

# GO with THE FLOW

THE OFFICIAL PUBLICATION OF THE ATLANTIC CANADA WATER AND WASTEWATER ASSOCIATION



## 2018 ANNUAL CONFERENCE

Sponsorship Opportunities

### INSIDE:

- AWWA Award Nominations
- Leaving a Sustainable Legacy:  
Charging User Fees to Pay for Federal WW Regulations
- Project Profile: Unique CIPP Rehab Project in Halifax
- Addressing Lead Concerns in Canadian Drinking Water



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# GO with THE FLOW

SPRING 2018



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Connect with us



**H**appy spring, folks! I am hoping many of you have noticed that ACWWA has jumped forward in the world of social media with an active Facebook page ([www.facebook.com/TheACWWA](http://www.facebook.com/TheACWWA)) and Twitter account (@ACWWA). A big thank you to Lindsay Wilcott (Communications Director) and her team for not only getting these sites up and running but also keeping them up to date. Check them out to find out updated news on calls for abstracts, conference announcements, scholarships, educational training and so much more. Please "like," "follow," and become "interested" in our pages

and events. Stay connected with our Association!

As we head into the warmer months, remember that our Annual Photo Contest will be opening in June. Start snapping photos! All you need is family and water and you could win!

No time like the present to consider recognizing the efforts of your colleagues. Did you know that ACWWA annually gives out several awards at the Fall Conference? It's vital to the success of our organization and industry that we value those who dedicate their time and efforts to improve the world of water. We have awards to recognize

volunteers and young professionals. The Silent Hero awards recognize outstanding contributions of water and wastewater operators. We also showcase work done around Atlantic Canada with the Project of the Year awards. But we need your help!

Please take some time and consider putting someone's name or a project name forward as a nomination. Details can be found on our website at [www.acwwa.ca](http://www.acwwa.ca), and on pages 16–17 in this magazine. You should also take some time to review the AWWA and WEF awards. I know there are many deserving individuals in our region who would qualify for one or more of these prestigious awards. Check them out!

If ever you have a question, suggestion, or are looking to volunteer with the Association, please be in touch. I look forward to hearing from you ([amyw@cbcl.ca](mailto:amyw@cbcl.ca)).



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## Continue to improve in AWWA and the water industry

**E**xcitement is building for AWWA Annual Conference & Exposition (ACE) in 2018, which will be held in Las Vegas, NV. Leading into Las Vegas, the AWWA Board of Directors at the January 2018 Winter Meetings have passed several important changes to the governance of AWWA.

First, the Board has elected Mr. Jim Williams as President Elect of AWWA. As a member of the Indiana Section, Jim brings more than 30 years of experience in the water industry as a CEO of Peerless Midwest and an active volunteer in his section, with AWWA and Water For People. Jim is a proud member of the Water Buffaloes – so

"I am pleased to see that our Section has many of these similar governance practices with an emphasis on strategic planning by the Board."

who knows, maybe you will see him ride in Las Vegas! What made Jim's election unique is that AWWA used a nominating committee to recruit and interview prospective candidates for the Board to eventually vote on. This exciting process has enabled greater opportunity for AWWA members to become engaged and identify strong leaders. I could imagine that the ACWWA could benefit from this process as well as it continues to

identify and develop strong leadership across the water industry.

Secondly, the AWWA Board has taken important steps towards improvements concerning Board efficiencies and strategic management. While the Board ultimately has opportunity to input across AWWA policy, we have taken the step to enable Executive Board members the opportunity to act more swiftly on routine decision-making and allowing more time for the Board has a whole to tackle strategic issues that are facing AWWA and the water industry. For example, at our last meeting we tackled the important issue of water affordability and AWWA strategies for this issue.

Following these meetings, I reflected on the Atlantic Canada Section and I am pleased to see that our Section has many of these similar governance practices with an emphasis on strategic planning by the Board. For example, led by our Chair Amy Winchester, the ACWWA has taken the strategic approach to develop a Water Utility Council. This move will be critical for helping utilities address emerging drinking water regulatory challenges and best practices.

As we prepare to for Las Vegas, it is clear that AWWA and our Atlantic Canada Section continue to take steps to become more innovative and efficient; these steps will ultimately help our industry develop policies and programs to ensure safe water in the communities that we serve. 

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# Energy Savings

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## Can positive displacement blower technology be energy efficient?

Air supply is a critical component for aeration processes within wastewater treatment. Although traditional lobe blowers are common, advances in blower technologies are showing how energy savings can be made for facilities.

**Did you know that over 80% of a blower's lifecycle cost is taken up by the energy it consumes and can account for more than 40% of your plant's total electricity bill?**

Choosing the right blower technology for your application will have a direct impact on your facility's sustainability and operational costs.

### Lobe Blowers

Despite the vital role air supply represents in most treatment process, many facilities still use old, inefficient and noisy lobe blower technology introduced more than a century ago.

While the principle of the lobe blower was cutting-edge when the Roots brothers discovered it in 1854, there has been only minor improvements over the 160+ years since its introduction. The singular advancement for this technology over this past century did not aim to improve efficiency, but reducing the noise levels. Bi-lobe blowers produced very high amplitude waves at a low frequency; to reduce the amplitude and increase the frequency of the waves, a third lobe was added. While this innovation decreased efficiency slightly, it reduced noise levels to below 85 dBA as mandated by OSHA.

### Screw Blower

Introduced in 2008 and benefiting from Atlas Copco's years of market leader expertise in the

design and manufacturing of screw compression, the ZS screw blower Series brings positive displacement into this century and offers a reliable sturdy alternative in energy efficiency. The screw blower uses a helical screw profile instead of lobes to create internal compression of the inlet air. The screw rotor profile serves a dual purpose:

- First, the internal compression of air reduces energy consumption by ±30 percent compared to traditional lobe blowers.
- Second, by eliminating the pulses caused by lobe technology, screw blower noise levels are typically below 77 dBA, three to five times quieter than the conventional tri-lobe blowers.

Although the screw blower optimal efficiency is mainly attributed to its superior screw technology, other design features such as the integrated gearbox, the closed-loop/ temperature controlled oil system and the innovative package design that integrates all individual components into a plug-and-play solution secure its increased efficiency and reliability. In addition, the screw blower offers close to 80% efficient turndown capacity, allowing your system to adapt to the process changing demand without waste or over supply.

### Shaft vs. Package Power

In making a true "wire-to-air" comparison between the old and new technologies, it is necessary to compare apples to apples. Power consumption analysis should consider not just comparable shaft power ratings but all the potential power losses that can occur in a blower package – from motor and electrical system to transmission, filters, and other



design features that contribute to pressure drops which are costly in energy terms.

For instance, a 50 mbar/0.7 psi pressure drop may appear to be small but when a blower is only providing a 500 mbar/7 psi discharge pressure this adds up to 10% of the power consumption.

Lobe blower power consumption is most commonly expressed in **shaft power** which is limited to the blower without consideration to the above stated losses whereas the screw blower is expressed in **package power** values indicating consumption at the terminals of the power supply.

To deliver a flow of 1600 m<sup>3</sup>/h (942 cfm) at a pressure of 0.8 bar(e) (11.6 psig), a tri-lobe blower would consume 61 kW (82 hp) on average whereas a comparable screw blower demands only 43kW (58hp) for the same volume. In fact, the **SER (Specific Energy Requirement)** is on average 28% lower and at a 600 millibar 50% load this can increase to as much as 34%.

Wastewater treatment plant operations and many other blower applications can benefit substantially from improved reliable performance and significant energy savings through modernizing their wastewater aeration equipment.

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## Encouraging the younger generation

**M**y main objective for 2018 is to talk to people about WEF and see if we can get more young people involved locally. I feel it is so important to encourage our young people to pursue careers in the water and wastewater industries. We only have so much water, so we need to provide ways of conserving and managing this most valuable resource. We need to support and mentor our students and Young Professionals. I ask you, the reader, to take time to encourage the younger generation to get involved... the youth of today are our future leaders.

The following is taken directly from [www.WEF.org](http://www.WEF.org):  
Leadership. Passion. Collaboration. Scholarship. Service.

These are the core values that guide the Water Environment Federation (WEF) and its members in fulfilling our mission of protecting public health and the environment.

The Water Environment Federation is a not-for-profit technical and educational organization of 34,000 individual members and 75 affiliated Member Associations representing water

quality professionals around the world. Since 1928, WEF and its members have protected public health and the environment. As a global water sector leader, our mission is to connect water professionals; enrich the expertise of water professionals; increase the awareness of the impact and value of water; and provide a platform for water sector innovation.

Previously called the Federation of Sewage Works Associations, the Federation of Sewage and Industrial Wastes Associations, and the Water Pollution Control Federation; the name was changed to the Water Environment Federation in 1991 to reflect an expanded focus of non-point and point sources of pollution.

WEF and its global network of members and Member Associations provide water quality professionals around the world with the latest in water quality education, training, and business opportunities. WEF's diverse membership includes scientists, engineers, regulators, academics, utility managers, plant operators, and other professionals. WEF uses this collective knowledge to further a shared goal of improving water quality around the world. 

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## Expanding our network

Lara Shea and I had the pleasure of representing ACWWA at the AWWA membership summit January 24 to 26 in Denver, Colorado. The summit is always a great learning opportunity as we meet with membership committee members from across North America and get to share ideas and knowledge. This year, AWWA had Debra Fine as a guest speaker, author of "the fine art of small talk." She focused on how to start a conversation, keep it going, as well as build networking skills while leaving a lasting impression. Unfortunately, small talk and the art of conversation is something that doesn't come easy for many, especially with the increasing use of electronic devices. If you are a long-time member, I challenge you to find a YP or a student who may not know a lot of people and engage

them in a conversation at our upcoming Annual Fall Conference. Help them feel welcome at our event. At the membership summit, we also accepted an award on behalf of the Atlantic Canada Water and Wastewater Association for having achieved first year retention goals. This could not be possible without our Membership Committee, which is comprised of Gabriel Belliveau, Melissa Fraser, and Sean Chillibeck as well as our members. Thank you!

This upcoming year, the Membership Committee will continue to expand on our member networking opportunities to help with member engagement, look at implementing a booth at career fairs, try to reach out to small communities who could benefit from the Association, and help with moving social media forward within our Association.



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## Welcome new members!

A warm welcome to our new members who have joined over the last few months:

Name	Company	
Stephen Bradley		AWWA
Jesse Hulsman	Municipality of East Hants	AWWA
Steven Stone	Membertou Pub. Works	AWWA
Hugh Schneider	University of New Brunswick	AWWA
Matt Bowers	Town of Springdale	AWWA
Matthew Abernethy	City of Bathurst	AWWA
Devin MacAskill	Cape Breton Regional Municipality	AWWA
Dewey Dunnington	Dalhousie University	AWWA
Rob Parker	Gary Parker Excavating Limited	AWWA
Vaughn McManus	ALR property Management	AWWA
Brenda Hoar	Village of Alma	AWWA
Nico Nirschl	Liberty Pumps	AWWA
Kevin Jones	Atlantic Backflow Specialists Ltd.	AWWA
Zewen Zhang	Dalhousie University	AWWA

Name	Company	
Carolina Ontiveros	Dalhousie University	AWWA
Lili Torres		AWWA
Fatou Secka	Dalhousie University	AWWA
Javier Locsin	Dalhousie University	AWWA
Deanne Harper	City of St. John's	WEF
Peter Takacs	Sansom Equipment	WEF
James Warford	City of Cornerbrook	WEF
Meghan Woszcynski	Halifax Water	WEF
Shivani Gilhotra	Dalhousie University	WEF
Brigitte Cyr	Sansom Equipment	WEF

As of February 16, 2018:

Total AWWA members: **431**

Total WEF members: **113**



### Did you know?

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## Spring plans

**S**pring is typically a time of planning for the coming year. As you prepare for upcoming activities and mark dates on the calendar, one of those should be the upcoming ACWWA Conference in Sydney, NS.

If your utility is short of funds you may wish to investigate the **ABEA "Annual ACWWA Conference" Attendance Grant** ([www.ABEA.biz](http://www.ABEA.biz)).

If another activity is a high school graduation, remind your graduate that the ABEA offers four \$1,000 **Academic Scholarships** to deserving individuals who meet the application criteria ([www.ABEA.biz](http://www.ABEA.biz)).

We are well into the planning stages for the upcoming ACWWA Annual Conference being held in Sydney, NS, September 16–18, 2018.

Some highlights brought to you by the ABEA include the annual Golf Tournament – this year we are planning an enhanced tournament. The Monday evening Common Hospitality Event will continue to provide an opportunity for colleagues to gather and catch up,

meet and greet some newcomers to the industry and, at the very least, enjoy the local entertainment, snacks, and suds. Tuesday morning, we will host the Trade Show from 10 am – 2 pm (inclusive of lunch for those in attendance). It is an excellent opportunity to take in the latest developments in the industry, have your questions answered, or get some new ideas that you can

share with your utility upon your return home.

We would like to take this opportunity to thank our membership for their continued support and involvement.

If you have any questions/ comments or membership inquiries, feel free to reach out to any of our executive members or visit the website. 

### 2017/18 ABEA Executive:

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# ACWWA invites submissions for award nominations for 2018

If you know someone who has made a contribution to the water and/or wastewater industry, don't let their efforts go unnoticed. The following awards are eligible for presentation at the ACWWA Conference in Membertou, NS on September 16–19, 2018.

**Please note that the deadline for 2018 Award Nomination submissions is June 29, 2018.**

## NOMINATIONS PROCEDURE

Where applicable, an awards committee has been established for the specific awards. The awards committee shall select the

recommended candidate for the award from the nominations received, and shall present the award to the recipients during the ACWWA annual conference.

All awards are presented at the ACWWA conference.

The deadline for submissions will be **June 29, 2018** for Awards to be presented at the **ACWWA Conference Membertou, NS on September 16–19, 2018.**

Individuals wishing to nominate an individual or group for an award should complete below or contact the ACWWA office and request the applicable nomination form.

## LIST OF AWARDS (descriptions follow)

### Individual awards

- Silent Hero Award
- Young Professional Award
- Contribution Award

### Organizational award

- Project of the Year

### SILENT HERO AWARD (nominee must be an AWWA or a WEF member)

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### **CONTRIBUTION AWARD (nominee must be an AWWA or a WEF member)**

The Volunteer Recognition Award is awarded by ACWWA and may be presented annually to recognize outstanding contributions by an **individual or a group of individual volunteers** to ACWWA programs and/or the water industry throughout Atlantic Canada.

### **YOUNG PROFESSIONAL AWARD (nominee must be an AWWA or a WEF member)**

The Young Professional Award recognizes a Young Professional

within the Atlantic Canada Water & Wastewater Association for **outstanding contributions to the water & wastewater industry**, and to the ACWWA Young Professionals' committee.

### **PROJECT OF THE YEAR – ENGINEERING AWARD/ENVIRONMENTAL AWARD**

The Project of the Year – Engineering Award/Environmental Award is awarded by ACWWA to a Municipality or Utility and their Consultant, one of which is a member of ACWWA, to recognize

**outstanding projects in Atlantic Canada that demonstrate innovation and state-of-the-art technology** in water or wastewater projects.

Awards may be presented in each of the following three categories:

- Small Utility – fewer than 5,000 customers
- Medium Utility – between 5,000 and 25,000 customers
- Large Utility – more than 25,000 customers



## **ACWWA AWARD NOMINATION FORM 2018**

Nominee's full name: \_\_\_\_\_

Nominee's title: \_\_\_\_\_

Nominee's phone & email: \_\_\_\_\_

Award: \_\_\_\_\_

Submitted by: \_\_\_\_\_

Phone: \_\_\_\_\_

Email: \_\_\_\_\_

For Project of the Year

Size of utility: \_\_\_\_\_

Individuals/companies involved: \_\_\_\_\_

- For individual awards, please provide a short write-up that outlines the contribution of the nominee.
- For project awards, please provide a short write-up that outlines the specifics of the project being nominated and identifies the primary people involved with the project.
- Please fax your nominations to ACWWA at **902-435-7796** or send by email to [contact@acwwa.ca](mailto:contact@acwwa.ca).

### **For any questions, please contact:**

Clara Shea, Executive Director

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# 2018 ACWWA Annual Conference

Membertou Trade and Convention Centre

Sydney, Nova Scotia • September 16 - 18, 2018



# Call for Abstracts

For the first time in recent history, the Atlantic Canada Water and Wastewater Association welcomes delegates to Sydney, NS for the 2018 ACWWA Annual Conference. This conference not only marks the first time in decades that the event will be hosted on Cape Breton soil, but it is also the first time the conference will be hosted on First Nations land, as the Membertou Trade and Convention Centre has been selected as the host venue.

The theme for this year's conference is "[Turning Tides](#)" and how very fitting as beautiful views of tidal waters border all paths that lead to Sydney. Whether it's working to meet ever changing regulatory requirements, modifying operations to adapt to seasonal variations, or shifting organizational focus and direction to improve operational efficiencies – as Water and Wastewater Professionals, the [Tides](#) are always [Turning](#).

Share your experiences and enjoy some of Cape Breton's world famous hospitality. In addition to engaging technical sessions, the ABEA tradeshow, and the Water Tower Building competition, delegates will have the opportunity to network at a Cape Breton Ceilidh.

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## Oral Presentations

The ACWWA is inviting abstract submissions for the 2018 Conference in Sydney, NS. All topics related to the water and wastewater profession will be considered. Presentations will be 20 or 30 minutes in length with 5 minutes for questions.

## Instructions for Submitting Abstracts

Please submit an abstract (maximum length of 300 words), a presenter biography (maximum length of 200 words) and copyright release form at [www.acwwa.ca](http://www.acwwa.ca) by April 18th, 2018.

Also, please indicate if the presenter is a first-time Young Professional participant at the ACWWA section conference, and would like to be considered for the Fresh Ideas program that has been developed through AWWA's Manufacturers/Associates Council and the Young Professionals Committee. The top presentation selected from this group of presenters will be given the opportunity to compete in the Fresh Ideas poster competition at the AWWA Annual Conference and Exposition (ACE 2019) in Denver, Colorado, representing the Young Professionals of ACWWA. Along with complimentary conference registration provided by the ACE 2019 organizing committee, ACWWA will provide the winner with a stipend to assist with travel costs to the conference.

## Selection Criteria

Submissions will be reviewed based on the significance of the work/content to a broad audience, originality of the work, new concepts, improvements or new data, technical content, the status of the completeness of the work, and the relevance to the theme of the conference if applicable. Case studies on new technologies and industry presentations that are innovative/ educational are encouraged, however submissions that appear to be marketing material for a particular product or company will not be accepted.

Authors will be notified of the selection of their abstracts for presentation by the end of May 2018.

## Calling All Students!

In addition to being considered for the Fresh Ideas program and a chance of representing the Young Professionals of ACWWA at ACE 2019, we are offering an added incentive for students. New this year, students whose abstracts are accepted will have their conference registration waived.

**Thank you for submitting and we look forward to seeing you in Sydney!**





## SPONSORSHIP OPPORTUNITIES

For the first time in recent history, the Atlantic Canada Water and Wastewater Association welcomes delegates to Sydney, Nova Scotia for the 2018 ACWWA Annual Conference. This conference not only marks the first time in decades that the event will be hosted on Cape Breton soil, but it is also the first time the conference will be hosted on First Nations land, as the Membertou Trade and Convention Centre has been selected as the host venue.

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Your 2018 ACWWA conference experiences promises to be a memorable one!



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The success of this conference is made, in part, by the generous support of national, regional and local businesses and companies. By becoming a sponsor, you'll be helping us share your particular message of how you are participating in "Turning Tides."

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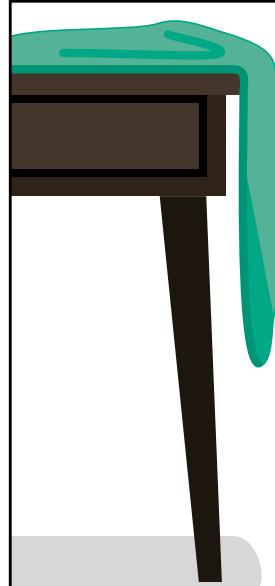
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- One presentation slide at 'Meet & Greet' and Kitchen Party.

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### PAYMENT METHOD

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QUESTIONS OR CONCERNS? Contact Clara at (902) 434-6002 or [contact@acwwa.ca](mailto:contact@acwwa.ca).

SEND LOGO in a Vector (.eps) or Illustrator (.ai) format. If a Vector format is not available, PDF with high resolution is accepted.

\*Insertion in magazine will be logo only, names and contact info not included. 

# Announcing some of our 2017 scholarship recipients

## 2017 AWWA One Operator Scholarship winner



Congratulations to Daniel Wesley, the recipient of the AWWA One Operator Scholarship for 2017/18. Daniel has received \$1,000 to support his attendance at AWWA ACE 2018, where he hopes to bring fresh ideas back to his team in Antigonish where they are undergoing wastewater treatment upgrades, backwash water residual pond sludge

disposal upgrades, and implementation of a lead service line abatement program.

The One Operator Scholarship is co-funded by AWWA and ACWWA, and is available to operators and students who are individual or utility members of ACWWA. This is an exciting opportunity that can be used for various professional development initiatives such as purchasing books, attending a conference, funding certification, training programs, and so on. Up to \$2,000 is available

annually, and ACWWA will accept and review applications as received. You can easily and quickly apply online or by email, and all related information is posted on the ACWWA website. Here is how Daniel described the impact the scholarship would have on his professional development:

Lead release in distribution systems, poor raw water quality, aging infrastructure, combined sewers and restrictive budgets are some of the challenges faced by rural municipalities in Nova Scotia. We are in a field that is constantly growing and changing to improve on how we deliver a critical service to the public safely and consistently and it is important to keep abreast of these changes in the industry.

Quite often, as plant operators, we have a high degree of experience with the water and wastewater works of our own municipality but lack exposure to the broader industry. There is a wide array of engineering solutions that have been developed by leaders in the water and wastewater industry to tackle the challenges head on that we see every day. I have had the great fortune to complete a Master's degree at the Centre for Water Resources Studies where I was exposed to cutting-edge research and the most current and innovative solutions in the water industry today. The most memorable event during my studies was attending ACE 2014, where I was exposed to the Top Ops competition, water line tapping, events for young professionals, and some very informative workshops. I was also able to meet many water industry professionals just like me from all across North America to find out how they cope with everyday tasks like equipment maintenance or completing large projects with a limited staff. Exposure to the latest technology in the industry was a definite aid during large-scale maintenance projects at my current water plant, such as a chemical pump retrofit. I was able to take the lead on this project and we were able to bring it to completion with minimal loss of production and no reduction in water quality.



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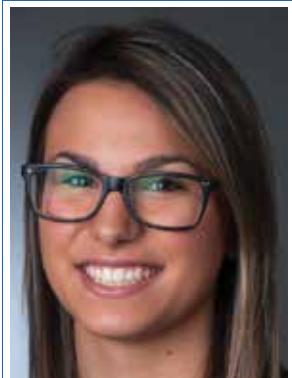
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# Congratulations!

## Kayla Freeman, winner of the Craig Kelman Scholarship



Kayla Freeman is currently in the Environmental Engineering Technology program at the Nova Scotia Community College (NSCC). During her time working full time at Michelin North America in Bridgewater, she began to realize her real desire was to work in an engineering field and having more time to research programs in environmental engineering

looked like a great fit. After finishing her first year in the program she was even more inspired by the program and

her teachers. Moving into year two, she has already begun researching the Mikumi Project in Tanzania. During her time in high school she was very involved student council acting as Vice President for a year and for four years was her class representative. Student council provided her opportunities to volunteer for Student's for Social Justice committee and she worked with We Day Toronto. When Me to We came to Halifax, she volunteered in 2013–2014. Additionally, she was involved with NSSSA for five years and in her final year was part of the regional cabinet. Locally she volunteered at her local fire hall during fundraising events like the community dinners.



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# LEAVING A SUSTAINABLE LEGACY: Charging user fees to pay for the federal wastewater regulations

By Jonathan Arnold

Water and wastewater utilities in Atlantic Canada are facing serious financial headwinds. The region has some of the oldest infrastructure in the country and many municipalities are digging themselves out from decades of underinvestment. Impacts from climate change, shrinking tax bases, and an economic downturn are making matters worse.

The federal government's Wastewater Systems Effluent Regulations (WSER) adds to these pressures. In total, nearly 200 utilities need to upgrade their wastewater systems to comply with these regulations. Many of these utilities are required to construct wastewater

treatment plants to the National Performance Standard [secondary treatment] by 2020, although many have not started the design process. While provincial and federal grants are providing some relief, municipalities will need to pick up a big portion of the tab.

So how can utilities in Atlantic Canada stay afloat with these additional funding pressures? One solution is to charge user fees that reflect the full cost of service.

## THE ELEPHANT IN THE ROOM

Untreated or undertreated wastewater is the single largest source of water pollution in Canada. Between

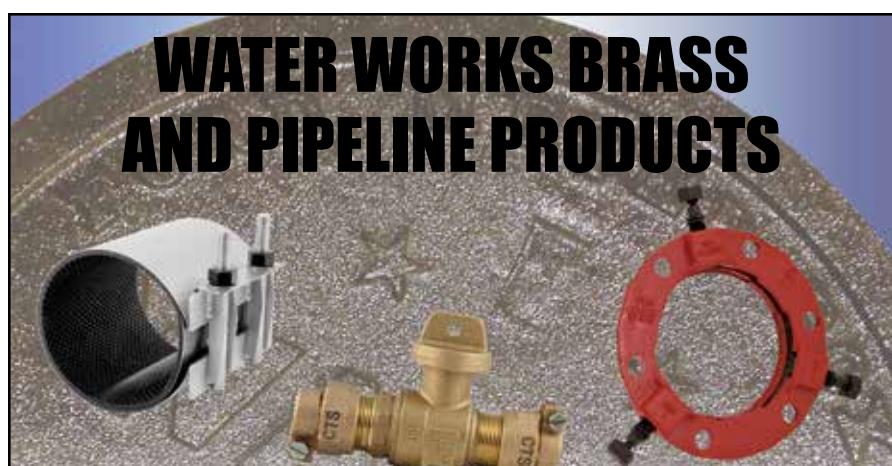
November and December 2015, for example, the Atlantic provinces discharged seven billion litres of raw sewage, mostly into the Atlantic Ocean.

The federal government's WSER requires all wastewater facilities to provide a minimum of secondary treatment, which can significantly reduce harmful impacts on receiving waters. High-risk systems have until 2020 to upgrade, while medium- and low-risk systems have until 2030 and 2040, respectively.

The financial impact from WSER is hitting the east coast hard. Nearly 50% of all high-risk wastewater systems in Canada are in the Atlantic region. Environment Canada estimates the regulations will cost the region \$1 billion. The Federation of Canadian Municipalities (FCM) thinks the cost will be closer to \$2 billion. Either way, it's a lot of money for municipalities.

The Cape Breton Regional Municipality (CBRM), for example, needs an additional \$450 million to comply with WSER. Paying for this would require more than doubling the CBRM's entire 2017 capital budget (\$31 million) for the next decade. The region is still unsure where the new funds will come from. And this is not an atypical example.

Of all the Atlantic provinces, Newfoundland is feeling the biggest pinch. Nearly three-quarters of the high-risk wastewater systems in Atlantic Canada are on the Rock. In St. Anthony, N.L., population



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"Of all the Atlantic provinces, Newfoundland is feeling the biggest pinch. Nearly three-quarters of the high-risk wastewater systems in Atlantic Canada are on the Rock."

2,500, the cost of a new wastewater treatment plant is \$3 million – more than the town's entire budget. Upgrades to St. John's wastewater treatment plant will cost an estimated \$200 million, added to the \$1.2 billion of other necessary funding for things like street paving, water mains, and recreation facilities.

#### THE OTHER, BIGGER ELEPHANT

The financial pressures from WSER highlight a much larger problem for utilities: infrastructure gaps. For decades, water and wastewater systems in Atlantic Canada (and elsewhere in Canada) have been underfunded, creating gaps between the infrastructure required and the infrastructure built or maintained. The FCM estimates the replacement value of deteriorating or deficient water and wastewater infrastructure across Canada is \$142 billion.

In some cases, municipalities have kept water and wastewater rates artificially low – below the prices required to make sustainable investments in infrastructure.

Other communities have relied on property taxes to fund water and wastewater infrastructure. But while property taxes provide predictable revenues, utilities compete with other municipal services for a slice of the pie. This makes funding less predictable and long-term planning a headache, especially given the fact that water and wastewater infrastructure can last for 100 years in the ground.

Provincial and federal grants help municipalities pay for big capital projects. But there are problems here as well. Funding amounts are often below the amounts required

for municipal infrastructure needs. And perhaps rightly so: grants can discourage municipal water and wastewater systems from achieving financial self-sufficiency. The availability of grants is also unpredictable, posing more challenges for municipal planners.

#### USER FEES AS A LONG-TERM SOLUTION

The way we pay for water and wastewater services matters. A recent report by Canada's Ecofiscal Commission finds that user fees – when they reflect the full cost – are

the best way to pay for water and wastewater services. They provide stable, predictable revenues to water utilities and, when paired with good asset management, can help municipalities plan for the long term.

User fees also act as a conservation signal, lessening demand on water and wastewater systems. This helps reduce long-term infrastructure costs and puts less pressure on the natural assets that are the foundation of municipal water, such as lakes, rivers, and aquifers.

Municipalities in the Atlantic region are already moving down this



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path. Windsor, N.S., for example, is using a combination of user fees and grants to pay for the upgrades to its system. It's also setting more sustainable funding for the future: between 2017 and 2021, its volumetric and fixed rates for wastewater from households will increase by 18% and 28% respectively.

Halifax Water has one of the most mature applications of user fees in the region. They have a formal cost-of-service rate structure for water, wastewater and stormwater services, with regulatory oversight through the NS Utility and Review Board. In 2007, the Halifax Regional Municipality (HRM) transferred its wastewater and stormwater assets to Halifax Water, along with a mandate to make all wastewater plants compliant with WSER.

In 2007, only two wastewater plants in the HRM were deemed compliant. As of 2018, all 14 plants under its wing are compliant or operating under approved transitional authorizations (giving them more

time to comply with WSER based on risk assessments).

### FINDING A SHORT-TERM FIX

Despite their importance, however, user fees cannot be implemented overnight. It can take several years before municipalities can ramp up rates to a point where they reflect the full cost of the service. User fees also work best when they're supported by robust asset management planning and water meters – things that not all municipalities have in place. Lastly, moving to a full user-pay system can be challenging for smaller communities due to fewer economies of scale.

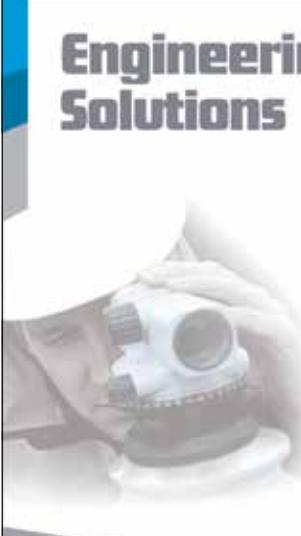
In the shorter term, grants from federal and provincial governments may be a necessary stopgap to help high-risk systems comply with WSER, especially in smaller communities. The federal government's Clean Water and Wastewater Fund is providing more than \$300 million for infrastructure projects in Atlantic Canada. Provincial funds are helping, too.

Other municipalities are combining efforts to comply with WSER. The upgrades to St. John's wastewater system, for example, will also service the smaller, neighbouring communities of Mount Pearl and Paradise. Although combined or regionalized systems like St. John's, CBRM, and Halifax may not make sense everywhere, it can be a smart way to reduce costs.

### LEAVING A SUSTAINABLE LEGACY

The path toward financial sustainability for water and wastewater utilities in Atlantic Canada is long. Complying with WSER represents a significant expense for Atlantic Canadian communities and many have no clear way to pay for all of it. Further, these funding needs exacerbate and deepen existing infrastructure gaps.

Well-designed user fees are a key part of the solution. Of all the different financing instruments, user fees are the most flexible, equitable, and practical tool available to municipal water utilities. User fees can recover the full costs of the service, encourage conservation, and set a more sustainable path for the future. 



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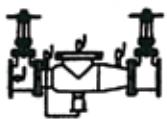
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Jonathan Arnold is a Research Associate with Canada's Ecofiscal Commission. His work at the Commission focuses on transportation, climate, and municipal policy. Previously he was an Economist with Environment Canada's Regulatory Analysis and Valuation Division in Gatineau, working on industry air pollution regulations. Jonathan has a Master's of Public Policy from Simon Fraser University. Jonathan was born and raised in Halifax, N.S., and has lived in Stockholm, Ottawa, and now Vancouver.

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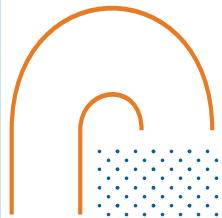
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PROJECT PROFILE:

# UNIQUE CIPP REHAB PROJECT IN HALIFAX

*Project team: Halifax Water (owner), Robinson Consultants & CBCL (owners engineers), LiquiForce Services (general contractor), Insituform – Aegion (CIPP sub-contractor).*

By Kevin Bainbridge and Keith Kelly



"One installation length was 680 m and set a new Canadian record for the longest single installation of CIPP."

In July 2016, Halifax Water initiated the large scale, \$23 million, rehabilitation of the Northwest Arm Trunk sewer (NATS). The sewer is 0 to 15 m from the shore and is generally located in an easement on private residential properties. The goal of the rehabilitation is to remove debris, restore structural integrity, eliminate exfiltration and infiltration, establish a corrosion barrier and extend the life of the sewer for up to 75 years. The project was funded through the Clean Water and Wastewater Fund (CWFF) announced in 2016. To comply with CWFF stipulations an accelerated, 16 month, project schedule was developed from planning commencement and engineering to completion of construction.

## PROJECT PROFILE: UNIQUE CIPP REHAB PROJECT IN HALIFAX

4,000 m of 1,200-mm round and 1,200 mm by 1,500 mm arch-shaped sewer was rehabilitated between June 2017 and December 2017.

The off-street location and topography surrounding the sewer presented significant accessibility challenges which resulted in approximately 3,000 m of the total 4,000 m being installed from just four access locations. Numerous installation lengths exceeded 400 m; this pushed the boundaries of CIPP technology as it is well beyond the typical CIPP installation lengths of 100 m to 200 m. Of note, one installation length was 680 m and set

a new Canadian record for the longest single installation of CIPP. Furthermore, the limited access required an innovated approach to the fabrication of the CIPP on site in order to reduce the weight of material trucks required to accommodate bridge loading restrictions on the access routes. CIPP typically comprises of a felt liner which is impregnated with resin and shipped to a project site in a refrigerated truck, to be inverted (installed) into the existing sewer, then cured insitu using either hot water or steam heat. Due to the load restricted bridges on the access route to the NATS and the size (diameter and length) of the CIPP to be installed, the resin and liner had to be transported to site separately and an onsite facility was constructed to impregnate the felt tube directly over the installation manhole.

While CIPP was a practical solution to address access and schedule challenges associated with the project, the design of the CIPP liner required a unique design approach. CIPP design standards (ASTM F1216) are founded on the basis that the sewer which is being rehabilitated is circular in shape and is not applicable for non-circular sewers. As a result, the project required the use of a unique design approach, including development of a specialized design calculator for the arch-shaped portions of the sewer. 



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# Update from the YP and Water For People Committees

By Lindsay Anderson

I have recently taken over Young Professional Chair position from Brad McIlwain. Although I know I have some big shoes to fill, I am excited for the challenge and am looking forward to working with the YP Committee to further engage YPs in our field. To briefly introduce myself, I have been an AWWA/ACWWA member since 2011 and am currently enrolled as a PhD student in Civil and Resource Engineering at Dalhousie University in Halifax. I also completed my B.Eng from Dalhousie in 2011 as well as my MASC in Civil Engineering in 2013. My interests are source water quality monitoring as well as drinking water treatment optimization.

The 2017 ACWWA Annual Conference was a success for both YPs and the Water For People Committee. For the first time, we held a YP Seminar on Sunday of the conference. The format for the YP Seminar was inspired by the AWWA YP Summit and included presentations from industry leaders including Amy Winchester (CBCL Ltd.), Sam Arsenault (City of Summerside), and Ramona Doyle (City of Charlottetown). There were also various professional networking activities as well as prizes, snacks, and refreshments. The event was followed by the YP mixer at the Merchantman Pub in Charlottetown. Due to the great response to the event, you can expect to see another YP Seminar and mixer at the 2018 Annual Conference in Sydney (Membertou Trade & Convention Centre, September 16–19, 2018).

In addition to the YP Seminar, the YPs were busy volunteering, networking, and giving presentations. Overall, eight YPs were Fresh Ideas presenters at the 2017 Annual Conference. It is my pleasure to announce that Dewey Dunnington, a PhD student from Dalhousie University won the Fresh Ideas competition with his talk on “Using Lake Sediment to Predict Future Treatment.” Dewey will be representing the YPs of ACWWA in the Fresh Ideas poster competition at the AWWA Annual Conference and Exposition in Las Vegas!

World Water Day is Thursday, March 22 this year, and in celebration of this annual event the Water For People committee will be having our annual Well Tapped



“Due to the great response to the 2017 event, you can expect to see another YP Seminar and mixer at the 2018 Annual Conference in Sydney.”

fundraiser on the following weekend. On Saturday, March 24, Water For People Atlantic Canada will be having their annual Well Tapped event at Garrison Brewery. The event will run from 8–10 PM in the newly renovated Garrison Brewery Tap Room! The Water For People Committee welcomes all members to attend for a night of drinks, snacks, and networking opportunities. Tickets are \$20 and will be available through members of the ACWWA YP Committee. Those who are interested in volunteering for the event can contact the Water For People Chair, [seanmacisaac@dal.ca](mailto:seanmacisaac@dal.ca), for further information. All proceeds will go towards the 2018 Water For People projects in Bolivia, Honduras, Malawi, and Vietnam. We hope to see lots of you there for the celebrations!

The YP Committee and Water For People Committee have more events planned for this spring. In March, a successful bowling night was held in Halifax. We are also working on several other events for 2018, including the YP Seminar to be held again this year at the Annual Conference in Sydney. Finally, I would like to add that the ACWWA Facebook page is live – please feel free to go like and share our page ([www.facebook.com/TheACWWA/](http://www.facebook.com/TheACWWA/)).

More details on upcoming events will be provided in the monthly YP Newsletter, on our Facebook page, and on Twitter (@acwwayp). If you do not currently receive the newsletter but would like to be added to the list, contact Lindsay Anderson ([Lindsay.Anderson@dal.ca](mailto:Lindsay.Anderson@dal.ca)). 

# ADDRESSING LEAD CONCERNS IN CANADIAN DRINKING WATER

By Graham Gagnon<sup>1</sup> and Michele Grenier<sup>2</sup>

<sup>1</sup>Professor & NSERC /Halifax Water Industrial Research Chair, Dalhousie University / <sup>2</sup>Executive Director, OWWA

The Federal-Provincial-Territorial Committee on Drinking Water (CDW) has recently proposed changes to the guideline for lead in drinking water. These changes would reduce the maximum acceptable concentration from 10 µg/L to 5 µg/L. Across the industry there is broad support for the CDW's proposal to measure lead at the tap with increased stringency. However, it is becoming evident that the CDW proposed guideline will be a significant technical and financial challenge for Canadian water suppliers.

## An important change to lead sampling

In addition, the revised lead guideline specifies new sampling protocols for Canada. For more than 25 years, the CDW health-based guideline for lead was based on a flushed sample. Many published reports and documents have demonstrated the inadequacy of a flushed sample for monitoring lead in drinking water. Accordingly, the CDW has shifted lead sampling to either a random daytime sample or 30-minute stagnation sample. Random daytime sampling entails collection of a single one-litre sample from a drinking water outlet, without prior flushing, at a randomly selected time during the day. Thirty-minute stagnation sampling proceeds as follows: 1) the outlet is flushed for five minutes, 2) water is left to stand for 30 minutes, 3) two consecutive one-litre samples are collected separately, and 4) the average lead level for the total volume is calculated.

So, why is lead different than other chemicals we treat for?

Unlike water quality parameters that are found in the water source, such as arsenic, lead typically enters the drinking water after the treatment process is completed. Lead is a contaminant that is found in lead service lines, drinking

water fountains, solder material, brass fittings, and other plumbing connections. However, it is well recognized that a significant source of lead in the home results from lead service lines, the pipes that connect individual houses to water mains. While national estimates of lead service lines are not widely known, a US national estimate places the number of service lines in the range of six million (Cornwell et al. 2016). A reasonable estimate for Canada would be 10% of the US value, or 600,000 connections. As a first step, Canadian water utilities should undertake measures to identify and remove lead pipes in their communities.

To date, one strategy used by water utilities has been to remove only the city owned portion and encourage private property owners to address their section of the pipe – this is known as a partial lead service line replacement. Available data do not support partial lead service line replacement as a viable strategy for meeting the proposed 5 µg L<sup>-1</sup> guideline, or for protecting public health. In Halifax, work has shown that partial lead service line replacement may be followed by severe short-term increases in point-of-use lead levels, without clear long-term reductions (Trueman et al., 2016). Moreover, data from Montreal show that residences with partial lead service lines often exceed the 5 µg/L threshold, even after extended periods of time (Deshommes et al., 2017). Communities are therefore encouraged to develop a lead reduction strategy that includes identifying and removing all lead service lines over time.

## Corrosion control – an additional treatment barrier for utilities

In parallel with removing lead pipes, many utilities will also be faced with implementing corrosion control

strategies to manage the remaining lead that may be present in their systems. Unfortunately, corrosion control is not a one size fits all approach. In developing corrosion control strategies, utilities will need to consider their treated water pH, concentrations of other metals in their treated and distributed water, the type of disinfectant used and its concentration, the amount of natural organic matter remaining in the treated water, and many other operational factors.

## Next steps

Considering both the complexity of lead service line replacement and the development of corrosion control plans, the members of the CDW, Canadian utilities and other stakeholder should consider a national strategy to address this legacy contaminant. The strategy may take advantage of the many educational resources and outreach tools that already exist (e.g., Lead Service Line Replacement Collaborative, [www.lslr-collaborative.org](http://www.lslr-collaborative.org)), consider a mechanism to share best practices across the Canadian water sector, and take a long-term view for funding measures that will ultimately reduce lead levels at the tap. 

## Cited material:

- (<sup>i</sup>) Lead in drinking water; Health Canada: Ottawa, Canada, 2017; [www.healthcanadians.gc.ca/health-system-systeme-sante/consultations/lead-drinking-water-plomb-eau-potable/document-eng.php#purpose](http://www.healthcanadians.gc.ca/health-system-systeme-sante/consultations/lead-drinking-water-plomb-eau-potable/document-eng.php#purpose).
- Cornwell et al., 2016. Journal AWWA 108(4): 68-69.
- Deshommes et al., 2017. Environ. Sci. Technol., 2017, 51 (17), pp 9507-9515.
- Trueman et al., 2016 Environ. Sci. Technol., 2016, 50 (14), pp 7389-7396.



## Halifax Water's approach to rate affordability

Although socio-economic rate-making is not considered under the Nova Scotia Public Utilities Act, Halifax Water does have three programs that benefit customers with low incomes.

*Emergency assistance – Halifax Water has partnered with the Salvation Army since 2010 to provide emergency assistance to low income customers through the H2O (Help*

**to Others) Program.** This program is available once in a 24-month period to a maximum grant of \$250 with funds provided from unregulated activities. A Rate Affordability Study was recently conducted and the current customer assistance program was reviewed. As a result, the H2O Program is being expanded in April 2018. The income eligibility thresholds will increase to \$21,000 for single income and \$39,000 for family income in April 2018, and the amount of assistance available will increase to a maximum grant of \$275 once in a 24-month period.

**Lead Service Line Replacement Rebate**  
In 2017, Halifax Water implemented a program to provide a rebate to customers of 25% of the cost of private lead service line replacements, up to a maximum of \$2,500. This will benefit all customers replacing lead service lines, as there is no income threshold.

**Financing Assistance for Replacement of Private Laterals** – In April 2018 Halifax Water will be implementing a program to provide financing

“Halifax Water monitors rate affordability on an ongoing basis, by benchmarking against 14 comparative Canadian cities.”

assistance to customers doing full replacement of the private portion of laterals to address situations such as cross connections, leaking water lines, no-corrode pipe, lead service lines, and installation of deep storm sewer where none previously existed. This program will:

- Help our customers, particularly those who do not have other means to pay for or finance the private portion of lateral replacements. Customers with low income, no savings, no available credit room, or poor credit ratings currently find it difficult to pay for the private portion of lateral replacements.
- Help the utility achieve its goals. Full replacements are better for the utility and partial replacements. Full lateral replacements increase integrity of the water and wastewater systems through reduced leakage and inflow and infiltration. Some lateral replacements help improve

environmental compliance and public health.

Financing assistance is available to eligible customers as a loan to a maximum of \$10,000 (inclusive of any grants provided by Halifax Water for lead service line replacements) secured by a lien on the property. The loan is repayable over five years at an interest rate of prime plus 2%.

Halifax Water monitors rate affordability on an ongoing basis, by benchmarking against 14 comparative Canadian cities, and monitoring the total annual residential bill as a percentage of median household income for Halifax. The current combined rates are equivalent to 1% of the median household income and well below industry benchmarks for affordability.

If you would like more information on Halifax Water's approach to rate affordability and customer assistance programs, please contact Cathie O'Toole, Director of Corporate Services/CFO, at [cathieo@halifaxwater.ca](mailto:cathieo@halifaxwater.ca).

## Brian Scott promoted to VP, Waterworks

Wolseley Canada Inc. (Wolseley) announced the promotion of Brian Scott to the position of Vice-President, Waterworks. Scott joined the Waterworks division more than three years ago, and for the past year was the GM for both Ontario and Atlantic Canada.

In his new role, Scott will be responsible for the profitable operation of the Waterworks

division. He will provide leadership in the planning and implementation of business goals, continue to build strong relationships within the industry, and focus on delivering exceptional customer value. Scott will report to Kevin Fancey, President, Wolseley Canada.

Scott has more than 19 years of experience in the industry. Prior to joining Wolseley, he was with

EMCO Corporation where he held roles including National Pricing Manager, Regional Waterworks Operations Manager, and Director of Procurement. He is a Chartered Accountant and holds a Bachelor of Business Administration degree from Wilfred Laurier University. Scott works out of Wolseley Canada's head office in Burlington, Ont.

## Kelly Martin appointed new Wolseley Canada CFO

Wolseley Canada Inc. announced the appointment of Kelly Martin to the position of Chief Financial Officer. In her new role, Martin will be responsible for the overall leadership and direction of the finance team and will provide

leadership and analytics to the company's business leaders to drive Wolseley's financial performance.

Martin has more than 25 years of finance experience and a broad and unique background in both Finance and Logistics. Most recently, she was

the Chief Financial Officer and VP Finance at Purdue Pharma.

Martin earned a Bachelor of Commerce degree from the University of Toronto. She is also a Chartered Professional Accountant.

## Yves Bélanger named VP, Supply Chain

Wolseley Canada Inc. announced the appointment of Yves Bélanger to the position of Vice-President, Supply Chain. In his new role, Bélanger has the mandate to build supply chain, sourcing, and product management functions that deliver exceptional customer value. He will lead and manage critical relationships between operations,

supply chain, sourcing, vendors and customers in support of overall business and growth objectives.

Bélanger has a Master in Industrial Engineering from École Polytechnique de Montréal. He is a member of the Professional Engineers of Ontario, Ordre des ingénieurs du Québec, and the Institute of Industrial and Systems Engineers.

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# Pump hydraulics

A common item found in every almost every aspect of water and wastewater systems, pumps are mechanical devices that use energy to move fluids from one location to another. While there are several different types, each are bound by the same hydraulic principle – the Bernoulli Equation. This equation states that an increase in fluid velocity must have an associated decrease in pressure or decrease in potential energy.

In practice this is broken down into a simple equation:

$$v^2/2 + gz + P/\rho - H = \text{constant}$$

Where  $v$  is the fluid velocity,  $g$  is gravity's acceleration,  $z$  is the elevation,  $P$  is the pressure,  $H$  is the headloss, and  $\rho$  is the fluid's density. In real-world systems, there are also losses due to friction and fittings that need to be considered. Smaller pipe sizes may be cheaper to purchase and install, but will have increased friction losses and possibly require a larger pump.

Head is an important concept in pumped systems. Simply put, head is

a measure of how much resistance to flow (generally friction and elevation difference) a pump can overcome at a given flow rate. Pump performance varies by type, make and model, but a pump curve should show that an increase in head reduces the flow capacity of a pump. There's a common misconception that pumps generate pressure directly; in reality they simply create flow in a hydraulic system, and the resistance to flow creates the pressure.

Several different methods are out there to calculate the head losses or pressure drop in a system. Two of the more commonly used in water and wastewater are:

- Darcy Weisbach Equation
- Hazen Williams Equation

Hazen Williams can only be used for water, but is generally simpler to use and more conservative. Darcy works for a wider range of fluids and conditions, and is generally more accurate but requires more information.

Net positive suction head (NPSH) is the last topic we will cover. NPSH relates to pump cavitation (formation of vapour bubbles which implode and damage the pump impeller). NPSH<sub>available</sub> is the water pressure present at the suction/intake end of a pump. Pump manufacturers typically specify NPSH<sub>required</sub> for a given pump and condition. If NPSH<sub>a</sub> is less than NPSH<sub>r</sub>, the pump selection and/or conditions should be re-evaluated. ☺

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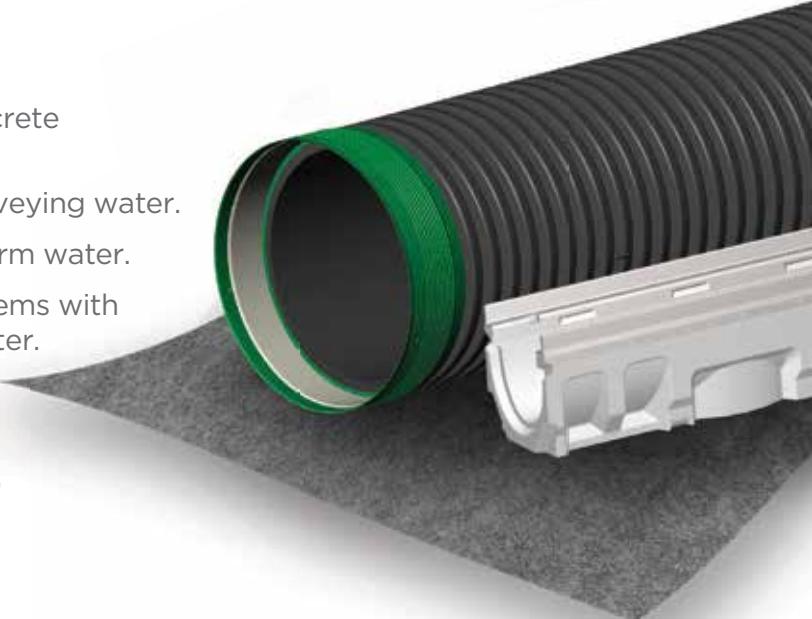
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"The best way to create value in the 21st century is to connect creativity with technology" - Steve Jobs

Due to favourable installation, operational and environmental advantages, Cured In Place Pipelining (CIPP) was the method chosen to rehabilitate the 45 year old Hespeler Trunk Sanitary Sewer in the City of Cambridge, On. A bridge was constructed to effectively and safely divert flows while approximately 1,400 metres of 600/675mm diameter vitrified clay pipe running along and crossing beneath the Speed River was repaired.

Visit [liquiforce.com](http://liquiforce.com) to learn more about the advantages of trenchless technology.

**LiquiForce**

**GRAVITY**  
The proven trenchless sewer program cities trust.