THE COMPLETE WATER MAGAZINE

JULY/AUGUST 2019

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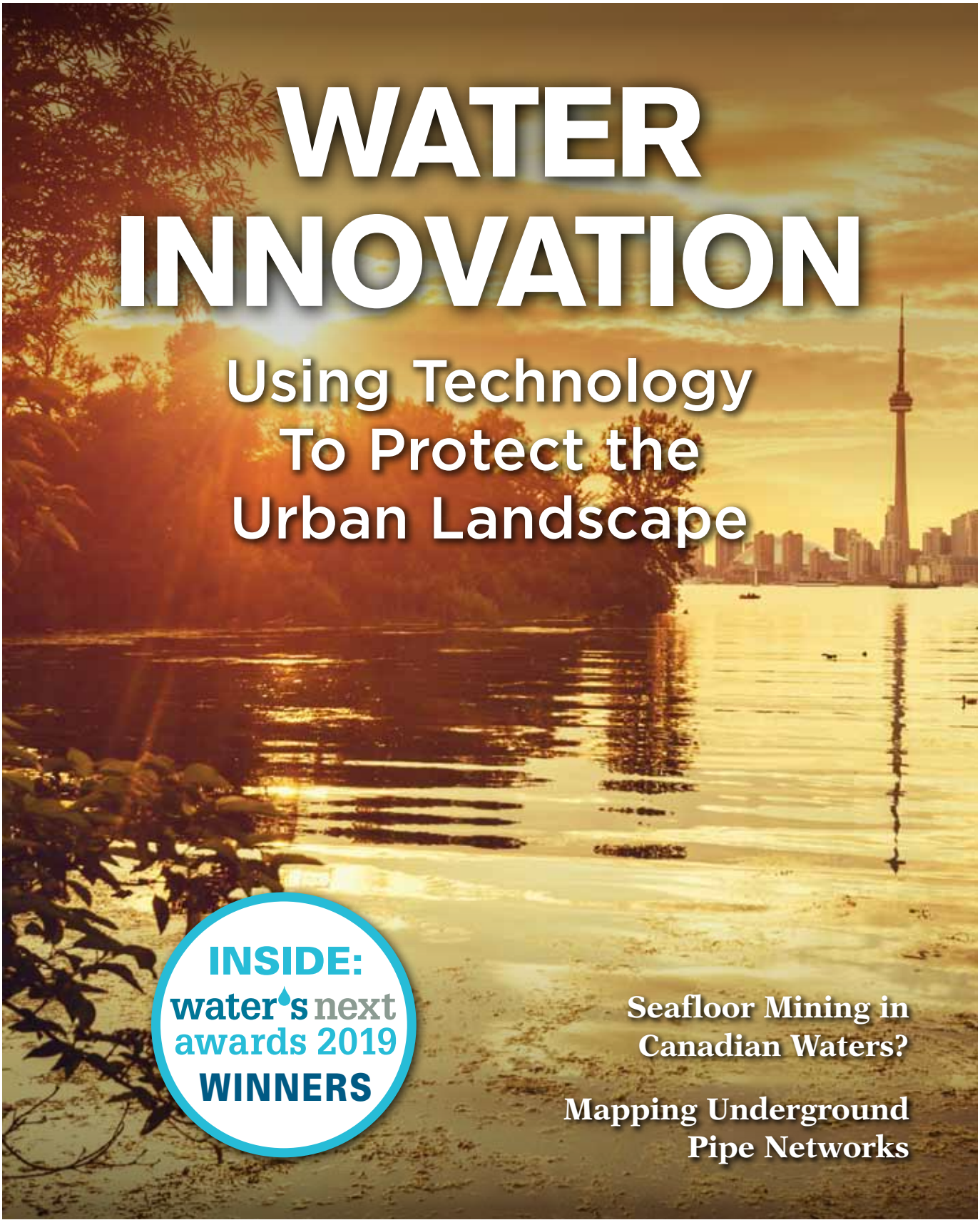

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SPECIAL FEATURES

water's next awards 2019

Water Canada proudly profiles the 11 Water's Next 2019 winners.

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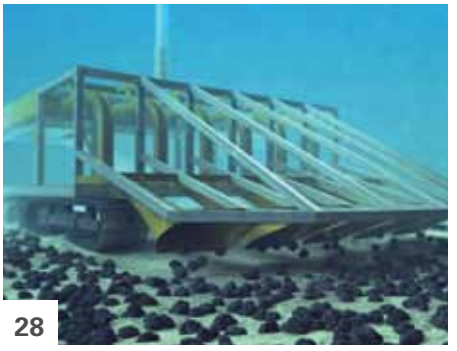

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JULY/AUGUST 2019
VOLUME 19 NUMBER 4

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Can We Talk About Lead?

BY ANDREW MACKLIN

IN EARLY JUNE, I had the pleasure of joining the Canadian Water and Wastewater Association (CWWA) for its Window on Ottawa event (*see page 32*). It was the first chance I had to attend, as my former colleague Katherine Balpataky had always found a way to go despite a crazy May/June event schedule.

I was intrigued by one of the early conversations, which centered around the anticipated lower lead guideline, and how it would be implemented in communities across Canada.

As the panelists discussed various aspects of the new regulation from both technical and legislative standpoints, the issues around the safe consumption of lead emerged. That is to say, if lead truly is a health risk, and that's why this standard is being lowered, is this a conversation that needs to be held publicly in order to force people to act?

It is a very important question, one that this industry needs to have an open discussion about, even if behind closed doors. Because it isn't just as simple as standing at a podium or sending out a press release and saying that any sort of lead consumption is too high so all lead pipes should be replaced immediately to avoid further health-related consequences. For starters, consumers have the responsibility for assets on their property. What happens to those individuals who can't afford the replacement cost? Do we first need a municipal, provincial, or federal grant program to ensure every stretch of lead pipe could be replaced, regardless of an individual's ability to pay?

There is also a serious question to be answered about the sale of a property with lead piping still in use. Can the sale of the property still legally move forward, or does the cost of pipe replacement need to be factored into the final sale price? And what for those properties in the sale process at the time the regulation is approved? Could that hold up the sale of thousands of properties already progressing towards their respective closing dates?

And lastly, there is the issue of labour. If tomorrow it is announced that any consumption of lead is unsafe and all lead piping must be replaced immediately, do we have the needed labour force to accomplish this? Or will we be in a situation where thousands of homeowners will have to rely on an alternative water source while they wait for their turn to have their pipes replaced?

It is an important issue, one I am certainly not qualified enough to insist on a solution for. But if the Canadian water industry believes that, even this new lead standard is too high for human consumption, then we as an industry better take the lead and work with our government partners on a solution to replace every lead pipe in this country. WC

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ABOUT THE COVER

Adopting new technologies is helping municipalities protect their urban landscape. Such is the case with the City of Toronto, who walked away with the Company of the Year award at the 2019 Water's Next awards. Learn more on page 19.

FRONT

Microplastic Consumption

A NEW UNIVERSITY OF VICTORIA STUDY suggests humans are unknowingly consuming tens of thousands of microplastic particles per year, a problem that requires further research to understand potential health impacts.

At just under five millimetres in diameter, microplastics are tiny pieces of plastic that come from the degradation of larger plastic products or the shedding of particles from water bottles, plastic packaging, and synthetic clothes. These particles can easily sneak into our bodies undetected through food or when we breathe air containing microplastics, said Kieran Cox, a marine biology PhD candidate in UVic Biologist Francis Juanes' lab. Cox is the lead author of a research paper in the American Chemical Society's journal Environmental Science & Technology.

"Human reliance on plastic packaging and food processing methods for major food groups, such as meats, fruits, and veggies is a growing problem. Our research suggests microplastics will continue to be found in the majority—if not all—of items intended for human consumption," said Cox. "We need to reassess our reliance on synthetic materials and alter how we manage them to change our relationship with plastics."

Cox and his colleagues reviewed 26 previous studies and analyzed the amount of microplastics in fish, shellfish, sugars, salts, alcohol, water, and air, which accounted for 15 per cent of Americans' caloric intake. By looking at the amounts of these foods people ate, based on their age, sex, and dietary recommendations, the team was able to estimate that a person's average microplastic consumption is between 70,000 and 121,000 particles per year, with rates rising up to 100,000 for those who drank only bottled water.

There are limitations in available data and the health impacts are still not known, said Cox. The majority of current research has focused on seafood, but the new study indicates a significant amount of the plastic humans consume may be in the air we breathe or water we drink. More research is needed on microplastic levels in our foods—particularly major food groups like beef, poultry, dairy, and grains—in order to understand health impacts and the broader problem of plastic pollution added Cox.

The study, co-authored by scientists at UVic, Hakai Institute, and Fisheries and Oceans Canada, was supported by the Natural Sciences and Engineering Research Council of Canada and the Liber Ero Foundation. WC

Share your story about the Canadian water industry with Water Canada!

Email Managing Editor Andrew Macklin at **andrew@actualmedia.ca**

Water By-products

RESEARCHERS AT LINKÖPING UNIVERSITY have gained insights into the types of by-products that are found in drinking water based on testing that was undertaken at four water treatment plants in Sweden.

"Using advanced techniques, we have been able to trace additional substances detected at the molecular level," said Anna Andersson, a PhD student at Linköping University. "It turns out that most of the by-products are unique to each water treatment plant. This means that specific conditions at each water treatment plant affect which by-products are formed."

The researchers used ultra-high-resolution mass spectrometry to analyze the water. This technique means that you do not have to look for known substances that you have been forced to do so far. Instead, the mass of the molecules in a sample can be determined so accurately that one finds out which atoms each molecule consists of.

For a year, Andersson carried out water sampling in close cooperation with four Swedish water treatment plants: Tekniska verken in Linköping, Nodra in Norrköping, Norrvatten in Stockholm, and VA SYD in Malmö. Each of these water treatment plants has different water purification processes. The analysis was conducted in collaboration with researchers at the Helmholtz Research Center in Munich and at the University of Maryland in the United States.

The results showed that even at the water treatment plants where the regulated trihalomethanes (for example, chlorofoam) cannot be measured, there was a large variety of by-products. The wide variety of by-products makes it difficult to know how to best reduce the health risk from these substances.

"Sometimes you talk about the cocktail effect, and that is what this is about," said Andersson. "What we need to understand is how we can reduce the risk from the entire mixture of substances. The risk from the by-products that has now been mapped is unknown, but the potential risk is motive enough to work towards reduced by-product formation."

Chlorination is one approach that can provide protection against bacteria in drinking water. The chlorine has an important function to provide good water quality through the pipeline network. The question the researchers are now asking is how to continue to use the chlorination effectively and at the same time reduce the exposure of unwanted by-products.

A copy of the study is available at the Royal Society of Chemistry's website: *pubs.rsc.org*. WC

Online at WATERCANADA.NET

NEWS: New Watershed Governance Guide for B.C. ***bit.ly/BCWatershed***

NEWS: IBC Report on Managing Flood Costs. ***bit.ly/IBCFlood***

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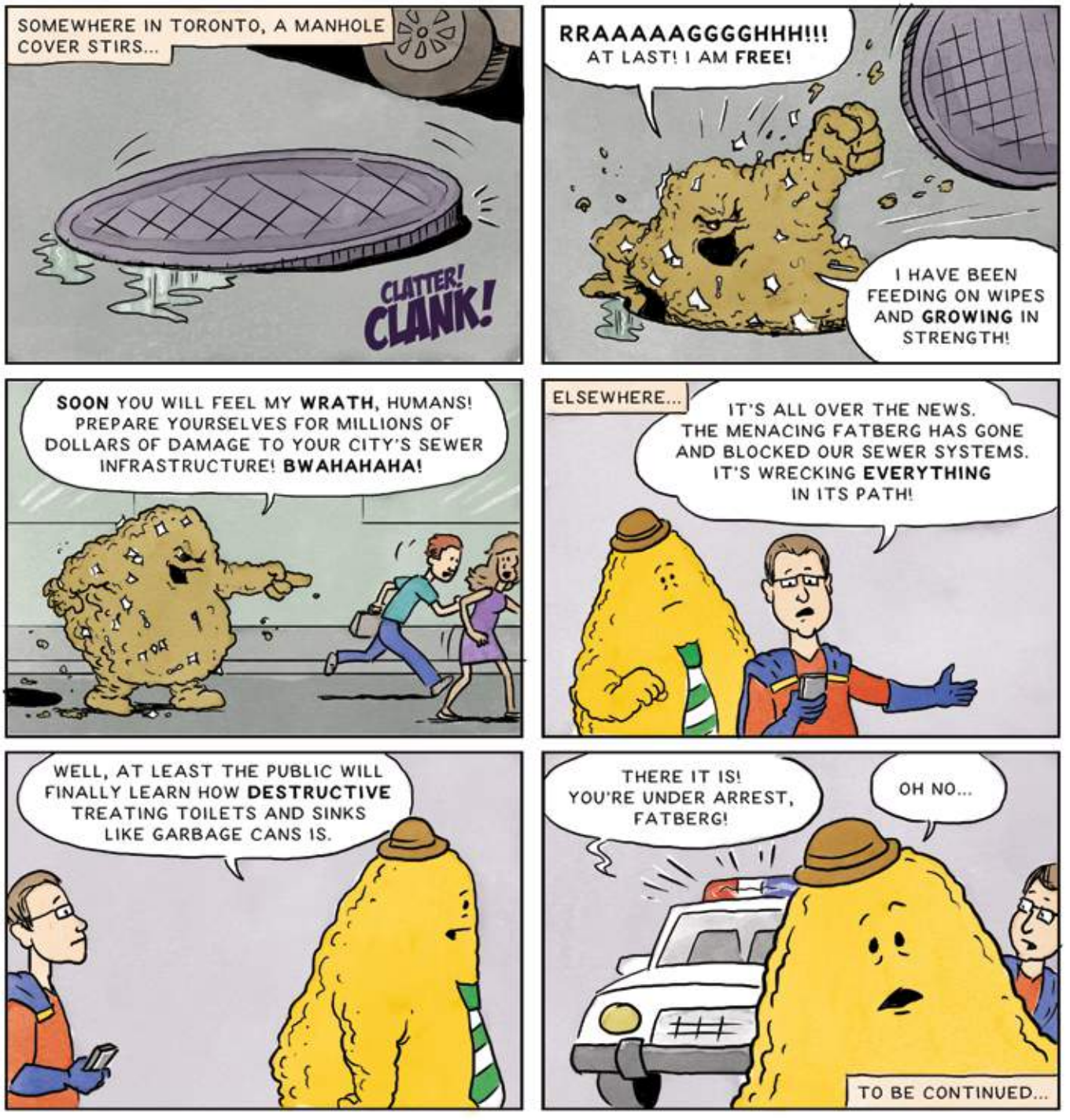


VISIT **KSB.CA/CONQUER-THE-CLOG** TO LEARN MORE ABOUT CLOGGING AND STRATEGIES TO COMBAT IT.

Nathan T. Wright is a freelance illustrator and artist based in Des Moines, Iowa, USA.

Photos: Water Canada

Katherine Balpataky from ALUS Canada led the Women in Water workshop on May 31, 2019.

Sheila Rider led a roundtable discussion on unconscious bias training during the workshop portion of Women in Water.

Speakers from left to right: Sheila Rider from Stantec, Robin Kind from OCWA, and Claire Oswald from Ryerson University.

Attendees participating in a breakout session during the workshop.

Women in Water

How women are championing diversity and inclusion in the water sector.

BY SIMRAN CHATTHA

"HOW DO WE SUPPORT women in water and greater diversity in the sector? What actions can we take together to increase diversity across the sector?"

These were two key questions that Katherine Balpataky from ALUS Canada posed during the Women in Water workshop. It hosted by Water Canada on May 31, 2019 at the Blue Mountain Resort in Georgian Bay, Ontario.

The workshop kicked off with a panel discussion that was moderated by Katherine and included three speakers: Robin Kind from the Ontario Clean Water Agency (OCWA), Claire Oswald from Ryerson University, and Sheila Rider from Stantec. During the discussion, Katherine asked each of the speakers to describe three things she is doing to affect diversity in her workplace or in the water sector.

Some of the ideas brought forward by the speakers during the panel discussion are highlighted here.

CLAIRE OSWALD, assistant professor at Ryerson University, on incorporating diversity principles into hiring practices.

In our department, like many geography departments across Canada, we do not have great women to men ratios. As an example, we have 21 faculty and we only four of them are women. This is pretty typical.

The university has some guidelines around EDI [equity, diversity, and inclusion] in hiring practices. […] An example of something you could do to promote diversity in an applicant pool would be to make sure that you post your job ad for at least 30 days and that there is an EDI statement in it. You could also identify a diverse group of people that could potentially apply during networking events.

Despite the fact that the university has guidelines, and some of our major funding bodies have guidelines, I find that at the faculty level in my department, it is still quite a battle to try and get people, like the chair or the hiring committee, to understand that these things need to be done.

I find that sometimes they even get a token EDI statement on the job ad but when it comes to the actual process of hiring, there are many systemic flaws and barriers to getting a diverse pool. This is something I think this needs to be taken seriously in universities. I actually think you need to get training on it and everyone needs to be trained on it, not only if you are the chair or if you are on a hiring committee. Everyone needs to understand what impact barriers are having on [their] the ability to attract a diverse applicant pool.

ROBIN KIND, executive vice president and general counsel of OCWA, on being a champion for diversity.

I thought it would be interesting if I gave you a few background facts because OCWA is a large player in the industry. OCWA has about 850 employees. Overall, 27 per cent of them are women. That statistic in operations is 20 per cent, which has not changed significantly in the last five years.

Some positive things. Fifty per cent of our executive team is women and 50 per cent of our board members are women. That is for a couple of reasons—we had a chief executive officer who was interested in encouraging women to take on vice president positions and we had a vice president of operations who was really successful.

On our board, we had a chair who was really interested in diversity and not only wanted gender balance, but also First Nation representation on the board and so we have good statistics there. In operations, it is not as good, as you might expect. In operations management, 75 per cent of the employees are men. In the operator position, 84 per cent men. In the supervisor position, 95 per cent men. So the groups that are going to feed into the next level down from the executive level, they are not there to get women up into regional manager, which is one level below executive team. There are just not people in the pipeline.

So I think that one of the things that we need to do is look at that pipeline and ask, who are we encouraging? Who are we looking to be in that pipeline? How do advertise? I think that there is a lot of that that we need to do.

SHEILA RIDER, vice president of human resources from Stantec, on unconscious bias training.

Probably the biggest piece of work around conscious inclusion is we have some unconscious bias training. We worked with the Canadian Centre of Diversity Inclusion, which is a really great not-for-profit organization.

We knew we wanted to take this on a couple of years ago but we did a lot of research and found you can you can do harm if you do not do it well. We took a good year and we piloted sessions with CCDI, one in Canada and one in the U.S., to help us understand how we have to be ready for the training. This was so that people do not end up in a room at feel like they are prisoners. It could end up as a waste of time.

We also we wanted to make sure that it was led by us. We got a number of staff certified and had a second round of training. We now have 50 people within Stantec—very few in HR, almost all in business, and a lot of men who are certified to deliver unconscious bias.

We set it up with a 30-minute online course first before somebody comes to get the training to get into what our biases are and what our stereotypes are. How do they show up? How do we move [away] from biases?

We all have biases. Some are conscious, some are unconscious. We have natural preferences. We are wired that way and our biases are reinforced by trusted sources, including the media, every single day. It is not about somebody becoming bias free. It is really about people becoming conscious to their biases and understanding when the biases serve them because they can be positive or negative. WC

Simran Chattha is the associate editor of Water Canada.

Based on feedback received during the 2019 workshop, Women in Water will be rebranded to Diversity in Water. This is so that the workshop will address cross-cutting issues between different groups including, but not limited to, women, LGBTQ, and minorities. More information about the Diversity in Water workshop, which will take place during the 11th annual Canadian Water Summit in June 2020, will be available at ***watersummit.ca*** *in the coming months.*

water's next awards 2019

Celebrating Canadian water leaders and champions

Water's Next winners received a plaque and an individually hand crafted glass pin by artisan glassblower Aaron Calenda of Guelph, Ont.

All event photos: Water Canada

Ontario's Minister of the Environment, Conservation and Parks Rod Phillips (second from left) was a special guest at the 2019 Water's Next awards.

Former Water Canada editor Katherine Balpataky shares a laugh after winning one of the 'unofficial' awards of the evening.

Water's Next awards co-hosts got their game faces on before the event, a tribute to the Toronto Raptors appearance in the NBA Championship.

Welcome to Water's Next 2019

WATER CANADA brought together industry leaders from across Canada and around the world to celebrate the people, projects, and technologies that are creating a healthier, cleaner, and more vibrant water sector.

Presented annually at a gala dinner during the Canadian Water Summit, the Water's Next awards is the only awards program that honours leadership and innovation on a national scale. This year's summit and awards took place at the Blue Mountain Resort in the Town of the Blue Mountains near the southern shores of Georgian Bay in Ontario.

This year our selection committee was composed of experts from a wide variety of industry sectors. They poured through 49 finalists across 11 categories to choose the best of the best. Once those winners were selected, the judges then chose the top company, and the top individual, to receive the overall honours of Company of the Year and Water Steward of the Year.

Congratulations to all of this year's award finalists and thank you to everyone who took the time to put forward nominations.

Without further ado, we present the winners of the 2019 Water's Next awards.

L-R: Karen Finney, Computational Hydraulics International (Presenting); Claire Oswald, Ryerson University; Kerry Freek, Water's Next host.

Credit: Ryerson Urban Water

The pilot project led by Claire Oswald is looking at how road salt use can be reduced with a brine making machine, a relatively small financial investment compared to alternatives (e.g. beet juice, cheese brine.).

Marsolais-Nahwegahbow (centre) with ALUS' Katherine Balpataky and event co-host Kerry Freek.

Academia:

Claire Oswald, Ryerson University

"I THINK IT IS STELLAR and should be commended."

That is how Angela Murphy, manager of research and partnerships at Ryerson Urban Water, described Claire Oswald's practical research that aims to reduce road salt use on private properties.

As a part of this research, Claire has been leading a pilot project on Ryerson University's campus to develop best management practices on salt storage and application. She has been working with Ryerson University's Facilities Management and Development team on this project.

Since January 2019, the facilities team has used brine on four pilot areas during five winter storm events. Thanks to the pilot project, Ryerson University was able to reduce the use of road salt and was able to achieve cost-savings by using brine in the right conditions. There were also aesthetic benefits because people's shoes were cleaner when they walked through areas where brine had been applied instead of rock salt.

Given that road salt is used across Canada, scaling this type of pilot project to other parts of the country could help address issues associated with the salinisation of fresh water bodies.

"With population growth, we're putting down more road salt. It is still our first choice when it comes to achieving bare pavement for road safety," said Claire Oswald, an assistant professor at Ryerson University. "The ecosystem that are living in these freshwater [bodies] are not tolerant to major shifts in salinity. I think that I think it [oversalting] is an easy issue to solve, especially on the private properties. We can educate private contractors who are responsible for winter maintenance, and property managers, that this is an environmental issue." WC

Business:

Mark Marsolais-Nahwegahbow, Birch Bark Coffee Company

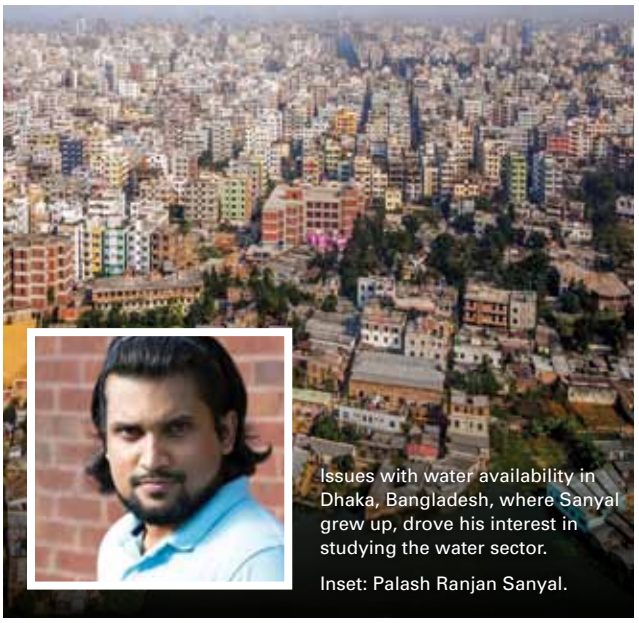
IT HAS BEEN JUST 16 months since Mark Marsolais-Nahwegahbow introduced Canada to the Birch Bark Coffee Company. But in that short time, he has gained national attention for his effort to directly support the water crisis plaguing Indigenous communities across Canada through this new business venture.

"Birch Bark Coffee Company is much more than selling coffee: it's about self-determination, self-governance, and integrity," said Marsolais-Nahwegahbow.

An Ojibwe and band member of the Whitefish First Nation on Birch Island in the District of Manitoulin in Ontario, Marsolais-Nahwegahbow's company offers organic, fair-trade coffee that is certified SPP (Simbolo de Pequenos Productores) certified and produced by farmers with Indigenous descendants. The SPP is the first fair trade farmer-owned certification system, and its logo appears on every bag of Birch Bark coffee sold.

Ultimately, he hopes to use his coffee two-fold: to educate the public on the Indigenous water crisis through the company's website, and also to provide clean drinking water for Indigenous families throughout Canada. With every 50 bags sold directly to customers, or 100 bags sold in retail stores, Birch Bark is able to install one home with a certified water purification unit.

"Much of the federal water mandate is focused on the public water systems, but many of our communities have poor infrastructure to begin with and no access to public water systems." Coffee making a difference. WC



Issues with water availability in Dhaka, Bangladesh, where Sanyal grew up, drove his interest in studying the water sector.

Inset: Palash Ranjan Sanyal.

Young Professional:
Palash Ranjan Sanyal, University of Saskatchewan

PALASH RANJAN SANYAL learned the importance of clean water from a very young age.

Growing up in Bangladesh, he did not have access to running water at home. Instead, his family relied bi-weekly delivery from water trucks, as well as water from the nearest mosque.

"It was my duty to collect water from the nearest mosque every day from the age of eight. There were days I would have to skip school to ensure we had water at home."

It was this experience that laid the foundation for his interest in water and sanitation, subjects he passionately studies now at the University of Saskatchewan (USask).

After completing an initial Master's degree focused on sanitation, he focused his studies on obtaining his Master's in Water Security degree from the school of environment and sustainability at USask. Upon completion of his studies, Sanyal was hired by the school to coordinate placements for the very program he graduated from.

"The position provides me with the chance to interact with different stakeholders in the sector, create options for engagement for the Young Water professionals of the future in Canada. It's a gratifying job as I get to be involved indirectly with multiple projects."

But he hasn't stopped there. He is now focusing on organizing the TEDx University of Saskatchewan event, as well as Blue Drinks Saskatoon.

"There are lots of engagement opportunities for water professionals like me in Saskatoon, considering it's a connection to mining and agriculture industry."

In 2017, Sanyal became a permanent resident of Canada. Canada is lucky to have him. WC

John Zhang accepts his award at the 2019 Water's Next awards.

Credit: OCWA

A UV channel prior to cleaning.

Credit: OCWA

A UV channel post cleaning.

Government:
John Zhang, Ontario Clean Water Agency (OCWA)

SOMETIMES THE BEST THING you can do to address a challenge is to look outside your industry.

This is what happened when John Zhang, a senior program manager of water process optimization at OCWA, was working on a project to control fresh sponges at a wastewater treatment facility in southern Ontario.

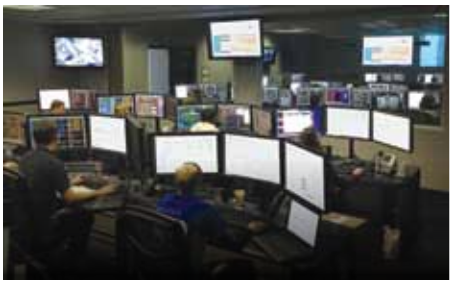
The operations staff at the facility were consistently finding a layer of glue under the UV channel. The staff tried to tackle the issue using a chlorine disinfectant but the glue kept on coming back.

After some testing, OCWA confirmed the wastewater treatment facility was dealing with fresh sponges. Although the appearance of fresh sponges created maintenance issues for the operations staff, it meant the plant was operating quite well because fresh sponges like to grow in clean water.

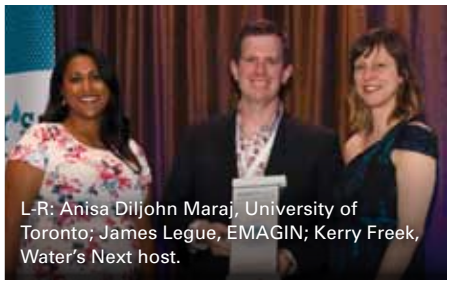
"We did some research and found that there are very few plants in North America that have this issue," said John. "We only saw one or two report that happened to them. But once it happened, it could be very nasty."

John discovered that nano coatings, which are normally used by the food industry for bacterial protection, could be used to protect the walls of the UV channel and reduce the amount of maintenance required by operators.

"I think that what is unique to John is that he is very holistic in his thinking," said Sangeeta Chopra, director of process optimization and technical services at OCWA. "He can be very detailed and really look into the nuts and bolts. He also has a very strong sense of the big picture and the overall good of the communities." WC


Credit: EMAGIN


Credit: EMAGIN


L-R: Anisa Diljohn Maraj, University of Toronto; James Legue, EMAGIN; Kerry Freek, Water's Next host.

Wastewater: **EMAGIN**

"ONLY 21 PER CENT of utilities feel they are fully able to cover costs of service," according to Eric Bindler, research director for digital water at Bluefield Research.

This was one of the findings of a report released by Bluefield Research and Arcadis in June 2019, which examined how artificial intelligence and predictive analytics can help utilities in the United States address affordability. The overall findings of the report indicate there is a need for solutions that can help utilities reduce costs by increasing operational efficiency.

"In the next decade, the operational expenditure specifically for wastewater systems across North America is expected to represent around 40 per cent of the total cost of operations," said Emma Weisbord, marketing lead at EMAGIN. "In recent polls, 50 per cent of utilities feel that they are less able to fully cover the cost of providing continued service."

"This is a really worrying number that we are facing and it is important to realize that there are significant opportunities for technology to reduce expenditures while also improving operational resilience," Weisbord added. "Finding solutions like our AI technology that can enhance those efficiencies within wastewater treatment systems in real time is really crucial moving forward."

Currently, EMAGIN is working on a pilot project with a wastewater utility in southern Ontario. The company's aim is to use its technology to help the wastewater utility improve its operations by moving from reactive and static controls to predictive and dynamic intelligent controls. The results of the pilot project are expected in the coming months so stay tuned for more details. WC

Credits: Water First

L-R: Award presenter Eric Meliton from the TRCA, Water First's Ryan Osman and John Millar, and Water Canada's managing editor Andrew Macklin.

Kerry Freek (centre) accepts the award on behalf of LWS, alongside co-host Andrew Macklin (left) and Dr. Reagan Davidson of Imbrium Systems.

Drinking Water:
Water First Internship Program

FORTY PER CENT. That's the number of First Nations communities in the province of Ontario that are facing boil water advisories, or have until recently.

Part of the issue is infrastructure, but governments are taking strides at closing that gap. But even if the proper facilities get built, there is still a serious all-too-familiar issue that has to be addressed; the need for qualified operators to run the systems.

That's where Water First has stepped in, and that's why the Water First Internship Program captured a 2019 Water's Next award. The non-government organization, which began working in Uganda in 2009 before beginning its engagement with First Nations communities in 2012, works to address drinking water and environmental water concerns throughout Ontario and Quebec. To date, that has involved working with over 35 communities to address these issues.

The Water First Internship Program addresses a specific need; the need for water operators that are qualified to use the community's infrastructure and live within those same communities. With funding support from its partners, the program offers a paid 15-month internship program that provides training in water treatment and environmental water quality monitoring. The interns work within their home community water treatment plants during their internship.

So far, the results have been nothing short of outstanding, as the participating communities now have the next generation of highly-skilled water operators, ones that can take pride in providing clean water for their friends, their neighbours, and their own family. WC

Water Resources:
Livestock Water Recycling System

CLEAN WATER FROM MANURE. To most people, including some in the water sector, the concept of this bears on preposterous. But for Livestock Water Recycling (LWR), the winner of the 2019 Water's Next award for projects and technology in the water resources space, this is the reality of their thriving global business.

This wasn't the company's initial foray into the space. For over 15 years, the company was in the business of systems built to treat hydrocarbon-contaminated groundwater. But one conversation with one farmer changed their focus.

"Just over a decade ago, an Alberta hog farmer approached us desperate for help with his overflowing manure lagoon," said LWR's marketing and communications specialist Lisa Fast. "It immediately made us aware of the economic and environmental impacts of manure, but little did we know that that one conversation would completely alter the course of our innovation and set us on an inspired path to change the way manure is managed around the world. We set out to create a technology that would disrupt this market and replace an old fashioned and costly way of dealing with waste."

The system, borne out of the company's Calgary-based Innovation Centre, uses a process by which dry solids, phosphorus, fine solids, and nutrient concentrations are removed, filtration and conditioning occurs and clean, reusable water becomes one of the by-products.

"Only four per cent of all water consumed on our planet is recycled for reuse. Our mission is to change that statistic, and this award exemplifies how supportive Canada is of this mission.". WC

Stormwater: EnviroPod

IT STARTED SIMPLE. Mike Hannah talked to his university buddy and fellow diver, Greg Yeoman, about the need to invent a product that would catch litter and contaminants in the water before they had the ability to flow out to the lakes, rivers, and oceans.

After designing a prototype and founding Stormwater360 in their home country of New Zealand, they introduced their EnviroPod Filter to the market, a product that now has more than 25,000 installations worldwide.

But it is the evolution of that product, the LittaTrap, that earned the 2019 Water's Next award for stormwater.

"The stormwater industry has seen a tremendous influx of innovation over the past few years, so recognition of our technology and the importance of protecting our waterways was a huge win for us and has given us greater encouragement that we are making a difference," said Hannah. "Enviropod was started with a simple philosophy; to protect the world's waterways. To be recognized for doing just that is something we are incredibly grateful for."

The product can be installed in existing sewer drains and will catch anything that flows into the drain that is the size of a cigarette butt or larger. Based on what Hannah and Yeoman learned after the release of the EnviroPod Filter, they understood that the LittaTrap needed to be a product that just removed the larger garbage and debris from stormwater runoff, which could then be easily removed and disposed of.

After seeing the debris that the LittaTrap removed and having the appreciation for what they wouldn't be diving through as a result, the guys knew they had a product that could make a difference.

"Every time a LittaTrap is removed full of plastic, you realize just how impactful it can be." WC

Credit: EnviroPod

A LittaTrap is removed from a storm sewer with an abundance of debris.

L-R: CWWA Executive Director Robert Haller, EnvirPod's Mike Hannah, Dr. Reagan Davidson of Imbrium Systems, Water Canada's managing editor Andrew Macklin, and EnviroPod's Greg Yeoman.

Credit: Robert Haller

The team at SanEcoTec come together to celebrate their 2019 Water's Next award.

Early Adoptor: SanEcoTec Ltd.

"AGRICULTURE MAKES UP 70 PER CENT of total global water consumption," according to SanEcoTec's Water's Next nomination. "The global population is expected to increase to 9.8 billion by 2050 (UN-DESA) with an estimated 60 to 100 per cent increase in crop production needed to feed the population (Environment Reports)."

Due to these global demands, there is a need for companies like SanEcoTec to come up with solutions that can provide water treatment to help improve crop productivity.

Currently, SanEcoTec is working with an aeroponic vertical growing system company that has a highly controlled and effective growing system in place, according to SanEcoTec.

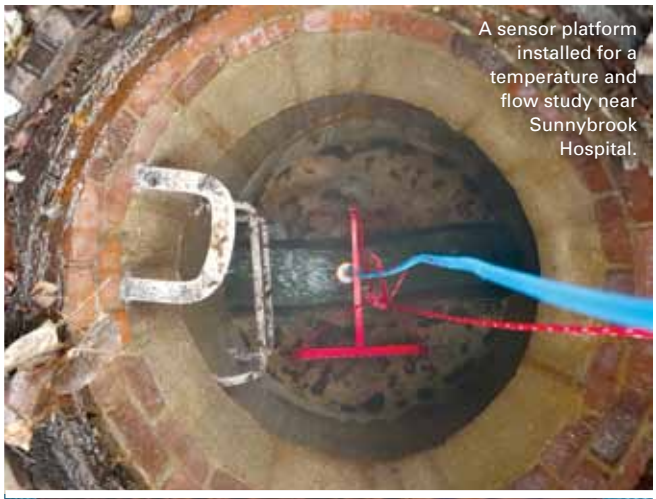
For a period of the time, SanEcoTec's client was struggling with its irrigation system. The aeroponic vertical growing system company was able to reduce the amount of water it was using onsite by recirculating its water on an ongoing basis. However, the company needed to ensure that it is only using high water quality water so that the aeroponic nozzles, which are very small and very fine, do not experience blockages.

To help alleviate the issue, SanEcoTec implemented a solution that is helping the aeroponic vertical growing system company monitor and manage the pH and the sanitizer levels in the water to improve the quality of the water that is being used.

Thanks to SanEcoTec, its client has maximum control over the quality of its water. One of the results of implementing this technology has been is that the aeroponic vertical growing system company has been able to produce greater yields of high-quality crops in a small footprint. WC

Credit: City of Toronto

Hardware mounted on sidewall of chamber. The City of Toronto was one of the first to do this with its product and provided important feedback.



A sensor platform installed for a temperature and flow study near Sunnybrook Hospital.

Credit: City of Toronto

L-R: Dave Murray, Kerr Wood Leidal Associates Ltd.; Arash Farajian, City of Toronto; Yiyi Shangguan, City of Toronto; Kerry Freek, Water's Next host.

Conveyance and Company of the Year:

Toronto Water

A LOW-COST SOLUTION is helping Toronto Water address water pressure extremes and ensure its customers continue to receive a steady, continuous supply of water.

"The City of Toronto is set-up in district pressure boundaries," said Arash Farajian, a policy planning and project consultant from Toronto Water. "They are isolated boundaries for where water gets delivered to and we have to maintain the pressure. If for whatever reason, whether it is a break or maintenance issue or valve in a wrong position, it impacts the pressure. There is really no way of us knowing ahead of time without any kind of smart grid infrastructure until somebody complains."

If not addressed, water pressure extremes can create a number of issues for customers. High water pressure can cause appliances that receive water, like washing machines, to fail prematurely since their seals might not be designed to withstand more than what is considered normal for a typical home. On the other hand, low pressure could restrict the flow of water to homes, which means that appliances might take longer than normal to fill.

"We had a very bad experience couple of years ago with St. James Town, where we were having pressure issues and it really took us the entire summer to figure out where they were coming from," Farajian said. "We had to touch nearly 300 valves in order to figure out exactly what valve was in the right or wrong position to try to address that issue. So that really was the reason to for us to look into some smart grid infrastructure solutions."

Since 2018, Toronto Water has been monitoring the water pressure in a pilot area using BeWhere, a solution that uses Internet of Things (IoT) to track assets. The biggest difference between this technology and alternatives is the communication protocol, according to Farajian. At the time that the pilot project was undertaken, Toronto Water was unaware of other solutions that had the LTE-M connectivity. An added benefit of using this solution was that Toronto Water had the opportunity to sit down with BeWhere's research and development team and build the solution from the ground up.

"It has been an amazing experience," Farajian said. "We have been able to find potential pressure issues in some areas in Toronto before residents complain so we have been able to be more proactive with our services."

While the pilot project is still ongoing, it is expected that the project will be expanded to other parts of the city that Toronto Water can truly create a smart grid. WC

Emma with her awards for NGO and Water Steward of the Year.

Credit: AtlanticDataStream

Volunteers throughout Eastern Canada are collecting data that is helping influence government decisions on watershed management.

Non-Government Organization and Water Steward of the Year:

Emma Wattie, Atlantic Water Network

GROWING UP IN NEW BRUNSWICK along the banks of the Saint John River, Emma Wattie worried every spring that the river could spill over the banks and threaten the homes of her and her friends. What she recognized in her youth about environment and resilience fuelled a passion to learn, and that same passion is what drives her today as a program manager at the Halifax-based Atlantic Water Network (AWN).

While working on her undergrad in Freshwater Biology at St. Francis Xavier in Antigonish, Nova Scotia, Wattie met a group of fisherman who taught her about a serious concern in Atlantic Canada: salmon populations, and how they are impacted by human and climate factors.

"During my undergrad thesis research I was able to work with a local environmental non-profit whose origin was a group of concerned fishermen who weren't seeing the same number of salmon return year after year. When I was working with the group, they were celebrating their 30th anniversary, and I was fascinated on how the community came together to work on a common area of concern."

With AWN, the organization formed from the work of the Community-Based Environmental Monitoring Network, based at Saint Mary's University, Wattie finds herself again immersed in educating people on, and tracking, Atlantic salmon populations.

"Several of our partners work with local schools on "Fish Friends" programs where kids get to help hatch salmon eggs and then release them into the wild. This is a great program in that it exposes school age children to the lifecycle of salmon and also plants the seed as to why there is such concern about Atlantic salmon populations."

But the success of the AWN's programming, led by Wattie, goes well beyond fish populations in the region. Wattie and her team have embraced the value of big data, and understand the impact of being able to track variations in watershed conditions. That's why the network has worked diligently to try and disseminate the information they collect from the community environmental monitoring to better understanding what's impacting the water quality in Atlantic Canada.

"Data is knowledge, if you don't know what your baseline conditions are then it's difficult to define changes. Our training and equipment ensure that groups are collecting high quality data, which they can then take to decision makers– whether that's a level of government or the community as a whole and share what they've found."

The quality of the data is vital to building positive relationships with local and provincial governments especially, as the monitoring work saves the government the expense of having to do it themselves, but also the data can help to direct funds to watershed management in the most cost-effective way possible.

"Slowly but surely, community-based water monitoring is becoming more trusted by decision makers, but by tapping into our training programs groups have been able to accelerate that trust with their local governments and decision makers. This is incredibly reaffirming for Atlantic Water Network and helps us to create more resources to better improve Community-monitoring programs."

Under Wattie's programming leadership, and with a strong team surrounding her, community programs throughout Eastern Canada are producing new, valuable data sets. And there is a definite need, as the 2017 WWF Canada watersheds report showed clear data deficiencies in multiple watersheds throughout the Atlantic Provinces.

"Atlantic Water Network's goal is to help make these groups' data more accessible and comparable. That's why we teamed up with The Gordon Foundation to make Atlantic DataStream possible. So many groups have data, but it may not be stored in a format that local decision-makers can use it. Picture everything from floppy disks to shoeboxes of field sheets in the back closet. So much time, energy, and money is put into collecting data, so we want to help our partners make sure it's used to understand our watersheds." WC

Brownie Awards 2019

Recognizing Excellence in the Remediation and Redevelopment of Brownfield Sites Across Canada

Tuesday, November 26

Reception: 5 p.m.

Dinner: 6 p.m.

Delta Toronto Hotel
75 Lower Simcoe St.,
Toronto, ON

HELP US CELEBRATE OUR 20th YEAR!

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AWARD CATEGORIES:
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REMEDIATE
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REINVEST
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Redevelopment at the local site scale

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BROWNFIELDER OF THE YEAR
Recognizing an outstanding individual in the industry

DINNER SPONSOR: $7,500

Award Ceremony Opening Remarks

- Three-minute introduction opportunity at gala

Table for Eight at the Gala

- VIP table location

Company and Logo Recognition

- Company name and logo on all awards-related communications material (web, social, print)
- Photos for post-event use
- Mention in post-event summary, email broadcast and article in ReNew Canada magazine

AWARD CATEGORY SPONSORS: $4,000 each

Award Ceremony Opening Remarks

- Senior representative invited to introduce category award presentation at gala

Table for Eight at the Gala

- Priority table location selection (first-come, first-served)

Company and Logo Recognition

- Company name and logo on all awards-related communications material (web, social, print)
- Photos for post-event use
- Mention in post-event summary, email broadcast and article in ReNew Canada magazine

SINGLE TICKETS: $250

CORPORATE TABLES: (eight guests) $1,800

For more information, contact Nick Krukowski at 416-444-5842 ext. 101 or nick@actualmedia.ca

brownieawards.ca

Using the software, York Region was able to collect all of its data resources in one location, which allowed a comprehensive map to be built of all of its underground pipes.

ALL PIPES

Solving an underground problem with an above-ground solution.

BY JENNIFER CHUNG

THEY SAY YOU KNOW A HIT SONG because the first time you hear it you feel like you've heard it before. Some ideas are the same; so good that when they are finally put into practice you can't believe anyone even hesitated. York Region's All Pipes solution is that kind of idea.

Here it is: through collaboration between York Region and our nine local municipalities, we maintain a single common standardized schema and water/wastewater utility dataset, accessible to all partners.

We knew we had to track and be ready to update our system and assumed money, time, and effort would be saved if we partnered with others.

In 2011, we knew York Region was going to start developing faster. This growth turned out to be explosive. We knew our infrastructure had to be ready for this, but infrastructure maintenance is expensive. Our water-wastewater projects costing $4.8 billion to 2031 jumps up to $6.6 billion to 2051. But in 2011 there was no common, complete system, or database for all the data about the Region's pipes, positioning, ownership, or material type. We needed to save money while preparing for the future.

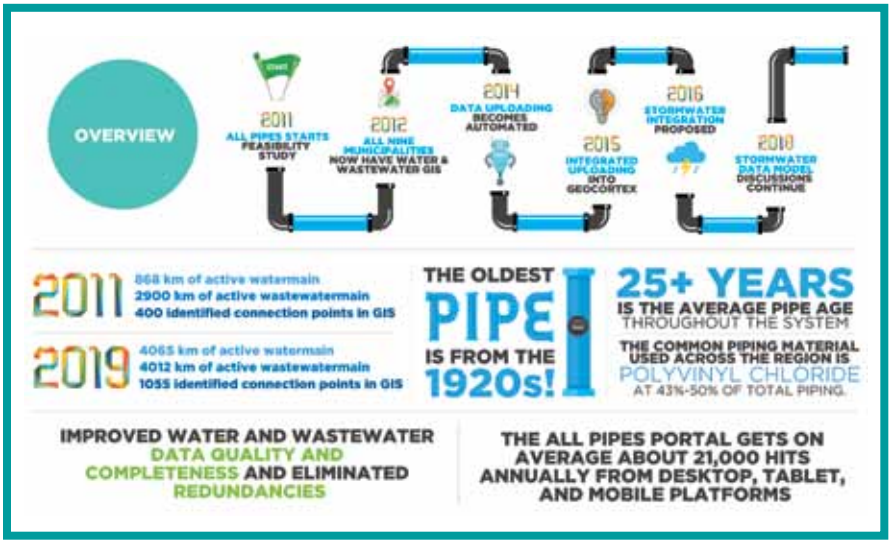
Through the All Pipes solution's architecture, we now have a database to support planning, emergency management, and other business and operational needs. We established 'meet points' where Regional and local pipes join, enabling easier identification of asset ownership, as well as supporting analysis and reporting. This also enables an automated ETL (data manipulation—extract, transform, load) process to accept local municipal data and automatically integrate it within a common Regional database, without making local municipalities change their own approach to data collection and storage.

There was also a legislative drive behind this idea. The provincial government requested every Ontario municipality to build a hydraulic water model of their water and wastewater pipes via an asset management plan, so they would know if—among other things—there was enough pipe capacity for projected growth.

Three of the nine partners had no data in a GIS system for, as an example, their water pipes. They knew they had to prepare the model, and this was going to be a big change. To reduce resistance and speed up compliance, we financially supported our partners to convert their CAD drawings and as-built construction drawings to digital, easily shared data. This meant the municipalities also had to organize their assets. While this is a huge undertaking there was an understanding that while each municipality and utility may be unique, we all share obligations and regulatory requirements.

Recognizing that, to a certain extent, information management strategies can be standardized and shared has enabled each municipality to save money and inter-operate their pipe systems more

Source: Esri



An overview of the challenges that faced York Region, and how those challenges were addressed.

effectively. This resulted in immediate savings because the municipalities did not have to pay a consultant to set this up independently. We had a system they could easily plug into and they knew if the projected growth was accurate they would also realize more taxes.

Not every municipality in York Region has the same projected explosive growth but they all want to save taxpayer's money. Georgina, Ontario, which borders Lake Simcoe, has a population of approximately 50,000 and operates as a town that includes a variety of small communities, many of whose population booms in the summer. Although its infrastructure isn't under immediate threat, it is also not as interconnected as with other municipalities in the Region. It's a strong structural base as David Scherbarth, operations analyst with the Operations and Infrastructure Department for Georgina, explained. "Leveraging tech is not something we had extensive resources to do." However, Georgina's mayor and regional councillor who represent the Town at York Regional Council endorsed it for Georgina when they heard about it and the advantages were quickly realized. Scherbarth said that now "we use this data on a daily basis" and the many sources of asset data now go directly into the communal GIS database.

Through non-duplication of efforts, partners save an estimated $445,000 annually.

Sharing pipe information is more than just responding to growth. It is a safety issue too, said Brian Bell, director for utilities with Esri Canada. "As our buried infrastructure ages, and the interconnections between companies and municipalities become more complex, having a better understanding of the risk and consequences of our asset management actions is essential. It's also essential to have the right tools and mechanisms to consolidate and organize that authoritative content."

It certainly is. We had to easily convert shared data into information so that it was available to all our partners, providing crucial support in a variety of situations. The software was the glue that made that possible.

Data files from different areas are entered via Geocortex and then go on an ETL data management platform. Because all our GIS information is in Esri software, it can read all the data coming in and works well with the Esri GIS architecture. It is displayed to all the partners on an Esri map.

York Region, its constituents and local municipalities are all saving money by coordinating their data sharing practices around industry best practices and standards, enabling them all to do more with both their own information and that of their peers. WC

Jennifer Chung is a GIS technologist with The Regional Municipality of York.

Flood Mitigation

EPCOR provides insights on its plan for Edmonton.

BY SIMRAN CHATTHA

Credit: EPCOR

A dry pond in the City of Edmonton. Dry ponds are designed to collect excess water during heavy rainfall and protect communities from flooding.

EDMONTON, similar to many cities across Canada, is dealing with intense rainstorms. These rainstorms are leading to flooding and having negative impacts on infrastructure (e.g. overwhelming the drainage system).

EPCOR started to take a fresh look at flood mitigation when it took over the drainage utility from the City of Edmonton in September 2017. Since that time, EPCOR has developed a flood mitigation plan that will help Edmonton better plan for intense rainstorms in the future.

Water Canada had an opportunity to speak with Susan Ancel, director of stormwater strategies at EPCOR, about the utility's flood mitigation plan for Edmonton. We asked her a few questions to dive into the need for the plan, what innovative approaches were used to develop it, and what lessons the utility learned while developing the plan.

What situation was Edmonton facing that required the development of a flood mitigation plan?

For Edmonton, the strategy started even before the southern Alberta floods [that occurred in 2013]. We had some fairly substantial urban flooding in 2004 as well as in 2012. We have had a few others [floods] since then.

What we recognized at the city was that things were changing. Flooding was happening where you did not expect it to happen so there needed to be a change. It could not just be about chasing the flood that happened yesterday. We also needed to ask whether there are areas of the city that are at risk of flood tomorrow. That was the genesis of the project.

What types of innovative approaches has EPCOR used while developing the flood mitigation plan?

We undertook a really sophisticated public engagement session as part of the work we did in preparation of our October report to council. We came up with flooding scenarios, but rather than talking about a one-in-100 or one-in-50 year storm, we translated that into the what it would really mean to a homeowner. You have water on your front lawn, you have water in your basement, your in-laws have been displaced and are to be living with you for the next six months. It was interesting because the one thing we forgot was pets so that was the number one comment we got back.

We included these scenarios in a survey that had 1,500 participants. We ran it with a professional polling service that would typically call you and ask you who you are going to vote for. It was one of those agencies that ran the survey, which went out to our demographics – males, females, income levels, high rise apartment dwellers, people who park underground at home, park underground at work, the whole inner-city developing community, and all that. That information is available on our website.

We went through a MaxDiff survey approach where you were randomly presented with five of these scenarios and asked what you would protect first versus what you would protect last. It was actually a bit of a surprise because a lot of our conversations were so driven by insurance and everyone was talking about the financial risk of flooding.

The top results of the survey that came back from the public as highest priority were tied. One of the results was the risk to health and safety, which includes risk to human life due to the depth of flooding or exposure to sanitary sewage or mold. The second risk was the social risk—so if your hospitals flooded and are out of commission for six months. Or if your water utility, power utility, or gas utility is even functioning. This has an impact if you are trying to deal with flooding in your home and you have no power, you have no water to wash anything. That is a big deal. Those came out as is really high priority.

Unfortunately, the environment came out quite low, as in let the let the banks collapse, but we have obligations to our regulatory body to continue on the environment. We weighted it a little bit lower, but it was not the highest thing.

When we combined all the risks together, we were able to define what areas were the highest priorities to work for on flood mitigation. In our initial publication, we published these maps that showed the risk of flooding based on health and safety, based on environment, based on social, and based on financial for that spectrum of storms along with how we combine it together.

The nuance I would say is for a health and safety risk, we said that if any one property in that region was at risk from a health and safety perspective it got the maximum rating. In the financial risk [category], it was based on the percentage of properties that were exposed. It was the same data but looked at a little bit differently.

What are some lessons EPCOR has learned while developing the flood mitigation plan?

We have to start thinking about the insurance industry as our partner, as opposed to our enemy. One of the challenges in the community, if you go back even five or ten years, was related to the way flood mitigation projects were prioritized in the utility or municipality.

Typically, we would have to have a certain number of flooding events for us to say that properties are at risk and so then we would initiate our project. But by that point, the insurance industry has said those properties are at risk and that it is no longer going to insure them or it is going to offer really expensive insurance. Then we go and do an upgrade. [At that point], the poor homeowners have lived through the floods, then lived through the construction. Then they go back to their insurer and the insurer says no.

So how do we close that that boundary? It is really hard because there are insurers, there are thousands by the time you include the reinsurers, the insurance brokers, the agents, the modelers that are doing that modeling. […] We all recognize it is an issue. WC

Simran Chattha is the associate editor of Water Canada.

Water Priorities

Industry leaders on the biggest issues for the next federal government.

RECORD INVESTMENTS in water infrastructure across the country have put a dent in the needs for new and rehabilitated assets, but there is still a substantial amount of investment needed. At the same time, there is still significant work to be done at the federal level on issues such as flood resilience and microplastics. And of course, the self-imposed target of ending all boil water advisories in Indigenous communities by the end of 2021 will take a great deal of work from the next government.

With the October 21st federal election looming, we reached out to a handful of industry experts to get there take on the greatest industry priority for the next government. We asked each for 50-75 words in an answer of the following question:

From your perspective, what policy, program, or initiative could the next federal government institute in order to have the greatest impact on the Canadian water sector?

Here is what they had to say.

Bernadette Conant, CEO, Canadian Water Network

"Water connects everything and everyone—and resonates with all Canadians. This provides a powerful gateway for achieving collective action across all sectors and governments. The next federal government should leverage the potential to advance water-related mandates through a national initiative to establish water goals, and then apply these goals across multiple federal departments to achieve progress on water through governance and financial innovations."

Madjid Mohseni, Science Director, RES'EAU-WaterNET/ Professor, University of British Columbia

"Leaders' fear of public failure drives their reticence toward making what they see as gambles on novel innovations. Failure, after all, often makes for great headlines. The Community Circle™ model, however, pools risk among collaborating decision makers so that they are more open to the promise of innovation and are therefore better prepared to make investments in game-changing solutions."

Irene Hassas and **Doug Wilton**, Co-Chairs of the Water Subcommittee of the Ontario Environment Industry Association (ONEIA)

"Ontario water companies would love to see the federal government launch a targeted program that funds municipalities to adopt new water technologies. There is a definite role for government in this area and it would help our companies sell their technologies into other markets."

Giovanni Cautillo, Executive Director, Ontario Sewer and Watermain Construction Association

"The federal government needs to continue to focus on asset management. The implementation of a standardized asset management plan that all municipalities can follow will level the playing field and reduce the current gap that exists between those municipalities that have adequate population for full cost recovery and those that lack such population. Knowing what each municipality has in the ground, and in what state, is the link to advancing water and wastewater."

Robert Haller, Executive Director, Canadian Water and Wastewater Association

"The people that manage and operate the water and wastewater systems in Canada are not politicians; we are scientists and engineers. We are very concerned with the climate crisis facing our world and how that affects our community's water supply, energy consumption, and risk of flood and fires. Much of the adaptation, and the potential solutions, lie within the municipal realm, but we need national-level leadership on strategies that include the funding to implement such strategies."

Brenda Lucas, Executive Director, Southern Ontario Water Consortium

"To support Canada's excellent water technology sector and drive innovative and sustainable cities, the federal government should modernize Wastewater Systems Effluent Regulations to set clear performance targets for effluent discharge, resource (nutrient, energy, and water) recovery and greenhouse gas reduction. Also, all programs for infrastructure funding should require municipalities to have strategic asset management programs, implement comprehensive optimization, and incentivize the adoption of new technology to get the most out of existing infrastructure."

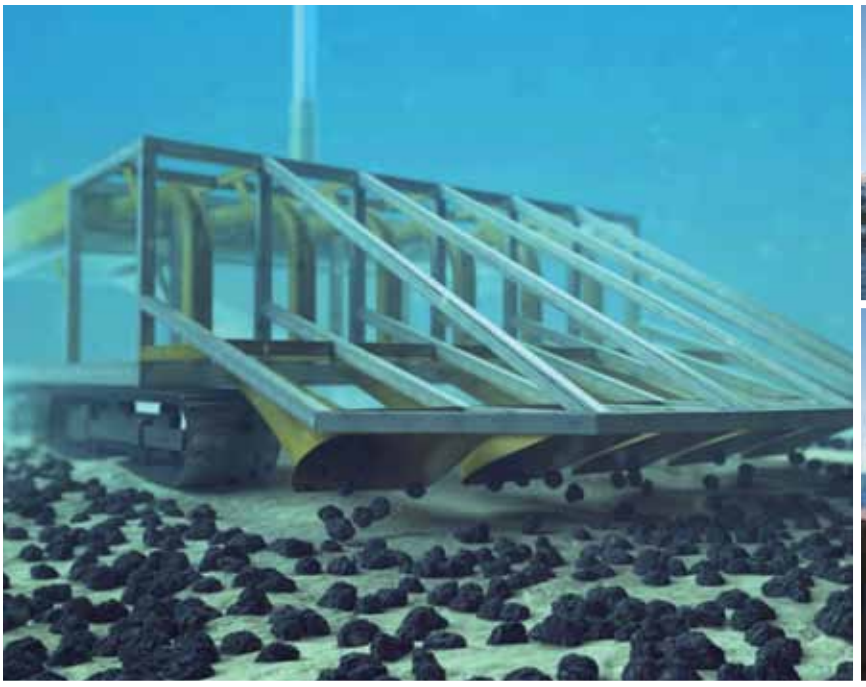
Dr. **Zafar Adeel**, Executive Director, Pacific Water Research Centre

"Canada needs a national vision that describes our relationship to water, our future aspirations, the requisite policies, and what we offer the rest of the world. The federal government must foster a national dialogue to achieve this vision and ensure that all voices—particularly indigenous perspectives—are included. The Canadian water vision should relate to the Sustainable Development Goals for 2030 and benefit from ongoing Canadian initiatives for the Water Decade for Action (2018-2028), such as IWDA."

Stephen Braun, President, Canadian Water Resources Association

"A key federal priority for water should be the modernization of the Canada Water Act. An updated act would allow greater opportunity for collaboration, cooperation, and reconciliation. Its renewal is needed to effectively define our shared ambitions around water. We need a re-tooled and stronger framework to inform collaborative governance approaches and the many multi-faceted initiatives being implemented for environmental protection, water security, and climate resilience."

Stay tuned to Water Canada as we provide you with industry-focused coverage of the 2019 federal election right up to Election Day.
Visit **watercanada.net** or follow us on **Twitter @CanadianWater** for updates.



PLUMBING THE DEPTHS

Will seabed mining sink or swim?

BY SAUL CHERNOS

MINING INTERESTS have set their sights on a new frontier—plumbing the depths of the world's oceans for metals as varied as those found atop the highest mountain ridges, along jagged coastlines, and in forests from the Amazon to the Boreal.

Until now, mineral extraction has been confined to dry land, and its had a troublesome environmental, safety, and human rights track record. Earlier this year, after a tailings dam collapsed in Brazil, killing 300 people and contaminating multiple waterways, its owner acknowledged similar risks at three other mines. In our own backyard five years ago, a tailings pond breach at the Mount Polley copper and gold mine in British Columbia dispatched nearly 25 million cubic metres of slurry into local waterways. From acid rock drainage along Canada's west coast to radioactive waste at decommissioned uranium sites in northern Ontario, mining has often had a fractious relationship with the environment and local communities.

Enter Vancouver-based Deep Green Metals, which is among a new crop of companies looking to harvest resources from some of the deepest zones of the world's oceans. Deep Green has exploration authorization from the International Seabed Authority, the United Nations agency that oversees international waters, and an agreement in principle from the Island of Nauru in the South Pacific Ocean between Hawaii and Mexico to operate in its territorial waters in the Clarion-Clipperton Zone. Mining ocean floors isn't an entirely new idea—the UN Law of the Sea, prompted by demand for ocean-borne resources, dates to the early 1970s and exploration has been underway for more than a decade.

At its annual convention in Toronto in March, the Prospectors and Developers Association of Canada devoted an entire session to seabed mining. Speaking alongside scientists and entrepreneurs, Deep Green Chief Development Officer Anthony O'Sullivan promised a decidedly ethical approach, describing "clean metals from the seafloor" as one of the biggest disruptors facing the base-metals industry. A promotional video outlined his company's pledge: an untapped supply of polymetallic nodules sitting on the ocean floor, often at considerable depths, holds the key to saving the planet. "Never before in the history of the world has the precautionary principle been applied at this scale," the narrator said, describing "years of environmental assessments" and the drive for polymetallic nodules containing nickel, copper, cobalt, manganese and other metals to build lithium-ion batteries needed to power windmills and other sustainable technologies. "The world needs this because we've seen how the land has been devastated everywhere around the world, and this is a lot better way of extracting minerals. Deep Green is on a quest for a more sustainable planet, to secure our supply of metals for our future. It's a big responsibility on our shoulders. We need to make this happen."

As the video trailed off, O'Sullivan described how remotely controlled

autonomous vehicles would pluck rocks off the ocean floor, filter out the mud and put it back, and then pump the harvest through hydraulically powered, closed-loop systems to vessels on the surface. The return water would then be discharged at a depth deemed to have a low environmental impact.

O'Sullivan said Deep Green doesn't plan to work ecologically sensitive active hydrothermal vents, which lie well beyond the company's exploration zone. While those vents have expelled massive sulfide deposits over millennia, giving rise to rich metal resources, they also release geologically warmed waters which nurture rare deep-sea habitat. Instead, Deep Green is pursuing polymetallic nodules which lie on the ocean floor, and would restrict itself to selected patches rather than clearing entire areas wholesale. "It's actually environmentally a much lower footprint on the planet than what (mining is) doing today," O'Sullivan said. "Minimal waste, very high grades, clean processing, no waste streams from processing, no deforestation in equatorial areas where a lot of the world's nickel comes from, and no social displacement."

While exploration companies proceed with their research and the ISA considers parameters, Deep Green has secured interest from shipping companies and commodity traders and set 2025 as a target date for production. At the same time, with other companies also working on an array of prospects, Verena Tunnicliffe, professor of marine biology at the University of Victoria, said oceans are a relatively new frontier for scientists as well as miners, with considerable unknown about deep-sea life and geology. "We're going too far too fast," Tunnicliffe said, urging caution and calling for broad public consultation and detailed environmental assessments before any actual commercial resource recovery is permitted.

While Deep Green is interested in nodules which have formed over millions of years through the precipitation of metals from seawater under special conditions, some other companies are exploring vents. Tunnicliffe describes active vents as sanctuaries for warm-water, deep-sea species and wants the ISA to codify them as protected marine ecosystems. "There's precedent for that. Canada has looked at every single one of its own hydrothermal vents, and they're all going into marine protected areas—one already is, the others are all designated." Furthermore, Tunnicliffe said, some companies are talking about scraping thin layers off the ocean floor. "This is the cleanest water in the ocean. It's an ecosystem with its own group of organisms that have never seen sediment. And now we'd be creating massive plumes across the bottom."

At BQE Water, a Vancouver water treatment firm that services the traditional land-based mining sector, technical specialist Patrick Littlejohn sees pros and cons to mining oceans.

On one hand, oceans are vast and capacity for dilution is greater than with surface waters. As well, one common problem with conventional mines is acid rock drainage, where mineral surfaces exposed by mining react with oxygen and release metals, and Littlejohn said this would be of considerably less risk at sea. "The standard way to deal with acid mine drainage is to prevent it from happening by putting it (mineralized water) under water, and here (with seabed mining) everything is already underwater in a deep-sea situation so you don't need to worry about that mechanism of metal release." On the other hand, the potential for sediment disturbance from remotely operated vehicles on the ocean floor is a drawback. "Turbidity and suspended solids are relevant to water quality parameters for rivers and lakes and I would assume they would be relevant water quality parameters for deep underwater as well," Littlejohn said. "So one thing I would look at most closely is the impact of sediment as nodules are removed from the ocean floor."

The practicalities of remediation in an ocean setting also need consideration, and Littlejohn anticipates differences in engineering and scientific approaches on land and at sea. "Probably the big treatment or mitigation angle for deep sea mining would be controlling sediment and running a mining process or a nodule collection process in such a way that you don't kick up or disturb sediment," Littlejohn said, adding that treatment to mitigate impacts after-the-fact is probably not practical in a vast ocean environment. "With deep-sea mining you would want to develop best practices and mitigation methods so you don't have that impact in the first place and obviate the need for treatment altogether."

Regulation is another conundrum. "These places are hard to get to and hard to understand," Littlejohn said. "Baseline information is not going to be as fleshed out as it is for a mine in British Columbia or Chile. Any reviewer or regulator applying environmental assessment or permit conditions around what is required in order to do this safely and sustainably has their work cut out." Furthermore, enforcement would be challenging in transnational zones and at the proposed depths. "How do you send an inspector out there?" Littlejohn asked. "It's difficult for British Columbia to send mining inspectors around the province as much as is needed, and oceans are a lot less accessible."

With prospects for seabed mining as yet unresolved, resource companies might want to take note of recent news reports about fledgling companies eying outer space for asteroids bearing iron and other precious metals. WC

Saul Chernos is a freelance writer based in Toronto, Ont.

APPOINTED

WALTER MARLOWE

Walter Marlowe will join the Water Environment Federation (WEF) as its new executive director on September 9, 2019.

Marlowe brings extensive, high level experience in the areas of civil engineering, construction, certification, and science to the WEF position. This includes a tenure as a director at the American Society of Civil Engineers.

Marlowe is currently the executive director of the American Association of Pharmaceutical Scientists. Previously, he was the executive director of the Construction Specifications Institute and the executive director of the American Academy of Water Resources Engineers.

Walter Marlowe holds a B.E. in Civil Engineering from Stevens Institute of Engineering and an MBA from George Washington University.

"Water quality and availability are among this century's most important and urgent global challenges," Marlowe said. "I'm extremely excited to be joining the WEF community of water professionals and look forward to supporting their vital work and contributing to their incredible successes."

WEF is a not-for-profit technical and educational organization of 35,000 individual members and 75 affiliated member associations representing water quality professionals around the world.

INDRA MAHARJAN

The Ontario Clean Water Agency (OCWA) has announced four changes to its staff

Indra Maharjan is the new director of innovation, technology, and alternate delivery. Indra took over for Don Hoekstra, who retired at the end of 2018. Over his past five years with the agency, Indra has proven his ability to develop energy efficiency programs, identify unique applications for technology, and obtain grant funding for clients.

SHELLEY BONTE-GELOK

Shelley Bonte-Gelok recently joined the innovation, technology and alternate delivery group as program manager of biosolids and resource recovery. She brings two decades of experience to the role and has worked as team lead for biosolids management with the provincial environment ministry for the past 16 years. She will drive OCWA's biosolids management program and Net Zero initiative and any matters related with organics and biosolids.

ALICIA FRASER

Alicia Fraser moved from the role of vice president of engineering, capital, and support services, to vice president of operations for the Peel Region Hub. Over the past several years, Alicia has successfully led a number of teams at OCWA, including engineering, process optimization, compliance, health and safety, and innovation and technology. Alicia has also been instrumental in leading OCWA's Asset Management Planning initiatives.

JIM NARDI

Jim Nardi, formerly the acting vice president of operations, Peel, has taken on a new role as director of waste diversion and climate resiliency projects. He will be focusing on further developing and leading our Renewable Natural Gas (RNG) projects across the province.

The Ontario Clean Water Agency provides its clients with total solutions in water and wastewater.

LISA SPARROW

The Corix Group of Companies (Corix) announced that **Lisa Sparrow** has been appointed as its new president and chief executive officer (CEO) effective July 2, 2019.

Sparrow joined Corix in December 2012 when Corix acquired Utilities, Inc. Since that time, she has continued as the president and CEO of Utilities, Inc. In 2016, Sparrow assumed the role of chief operating officer of US Regulated Utilities for the Corix Group of Companies and her responsibilities continued to expand.

An active member of the professional water community, Sparrow was appointed to a three-year term on the National Drinking Water Advisory Council in 2009. She was also appointed to the EPA Climate Ready Utilities Working Group in 2009 and elected to the Water Research Foundation board of directors in 2014. She continues to be a board member of the National Association of Water Companies, having served as vice president and president, as well as having served on the Government Relations, Communications and Executive Committees.

Sparrow holds a Masters in Management, Marketing and Strategy from the J.L. Kellogg Graduate School of Management, Northwestern University. She also holds a Bachelor of Science, Mechanical Engineering from Michigan State University. In addition, Sparrow is a 2018 Michigan State University Department of Mechanical Engineering Distinguished Alumni Award winner.

SAMANTHA LAWSON

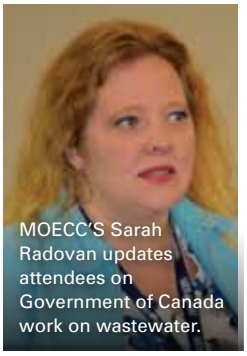
Samantha Lawson has been appointed as the new chief administrative officer (CAO) of the Grand River Conservation Authority (GRCA).

Lawson joined GRCA in 2005 as a resource planner. In 2008, she progressed to the role of supervisor of resource planning, and has been serving as the GRCA's manager of property since 2012.

Lawson is experienced and knowledgeable in the areas of urban planning, water quality, environmental impact assessments, wetlands, and natural resource management. Her education includes an undergraduate degree in Environmental Studies from the University of Waterloo, a Master of Arts degree in Geography from the University of Guelph, and a Master of Public Administration degree from Western University.

Lawson will begin in her new role as the CAO of GRCA on July 15, 2019. She succeeded Joe Farwell, who has been CAO of GRCA since November 2010. At the General Membership meeting on March 22, 2019, Farwell advised the board of his intention to retire.

Photos: Water Canada



MOECC'S Sarah Radovan updates attendees on Government of Canada work on wastewater.

AFN's Irving Leblanc

Window on Ottawa
Ottawa, Ont.

The Canadian Water and Wastewater Association (CWWA) held its annual Window on Ottawa event, providing a glimpse into the water-related issues worked on by the federal government and the organizations it funds.

Several important conversations emerged from the two-day program, which was led by CWWA executive director **Robert Haller**. During a conversation on modeling critical infrastructure interdependencies, **Monica Emelko**, director of the water science, technology and policy group at the University of Waterloo, raised the issue of best management practices for source water protection. During her talk, she raised the issue of forestry in Canada, noting that it is the only key water-bearing industry that does not implement source water protection into its industrial practices. She noted that influencers in the water industry need to work together to protect the watersheds where logging takes place to ensure that source water protection becomes part of their business.

A conversation on safe drinking water for First Nations communities in Canada also struck a resonant chord. During his comments, **Caleb Behn**, who is a special advisor on water at the Assembly of First Nations, commented that adequate resources for operations and maintenance, as well as training, are more critical to ensuring safe drinking water than regulations alone. While it is vital to provide a system for safe drinking water for all homes in all First Nations communities, the infrastructure alone is not enough. Institutional knowledge among those within the community is vital to ensure that infrastructure gets the necessary upkeep to ensure drinking is safely delivered within these communities for decades to come.

For more information on Window on Ottawa, visit *cwwa.ca*.

Photos: Water Canada

Representatives from OWWA and AWWA with conference keynote speaker Geoff Green (middle).

OWWA Water Conference and Tradeshow
Ottawa, Ont.

The Ontario Water Works Association gathered in the nation's capital for its 100th anniversary water conference and tradeshow.

This year's event drew hundreds of water operators, engineers, and additional industry stakeholders from throughout the province and across the country for the three-day event. The program featured a robust pipeline of education opportunities, with individual and panel presentations covering all aspects on the Ontario water industry.

The event kicked off with a keynote presentation from **Geoff Green**, the renowned Canadian explorer behind the 2017 C3 mission and the founder/executive director of Students on Ice. One of the key outcomes of Green's C3 mission was a biodiversity study, the first of its kind in Canada. Throughout the journey, samples were taken from the water as points along the journey, thanks in part to the help of research teams from 13 different universities that took part in the expedition. That study is set to be released in 2020, providing a baseline for understanding how our coastal waters evolve as the impacts of climate change continue to impact the Canadian coastline.

The opening ceremonies also included the awarding of the annual George Warren Fuller Award, which is presented in recognition of distinguished service in the water supply field. The award was given to **Ian Douglas**, the water quality engineer for the City of Ottawa. Douglas has worked on a litany of research and optimization projects with partners from across Canada. He also works as an adjunct professor at the University of Toronto.

For more information, visit *owwa.ca*.

Paving the Way for Innovation Toronto, Ont.

A session moderated by **Carl Yates**, general manager of Halifax Water, at the Blue Cities conference on May 7, 2019, explored the definition of "innovation" that speakers in the session use in their workplace. A part of the response provided by **Erin Mahoney**, commissioner of environmental services at York Region, is included below.

"For us in York Region, it starts with some clarity of thought. The word 'innovation' itself can be intimidating to our staff, threatening, and almost inaccessible. So we started a few years ago by trying to define what innovation meant to us in our culture at York Region. We started very early with a definition of doing more with less and since that time, we have built upon that definition as we have advanced the culture.

"The other advantage of being part of the Canadian Water Network (CWN) and broader networks is that we are not in it alone and so while building a process, we had the advantage of looking at the processes that Sudhir [Murthy] developed at DC Water and that San Diego has developed. We have advanced that process, distributed that process to our staff, and developed a portal where there's a toolkit."

Photos: Water Canada

❶ Chris Hilkene from Pollution Probe and then-Minister of the Environment, Conservation and Parks Rod Phillips participated in a fireside chat to open the final day of CWS 2019. ❷ CWS 2019 co-chair Steven Liss. ❸ Fourteen individuals from nine Canadian water associations participated in the Association Roundtable hosted by Water Canada on May 29, 2019. ❹ Zafar Adeel from Simon Fraser University, Dan Kraus from the Nature Conservancy of Canada, and Manjusha Sunil from the Water Research Commission participated in a session on Progress through Partnerships: Advancing on Sustainable Development Goals.

2019 Canadian Water Summit Blue Mountain, Ont.

The 10th Annual Canadian Water Summit, Partnering to Innovate in the Blue Economy, took place from May 29 to 31, 2019 at the Blue Mountain Resort in the Town of the Blue Mountains, Ontario. The event brought together close to 200 industry leaders to discuss how partnerships and collaboration are driving innovation in the blue economy.

The 2019 Canadian Water Summit kicked off with an Association Roundtable on May 29, 2019. The session, which was moderated by Water Canada's managing editor **Andrew Macklin**, brought together a dozen water associations for a facilitated discussion on how to break down silos and search for common interests to develop partnerships.

The first full day of programming kicked off on May 30, 2019, with an address from co-chairs **Katherine Balpataky** from ALUS and **Steven Liss** from Ryerson University. The first plenary session kicked off with a discussion on Progress through Partnerships: Advancing on Sustainable Development Goals. Speakers included: **Zafar Adeel** from Simon Fraser University and the Pacific Water Research Centre, **Dan Kraus** from the Nature Conservancy of Canada, and **Manjusha Sunil** from the Water Research Commission. The discussion focused on where Canada is at with supporting the global mandate to support the number six (clean water sanitation) of the seventeen Sustainable Development Goals set by the United Nations in 2015.

This discussion was followed by a session on Dismantling Barriers to Achieve Water Innovation. Speakers included: Water Industry Expert **Kerry Freek**, **Dan Draghici** from Global Affairs Canada, **Dan Mathieson** from the City of Stratford, **Hein Molenkamp** from the Water Alliance, and **Jon Radtke** from Coca-Cola North America. The public and private stakeholders in this session discussed how they are challenging traditional barriers, forming partnerships, and using innovative ideas to change the way we think about managing water.

Scott Kress from Summit Team Building provided a lunchtime keynote address following the morning plenary sessions. He spoke to the power of partnerships and teams through the lens of his many exciting journeys around the world, like climbing Mount Everest.

The afternoon sessions during the event explored topics such as: how digital solutions are being used to support practical water infrastructure investments; how small communities are ensuring their residents have access to clean water; and, how public and private stakeholders are financing flood resilience.

Day three kicked off with a fireside chat with **Chris Hilkene**, chief executive officer of Pollution Probe and the Honourable **Rod Phillips** who was Ontario's minister of the environment, conservation, and parks at the time of the event. The fireside chat was followed by a Women in Water workshop, a popular tradition at the Canadian Water Summit. The workshop led by **Katherine Balpataky** from ALUS Canada identified actions that stakeholders are taking and can take to improve the inclusion of women in the water sector. *watersummit.ca*

Credit: WaterTap

WaterTAP was invaluable in bringing together public and private sector stakeholders to develop innovative solutions for water-related issues.

WaterTAP's Tap Runs Dry

BY SIMRAN CHATTHA

AFTER SEVEN YEARS IN OPERATION, the Water Technology Acceleration Project (WaterTAP) closed its doors on June 30, 2019. The organization's funding, which was provided by the Government of Ontario, was not renewed as a result of cost-cutting measures.

The organization helped over 300 companies create 1,600 high value jobs between 2012 and 2019 according to the press release issued by WaterTAP on June 21, 2019. While the press release highlights the number of jobs WaterTAP helped create, I know that the organization did more than that. I know because I worked for the organization as a content writer and strategist from August 2017 to December 2019.

I was hired by Tony Kobilnyk, who was WaterTAP's program manager, to deliver the e-newsletter program that was offered through the Growth Catalyst program. The e-newsletter program was designed to help water technology companies start and maintain the momentum for their monthly e-newsletters so that they could generate leads.

Barrier reduction

WaterTAP's Change Leaders Lab worked on addressing the barriers that water technology companies face in Ontario. Trish Johnson, Lynne MacLennan, and Lesley Herstein hosted a number of workshops and meetings to understand the barriers that industry experts were facing in the context of topics like procurement. Following the workshops, the results that highlighted the barriers that industry experts faced were taken to the appropriate stakeholders so that the barriers could be addressed.

WaterTAP provided a platform for Ontario's water technology companies to showcase their innovative technologies and solutions. This was partly done through Ontario Water Innovation Week (OnWIN) that took place annually in the fall. Pulling together a week's worth of events year after year was no small feat but it was made possible by individuals like Kerry Freek, Josh Chong, and Yvette Byrne-Menard.

A special thanks

All this work mentioned above was possible in part because it was being supported by WaterTAP's Administration Team. The team included a number of individuals but I wanted to give a shout out to Kristy Pepin who created a number of new processes for the organization and led their implementation as well. Although the implementation part required some culture change, the new processes helped ensure that the organization was running as smoothly and efficiently so that the team could maximize its time and dedicate it to supporting Ontario's water technology companies. WC

Simran Chattha is the associate editor of Water Canada.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