined as the treatment of municipal wastewater to make it acceptable for reuse for beneficial purposes (e.g. agricultural irrigation, landscape irrigation, and industrial uses). Through York Region's 2016 Water and Wastewater Master Plan and the Long Term Water Conservation Strategy Update, water reuse has been identified as an essential component in meeting the Region's ambitious 2051 target of reducing per capita water consumption to 150 litres per day. Furthermore, it is a critical measure in safeguarding valuable water supplies in the Lake Simcoe watershed.

Water reuse is an important strategic program that requires supporting activities to establish a water reuse framework. Sections 4.6.1 and 4.6.2 outline water reuse initiatives that are currently underway in the Region.

4.6.1 Upper York Water Reclamation Centre

To accommodate for planned growth in East Gwillimbury, Newmarket and Aurora, York Region is planning to construct the Upper York Water Reclamation Centre—a state-of-the-art wastewater treatment and water recovery facility in East Gwillimbury. It is envisioned to be a centre of excellence for sustainable and innovative wastewater treatment and reclaimed water use, based on proven advanced treatment technologies.

To start laying the groundwork for future water reuse opportunities including the Upper York Water Reclamation Centre, York Region is collaborating with academic researchers and other interested stakeholders, including the Ministry of the Environment and Climate Change, and the Lake Simcoe Region Conservation Authority, to undertake a water reuse research demonstration project using reclaimed water from one of York Region's existing wastewater treatment facilities. Research from this project will help the Region to better understand the technical, environmental, economic and societal aspects of water reuse that will be used to inform the future development of a broader water reuse program for York Region.

The demonstration project will focus on the use of reclaimed water for non-food crop agricultural irrigation (e.g. sod, trees) and will evaluate the effects of reclaimed water on plant health (e.g. salinity and nitrogen), soil properties, and water quality. Additional study parameters will be scoped in consultation with research experts. Irrigation would occur in the

growing season from approximately May–October. Groundwater and surface water near the demonstration site would be monitored. Energy reductions and greenhouse gas emission reductions would also be tracked and assessed as part of the study.

4.6.2 Water Reuse in the ICI Sector

York Region is investigating the potential of adding a water reuse incentive to the ICI Water Use and Wastewater Consultation and Capacity Buyback Incentive programs. Implementing a water reuse initiative would be highly beneficial for ICI sector businesses that produce large volumes of wastewater annually.

A suitable incentive structure for water reuse will be developed, with consideration of available and emerging water reuse technologies and the types of ICI facilities most likely to participate. Previous and current water reuse incentives offered by similar programs in other jurisdictions will be used as benchmarks during the development process. Furthermore, the potential monetary and water savings and payback period associated with a typical water reuse-related retrofit will be determined.

Upon completion of the investigation, a number of ICI sector businesses that have previously expressed their willingness to participate in this pilot initiative will have water reuse implemented at their facilities.

4.7 Advocacy

Advisory committees—comprised of Regional and municipal staff, and community stakeholders representing a multitude of sectors and disciplines—continue to provide valuable input and guidance on the Region's Long Term Water Conservation objectives.

4.7.1 Water Conservation Advisory Committee

The Region hosts the Water Conservation Advisory Committee, an advisory body that consists of a variety of stakeholders including York Region residents, the MOECC, municipalities, school boards, Toronto and Region Conservation Authority (TRCA) and Lake Simcoe Region Conservation Authority (LSRCA). The committee is used as a forum to discuss, provide support and receive feedback on water conservation programs and initiatives. In 2016 the committee met three times to provide feedback and guidance on the strategic direction of the Long Term Water Conservation Strategy.

4.7.2 Water and Wastewater Liaison Committee

To increase collaboration between the Region and the local municipalities, the Region hosts the Water and Wastewater Liaison Committee. The committee was created to help coordinate water and wastewater business, improve communications between Regional and local municipal water and wastewater staff, increase infrastructure efficiencies, and foster continuous improvement of processes across the local municipalities and York Region. It provides an opportunity for York Region and municipal staff to discuss capital projects, operation projects/programs, water resources, compliance, regulations/policy, stormwater management, collaboration opportunities, and lessons learned.

4.8 Operational Strategies

As the Region's and local municipalities' capacity to collect and analyze data expands, so does the ability to examine the water system, manage assets, meet changing demands, plan for growth and optimize and harmonize water management across the Region and local municipalities.

As part of the Region's commitment to continuous improvement, greater integration of data capture and analytics across key divisions and local municipalities to maximize water system conservation is a key objective over the next few years. Continued work with the local municipalities to enhance and harmonize data collection for improved integrated decision making in areas of importance—reducing water lost to leakage, preventing excessive flushing, reducing Inflow and Infiltration, monitoring demand trends, measuring and assessing program performance, planning for growth, optimizing operations protocols, etc.—will remain a priority for the Region in the near and longer term.

The increased availability of data is helping staff to better design water conservation programming and to provide more information for planning and forecasting models. The Water Consumption Database and the All-Pipes model represent good examples of collaboration.

4.8.1 Water Consumption Database (WCD) Application

Aligning with the concept of 'big data', in 2016 York Region embarked on a project to improve analysis, data quality, reporting functionality, and geographic information system (GIS) mapping capabilities within their Water Consumption Database (WCD).

The WCD is a database-driven, web-based application developed in Oracle Application Express (APEX) 5. This database serves as a common platform for all local municipalities in York Region to upload and retrieve their water billing data and prepare relevant reports.

Some key functionalities of the application include the ability to:

- Upload and download water billing data
- Generate and review custom consumption reports
- Review selectable time period reports (summer and winter)
- Search water consumption by address or by a group of addresses
- Search top water consumers
- Determine the average consumption per capita per day

This application will support the development of targeted water conservation programs, as it will identify high water users and trends in water use.

4.8.2 GIS Water Consumption Platform

Analytical results generated by the WCD APEX application are displayed visually on the geographic information systems (GIS) mapping platform. Latitude Geographic's Geocortex (Geocortex) application will be used to develop the integrated mapping capacities.

Both Geocortex and APEX sit on an Oracle server, allowing seamless integration between the two platforms and ensuring data accuracy and consistency. Mapping consumption spatially not only allows users to better understand the data and identify spatial patterns, but also displays it in a more understandable and visually pleasing manner.

The GIS platform will allow users to:

- View the tabular consumption results calculated by the WCD spatially
- Zoom into parcels, intersections, addresses, etc., and review attribute data on the fly without having to generate a report
- Create reports showing consumption based on a desired geography (i.e. parcel, traffic zone, lot, concession)
- Create reports showing consumption based on a user-defined area
- Select consumption per period (i.e. annual, summer, winter, or custom)
- View and analyze spatial patterns based on water use

4.8.2.1 Mapping High Water Users in York Region

In 2017, the Region created heat maps using GIS to identify where high water users are located and target their water conservation programs accordingly. These heat maps will be generated and compared on an annual basis to study and evaluate trends.

Some examples of GIS heat maps that can be generated are:

- **Figure 7:** 2016 Annual Water Consumption in York Region
- **Figure 8:** 2016 Annual ICI Water Consumption in York Region
- **Figure 9:** 2016 Annual Residential Water Consumption in York Region
- **Figure 10:** 2016 Annual Residential Outdoor Water Consumption in York Region
- **Figure 11:** 2016 Audited ICI Facilities in York Region

As the heat maps in **Figure 7, Figure 8,** and **Figure 9** show, the majority of high water users (ICI and residential) are concentrated near the border between York Region and the City of Toronto—specifically in the municipalities of Vaughan, Richmond Hill, and Markham. Together, the three municipalities are home to the majority of York Region's total population.

The prominent red and dark orange areas in **Figure 8** correspond with the high number of businesses, shopping centres and big box stores concentrated in southern Vaughan and southern Markham. Most of the ICI high water users that participated in York Region's Water-Use and Wastewater Quality Consultation program are from these areas.

The red and dark orange areas in **Figure 9** correspond with areas of high residential population density. These residential high water users also consume large volumes of water for outdoor water use, as seen in **Figure 10**. As a result, York Region's water conservation programs and pilot projects (such as the Fusion Gardening® pilot in Kleinburg) are targeted to these groups of residents.

Figure 11 shows facilities audited by York Region; the majority of audits were completed for ICI facilities in southern Vaughan.

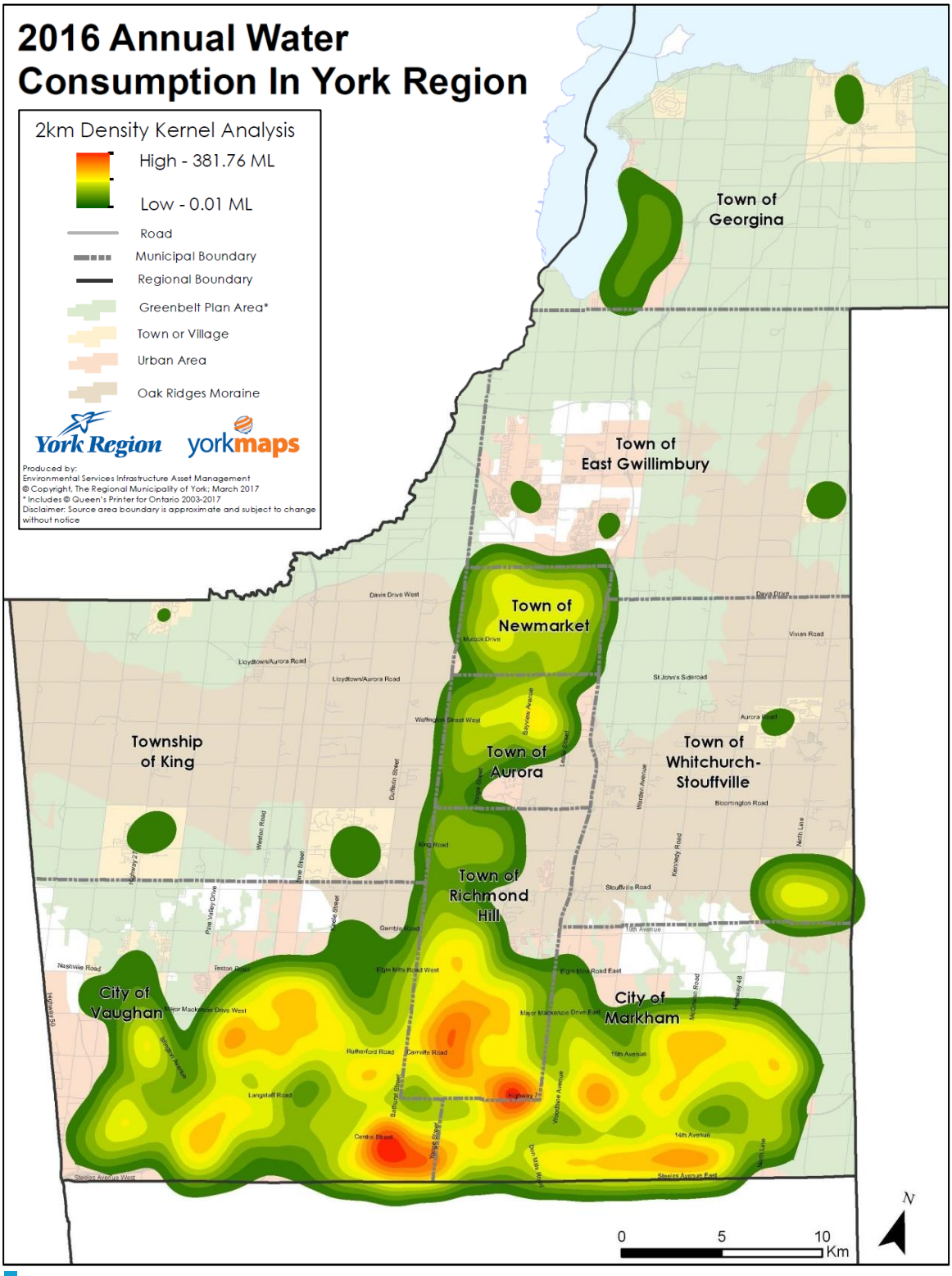


Figure 7: 2016 Annual Water Consumption in York Region

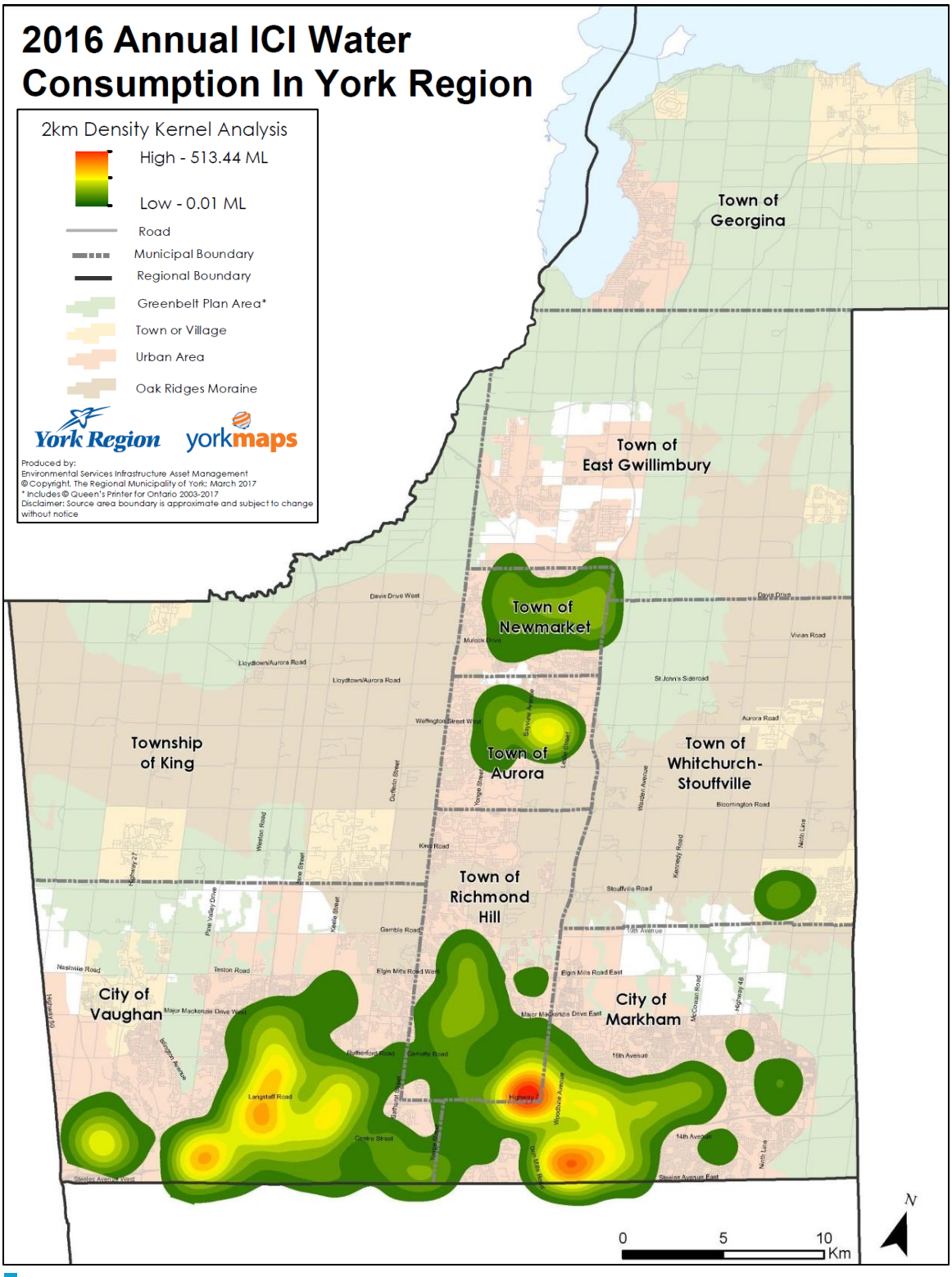


Figure 8: 2016 Annual ICI Water Consumption in York Region

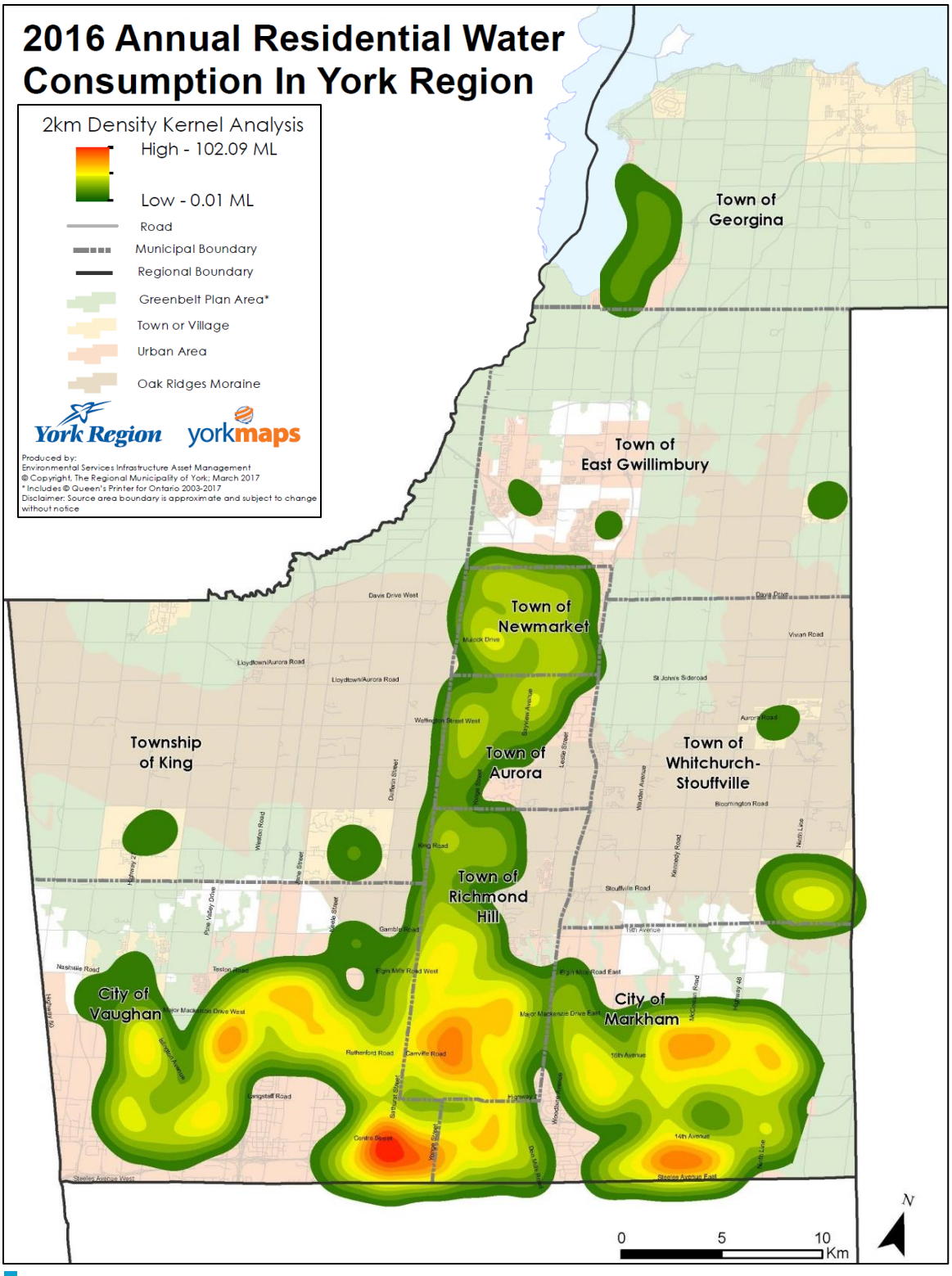


Figure 9: 2016 Annual Residential Water Consumption in York Region

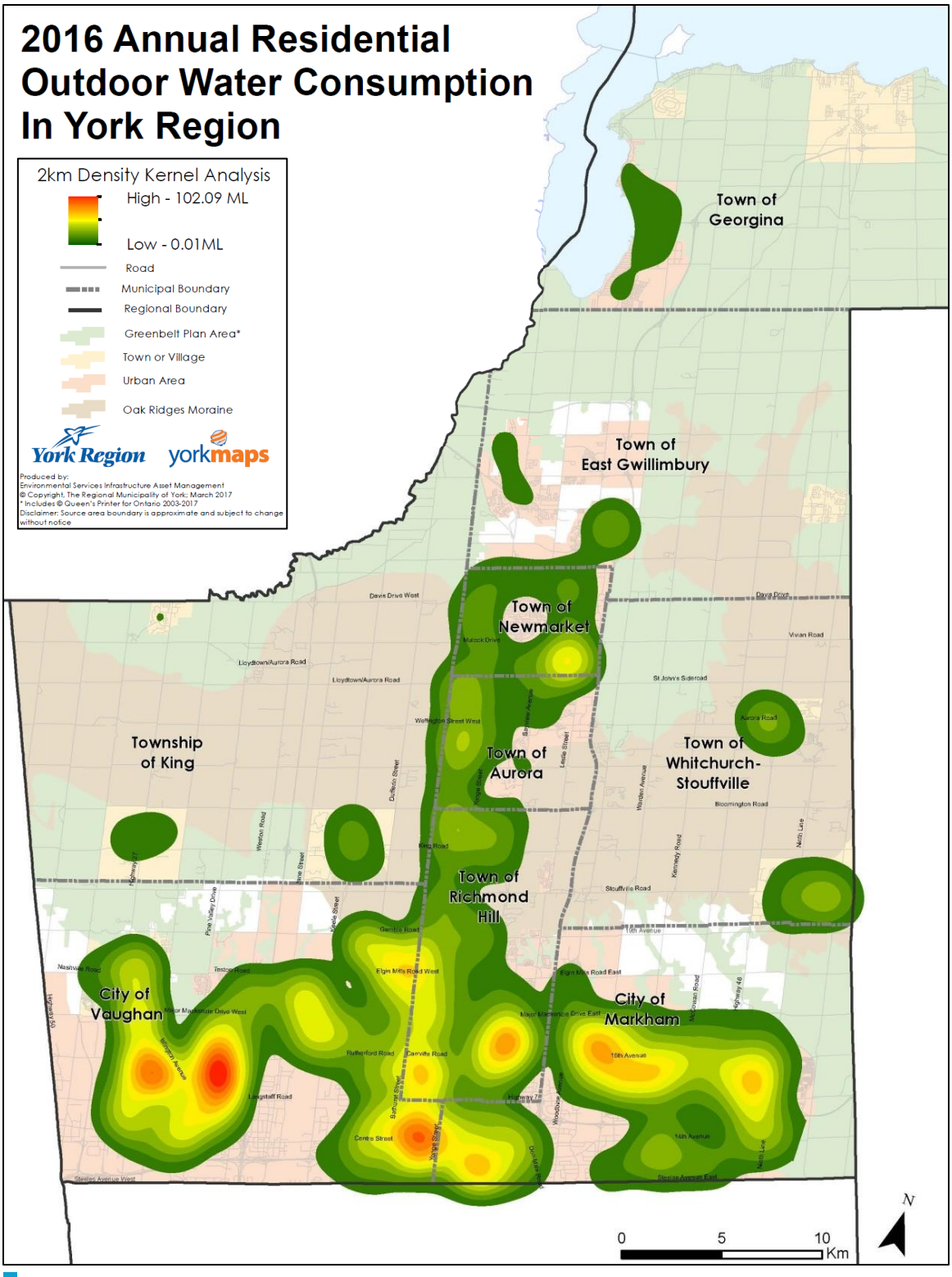


Figure 10: 2016 Annual Residential Outdoor Water Consumption in York Region

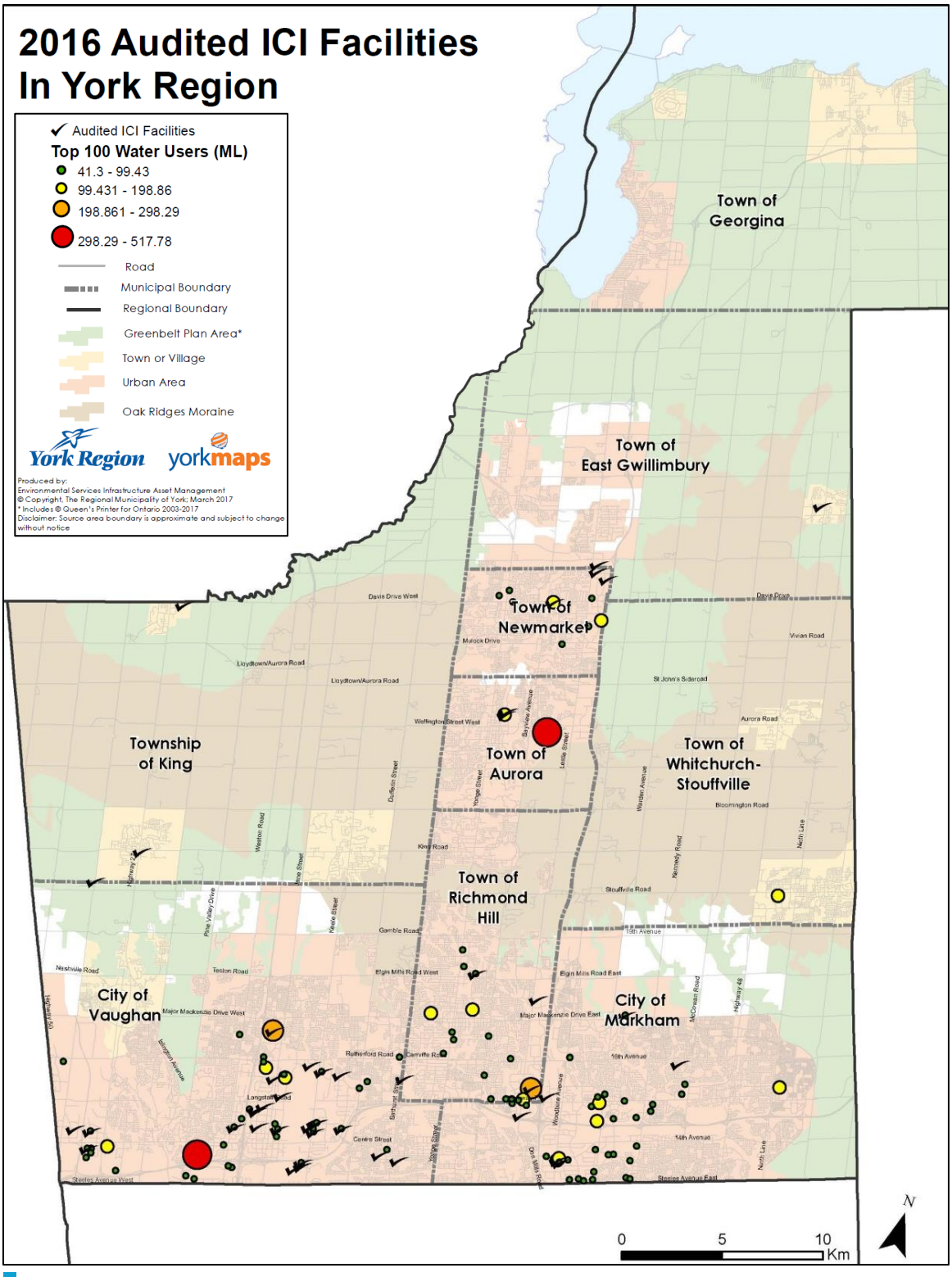


Figure 11: 2016 Audited ICI Facilities in York Region

5.0 Conclusion

York Region continues to demonstrate strong leadership in promoting water conservation. Since 2010 the Region has achieved overall savings of 26.4 million litres per day; this is enough water for more than 132,000 people. Despite increases in the Region's population, water demand has remained relatively flat—demonstrating the Region's commitment to water conservation.

The Region continued to provide water audits and incentives for businesses that carried out water-saving retrofits and upgrades. As part of the outdoor peak demand reduction strategy, the Region educated irrigation contractors on water efficient practices and technology.

With regards to outreach, the Region continued to increase public awareness about the importance of water conservation through campaigns and educational programs. Furthermore, the Region collaborates with local municipalities to identify and minimize leakage in the system. For sustainable residential building developments, the Region offered servicing allocation assignment credits.

The Region continues to pursue water reuse as an important strategy in achieving the Region's aspirational 2051 target of 150 litres per person per day. To accommodate for planned growth, the Region is planning to construct the Upper York Water Reclamation Centre, a state-of-the-art wastewater treatment and water recovery facility. The Region is also investigating the potential of including a water reuse incentive in existing water conservation programs for businesses and piloting water reuse applications. Currently, there are no regulatory frameworks to support robust water reuse applications in Ontario.

To improve data sharing and collection between municipalities, the Region implemented various operational initiatives. In alignment with the concept of 'big data', the Region created the Water Consumption Database (WCD) application. This database application makes it easier to manage and analyze water consumption data and generate a variety of reports; as a result, the Region is able to better target its water conservation efforts.

Moving forward the Region will continue to investigate and implement best-in-class technology and practices, showing that they are committed to improving water management and reducing consumption.

Appendix A: Intra-Basin Transfer Summary 2016

The Regional Municipality of York is submitting the information below in accordance with Schedule B to the following Permits to Take Water that relate to York Region's intra-basin transfer agreement between the Permit Holders and York Region, the Related Transferor, and that supply water to be transferred to York Region (see *Appendix B: Permits to Take Water (PTTWs)* for the full permits):

- PTTW No. 1866-A6QHRP, issued to the City of Toronto on March 23, 2016
- PTTW No. 0726-A6QJTA, issued to the City of Toronto on March 23, 2016
- PTTW No. 6604-A6QKEB, issued to the City of Toronto on March 23, 2016
- PTTW No. 0016-A6QKN2, issued to the City of Toronto on March 23, 2016
- PTTW No. 1064-A6KQKQ, issued to The Regional Municipality of Peel on March 23, 2016

As stipulated in Schedule B of the aforementioned permits, Condition (e) requires York Region to report, no later than March 31st of every year, on monthly volumes and a calculated daily average amount of its intra-basin transfer in the preceding calendar year. **Table 10** lists total monthly volumes transferred from the Lake Ontario watershed into the Lake Huron watershed with return flow to Lake Ontario.

Table 10: Intra-Basin Transfer Volumes

Month (2016)	Total Intra-Basin Transfer Volume (m^3)
January	505,404
February	538,298
March	604,906
April	689,834
May	946,560
June	1,122,380
July	1,122,912
August	1,141,230
September	1,012,245
October	887,185
November	796,810
December	838,239
Total	**10,206,003**

In 2016, York Region's average daily intra-basin transfer amount was 27.885 ML. It is projected that York Region's population will increase by 35 per cent in 2031; and the intra-basin transfer volume is projected to be well within the 105 MLD transfer limit, based on system demand identified in the York Region Water and Wastewater Master Plan Update completed in June 2016.

Appendix B: Permits to Take Water (PTTWs)

PTTW No. 1866-A6QHRP, page 1 of 8

Ontario

Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement climatique

AMENDED PERMIT TO TAKE WATER
Surface Water
NUMBER 1866-A6QHRP

Pursuant to Section 34.1 of the Ontario Water Resources Act, R.S.O. 1990 this Permit To Take Water is hereby issued to:

City of Toronto
55 John Street, 18th Floor
Toronto, Ontario, M5V 3C6
Canada

For the water taking from: Lake Ontario: Toronto Island Treatment Plant

Located at: 446 Lakeshore Ave
Toronto

For the purposes of this Permit, and the terms and conditions specified below, the following definitions apply:

DEFINITIONS

(a) "Director" means any person appointed in writing as a Director pursuant to section 5 of the OWRA for the purposes of section 34.1, OWRA.

(b) "Provincial Officer" means any person designated in writing by the Minister as a Provincial Officer pursuant to section 5 of the OWRA.

(c) "Ministry" means Ontario Ministry of the Environment and Climate Change.

(d) "District Office" means the Toronto District Office.

(e) "Permit" means this Permit to Take Water No. 1866-A6QHRP including its Schedules, if any, issued in accordance with Section 34.1 of the OWRA.

(f) "Permit Holder" means City of Toronto.

(g) "OWRA " means the *Ontario Water Resources Act,* R.S.O. 1990, c. O. 40, as amended.

Page 1 - NUMBER 1866-A6QHRP

Appendix B. PTTW No. 1866-A6QHRP, page 2 of 8

You are hereby notified that this Permit is issued subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. Compliance with Permit

1.1 Except where modified by this Permit, the water taking shall be in accordance with the application for this Permit To Take Water, dated October 23, 1995 and signed by H.A Taniguichi, and all Schedules included in this Permit.

1.2 The Permit Holder shall ensure that any person authorized by the Permit Holder to take water under this Permit is provided with a copy of this Permit and shall take all reasonable measures to ensure that any such person complies with the conditions of this Permit.

1.3 Any person authorized by the Permit Holder to take water under this Permit shall comply with the conditions of this Permit.

1.4 This Permit is not transferable to another person.

1.5 This Permit provides the Permit Holder with permission to take water in accordance with the conditions of this Permit, up to the date of the expiry of this Permit. This Permit does not constitute a legal right, vested or otherwise, to a water allocation, and the issuance of this Permit does not guarantee that, upon its expiry, it will be renewed.

1.6 The Permit Holder shall keep this Permit available at all times at or near the site of the taking, and shall produce this Permit immediately for inspection by a Provincial Officer upon his or her request.

1.7 The Permit Holder shall report any changes of address to the Director within thirty days of any such change. The Permit Holder shall report any change of ownership of the property for which this Permit is issued within thirty days of any such change. A change in ownership in the property shall cause this Permit to be cancelled.

2. General Conditions and Interpretation

2.1 Inspections
The Permit Holder must forthwith, upon presentation of credentials, permit a Provincial Officer to carry out any and all inspections authorized by the OWRA, the *Environmental Protection Act* , R.S.O. 1990, the *Pesticides Act* , R.S.O. 1990, or the *Safe Drinking Water Act*, S. O. 2002.

2.2 Other Approvals
The issuance of, and compliance with this Permit, does not:

(a) relieve the Permit Holder or any other person from any obligation to comply with any other applicable legal requirements, including the provisions of the *Ontario Water Resources Act* , and the *Environmental Protection Act* , and any regulations made thereunder; or

(b) limit in any way any authority of the Ministry, a Director, or a Provincial Officer, including the authority to require certain steps be taken or to require the Permit Holder to furnish any further information related to this Permit.

2.3 Information
The receipt of any information by the Ministry, the failure of the Ministry to take any action or require any person to take any action in relation to the information, or the failure of a Provincial Officer to prosecute any person in relation to the information, shall not be construed as:

(a) an approval, waiver or justification by the Ministry of any act or omission of any person that contravenes this Permit or other legal requirement; or

(b) acceptance by the Ministry of the information's completeness or accuracy.

2.4 Rights of Action
The issuance of, and compliance with this Permit shall not be construed as precluding or limiting any legal claims or rights of action that any person, including the Crown in right of Ontario or any agency thereof, has or may have against the Permit Holder, its officers, employees, agents, and contractors.

2.5 Severability
The requirements of this Permit are severable. If any requirements of this Permit, or the application of any requirements of this Permit to any circumstance, is held invalid or unenforceable, the application of such requirements to other circumstances and the remainder of this Permit shall not be affected thereby.

2.6 Conflicts
Where there is a conflict between a provision of any submitted document referred to in this Permit, including its Schedules, and the conditions of this Permit, the conditions in this Permit shall take precedence.

3. Water Takings Authorized by This Permit

3.1 **Expiry**
This Permit expires on **December 31, 2025**. No water shall be taken under authority of this Permit after the expiry date.

3.2 Amounts of Taking Permitted
The Permit Holder shall only take water from the source, during the periods and at the rates and amounts of taking specified in Table A. Water takings are authorized only for the purposes specified in Table A.

Appendix B. PTTW No. 1866-A6QHRP, page 4 of 8

Table A

	Source Name / Description:	Source: Type:	Taking Specific Purpose:	Taking Major Category:	Max. Taken per Minute (litres):	Max. Num. of Hrs Taken per Day:	Max. Taken per Day (litres):	Max. Num. of Days Taken per Year:	Zone/ Easting/ Northing:
1	Lake Ontario: Toronto Island Treatment Plant	Lake	Municipal	Water Supply	382,000	24	550,000,000	365	17 630423 4830396
						Total Taking:			

4. Monitoring

4.1 The Permit Holder shall, on each day water is taken under the authorization of this Permit, record the date, the volume of water taken on that date and the rate at which it was taken. The daily volume of water taken shall be measured by a flow meter. The Permit Holder shall keep all records required by this condition current and available at or near the site of the taking and shall produce the records immediately for inspection by a Provincial Officer upon his or her request. The Permit Holder, unless otherwise required by the Director, shall submit, on or before March 31st in every year, the daily water taking data collected and recorded for the previous year to the ministry's Water Taking Reporting System.

4.2 Any application submitted to the Ministry for renewal or amendment of this Permit shall be accompanied by all records required by the conditions of this Permit.

5. Impacts of the Water Taking

5.1 Notification

The Permit Holder shall immediately notify the local District Office of any complaint arising from the taking of water authorized under this Permit and shall report any action which has been taken or is proposed with regard to such complaint. The Permit Holder shall immediately notify the local District Office if the taking of water is observed to have any significant impact on the surrounding waters. After hours, calls shall be directed to the Ministry's Spills Action Centre at 1-800-268-6060.

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5.2 For Surface-Water Takings
The taking of water (including the taking of water into storage and the subsequent or simultaneous withdrawal from storage) shall be carried out in such a manner that streamflow is not stopped and is not reduced to a rate that will cause interference with downstream uses of water or with the natural functions of the stream.

6. **Director May Amend Permit**
The Director may amend this Permit by letter requiring the Permit Holder to suspend or reduce the taking to an amount or threshold specified by the Director in the letter. The suspension or reduction in taking shall be effective immediately and may be revoked at any time upon notification by the Director. This condition does not affect your right to appeal the suspension or reduction in taking to the Environmental Review Tribunal under the *Ontario Water Resources Act* , Section 100 (4).

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is included to ensure that the conditions in this Permit are complied with and can be enforced.

2. Condition 2 is included to clarify the legal interpretation of aspects of this Permit.

3. Conditions 3 through 6 are included to protect the quality of the natural environment so as to safeguard the ecosystem and human health and foster efficient use and conservation of waters. These conditions allow for the beneficial use of waters while ensuring the fair sharing, conservation and sustainable use of the waters of Ontario. The conditions also specify the water takings that are authorized by this Permit and the scope of this Permit.

Page 5 - NUMBER 1866-A6QHRP

In accordance with Section 100 of the Ontario Water Resources Act, R.S.O. 1990, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 101 of the Ontario Water Resources Act, R.S.O. 1990, as amended, provides that the Notice requiring the hearing shall state:

1. The portions of the Permit or each term or condition in the Permit in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

In addition to these legal requirements, the Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Permit to Take Water number;
6. The date of the Permit to Take Water;
7. The name of the Director;
8. The municipality within which the works are located;

This notice must be served upon:

The Secretary
Environmental Review Tribunal
655 Bay Street, 15th Floor
Toronto ON
M5G 1E5
Fax: (416) 326-5370
Email: ERTTribunalsecretary@ontario.ca

AND

The Director, Section 34.1, Ministry of the Environment and Climate Change
8th Floor
5775 Yonge St
Toronto ON M2M 4J1
Fax: (416) 325-6347

Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal:

by Telephone at	by Fax at	by e-mail at
(416) 212-6349	(416) 326-5370	www.ert.gov.on.ca
Toll Free 1(866) 448-2248	Toll Free 1(844) 213-3474	

This Permit cancels and replaces Permit Number 91-P-3041, issued on 1996/02/12.

Dated at Toronto this 23 rd day of March, 2016.

Ross Lashbrook
Director, Section 34.1
Ontario Water Resources Act , R.S.O. 1990

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Appendix B. PTTW No. 1866-A6QHRP, page 7 of 8

Schedule A

This Schedule "A" forms part of Permit To Take Water 1866-A6QHRP, dated March 23, 2016.

1. Letter to Steve Klose, Director Section 34, Ministry of Environment and Energy (MOEE) from H.A. Taniguichi, Director of Water Supply, Municipality of Metropolitan Toronto, requesting an amendment to the Permit to Take Water, and dated October 23, 1995.

2. Letter to Robert Ryan, Senior Approvals Officer, MOEE from H.A Taniguichi, Director of Water Supply, Municipality of Metropolitan Toronto, enclosing additional information, and dated January 2, 1996.

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Appendix B. PTTW No. 1866-A6QHRP, page 8 of 8

Schedule B

This "Schedule B" forms part of Permit to Take Water 1866-A6QHRP issued to the City of Toronto.

a) This Schedule B recognizes The Regional Municipality of York (York Region) as a Related Transferor (as defined in the OWRA s. 34.5 (1) and O. Reg. 387/04 s. 11) for water taken under the authority of this Permit to Take Water by the Permit Holder.

b) The total amount of water currently deemed to be transferred (i.e. baseline amount) by York Region is 105 million litres per day as considered and established in Prior Notice and Consultation under the Great Lakes Charter prior to December 31, 2014.

c) Permits to Take Water that relate to this intra-basin transfer agreement between the Permit Holders and the Related Transferor and that supply water to be transferred to York Region are:

PTTW No. 1866-A6QHRP, issued to the City of Toronto on March 23, 2016
PTTW No. 0726-A6QJTA, issued to the City of Toronto on March 23, 2016
PTTW No. 6604-A6QKEB, issued to the City of Toronto on March 23, 2016
PTTW No. 0016-A6QKN2, issued to the City of Toronto on March 23, 2016
PTTW No. 1064-A6KQKQ, issued to The Regional Municipality of Peel on March 23, 2016

d) The total transferable amount of 105 million litres per day is a combined amount for all Lake Ontario sources identified under the Permits to Take Water listed in condition c).

e) York Region shall monitor and report annually to the MOECC Central Region Director and to the MNRF Natural Resources Conservation Policy Branch Director monthly volumes and a calculated daily average amount of its intra-basin transfer in the preceding calendar year. The annual report shall be submitted no later than March 31st each year.

f) York Region shall carry out the Long-Term Water Conservation Strategy dated March 31, 2011, as may be amended from time to time, as outlined in the joint MOECC and MNRF letter to The Regional Municipality of York, dated September 14, 2010.

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Appendix B. PTTW No. 0726-A6QJTA, page 1 of 8

Ontario

Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement climatique

AMENDED PERMIT TO TAKE WATER
Surface Water
NUMBER 0726-A6QJTA

Pursuant to Section 34.1 of the Ontario Water Resources Act, R.S.O. 1990 this Permit To Take Water is hereby issued to:

City of Toronto
55 John Street, 18th Floor
Toronto, Ontario, M5V 3C6
Canada

For the water taking from: Lake Ontario: R.C Harris Treatment Plant

Located at: 2701 Queen St E
Toronto

For the purposes of this Permit, and the terms and conditions specified below, the following definitions apply:

DEFINITIONS

(a) "Director" means any person appointed in writing as a Director pursuant to section 5 of the OWRA for the purposes of section 34.1, OWRA.

(b) "Provincial Officer" means any person designated in writing by the Minister as a Provincial Officer pursuant to section 5 of the OWRA.

(c) "Ministry" means Ontario Ministry of the Environment and Climate Change.

(d) "District Office" means the Toronto District Office.

(e) "Permit" means this Permit to Take Water No. 0726-A6QJTA including its Schedules, if any, issued in accordance with Section 34.1 of the OWRA.

(f) "Permit Holder" means City of Toronto.

(g) "OWRA " means the *Ontario Water Resources Act,* R.S.O. 1990, c. O. 40, as amended.

Page 1 - NUMBER 0726-A6QJTA

You are hereby notified that this Permit is issued subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. Compliance with Permit

1.1 Except where modified by this Permit, the water taking shall be in accordance with the application for this Permit To Take Water, dated October 23, 1995 and signed by H. A. Taniguchi, and all Schedules included in this Permit.

1.2 The Permit Holder shall ensure that any person authorized by the Permit Holder to take water under this Permit is provided with a copy of this Permit and shall take all reasonable measures to ensure that any such person complies with the conditions of this Permit.

1.3 Any person authorized by the Permit Holder to take water under this Permit shall comply with the conditions of this Permit.

1.4 This Permit is not transferable to another person.

1.5 This Permit provides the Permit Holder with permission to take water in accordance with the conditions of this Permit, up to the date of the expiry of this Permit. This Permit does not constitute a legal right, vested or otherwise, to a water allocation, and the issuance of this Permit does not guarantee that, upon its expiry, it will be renewed.

1.6 The Permit Holder shall keep this Permit available at all times at or near the site of the taking, and shall produce this Permit immediately for inspection by a Provincial Officer upon his or her request.

1.7 The Permit Holder shall report any changes of address to the Director within thirty days of any such change. The Permit Holder shall report any change of ownership of the property for which this Permit is issued within thirty days of any such change. A change in ownership in the property shall cause this Permit to be cancelled.

2. General Conditions and Interpretation

2.1 Inspections
The Permit Holder must forthwith, upon presentation of credentials, permit a Provincial Officer to carry out any and all inspections authorized by the OWRA, the *Environmental Protection Act* , R.S.O. 1990, the *Pesticides Act* , R.S.O. 1990, or the *Safe Drinking Water Act*, S. O. 2002.

2.2 Other Approvals
The issuance of, and compliance with this Permit, does not:

(a) relieve the Permit Holder or any other person from any obligation to comply with any other applicable legal requirements, including the provisions of the *Ontario Water Resources Act* , and the *Environmental Protection Act* , and any regulations made thereunder; or

(b) limit in any way any authority of the Ministry, a Director, or a Provincial Officer, including the authority to require certain steps be taken or to require the Permit Holder to furnish any further information related to this Permit.

2.3 Information
The receipt of any information by the Ministry, the failure of the Ministry to take any action or require any person to take any action in relation to the information, or the failure of a Provincial Officer to prosecute any person in relation to the information, shall not be construed as:

(a) an approval, waiver or justification by the Ministry of any act or omission of any person that contravenes this Permit or other legal requirement; or

(b) acceptance by the Ministry of the information's completeness or accuracy.

2.4 Rights of Action
The issuance of, and compliance with this Permit shall not be construed as precluding or limiting any legal claims or rights of action that any person, including the Crown in right of Ontario or any agency thereof, has or may have against the Permit Holder, its officers, employees, agents, and contractors.

2.5 Severability
The requirements of this Permit are severable. If any requirements of this Permit, or the application of any requirements of this Permit to any circumstance, is held invalid or unenforceable, the application of such requirements to other circumstances and the remainder of this Permit shall not be affected thereby.

2.6 Conflicts
Where there is a conflict between a provision of any submitted document referred to in this Permit, including its Schedules, and the conditions of this Permit, the conditions in this Permit shall take precedence.

3. Water Takings Authorized by This Permit

3.1 **Expiry**
This Permit expires on **December 31, 2025**. No water shall be taken under authority of this Permit after the expiry date.

3.2 Amounts of Taking Permitted
The Permit Holder shall only take water from the source, during the periods and at the rates and amounts of taking specified in Table A. Water takings are authorized only for the purposes specified in Table A.

Appendix B. PTTW No. 0726-A6QJTA, page 4 of 8

Table A

	Source Name / Description:	Source: Type:	Taking Specific Purpose:	Taking Major Category:	Max. Taken per Minute (litres):	Max. Num. of Hrs Taken per Day:	Max. Taken per Day (litres):	Max. Num. of Days Taken per Year:	Zone/ Easting/ Northing:
1	Lake Ontario: R.C Harris Treatment Plant	Lake	Municipal	Water Supply	930,600	24	1,340,000,000	365	17 638847 4836905
						Total Taking:			

4. Monitoring

4.1 The Permit Holder shall, on each day water is taken under the authorization of this Permit, record the date, the volume of water taken on that date and the rate at which it was taken. The daily volume of water taken shall be measured by a flow meter. The Permit Holder shall keep all records required by this condition current and available at or near the site of the taking and shall produce the records immediately for inspection by a Provincial Officer upon his or her request. The Permit Holder, unless otherwise required by the Director, shall submit, on or before March 31st in every year, the daily water taking data collected and recorded for the previous year to the ministry's Water Taking Reporting System.

4.2 Any application submitted to the Ministry for renewal or amendment of this Permit shall be accompanied by all records required by the conditions of this Permit.

5. Impacts of the Water Taking

5.1 Notification
The Permit Holder shall immediately notify the local District Office of any complaint arising from the taking of water authorized under this Permit and shall report any action which has been taken or is proposed with regard to such complaint. The Permit Holder shall immediately notify the local District Office if the taking of water is observed to have any significant impact on the surrounding waters. After hours, calls shall be directed to the Ministry's Spills Action Centre at 1-800-268-6060.

5.2 For Surface-Water Takings
The taking of water (including the taking of water into storage and the subsequent or simultaneous withdrawal from storage) shall be carried out in such a manner that streamflow is not stopped and is not reduced to a rate that will cause interference with downstream uses of

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water or with the natural functions of the stream.

6. **Director May Amend Permit**
The Director may amend this Permit by letter requiring the Permit Holder to suspend or reduce the taking to an amount or threshold specified by the Director in the letter. The suspension or reduction in taking shall be effective immediately and may be revoked at any time upon notification by the Director. This condition does not affect your right to appeal the suspension or reduction in taking to the Environmental Review Tribunal under the *Ontario Water Resources Act* , Section 100 (4).

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is included to ensure that the conditions in this Permit are complied with and can be enforced.

2. Condition 2 is included to clarify the legal interpretation of aspects of this Permit.

3. Conditions 3 through 6 are included to protect the quality of the natural environment so as to safeguard the ecosystem and human health and foster efficient use and conservation of waters. These conditions allow for the beneficial use of waters while ensuring the fair sharing, conservation and sustainable use of the waters of Ontario. The conditions also specify the water takings that are authorized by this Permit and the scope of this Permit.

In accordance with Section 100 of the Ontario Water Resources Act, R.S.O. 1990, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 101 of the Ontario Water Resources Act, R.S.O. 1990, as amended, provides that the Notice requiring the hearing shall state:

1. The portions of the Permit or each term or condition in the Permit in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

In addition to these legal requirements, the Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Permit to Take Water number;
6. The date of the Permit to Take Water;
7. The name of the Director;
8. The municipality within which the works are located;

This notice must be served upon:

The Secretary
Environmental Review Tribunal
655 Bay Street, 15th Floor
Toronto ON
M5G 1E5
Fax: (416) 326-5370
Email: ERTTribunalsecretary@ontario.ca

AND

The Director, Section 34.1, Ministry of the Environment and Climate Change
8th Floor
5775 Yonge St
Toronto ON M2M 4J1
Fax: (416) 325-6347

Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal:

by Telephone at	by Fax at	by e-mail at
(416) 212-6349	(416) 326-5370	www.ert.gov.on.ca
Toll Free 1(866) 448-2248	Toll Free 1(844) 213-3474	

This Permit cancels and replaces Permit Number 91-P-3040, issued on 1996/02/12.

Dated at Toronto this 23 rd day of March, 2016.

Ross Lashbrook
Director, Section 34.1
Ontario Water Resources Act , R.S.O. 1990

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Appendix B. PTTW No. 0726-A6QJTA, page 7 of 8

Schedule A

This Schedule "A" forms part of Permit To Take Water 0726-A6QJTA, dated March 23, 2016.

1. Letter to Steve Klose, Director Section 34, Ministry of Environment and Energy (MOEE) from H.A. Taniguichi, Director of Water Supply, Municipality of Metropolitan Toronto, requesting an amendment to the Permit to Take Water, and dated October 23, 1995.

2. Letter to Robert Ryan, Senior Approvals Officer, MOEE from H.A Taniguichi, Director of Water Supply, Municipality of Metropolitan Toronto, enclosing additional information, and dated January 2, 1996.

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Appendix B. PTTW No. 0726-A6QJTA, page 8 of 8

Schedule B

This "Schedule B" forms part of Permit to Take Water 0726-A6QJTA issued to the City of Toronto.

a) This Schedule B recognizes The Regional Municipality of York (York Region) as a Related Transferor (as defined in the OWRA s. 34.5 (1) and O. Reg. 387/04 s. 11) for water taken under the authority of this Permit to Take Water by the Permit Holder.

b) The total amount of water currently deemed to be transferred (i.e. baseline amount) by York Region is 105 million litres per day as considered and established in Prior Notice and Consultation under the Great Lakes Charter prior to December 31, 2014.

c) Permits to Take Water that relate to this intra-basin transfer agreement between the Permit Holders and the Related Transferor and that supply water to be transferred to York Region are:

PTTW No. 1866-A6QHRP, issued to the City of Toronto on March 23, 2016
PTTW No. 0726-A6QJTA, issued to the City of Toronto on March 23, 2016
PTTW No. 6604-A6QKEB, issued to the City of Toronto on March 23, 2016
PTTW No. 0016-A6QKN2, issued to the City of Toronto on March 23, 2016
PTTW No. 1064-A6KQKQ, issued to The Regional Municipality of Peel on March 23, 2016

d) The total transferable amount of 105 million litres per day is a combined amount for all Lake Ontario sources identified under the Permits to Take Water listed in condition c).

e) York Region shall monitor and report annually to the MOECC Central Region Director and to the MNRF Natural Resources Conservation Policy Branch Director monthly volumes and a calculated daily average amount of its intra-basin transfer in the preceding calendar year. The annual report shall be submitted no later than March 31st each year.

f) York Region shall carry out the Long-Term Water Conservation Strategy dated March 31, 2011, as may be amended from time to time, as outlined in the joint MOECC and MNRF letter to The Regional Municipality of York, dated September 14, 2010.

Page 8 - NUMBER 0726-A6QJTA

Appendix B. PTTW No. 6604-A6QKEB, page 1 of 8

Ontario

Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement climatique

AMENDED PERMIT TO TAKE WATER
Surface Water
NUMBER 6604-A6QKEB

Pursuant to Section 34.1 of the Ontario Water Resources Act, R.S.O. 1990 this Permit To Take Water is hereby issued to:

City of Toronto
55 John Street, 18th Floor
Toronto, Ontario, M5V 3C6
Canada

For the water taking from: Lake Ontario: F.J. Horgan Treatment Plant

Located at: 210 Copperfield Rd
Toronto

For the purposes of this Permit, and the terms and conditions specified below, the following definitions apply:

DEFINITIONS

(a) "Director" means any person appointed in writing as a Director pursuant to section 5 of the OWRA for the purposes of section 34.1, OWRA.

(b) "Provincial Officer" means any person designated in writing by the Minister as a Provincial Officer pursuant to section 5 of the OWRA.

(c) "Ministry" means Ontario Ministry of the Environment and Climate Change.

(d) "District Office" means the Toronto District Office.

(e) "Permit" means this Permit to Take Water No. 6604-A6QKEB including its Schedules, if any, issued in accordance with Section 34.1 of the OWRA.

(f) "Permit Holder" means City of Toronto.

(g) "OWRA " means the *Ontario Water Resources Act,* R.S.O. 1990, c. O. 40, as amended.

Page 1 - NUMBER 6604-A6QKEB

Appendix B. PTTW No. 6604-A6QKEB, page 2 of 8

You are hereby notified that this Permit is issued subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. Compliance with Permit

1.1 Except where modified by this Permit, the water taking shall be in accordance with the application for this Permit To Take Water, dated October 23, 1995 and signed by H.A. Taniguchi, and all Schedules included in this Permit.

1.2 The Permit Holder shall ensure that any person authorized by the Permit Holder to take water under this Permit is provided with a copy of this Permit and shall take all reasonable measures to ensure that any such person complies with the conditions of this Permit.

1.3 Any person authorized by the Permit Holder to take water under this Permit shall comply with the conditions of this Permit.

1.4 This Permit is not transferable to another person.

1.5 This Permit provides the Permit Holder with permission to take water in accordance with the conditions of this Permit, up to the date of the expiry of this Permit. This Permit does not constitute a legal right, vested or otherwise, to a water allocation, and the issuance of this Permit does not guarantee that, upon its expiry, it will be renewed.

1.6 The Permit Holder shall keep this Permit available at all times at or near the site of the taking, and shall produce this Permit immediately for inspection by a Provincial Officer upon his or her request.

1.7 The Permit Holder shall report any changes of address to the Director within thirty days of any such change. The Permit Holder shall report any change of ownership of the property for which this Permit is issued within thirty days of any such change. A change in ownership in the property shall cause this Permit to be cancelled.

2. General Conditions and Interpretation

2.1 Inspections
The Permit Holder must forthwith, upon presentation of credentials, permit a Provincial Officer to carry out any and all inspections authorized by the OWRA, the *Environmental Protection Act* , R.S.O. 1990, the *Pesticides Act* , R.S.O. 1990, or the *Safe Drinking Water Act*, S. O. 2002.

2.2 Other Approvals
The issuance of, and compliance with this Permit, does not:

(a) relieve the Permit Holder or any other person from any obligation to comply with any other applicable legal requirements, including the provisions of the *Ontario Water Resources Act* , and the *Environmental Protection Act* , and any regulations made thereunder; or

(b) limit in any way any authority of the Ministry, a Director, or a Provincial Officer, including the authority to require certain steps be taken or to require the Permit Holder to furnish any further information related to this Permit.

2.3 Information

The receipt of any information by the Ministry, the failure of the Ministry to take any action or require any person to take any action in relation to the information, or the failure of a Provincial Officer to prosecute any person in relation to the information, shall not be construed as:

(a) an approval, waiver or justification by the Ministry of any act or omission of any person that contravenes this Permit or other legal requirement; or

(b) acceptance by the Ministry of the information's completeness or accuracy.

2.4 Rights of Action

The issuance of, and compliance with this Permit shall not be construed as precluding or limiting any legal claims or rights of action that any person, including the Crown in right of Ontario or any agency thereof, has or may have against the Permit Holder, its officers, employees, agents, and contractors.

2.5 Severability

The requirements of this Permit are severable. If any requirements of this Permit, or the application of any requirements of this Permit to any circumstance, is held invalid or unenforceable, the application of such requirements to other circumstances and the remainder of this Permit shall not be affected thereby.

2.6 Conflicts

Where there is a conflict between a provision of any submitted document referred to in this Permit, including its Schedules, and the conditions of this Permit, the conditions in this Permit shall take precedence.

3. Water Takings Authorized by This Permit

3.1 **Expiry**

This Permit expires on **December 31, 2025**. No water shall be taken under authority of this Permit after the expiry date.

3.2 Amounts of Taking Permitted

The Permit Holder shall only take water from the source, during the periods and at the rates and amounts of taking specified in Table A. Water takings are authorized only for the purposes specified in Table A.

Table A

	Source Name / Description:	Source: Type:	Taking Specific Purpose:	Taking Major Category:	Max. Taken per Minute (litres):	Max. Num. of Hrs Taken per Day:	Max. Taken per Day (litres):	Max. Num. of Days Taken per Year:	Zone/ Easting/ Northing:
1	Lake Ontario: F.J. Horgan Treatment Plant	Lake	Municipal	Water Supply	666,700	24	960,000,000	365	17 605135 4837883
						Total Taking:			

4. Monitoring

4.1 The Permit Holder shall, on each day water is taken under the authorization of this Permit, record the date, the volume of water taken on that date and the rate at which it was taken. The daily volume of water taken shall be measured by a flow meter. The Permit Holder shall keep all records required by this condition current and available at or near the site of the taking and shall produce the records immediately for inspection by a Provincial Officer upon his or her request. The Permit Holder, unless otherwise required by the Director, shall submit, on or before March 31st in every year, the daily water taking data collected and recorded for the previous year to the ministry's Water Taking Reporting System.

4.2 Any application submitted to the Ministry for renewal or amendment of this Permit shall be accompanied by all records required by the conditions of this Permit.

5. Impacts of the Water Taking

5.1 Notification

The Permit Holder shall immediately notify the local District Office of any complaint arising from the taking of water authorized under this Permit and shall report any action which has been taken or is proposed with regard to such complaint. The Permit Holder shall immediately notify the local District Office if the taking of water is observed to have any significant impact on the surrounding waters. After hours, calls shall be directed to the Ministry's Spills Action Centre at 1-800-268-6060.

5.2 For Surface-Water Takings

The taking of water (including the taking of water into storage and the subsequent or simultaneous withdrawal from storage) shall be carried out in such a manner that streamflow is not stopped and is not reduced to a rate that will cause interference with downstream uses of water or with the natural functions of the stream.

6. **Director May Amend Permit**
The Director may amend this Permit by letter requiring the Permit Holder to suspend or reduce the taking to an amount or threshold specified by the Director in the letter. The suspension or reduction in taking shall be effective immediately and may be revoked at any time upon notification by the Director. This condition does not affect your right to appeal the suspension or reduction in taking to the Environmental Review Tribunal under the *Ontario Water Resources Act* , Section 100 (4).

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is included to ensure that the conditions in this Permit are complied with and can be enforced.

2. Condition 2 is included to clarify the legal interpretation of aspects of this Permit.

3. Conditions 3 through 6 are included to protect the quality of the natural environment so as to safeguard the ecosystem and human health and foster efficient use and conservation of waters. These conditions allow for the beneficial use of waters while ensuring the fair sharing, conservation and sustainable use of the waters of Ontario. The conditions also specify the water takings that are authorized by this Permit and the scope of this Permit.

In accordance with Section 100 of the Ontario Water Resources Act, R.S.O. 1990, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 101 of the Ontario Water Resources Act, R.S.O. 1990, as amended, provides that the Notice requiring the hearing shall state:

1. The portions of the Permit or each term or condition in the Permit in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

In addition to these legal requirements, the Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Permit to Take Water number;
6. The date of the Permit to Take Water;
7. The name of the Director;
8. The municipality within which the works are located;

This notice must be served upon:

The Secretary
Environmental Review Tribunal
655 Bay Street, 15th Floor
Toronto ON
M5G 1E5
Fax: (416) 326-5370
Email: ERTTribunalsecretary@ontario.ca

AND

The Director, Section 34.1, Ministry of the Environment and Climate Change
8th Floor
5775 Yonge St
Toronto ON M2M 4J1
Fax: (416) 325-6347

Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal:

by Telephone at	by Fax at	by e-mail at
(416) 212-6349	(416) 326-5370	www.ert.gov.on.ca
Toll Free 1(866) 448-2248	Toll Free 1(844) 213-3474	

This Permit cancels and replaces Permit Number 91-P-3039, issued on 1996/02/12.

Dated at Toronto this 23 rd day of March, 2016.

Ross Lashbrook
Director, Section 34.1
Ontario Water Resources Act , R.S.O. 1990

Page 6 - NUMBER 6604-A6QKEB

Appendix B. PTTW No. 6604-A6QKEB, page 7 of 8

Schedule A

This Schedule "A" forms part of Permit To Take Water 6604-A6QKEB, dated March 23, 2016.

1. Letter to Steve Klose, Director Section 34, Ministry of Environment and Energy (MOEE) from H.A. Taniguichi, Director of Water Supply, Municipality of Metropolitan Toronto, requesting an amendment to the Permit to Take Water, and dated October 23, 1995.

2. Letter to Robert Ryan, Senior Approvals Officer, MOEE from H.A Taniguichi, Director of Water Supply, Municipality of Metropolitan Toronto, enclosing additional information, and dated January 2, 1996.

Page 7 - NUMBER 6604-A6QKEB

Appendix B. PTTW No. 6604-A6QKEB, page 8 of 8

Schedule B

This "Schedule B" forms part of Permit to Take Water 6604-A6QKEB issued to the City of Toronto.

a) This Schedule B recognizes The Regional Municipality of York (York Region) as a Related Transferor (as defined in the OWRA s. 34.5 (1) and O. Reg. 387/04 s. 11) for water taken under the authority of this Permit to Take Water by the Permit Holder.

b) The total amount of water currently deemed to be transferred (i.e. baseline amount) by York Region is 105 million litres per day as considered and established in Prior Notice and Consultation under the Great Lakes Charter prior to December 31, 2014.

c) Permits to Take Water that relate to this intra-basin transfer agreement between the Permit Holders and the Related Transferor and that supply water to be transferred to York Region are:

PTTW No. 1866-A6QHRP, issued to the City of Toronto on March 23, 2016
PTTW No. 0726-A6QJTA, issued to the City of Toronto on March 23, 2016
PTTW No. 6604-A6QKEB, issued to the City of Toronto on March 23, 2016
PTTW No. 0016-A6QKN2, issued to the City of Toronto on March 23, 2016
PTTW No. 1064-A6KQKQ, issued to The Regional Municipality of Peel on March 23, 2016

d) The total transferable amount of 105 million litres per day is a combined amount for all Lake Ontario sources identified under the Permits to Take Water listed in condition c).

e) York Region shall monitor and report annually to the MOECC Central Region Director and to the MNRF Natural Resources Conservation Policy Branch Director monthly volumes and a calculated daily average amount of its intra-basin transfer in the preceding calendar year. The annual report shall be submitted no later than March 31st each year.

f) York Region shall carry out the Long-Term Water Conservation Strategy dated March 31, 2011, as may be amended from time to time, as outlined in the joint MOECC and MNRF letter to The Regional Municipality of York, dated September 14, 2010.

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Appendix B. PTTW No. 0016-A6QKN2, page 1 of 8

Ontario

Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement climatique

AMENDED PERMIT TO TAKE WATER
Surface Water
NUMBER 0016-A6QKN2

Pursuant to Section 34.1 of the Ontario Water Resources Act, R.S.O. 1990 this Permit To Take Water is hereby issued to:

City of Toronto
55 John Street, 18th Floor
Toronto, Ontario, M5V 3C6
Canada

For the water taking from: Lake Ontario: R.L. Clark Treatment Plant

Located at: 45 23rd St
Toronto

For the purposes of this Permit, and the terms and conditions specified below, the following definitions apply:

DEFINITIONS

(a) "Director" means any person appointed in writing as a Director pursuant to section 5 of the OWRA for the purposes of section 34.1, OWRA.

(b) "Provincial Officer" means any person designated in writing by the Minister as a Provincial Officer pursuant to section 5 of the OWRA.

(c) "Ministry" means Ontario Ministry of the Environment and Climate Change.

(d) "District Office" means the Toronto District Office.

(e) "Permit" means this Permit to Take Water No. 0016-A6QKN2 including its Schedules, if any, issued in accordance with Section 34.1 of the OWRA.

(f) "Permit Holder" means City of Toronto.

(g) "OWRA " means the *Ontario Water Resources Act,* R.S.O. 1990, c. O. 40, as amended.

Page 1 - NUMBER 0016-A6QKN2

You are hereby notified that this Permit is issued subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. Compliance with Permit

1.1 Except where modified by this Permit, the water taking shall be in accordance with the application for this Permit To Take Water, dated October 23, 1995 and signed by H.A. Taniguchi, and all Schedules included in this Permit.

1.2 The Permit Holder shall ensure that any person authorized by the Permit Holder to take water under this Permit is provided with a copy of this Permit and shall take all reasonable measures to ensure that any such person complies with the conditions of this Permit.

1.3 Any person authorized by the Permit Holder to take water under this Permit shall comply with the conditions of this Permit.

1.4 This Permit is not transferable to another person.

1.5 This Permit provides the Permit Holder with permission to take water in accordance with the conditions of this Permit, up to the date of the expiry of this Permit. This Permit does not constitute a legal right, vested or otherwise, to a water allocation, and the issuance of this Permit does not guarantee that, upon its expiry, it will be renewed.

1.6 The Permit Holder shall keep this Permit available at all times at or near the site of the taking, and shall produce this Permit immediately for inspection by a Provincial Officer upon his or her request.

1.7 The Permit Holder shall report any changes of address to the Director within thirty days of any such change. The Permit Holder shall report any change of ownership of the property for which this Permit is issued within thirty days of any such change. A change in ownership in the property shall cause this Permit to be cancelled.

2. General Conditions and Interpretation

2.1 Inspections
The Permit Holder must forthwith, upon presentation of credentials, permit a Provincial Officer to carry out any and all inspections authorized by the OWRA, the *Environmental Protection Act* , R.S.O. 1990, the *Pesticides Act* , R.S.O. 1990, or the *Safe Drinking Water Act*, S. O. 2002.

2.2 Other Approvals
The issuance of, and compliance with this Permit, does not:

(a) relieve the Permit Holder or any other person from any obligation to comply with any other applicable legal requirements, including the provisions of the *Ontario Water Resources Act* , and the *Environmental Protection Act* , and any regulations made thereunder; or

(b) limit in any way any authority of the Ministry, a Director, or a Provincial Officer, including the authority to require certain steps be taken or to require the Permit Holder to furnish any further information related to this Permit.

2.3 Information

The receipt of any information by the Ministry, the failure of the Ministry to take any action or require any person to take any action in relation to the information, or the failure of a Provincial Officer to prosecute any person in relation to the information, shall not be construed as:

(a) an approval, waiver or justification by the Ministry of any act or omission of any person that contravenes this Permit or other legal requirement; or

(b) acceptance by the Ministry of the information's completeness or accuracy.

2.4 Rights of Action

The issuance of, and compliance with this Permit shall not be construed as precluding or limiting any legal claims or rights of action that any person, including the Crown in right of Ontario or any agency thereof, has or may have against the Permit Holder, its officers, employees, agents, and contractors.

2.5 Severability

The requirements of this Permit are severable. If any requirements of this Permit, or the application of any requirements of this Permit to any circumstance, is held invalid or unenforceable, the application of such requirements to other circumstances and the remainder of this Permit shall not be affected thereby.

2.6 Conflicts

Where there is a conflict between a provision of any submitted document referred to in this Permit, including its Schedules, and the conditions of this Permit, the conditions in this Permit shall take precedence.

3. Water Takings Authorized by This Permit

3.1 **Expiry**

This Permit expires on **December 31, 2025**. No water shall be taken under authority of this Permit after the expiry date.

3.2 Amounts of Taking Permitted

The Permit Holder shall only take water from the source, during the periods and at the rates and amounts of taking specified in Table A. Water takings are authorized only for the purposes specified in Table A.

Table A

	Source Name / Description:	Source: Type:	Taking Specific Purpose:	Taking Major Category:	Max. Taken per Minute (litres):	Max. Num. of Hrs Taken per Day:	Max. Taken per Day (litres):	Max. Num. of Days Taken per Year:	Zone/ Easting/ Northing:
1	Lake Ontario: R.L. Clark Treatment Plant	Lake	Municipal	Water Supply	653,000	24	940,000,000	365	17 619741 4827728
						Total Taking:			

4. Monitoring

4.1 The Permit Holder shall, on each day water is taken under the authorization of this Permit, record the date, the volume of water taken on that date and the rate at which it was taken. The daily volume of water taken shall be measured by a flow meter. The Permit Holder shall keep all records required by this condition current and available at or near the site of the taking and shall produce the records immediately for inspection by a Provincial Officer upon his or her request. The Permit Holder, unless otherwise required by the Director, shall submit, on or before March 31st in every year, the daily water taking data collected and recorded for the previous year to the ministry's Water Taking Reporting System.

4.2 Any application submitted to the Ministry for renewal or amendment of this Permit shall be accompanied by all records required by the conditions of this Permit.

5. Impacts of the Water Taking

5.1 Notification
The Permit Holder shall immediately notify the local District Office of any complaint arising from the taking of water authorized under this Permit and shall report any action which has been taken or is proposed with regard to such complaint. The Permit Holder shall immediately notify the local District Office if the taking of water is observed to have any significant impact on the surrounding waters. After hours, calls shall be directed to the Ministry's Spills Action Centre at 1-800-268-6060.

5.2 For Surface-Water Takings
The taking of water (including the taking of water into storage and the subsequent or simultaneous withdrawal from storage) shall be carried out in such a manner that streamflow is not stopped and is not reduced to a rate that will cause interference with downstream uses of water or with the natural functions of the stream.

Page 4 - NUMBER 0016-A6QKN2

6. **Director May Amend Permit**
The Director may amend this Permit by letter requiring the Permit Holder to suspend or reduce the taking to an amount or threshold specified by the Director in the letter. The suspension or reduction in taking shall be effective immediately and may be revoked at any time upon notification by the Director. This condition does not affect your right to appeal the suspension or reduction in taking to the Environmental Review Tribunal under the *Ontario Water Resources Act* , Section 100 (4).

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is included to ensure that the conditions in this Permit are complied with and can be enforced.

2. Condition 2 is included to clarify the legal interpretation of aspects of this Permit.

3. Conditions 3 through 6 are included to protect the quality of the natural environment so as to safeguard the ecosystem and human health and foster efficient use and conservation of waters. These conditions allow for the beneficial use of waters while ensuring the fair sharing, conservation and sustainable use of the waters of Ontario. The conditions also specify the water takings that are authorized by this Permit and the scope of this Permit.

In accordance with Section 100 of the Ontario Water Resources Act, R.S.O. 1990, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 101 of the Ontario Water Resources Act, R.S.O. 1990, as amended, provides that the Notice requiring the hearing shall state:

1. The portions of the Permit or each term or condition in the Permit in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

In addition to these legal requirements, the Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Permit to Take Water number;
6. The date of the Permit to Take Water;
7. The name of the Director;
8. The municipality within which the works are located;

This notice must be served upon:

The Secretary
Environmental Review Tribunal
655 Bay Street, 15th Floor
Toronto ON
M5G 1E5
Fax: (416) 326-5370
Email: ERTTribunalsecretary@ontario.ca

AND

The Director, Section 34.1, Ministry of the Environment and Climate Change
8th Floor
5775 Yonge St
Toronto ON M2M 4J1
Fax: (416) 325-6347

Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal:

by Telephone at
(416) 212-6349
Toll Free 1(866) 448-2248

by Fax at
(416) 326-5370
Toll Free 1(844) 213-3474

by e-mail at
www.ert.gov.on.ca

This Permit cancels and replaces Permit Number 91-P-3042, issued on 1996/02/12.

Dated at Toronto this 23 rd day of March, 2016.

Ross Lashbrook
Director, Section 34.1
Ontario Water Resources Act , R.S.O. 1990

Page 6 - NUMBER 0016-A6QKN2

Appendix B. PTTW No. 0016-A6QKN2, page 7 of 8

Schedule A

This Schedule "A" forms part of Permit To Take Water 0016-A6QKN2, dated March 23, 2016.

1. Letter to Steve Klose, Director Section 34, Ministry of Environment and Energy (MOEE) from H.A. Taniguichi, Director of Water Supply, Municipality of Metropolitan Toronto, requesting an amendment to the Permit to Take Water, and dated October 23, 1995.

2. Letter to Robert Ryan, Senior Approvals Officer, MOEE from H.A Taniguichi, Director of Water Supply, Municipality of Metropolitan Toronto, enclosing additional information, and dated January 2, 1996.

Page 7 - NUMBER 0016-A6QKN2

Appendix B. PTTW No. 0016-A6QKN2, page 8 of 8

Schedule B

This "Schedule B" forms part of Permit to Take Water 0016-A6QKN2 issued to the City of Toronto.

a) This Schedule B recognizes The Regional Municipality of York (York Region) as a Related Transferor (as defined in the OWRA s. 34.5 (1) and O. Reg. 387/04 s. 11) for water taken under the authority of this Permit to Take Water by the Permit Holder.

b) The total amount of water currently deemed to be transferred (i.e. baseline amount) by York Region is 105 million litres per day as considered and established in Prior Notice and Consultation under the Great Lakes Charter prior to December 31, 2014.

c) Permits to Take Water that relate to this intra-basin transfer agreement between the Permit Holders and the Related Transferor and that supply water to be transferred to York Region are:

PTTW No. 1866-A6QHRP, issued to the City of Toronto on March 23, 2016
PTTW No. 0726-A6QJTA, issued to the City of Toronto on March 23, 2016
PTTW No. 6604-A6QKEB, issued to the City of Toronto on March 23, 2016
PTTW No. 0016-A6QKN2, issued to the City of Toronto on March 23, 2016
PTTW No. 1064-A6KQKQ, issued to The Regional Municipality of Peel on March 23, 2016

d) The total transferable amount of 105 million litres per day is a combined amount for all Lake Ontario sources identified under the Permits to Take Water listed in condition c).

e) York Region shall monitor and report annually to the MOECC Central Region Director and to the MNRF Natural Resources Conservation Policy Branch Director monthly volumes and a calculated daily average amount of its intra-basin transfer in the preceding calendar year. The annual report shall be submitted no later than March 31st each year.

f) York Region shall carry out the Long-Term Water Conservation Strategy dated March 31, 2011, as may be amended from time to time, as outlined in the joint MOECC and MNRF letter to The Regional Municipality of York, dated September 14, 2010.

Page 8 - NUMBER 0016-A6QKN2

Appendix B. PTTW No. 1064-A6KQKQ, page 1 of 8

Ontario

Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement climatique

AMENDED PERMIT TO TAKE WATER
Surface Water
NUMBER 1064-A6KQKQ

Pursuant to Section 34.1 of the Ontario Water Resources Act, R.S.O. 1990 this Permit To Take Water is hereby issued to:

The Regional Municipality of Peel
10 Peel Centre Dr
Brampton, Ontario, L6T 4B9
Canada

For the water taking from: Lake Ontario: Lakeview Water Treatment Plant

Lake Ontario: Lorne Park Water Treatment Plant

Located at: Lakeview- 920 East Ave
Mississauga, Regional Municipality of Peel

Lorne Park- 1180 Lakeshore Rd W
Mississauga, Regional Municipality of Peel

For the purposes of this Permit, and the terms and conditions specified below, the following definitions apply:

DEFINITIONS

(a) "Director" means any person appointed in writing as a Director pursuant to section 5 of the OWRA for the purposes of section 34.1, OWRA.

(b) "Provincial Officer" means any person designated in writing by the Minister as a Provincial Officer pursuant to section 5 of the OWRA.

(c) "Ministry" means Ontario Ministry of the Environment and Climate Change.

(d) "District Office" means the Halton-Peel District Office.

(e) "Permit" means this Permit to Take Water No. 1064-A6KQKQ including its Schedules, if any, issued in accordance with Section 34.1 of the OWRA.

Page 1 - NUMBER 1064-A6KQKQ

(f) "Permit Holder" means The Regional Municipality of Peel.

(g) "OWRA " means the *Ontario Water Resources Act,* R.S.O. 1990, c. O. 40, as amended.

You are hereby notified that this Permit is issued subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. Compliance with Permit

1.1 Except where modified by this Permit, the water taking shall be in accordance with the application for this Permit To Take Water, dated April 24, 2009 and signed by Andrew Farr for the Lakeview Water Treatment Plant and dated October 1, 2007 and signed by Andrew Farr for the Lorne Park Water Treatment Plant, and all Schedules included in this Permit.

1.2 The Permit Holder shall ensure that any person authorized by the Permit Holder to take water under this Permit is provided with a copy of this Permit and shall take all reasonable measures to ensure that any such person complies with the conditions of this Permit.

1.3 Any person authorized by the Permit Holder to take water under this Permit shall comply with the conditions of this Permit.

1.4 This Permit is not transferable to another person.

1.5 This Permit provides the Permit Holder with permission to take water in accordance with the conditions of this Permit, up to the date of the expiry of this Permit. This Permit does not constitute a legal right, vested or otherwise, to a water allocation, and the issuance of this Permit does not guarantee that, upon its expiry, it will be renewed.

1.6 The Permit Holder shall keep this Permit available at all times at or near the site of the taking, and shall produce this Permit immediately for inspection by a Provincial Officer upon his or her request.

1.7 The Permit Holder shall report any changes of address to the Director within thirty days of any such change. The Permit Holder shall report any change of ownership of the property for which this Permit is issued within thirty days of any such change. A change in ownership in the property shall cause this Permit to be cancelled.

2. General Conditions and Interpretation

2.1 Inspections
The Permit Holder must forthwith, upon presentation of credentials, permit a Provincial Officer to carry out any and all inspections authorized by the OWRA, the *Environmental Protection Act* , R.S.O. 1990, the *Pesticides Act* , R.S.O. 1990, or the *Safe Drinking Water Act*, S. O. 2002.

2.2 Other Approvals
The issuance of, and compliance with this Permit, does not:

(a) relieve the Permit Holder or any other person from any obligation to comply with any other applicable legal requirements, including the provisions of the *Ontario Water Resources Act* , and the *Environmental Protection Act* , and any regulations made thereunder; or

(b) limit in any way any authority of the Ministry, a Director, or a Provincial Officer, including the authority to require certain steps be taken or to require the Permit Holder to furnish any further information related to this Permit.

2.3 Information
The receipt of any information by the Ministry, the failure of the Ministry to take any action or require any person to take any action in relation to the information, or the failure of a Provincial Officer to prosecute any person in relation to the information, shall not be construed as:

(a) an approval, waiver or justification by the Ministry of any act or omission of any person that contravenes this Permit or other legal requirement; or

(b) acceptance by the Ministry of the information's completeness or accuracy.

2.4 Rights of Action
The issuance of, and compliance with this Permit shall not be construed as precluding or limiting any legal claims or rights of action that any person, including the Crown in right of Ontario or any agency thereof, has or may have against the Permit Holder, its officers, employees, agents, and contractors.

2.5 Severability
The requirements of this Permit are severable. If any requirements of this Permit, or the application of any requirements of this Permit to any circumstance, is held invalid or unenforceable, the application of such requirements to other circumstances and the remainder of this Permit shall not be affected thereby.

2.6 Conflicts
Where there is a conflict between a provision of any submitted document referred to in this Permit, including its Schedules, and the conditions of this Permit, the conditions in this Permit shall take precedence.

Appendix B. PTTW No. 1064-A6KQKQ, page 4 of 8

3. Water Takings Authorized by This Permit

3.1 **Expiry**
This Permit expires on **November 30, 2020**. No water shall be taken under authority of this Permit after the expiry date.

3.2 Amounts of Taking Permitted
The Permit Holder shall only take water from the source, during the periods and at the rates and amounts of taking specified in Table A. Water takings are authorized only for the purposes specified in Table A.

Table A

	Source Name / Description:	Source: Type:	Taking Specific Purpose:	Taking Major Category:	Max. Taken per Minute (litres):	Max. Num. of Hrs Taken per Day:	Max. Taken per Day (litres):	Max. Num. of Days Taken per Year:	Zone/ Easting/ Northing:
1	Lake Ontario: Lakeview Water Treatment Plant	Lake	Municipal	Water Supply	888,889	24	1,250,000,000	365	17 617200 4825400
2	Lake Ontario: Lorne Park Water Treatment Plant	Lake	Municipal	Water Supply	399,306	24	575,000,000	365	17 614193 4820155
						Total Taking:			

4. Monitoring

4.1 The Permit Holder shall, on each day water is taken under the authorization of this Permit, record the date, the volume of water taken on that date and the rate at which it was taken. The daily volume of water taken shall be measured by a flow meter. A separate record shall be maintained for each source. The Permit Holder shall keep all records required by this condition current and available at or near the site of the taking and shall produce the records immediately for inspection by a Provincial Officer upon his or her request.

4.2 The Permit Holder, unless otherwise required by the Director, shall submit, on or before March 31st of every year, the daily water taking data collected and recorded, as per Condition 4.1, for the previous year to the ministry's Water Taking Reporting System.

4.3 Any application submitted to the Ministry for renewal or amendment of this Permit shall

Page 4 - NUMBER 1064-A6KQKQ

be accompanied by all records required by the conditions of this Permit.

5. Impacts of the Water Taking

5.1 Notification
The Permit Holder shall immediately notify the local District Office of any complaint arising from the taking of water authorized under this Permit and shall report any action which has been taken or is proposed with regard to such complaint. The Permit Holder shall immediately notify the local District Office if the taking of water is observed to have any significant impact on the surrounding waters. After hours, calls shall be directed to the Ministry's Spills Action Centre at 1-800-268-6060.

5.2 For Surface-Water Takings
The taking of water (including the taking of water into storage and the subsequent or simultaneous withdrawal from storage) shall be carried out in such a manner that streamflow is not stopped and is not reduced to a rate that will cause interference with downstream uses of water or with the natural functions of the stream.

6. Director May Amend Permit
The Director may amend this Permit by letter requiring the Permit Holder to suspend or reduce the taking to an amount or threshold specified by the Director in the letter. The suspension or reduction in taking shall be effective immediately and may be revoked at any time upon notification by the Director. This condition does not affect your right to appeal the suspension or reduction in taking to the Environmental Review Tribunal under the *Ontario Water Resources Act* , Section 100 (4).

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is included to ensure that the conditions in this Permit are complied with and can be enforced.

2. Condition 2 is included to clarify the legal interpretation of aspects of this Permit.

3. Conditions 3 through 6 are included to protect the quality of the natural environment so as to safeguard the ecosystem and human health and foster efficient use and conservation of waters. These conditions allow for the beneficial use of waters while ensuring the fair sharing, conservation and sustainable use of the waters of Ontario. The conditions also specify the water takings that are authorized by this Permit and the scope of this Permit.

In accordance with Section 100 of the Ontario Water Resources Act, R.S.O. 1990, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 101 of the Ontario Water Resources Act, R.S.O. 1990, as amended, provides that the Notice requiring the hearing shall state:

1. The portions of the Permit or each term or condition in the Permit in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

In addition to these legal requirements, the Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Permit to Take Water number;
6. The date of the Permit to Take Water;
7. The name of the Director;
8. The municipality within which the works are located;

This notice must be served upon:

The Secretary
Environmental Review Tribunal
655 Bay Street, 15th Floor
Toronto ON
M5G 1E5
Fax: (416) 326-5370
Email: ERTTribunalsecretary@ontario.ca

AND

The Director, Section 34.1, Ministry of the Environment and Climate Change
8th Floor
5775 Yonge St
Toronto ON M2M 4J1
Fax: (416) 325-6347

Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal:

by Telephone at	by Fax at	by e-mail at
(416) 212-6349	(416) 326-5370	www.ert.gov.on.ca
Toll Free 1(866) 448-2248	Toll Free 1(844) 213-3474	

This Permit cancels and replaces Permit Number 5021-83SL3X, issued on 2010/11/29.

Dated at Toronto this 23 rd day of March, 2016.

Ross Lashbrook
Director, Section 34.1
Ontario Water Resources Act , R.S.O. 1990

Page 6 - NUMBER 1064-A6KQKQ

Appendix B. PTTW No. 1064-A6KQKQ, page 7 of 8

Schedule A

This Schedule "A" forms part of Permit To Take Water 1064-A6KQKQ, dated March 23, 2016.

1. Application for Permit to Take Water renewal for the Lakeview Water Treatment Plant signed by Andrew Farr and dated April 21, 2009.

2. Application for Permit to Take Water renewal for the Lorne Park Water Treatment Plant signed by Andrew Farr and dated October 1, 2007.

3. Letter titled "Regional Municipality of Peel: Increase in Existing Permit to Take Water 6715-678SQX dated December 6, 2004 Lakeview Water Treatment Plant" prepared by CH2MHILL, signed by Arun Jain, P.Eng., and dated February 18, 2010.

4. Letter Report - GENIVAR Ontario Inc. Oct. 3, 2007. Permit to Take Water Application Lorne Park Water Treatment Plant Expansion. Project # 5920 signed by Martin Gravel and Muin Husain of GENIVAR.

Page 7 - NUMBER 1064-A6KQKQ

Schedule B

This "Schedule B" forms part of Permit to Take Water 1064-A6KQKQ issued to The Regional Municipality of Peel.

a) This Schedule B recognizes The Regional Municipality of York (York Region) as a Related Transferor (as defined in the OWRA s. 34.5 (1) and O. Reg. 387/04 s. 11) for water taken under the authority of this Permit to Take Water by the Permit Holder.

b) The total amount of water currently deemed to be transferred (i.e. baseline amount) by York Region is 105 million litres per day as considered and established in Prior Notice and Consultation under the Great Lakes Charter prior to December 31, 2014.

c) Permits to Take Water that relate to this intra-basin transfer agreement between the Permit Holders and the Related Transferor and that supply water to be transferred to York Region are:

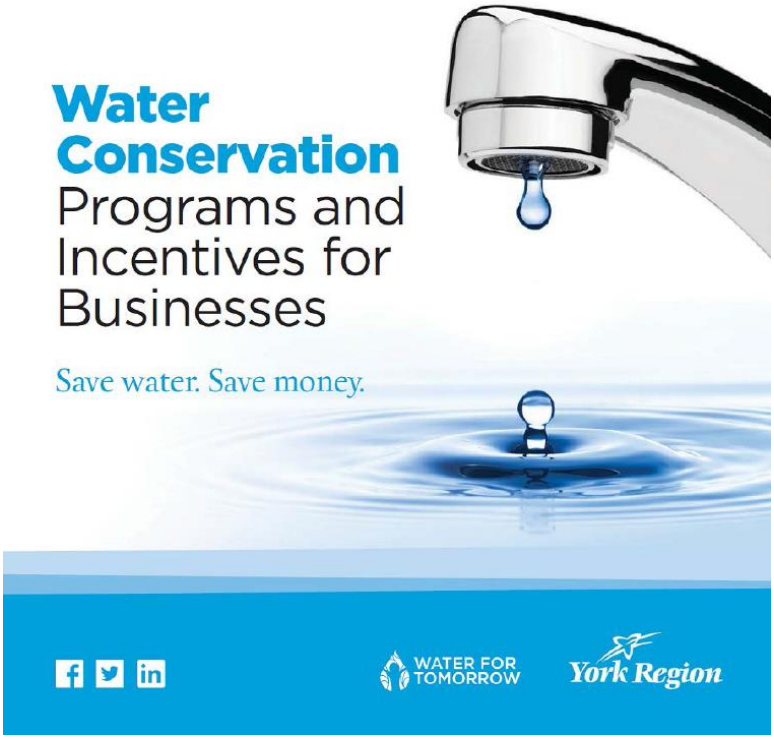
PTTW No. 1866-A6QHRP, issued to the City of Toronto on March 23, 2016
PTTW No. 0726-A6QJTA, issued to the City of Toronto on March 23, 2016
PTTW No. 6604-A6QKEB, issued to the City of Toronto on March 23, 2016
PTTW No. 0016-A6QKN2, issued to the City of Toronto on March 23, 2016
PTTW No. 1064-A6KQKQ, issued to The Regional Municipality of Peel on March 23, 2016

d) The total transferable amount of 105 million litres per day is a combined amount for all Lake Ontario sources identified under the Permits to Take Water listed in condition c).

e) York Region shall monitor and report annually to the MOECC Central Region Director and to the MNRF Natural Resources Conservation Policy Branch Director monthly volumes and a calculated daily average amount of its intra-basin transfer in the preceding calendar year. The annual report shall be submitted no later than March 31st each year.

f) York Region shall carry out the Long-Term Water Conservation Strategy dated March 31, 2011, as may be amended from time to time, as outlined in the joint MOECC and MNRF letter to The Regional Municipality of York, dated September 14, 2010.

Appendix C: Water Conservation Programs and Incentives for Businesses Brochure



Incentives for Outdoor Irrigation Systems

Water Smart Irrigation Professional (WSIP) Program

The Water Smart Irrigation Professional (WSIP) Program provides specialized training in irrigation system efficiency, assessment and maintenance services. Certified WSIP contractors are industry leaders, and can help businesses maintain beautiful curb appeal, while lowering water consumption and costs.

Following an irrigation assessment, businesses will receive:

- Customized landscape watering schedule
- Summary report which includes calculations of the associated return on investments
- Average water savings of approximately 45 per cent

Incentives for the Industrial, Commercial, and Institutional (ICI) Sector

Water-Use and Wastewater Quality Consultation Program

York Region offers water-use and wastewater quality consultations at no cost for high water-use businesses. Participating businesses will also receive access to incentives based on installed eligible retrofits through the Capacity Buyback Incentive Program.

Capacity Buyback Incentive Program

Financial incentives of up to $50,000 are available if your facility implements one or more of the recommended capital retrofits identified in the water-use and wastewater quality consultation, to permanently reduce water use.

Incentives for Small and Medium Size Businesses

Once-Through Cooling (OTC) System Replacement Incentive Program

York Region offers simple water audits for small and medium size businesses. Participating businesses will receive information on estimated water savings from recommended opportunities identified, including access to OTC System Replacement Incentive.

Financial incentives of up to $3,000 are available for facilities to replace OTC system (i.e., condensing units, ice machines) with equivalent water efficient equipment. York Region will verify eligibility and completion of program requirements through a follow-up assessment.

Incentives for Sustainable Residential Developments

Servicing Incentive Program

New residential developments that are a maximum of three storeys high can qualify for water and wastewater servicing capacity assignment credits of up to 20 per cent through the Servicing Incentive Program.

Sustainable Development Through LEED®

The Sustainable Development Through LEED® (Leadership in Energy and Environmental Design) incentive program provides up to 30 per cent in water and wastewater capacity assignment credits for new residential high-rise buildings that are four storeys or higher.

To find out more about our water-saving programs and to download application forms, please visit **york.ca/waterincentives**

1-888-967-5426
waterfortomorrow@york.ca

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Appendix D: Salga Associates Case Study

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York Region's Industrial, Commercial and Institutional (ICI) Water Use and Wastewater Quality Consultation and Capacity Buyback Incentive Programs

CASE STUDY: SALGA ASSOCIATES

Salga Associates (Salga), a division of ABC Group Inc., is a manufacturer of blow-moulded plastic parts for the automotive industry.

Improving water and energy efficiency is a key priority for Salga's Environmental Management System. The company's participation in York Region's Water Use and Wastewater Quality Consultation and Capacity Buyback Incentive program has already resulted in a 15 per cent reduction in their total water consumption since 2014.

By replacing five existing chillers with high-efficiency units, Salga has been able to reduce its annual water consumption by more than 1,200 cubic metres, which equates to a savings of $4,300. Salga also received a water saving incentive of $1,049 from York Region, plus additional incentives for reducing electricity and natural gas consumption.

Process: Chiller System

Solution: Replace five existing chillers with higher efficiency units

Water savings: >1,200 m³/year

Cost Savings: $4,300/year

Payback: 4.2 Years*

*Payback period includes both water and energy savings and incentives

For more information on how your business can benefit from water savings, contact waterfortomorrow@york.ca or visit york.ca/waterincentives

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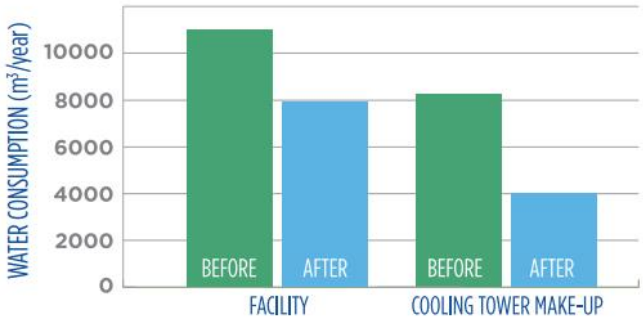
From left to right: Biju Mathew, Martin Komes, Kayla Jones, and Peter Tremmel, Salga Associates; Bill Chihata, York Region; Lloyd Hipel, Enviro-Stewards; and Chadarut Anan, York Region

Company Leadership

For more than 40 years, ABC Group Inc. has proven itself to be a leader in the global automotive parts manufacturing industry. The company's consistent growth and expansion has been the result of their bold vision, hard work and continuous innovation. Tremendous changes in the automotive world have not only enhanced ABC Group's success, but enabled its evolution as a technology leader, product innovator and pioneer in plastics processing applications.



Water consumption before and after opportunity implementation

"Leadership in environmental sustainability is one of the requirements from our customers. It is not just a nice practice for us; it is a survival strategy."

— Peter Tremmel, Salga Associates

Continuous Improvement

Salga's sustained successes are founded on a drive for continuous improvement. The company is always aiming to implement the best available technologies to conserve water and energy and reduce their carbon footprint.

For more information on how your business can benefit from water savings, contact waterfortomorrow@york.ca or visit york.ca/waterincentives

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Appendix E: Moscone Marble Case Study

York Region Industrial, Commercial and Institutional (ICI)

Water Use Consultation and Incentive Program

CASE STUDY | **Moscone Marble**

Company Overview

Providing installation and fabrication, Moscone Marble has serviced the construction industry for more than 60 years.

Moscone Marble houses state-of-the-art technology with five Computer Numerical Control (CNC) machines and automated conveyor belts including the **Champion 5** saw, which is exclusive to Moscone Marble in North America. This enables continuous cutting and the capacity to produce large volumes of stone countertops.

Water Measures Implemented

Moscone Marble's commitment to water efficiency in their facility has resulted in a 64 per cent reduction in their total water consumption.

In 2012, Moscone Marble reduced water consumption by more than 59,000 litres per day by collecting, treating and reusing spent water in five CNC machines, automatic and manual cutters and straight polishers. Moscone Marble received an incentive of $17,750 from York Region for the water-saving retrofits under the ICI Water Use Consultation and Incentive Program.

Process	Solution	Water Savings	Cost Savings	Payback
Process Water Demand (CNC Machines, cutters and polishers)	Treat and reuse process water	>15,000 m3/year	$37,000/year	1 year*

* Moscone Marble had previously invested in equipment used to construct the water reuse system. The total payback period including the previous investment is 3.5 years.

For more information on York Region's ICI Water Use Consultation and Incentive Program please visit www.york.ca/watercapacity

York Region

Appendix F: Fusion Gardening® Sample Marketing Material

(a) Fusion Gardening®/WSIP Postcard

(b) Fusion Gardening® *City Life* Magazine Advertisement Samples

February 2016

April 2016

(c) Fusion Gardening® Banner Stands

(d) Fusion Gardening® Direct Mail

Retail Partner Launch Invite (June 2016)

Binder Twine Festival (mailed out late August 2016)

Appendix G: York Region Children's Water Festival Invitation Poster

York Region