

Water Efficiency Strategy

2021 Progress Report



Environmental Services Department

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Table of Contents

2021 Annual Progress Report	0
Environmental Services Department	0
Table of Contents	i
List of Tables	ii
List of Figures	ii
Background	3
Water Reduction Target Progress	3
Water Efficiency Incentive and Rebate Programs	6
Direct Water Savings Programs	9
Residential Sector	9
Multi-Residential Sector	10
All-Season Rainwater Harvesting Rebate Program	10
Industrial, Commercial and Institutional Sector	11
Municipal Facility Water Efficiency Upgrades	11
Water Loss Management Program	12
Indirect Water Savings Programs	12
Peak Season Water Demand Management Initiatives	13
Outside Water Use Program	13
Healthy Landscapes	14
Public Outreach and Education Programs	14
Curriculum-Linked Education Programming	14
Water Related Events	15
Guelph Water Wagon	16
Research Programs	16
Cooling Tower Research	16
Water Softener, Alternatives and Impact of Sodium Chlorides	17

List of Tables

Table 1: Water Efficiency Strategy Update Program Progress..... 7

List of Figures

Figure 1: Water Supply Master Plan (2014) and Water Efficiency Strategy (2016) Production Rates 4
Figure 2: Residential Water Use..... 5

Background

Water servicing capacity reclaimed through conservation and efficiency continues to be a top priority in achieving a sustainable and cost-effective community water supply. In July 2014, Guelph City Council endorsed the updated Water Supply Master Plan (WSMP). The WSMP established a new reduction target of 9,147 cubic metres in average daily production by 2038 to guide the City's water efficiency programming. In support of the new reduction target, Guelph City Council approved the 2016 Water Efficiency Strategy (WES), which defined programs, policies, and resources to assist the City in achieving the WSMP reduction targets.

The following provides an update of the water efficiency and optimization goals achieved from the Water Efficiency Strategy for the period of January 1 to December 31, 2021.

Water Reduction Target Progress

Building off the data analysis completed for the WSMP, the WES identified a ten-year water savings goal of 6,265 cubic metres per day between 2017 and 2026. The Strategy anticipates a considerable amount of supply capacity can be reclaimed through water loss management and efficiencies realized within the industrial, commercial, and institutional sector.

Based on community uptake and participation in new and enhanced water efficiency programs, the total water savings achieved for 2021 was 206 cubic metres per day. Based on reductions in energy needed for water treatment and distribution, it is anticipated that 38 tonnes of greenhouse gas emissions and over \$18,400 in electricity costs will be avoided through this year's water savings. Since the implementation of the 2016 WES, the cumulative water savings achieved to date is 1,409 cubic metres per day.

Figure 1 presents the projected volumetric production values as presented in the 2014 Water Supply Master Plan and the 2016 Water Efficiency Strategy, as well as that of the actual average daily production. The City continues to experience lower average daily production volumes than those projected through the Water Supply Master Plan. This is due, in part, to the successful implementation of the 2016 WES and 2009 Water Conservation and Efficiency Strategy Update.

Figure 1: Water Supply Master Plan (2014) and Water Efficiency Strategy (2016) Production Rates

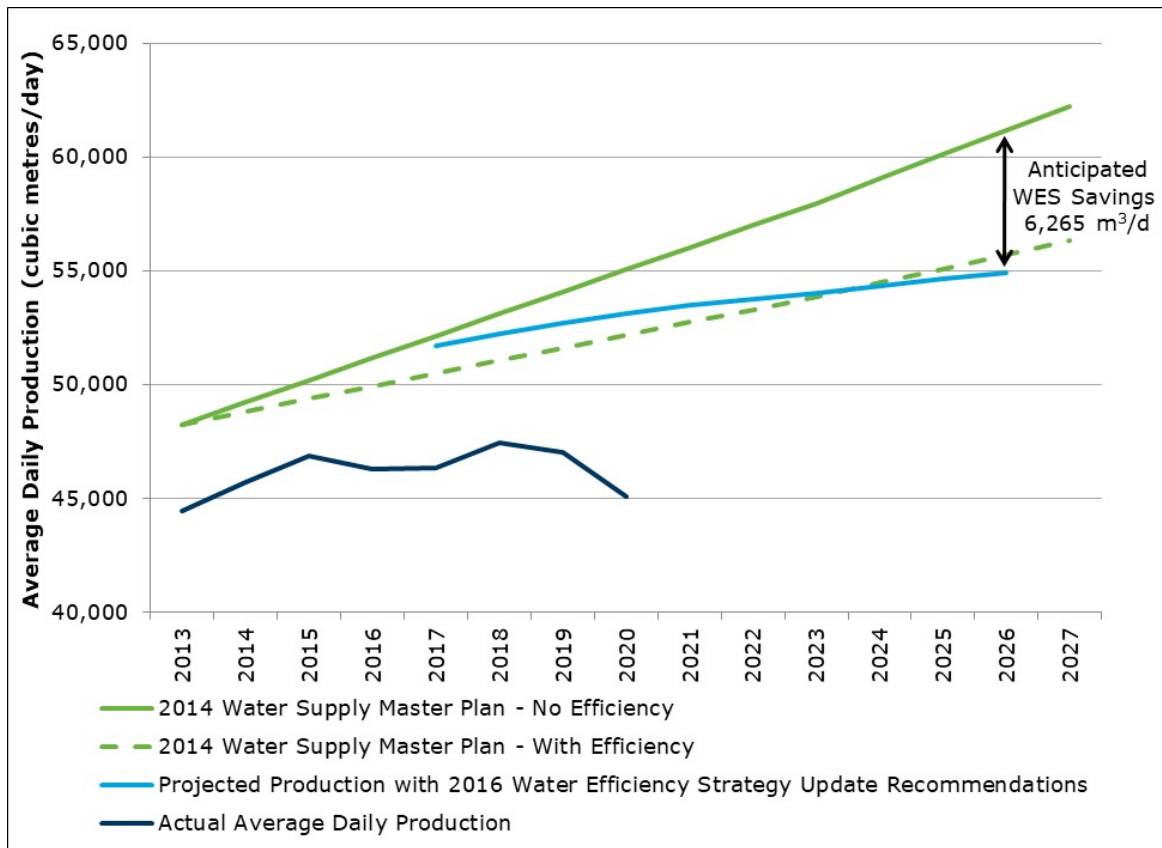
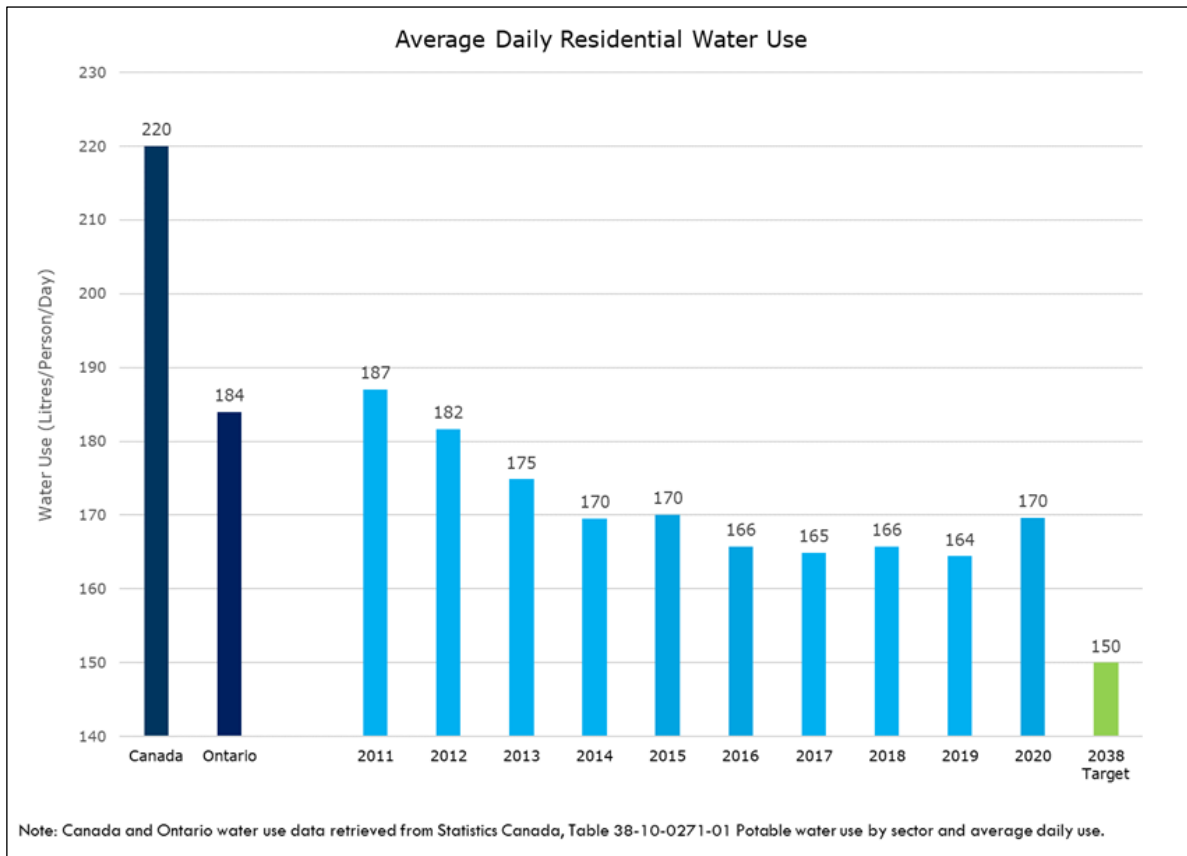


Figure 2 presents the City of Guelph's residential water use between 2011 and 2020, calculated using the volumetric consumption of water of all residential properties – low, medium, and high density. Prior to 2020 the City of Guelph's residential water use had been on a downward trend, at an approximate rate of 3.1 litres less per person per day annually.

Average daily residential water use in Guelph increased in 2020 but remains below the provincial and national averages. In 2020, the average water use was 170 litres per person per day, whereas the most recently published average for Ontario is 184 and Canada is 220 litres per person per day. The increase in residential usage is likely a result of the pandemic and associated Provincial restrictions. The City experienced a shift in residential consumption behaviour that saw the average resident spending more time within their home and using more water. This year's review successfully linked all account addresses that did not match those listed in the Municipal Property Assessment Corporation's (MPAC) records to assign the corresponding property classification (i.e., residential, non-residential), resulting in a more accurate representation of customer consumption.

Figure 2: Residential Water Use



The following sections outline the individual program successes for 2021, as identified in the 2016 WES.

Water Efficiency Incentive and Rebate Programs

During 2021 programs achieved an estimated savings of 206 cubic metres per day. Although these savings fell approximately 66% short of the annual target (599 cubic metres per day) considerable progress towards achieving the 2016 WES targets was still made despite complications due to the COVID-19 pandemic. In 2021, some rebate and information programs remained or were put on hold for a period of time. By June 2021, with the exception of information programs, all rebate programs resumed operation. For the period of 2017 to 2021 the estimated combined savings of 1,372 cubic metres per day has been achieved.

In 2021, 495 rebate applications and audits were completed through the City's residential rebate programs. An additional 2 incentives for business upgrades were processed. [Table 1](#) represents a summary break down for Water Efficiency Strategy program progress. For more information on the individual rebate and information programs available, visit guelph.ca/rebates.

Table 1: Water Efficiency Strategy Update Program Progress

Water Efficiency Program	WES Target, 2021 Average Daily Water Savings (m³/day)	Achieved Average Daily Water Savings (m³/d), 2021	Number of Rebates/ Audits, 2021	WES Combined Target, 2017-2021: Average Daily Water Savings (m³/day)	Achieved Average Daily Water Savings (m³/day), 2017-2021	Number of Rebates/ Audits, 2017-2021
Royal Flush	22	16	419	130	130	3,330
Blue Built Home	2	1	5	10	11	35
Home Visits, Audit	13	4.00	49	65	21	779
Multi-Residential Audit	8	11	3	54	74	23
Residential Sub-metering	1	0.29	4	5	9	26
Water Smart Business	150	39	2	750	111	6
Municipal Facility Upgrades	22	0	0	110	38	5
Water Loss Management	381	134	12	1,433	978	71

Water Efficiency Program	WES Target, 2021 Average Daily Water Savings (m ³ /day)	Achieved Average Daily Water Savings (m ³ /d), 2021	Number of Rebates/ Audits, 2021	WES Combined Target, 2017-2021: Average Daily Water Savings (m ³ /day)	Achieved Average Daily Water Savings (m ³ /day), 2017-2021	Number of Rebates/ Audits, 2017-2021
Water Reuse and Demand Management	n/a	0.41	1	n/a	0.41	1
Totals	599	206	495	2557	1372	4276

Direct Water Savings Programs

Residential Sector

Summary of the individual residential sector programs can be found in the 2016 Water Efficiency Strategy section 13.1.1.1 located at <https://guelph.ca/plans-and-strategies/water-efficiency-strategy/#documents>. The following is a summary of relevant updates, program achievements and challenges experienced in 2021.

Royal Flush Toilet Rebate Program

The 2016 Water Efficiency Strategy continued with the Royal Flush Toilet Rebate program. During 2021 there was an increase in applications compared to 2020, despite provincial restrictions and store closures due to the COVID-19 pandemic. Applications were still received throughout the year. The program's promotion resumed in 2021 through social media posts, store locations and online outreach events. Participation rates and savings are summarized in [Table 1](#).

Blue Built Home Water Efficiency Standards and Rebate Program

The 2016 Water Efficiency Strategy updated identified the Blue Built Home Program as a means to achieve direct water savings. During 2021 the program was promoted through different channels, including, social media campaigns, presentations, and targeted outreach to specific groups (builders, contractors, City internal stakeholders and others). Progress was affected as home inspections and home audits completed through the City's contractor were paused during the provincial restrictions, and thusly progress was affected. In total, five residential single-family properties were certified as Blue Built Homes. Together, single-family homes achieved a savings of 0.68 cubic metres per day (250 cubic metres per year). No multi-residential buildings participated in 2021. Participation rates and savings are summarized in [Table 1](#).

Water Use Home Visit and Audit Program

In 2021, the City contracted eMERGE Guelph, a building home knowledge contractor, to conduct in-home water audits as part of our Water Use Home Visit and Audit Program. Due to the pandemic, all in-home visits were put on pause for the first half of the year. As restrictions were lifted in-person audits resumed in June. During 2021 a total of 43 Home Visits were completed, which represent a combined water savings of 1,459 cubic meters of water per year, equating to almost 4 cubic metres of water per day across all participating

households, through on-site replacement of faucet aerators and showerheads, and verified subsequent action of the resident to correct an above normal average of leaking toilets. Participation rates and savings are summarized in [Table 1](#).

Multi-Residential Sector

Summary of the individual multi-residential sector programs can be found in the 2016 Water Efficiency Strategy section 13.1.1.2 located at <https://guelph.ca/plans-and-strategies/water-efficiency-strategy/#documents>. The following is a summary of relevant updates, program achievements and challenges experienced in 2020.

Multi-Residential Water Audit Program

This year the Multi-Residential Water Audit Program had three participants. This was a decrease from the previous year due to impact of the ongoing pandemic and limited access to facilities. The main findings from all audits performed in 2021 assumed a ten per cent decrease in water use (as per the WES). This equates to 10.8 cubic metres of water per day that has been reclaimed through 2021 participation. This provides a combined water savings of 73.5 cubic metres per day since the launch of the program in 2018. Participation rates and savings are summarized in [Table 1](#).

Residential Sub-Water Meter Rebate Program

This program is open to all residential sectors in the City of Guelph, both single family and multi-family applications.

In 2021, this program had four applicants and accounted for 0.29 cubic metres per day of water savings. Staff promoted the program through a hydro bill insert. Each of the four program applicants indicated this promotion as their motivation to participate in the program. Participation rates and savings are summarized in [Table 1](#).

All-Season Rainwater Harvesting Rebate Program

As identified on the 2016 Water Efficiency Strategy, rainwater harvesting plays an important role in water conservation and the All-Season Rainwater Harvesting Rebate programs seeks to encourage water reuse and fit-for-purpose use. During 2021 the City received one application for the All-Season Rainwater Harvesting Rebate Program. The application was for a system installed into a commercial office building, providing 4,031L of storage capacity

and will represent an estimated municipal water savings of 149 cubic meters annually. Participation rates and savings are summarized in [Table 1](#).

Industrial, Commercial and Institutional Sector

Summary of the individual industrial, commercial and institutional sector programs can be found in the 2016 Water Efficiency Strategy section 13.1.1.3 found at <https://guelph.ca/plans-and-strategies/water-efficiency-strategy/#documents>. The following is a summary of relevant updates, program achievements and challenges experienced in 2021.

Water Smart Business Program

The Water Smart Business Program was formally on pause due to the impacts of the ongoing pandemic. The program resumed in May.

In 2021, two program participants completed the program accounting for 14,191 cubic metres of water savings per year – or 38.9 cubic metres per day. These savings were achieved through replacement of a softener with alternative technology and a water reuse project. A third water saving project was completed, estimated to reclaim 50 cubic metres day of treated municipal water. This project, however did not meet the Terms and Conditions of the program for verification. It is worthy of note since the project was derived from facility review and audit completed by City staff, and ongoing relationship. Participation rates and savings are summarized in [Table 1](#).

Municipal Operations

Summary of the individual municipal operation initiatives can be found in the 2016 Water Efficiency Strategy section 13.1.1.4 found at <https://guelph.ca/plans-and-strategies/water-efficiency-strategy/#documents>. The following is a summary of relevant updates, program achievements and challenges experienced in 2021.

Municipal Facility Water Efficiency Upgrades

In support of the City's Strategic Plan, the City continues to lead by example with water efficiency within its own facilities. Staff consulted on the plans for the Baker Street Redevelopment Project and engaged with the Corporate Energy Office in support of projects that proceeded in 2021. Projects undertaken were the installation of water meters on the District Energy System at Sleeman Centre and the installation of a more water efficient

treatment system for making ice (REALice) at Exhibition Park Arena, West End Recreation Centre and Centennial Park Arena. A recirculation system at Hanlon Creek Splash Pad is still under construction and will be completed in 2022.

Water Loss Management Program

Water Loss Strategy

The Water Loss Strategy continued in 2021. The City's consultant leading the update to the Water Supply Master Plan completed a cost-benefit evaluation of the Water Balance and a review of existing and potential options to reduce non-revenue water losses within the distribution system. Overall, the City's work to date in minimizing non-revenue water has shown continuous improvement. The data now indicates that the City may be at or near the level at which further attempts at reductions is not economically feasible. The cost of locating a potential leak may cost more than the water lost to the leak itself. The consultant's review indicated that if the City wants to further reduce non-revenue water and have its efforts remain cost effective then an additional expenditure between \$97,000 to \$116,000/year should not be exceeded. Additional options to limit non-revenue water suggested by the consultant will be explored in greater detail in the Water Efficiency Strategy Update to be completed in 2022.

Leak Detection Program

The City's leak detection program started in the spring of 2011 and aims to reduce the amount of water lost between the point of treatment and delivery to customers. The 2021 Leak Detection Program included sounding and correlation of all 527 kilometers of watermains within the City's distribution system. In total, twelve possible leaks were identified through this survey, including four main breaks and the rest consisting of hydrant, service, or valve repair/replacements. The average daily volume of servicing capacity reclaimed through the location and remediation of these leaks equate to approximately 134 cubic metres per day in 2021. Savings attributed to reclaimed water supply capacity (production) are summarized in [Table 1](#).

Indirect Water Savings Programs

Education is a fundamentally important tool to engage and motivate action. The commitment to increasing local water literacy is a complimentary piece to changing toilets, completing water audits, and installing water meters, to ensure the wise use of the resource. Staff continue to offer a variety of very successful programs (including

continuation of in-school programming in a virtual delivery model throughout 2021) to increase awareness, influence people's attitudes and habits regarding water use, and inform public on how the City invests their rate dollars. Investment in Guelph's water future includes education and outreach programming. Summary of the individual indirect water savings programs can be found in the 2016 Water Efficiency Strategy section 13.1.2 located at <https://guelph.ca/plans-and-strategies/water-efficiency-strategy/#documents>. The following is a summary of relevant updates, program achievements and challenges experienced in 2021.

Peak Season Water Demand Management Initiatives

Reduction of peak season (summer) water demand continues to be a primary objective of the City's water efficiency programming. The ability to reduce or minimize variations in seasonal water use limits the impact on our finite groundwater supply during times of environmental stress and creates operational efficiencies.

Summary of the outside water use initiatives that result in indirect savings can be found in the 2016 Water Efficiency Strategy section 13.1.2.1 found at <https://guelph.ca/plans-and-strategies/water-efficiency-strategy/#documents>. The following is a summary of relevant updates, program achievements and challenges experienced in 2021.

Outside Water Use Program

This program is driven by the City's Outside Water Use Bylaw – which restricts certain outdoor water-using activities during peak demand, when conditions such as dry, hot weather and river flows warrant restrictions.

The Outside Water Use Program ran between May and October 2021 and experienced a fluctuation in level changes throughout the season. Starting in Level 0 – Blue, a very dry spring (precipitation below the average for the time of the year) brought about a change to Level 1 – Yellow on May 26. Increase in average precipitation through mid-July, and a stabilizing of demand, permitted a drop in program level on July 14. On August 25, the City elevated the Program level again to Level 2 – Yellow due to ongoing above average temperature and uncharacteristically low precipitation levels. After higher precipitation levels and return to normal temperatures in September, the Program level was reduced to Level 1 - Blue on September 29 to close out the year.

Due to the ongoing pandemic, the annual rain barrel sale was moved to an online ordering and delivery service. In partnership with Stormwater Engineering, 500 rain barrels were sold

to Guelph residents in 2021. An additional 36 rain barrels were purchased and distributed to City facilities and community gardens.

Healthy Landscapes

The Healthy Landscapes Program continues to offer various resources to residents on preferred landscape management tools and techniques that result in desired yard aesthetics and minimize impact on water resources.

The annual Healthy Landscapes Speaker Series featured five virtual talks on outdoor water use topics including efficient landscape design, plant selection, and proactive maintenance best practices to manage the impact of drought and common turf pests. It is estimated over 3,500 participants took part in this year's speaker series. A further 1,392 individuals participated in the annual three-part Landscape Design Course.

Healthy Landscape visits resumed in June 2021 and continued to be a popular resource, with 145 complimentary one-hour visits completed by trained staff this year; 46 Healthy Landscape visits were completed to support residents in achieving their Blue Built Home credentials in 2021. There was only one Landscape advisor this year, operating the program at half-capacity.

Visit the City of Guelph webpage for more information on the [Healthy Landscapes Program](#).

Public Outreach and Education Programs

Summary of the public outreach and education program initiatives can be found in the 2016 Water Efficiency Strategy section 13.1.2.2 located at <https://guelph.ca/plans-and-strategies/water-efficiency-strategy/#documents>. The following is a summary of relevant updates, program achievements or challenges experienced in 2021.

Curriculum-Linked Education Programming

The City's curriculum-based Grade 2 and Grade 8 in-class water programming continues to be a popular resource for local educators in both the Upper Grand District School Board and the Wellington Catholic District School Board. The pandemic necessitated an ongoing reliance on virtual presentation methods. In total, staff provided 51 school presentations, engaging 1,065 students.

As content has continued to expand, staff created two presentation streams: *Source to Tap* (source water protection, water treatment, water conservation); and, *Tap Back to Source* (wastewater treatment and stormwater management). The separation of content into two distinct presentations will be piloted in 2022. Note: Due to the ongoing pandemic staff were unable to facilitate class tours of F.M. Woods Water Treatment Plant.

Water Related Events

Staff coordinated notable events during the spring of each year. The ongoing pandemic required events adapt to the circumstances, whether this meant going virtual, or operating in a space that met the provincial health measures. These events included:

- H2Awesome – Hosted 8 speakers over the course of four weeks between World Water Day (March 22) and Earth Day (April 22). This virtual speaker series attracted over 3,440 students.
- Water Hero Wander – This event replaced Wacky Water Week, traditionally hosted in local libraries through the local schoolboards' March break. The Water Hero Wander encouraged residents to walk the Royal Recreation Trail in search of six signs containing messages linked to water conservation, stormwater, wastewater, source water protection, and tap water promotion. Each sign included an online pledge for residents to commit to actions benefiting local water systems – built and natural.
- H2O Go Festival – This annual event was cancelled in 2021.
- Environmental Services Open House – This annual event was cancelled in 2021.
- Waterloo-Wellington Children's Groundwater Festival – In 2021 the festival operated virtually for the first time in its 26 years of programming. The event featured water related activities and experiments that could be carried out in-class or at home. It also included a host of speakers discussing the importance of water and wastewater treatment, source water protection and conservation in our daily lives. In total, the virtual festival attracted more than 6,800 participants across the region.
- Imagine a Day Without Water – In 2021, staff participated for the first time in this North American campaign to draw attention to the influence of water, wastewater and stormwater as individuals, a community and globally. Staff created a poster contest for local students to submit original art linked to water. The contest received over 200 submissions. The winning submissions were posted in the City's libraries and community centres.
- Speaking engagements:
 - Ontario's Water Conference & Trade Show (OWWA) – Staff spoke to 85 participants regarding the 2019 water conditioner market research study.

- Salt Symposium (Fortin Consulting) – Staff spoke to 160 participants regarding the 2019 water conditioner market research study.
- eMERGE Webinar series - eMERGE offered a series of online events to engage the public. Along with other subject matter experts, City staff participated in three eMERGE events highlighting City's rebate programs and water efficiency themes. These presentations were:
 - Blue Built Home Certification – 12 attendees, 43 views following event,
 - Stormwater Management and Rainwater Harvesting Rebates – 97 attendees, 238 views following event,
 - Salty Softeners, Salty Rivers (eMERGE Guelph) - 88 attendees, 22 views following the event.

Guelph Water Wagon

In support of the City's 2009 Public Promotion Action Plan for City Drinking Water Consumption, the Guelph Water Wagon has been providing tap water to attendees of large, outdoor community events during the summer months for seven years.

Due to the restrictions of large gatherings related to the ongoing pandemic, the Guelph Water Wagon service did not operate in 2021. Service is currently planned to be resumed in 2022, a decision made with the City's Recreation Services, Special Events department and with direction from the City's Executive Team.

Research Programs

Summary of the outside water use initiatives can be found in the 2016 Water Efficiency Strategy section 13.1.3 found at <https://guelph.ca/plans-and-strategies/water-efficiency-strategy/#documents>. The following is a summary of relevant updates, program achievements or challenges experienced in 2021.

Cooling Tower Research

The Alliance for Water Efficiency (AWE) commenced a multi-year Cooling Tower Research project in 2018, in partnership with 13 municipalities and utilities from across North America. The overall purpose of this study is to gain foundational knowledge needed to create an effective, targeted, and appealing incentive and outreach program to achieve greater efficiency in industrial cooling systems. The results of this research will provide the framework for the WES-proposed cooling tower audit and rebate program. 2021 saw the

release of the Cooling Tower Estimating Model, an Excel based tool. This marked a major project milestone of the research study. This tool can be used with those businesses participating in the Water Smart Business program. Completion of this research is scheduled for completion for mid-2022 and will inform the upcoming WES update.

Water Softener, Alternatives, and Impact of Sodium Chlorides

In partnership with the Region of Waterloo, the City of Guelph released [A Salt-free Alternative to Residential Water Softeners: Market Research Study](#) in 2019. Since its release, City staff have participated in various events to discuss related results. In 2021 staff participated in three events: Ontario's Water Conference & Trade Show (OWWA); Salt Symposium 2021 (Fortin Consulting); and, Salty Softeners, Salty Rivers (eMERGE Guelph). These events accumulated 297 participant views collectively.

Internally, staff participated in a working group convened by our Source Water Protection program aimed to develop a sodium and chloride monitoring program to better understand the water quality trends and potential impacts to our drinking water system. This effort will proactively mitigate sodium and chloride-contributing activities to our source water such as: sewage systems; the storage of snow; and the application, handling, and storage of road salt. 2022 is expected to bring about subcommittee working groups that will include data collection, alignment, a review of the City's Salt Management Strategy and public education and outreach initiative(s).