

Connections

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For the latest information about activities and events at RPZ, visit riverviewparkandzoo.ca

From the Otonabee River to your tap: the science of water treatment in Peterborough

Jenn McCallum, Water Programs Coordinator, GreenUP. Reprinted with permission.

In the City of Peterborough, the water treatment plant provides us with reliable, safe, high-quality drinking water that flows right from our taps. To better understand where our drinking water comes from, I connected with John Armour, the water quality specialist at Peterborough Utilities.

“Our drinking water comes from the Otonabee River, part of the Otonabee region watershed system,” Armour says. Water from the Otonabee River originates in surrounding lakes and then flows down into Katchewanooka Lake in Lakefield and south into Peterborough, where the water treatment plant is permitted to remove up to 104 million litres per day from the river for treatment.

“Due to educational programs such as the Children’s Water Festival, lawn watering restrictions, and public awareness, the water removed from the Otonabee watershed has been significantly reduced over the past two decades,” Armour notes.

Approximately 26.7 million litres of water were processed per day at the water treatment plant in 2019, amounting to about 322 litres per person per day. This was a five per cent decrease from 2018.

Three-stage purification process

When the Otonabee River water enters the water treatment plant, there is a screen to prevent fish and other large items from entering the facility. Afterwards, Armour explains, “solids in the water



The water we drink undergoes many filtration and purification processes at the water treatment plant in Peterborough before it is pumped to our taps.

Photo: Benjamin Hargreaves / GreenUP

are settled out using coagulation, flocculation, and sedimentation.”

Coagulation is the process of adding a chemical (alum) to clump particles together. Flocculation is the process of removing these clumped particles. Sedimentation allows other debris, like pebbles, to settle out of the water.

“These solids are removed from the water as the first part of the process of removing pathogens, including the Cryptosporidium parasite,” says Armour. Cryptosporidium in humans causes diarrhea and is highly contagious.

Continued on reverse

Welcome to our newest Sulawesi forest turtle hatchling!

Riverview Park & Zoo is one of a handful of North American organizations that have, as part of an international effort, successfully bred these rare little-known chelonians. In recognition of this extraordinary work, RPZ earned the CAZA Col. G. D. Dailley Award for ex-situ species propagation.

Native to the Indonesian island of Sulawesi, fewer than 100 of these unique freshwater turtles exist in the wild. Illegal exportation for the pet trade, poaching for food and severe habitat loss are major factors threatening the species.

Most turtle species will lay many eggs at a time, increasing the chances of survival of some offspring. But Sulawesi forest turtles lay only one or two eggs per clutch, making repopulation rates much slower and the successful birth of our latest hatchling even more worth celebrating.



RPZ had healthy hatchlings in 2015, 2017 and now, we are thrilled to announce, in 2020!



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Making honey at the Lily Lake Solar Farm

One of the first large-scale solar projects in Ontario, the 10 MW Lily Lake Solar Farm sits on 140 acres in Selwyn Township and was completed in 2011. The facility includes over 100,000 solar photovoltaic modules and has the capability to generate up to 10,000 kW of power during peak sunlight conditions. Improvements were recently made to allow the solar farm to produce more power during non-peak sunlight conditions and to achieve maximum power output more frequently during the summer months.

Hundreds of sheep live on the solar facility grounds, looked after by a local shepherd. The facility provides a safe environment for the animals and the sheep, in turn, are very effective at maintaining vegetative growth.

We also collaborated with a local beekeeper to introduce honeybees to the site, further enhancing the sustainable environment at this facility.

In addition to the Lily Lake facility, Peterborough Utilities Inc. also operates three rooftop solar projects and fifteen 500 kW solar projects in Bancroft and Haliburton.



In 2019, our honeybees produced more than 1,200 pounds of honey.

Innovative research continues at WTP

The Peterborough Water Treatment Plant (WTP) continues its exciting research that could fundamentally change the way municipalities treat waste water. In 2016, the WTP partnered with the University of Toronto's Drinking Water Research Group to build a "pilot plant" – a scaled-down version of Peterborough's main water treatment facility. The pilot plant can conduct many of the treatments the actual plant does, including coagulation, tapered mixing, flocculation, settling and filtration.

Research focused on alternative chemicals to aid in corrosion control and the use of ozonation technologies for improving water quality. The findings of this research were presented at the Ontario Waterworks Association Conference last year.

Information gathered over the next few years will play a key role in evaluating potential long-term treatment alternatives. If these alternatives are determined to be more efficient and eco-friendly, they could change the way water is treated not only in Peterborough but in other municipalities as well.



A coagulation study was completed, using an ozone contactor and biofiltration columns (shown above) to study ozone and biological treatment processes on water in the Otonabee River.

Continued from front

The next stage of treatment involves filtering the water through carbon and sand to remove algae, dirt and small animals like snails or beetles.

The water is then disinfected to remove any remaining parasites. One parasite that is removed from the water is the bacterium *Escherichia coli*, commonly referred to as *E. coli*. *E. coli* lives naturally in the intestines of animals, including humans, but when ingested it can cause us to become sick. Removing *E. coli* as part of the water treatment process helps to ensure that our drinking water is safe to consume.

"The final stage of treatment has fluoride added as mandated by the medical officer of health," explains Armour. Fluoride in our water helps to protect our teeth from cavities. One third of the fluoride in our drinking water comes naturally from the Otonabee River, according to Peterborough Public Health.

Frequent testing assures water safety and quality

To ensure the continued safety of our drinking water, the water treatment plant tests our water 20,000 times per year, or about once every 26 minutes.

"Our drinking water is tested as mandated by Ontario Regulations 169/03 under the 2002 *Safe Drinking Water Act*," says Armour. "Our water is tested on a daily, weekly, monthly, and annual basis depending on the water quality parameter. We have monitoring systems that are continually operating and providing data to our knowledgeable treatment operators who are onsite 24 hours a day, 365 days a year."

With all of this in mind, I have a new appreciation for the Otonabee River as the source of our drinking water, and for all of the staff who work hard to treat and test our drinking water to ensure its safety and reliability.

To John Armour and his colleagues, I raise a glass of icy cold, clear, tap water!