



# GO WITH THE FLOW

Atlantic Canada Water and Wastewater Association Newsletter

An affiliate of the American Water Works Association and the Water Environment Federation

WINTER 2011

## Regulatory Impacts on Small Systems

2011 Conference Recap

CWWA Report

Circulation Pumps





# GENIVAR PROVIDES SUSTAINABLE INFRASTRUCTURE SOLUTIONS TO THE ATLANTIC COMMUNITY

## GLOBAL SOLUTIONS IN PROFESSIONAL CONSULTING SERVICES

Municipal Infrastructure | Transportation | Industrial | Environment | Energy  
Project Management | Land Surveying | Urban Planning

## ATLANTIC OFFICE LOCATIONS

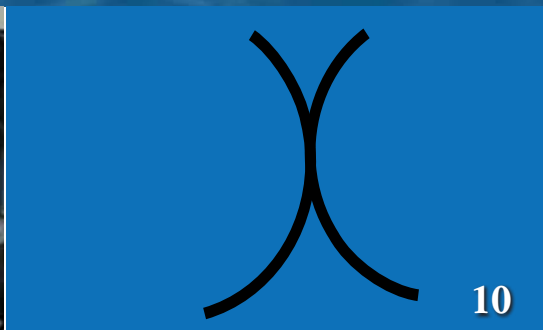
Nova Scotia Dartmouth | New Brunswick Moncton | Saint John | Fredericton  
Prince Edward Island Summerside | Charlottetown

[www.genivar.com](http://www.genivar.com)



GENIVAR

# Table of Contents



Atlantic Canada Water & Wastewater Association  
PO Box 41002  
Dartmouth, NS, B2Y 4P7  
Phone: 902.434.6002  
Fax: 902.435.7796  
www.acwwa.ca  
e-mail: acwwa@hfx.andara.com

#### SECTION OFFICE

##### Executive Director

Clara Shea ..... 902.434.6002  
contact@acwwa.ca ..... F: 902.435.7796

#### BOARD

##### Chair

Jamie Hannam, MBA, P.Eng ..... 902.490.4804  
jamie.hannam@halifaxwater.ca ..... F: 902.490.1584

##### Past Chair

Robert Gillis, P. Eng ..... 902.469.2806 x103  
robert@aps.ns.ca ..... F: 902.463.3529

##### First Vice Chair

Brett Pugh, P.Eng ..... 902.421.7241 x 2270  
brettp@cbcl.ca ..... F: 902.423.3938

##### Second Vice Chair

Margaret Walsh, PhD, P.Eng ..... 902.494.8430  
mw Walsh2@dal.ca ..... F: 902.494.3105

##### Secretary-Treasurer

Willard D'Eon, MPH, P.Eng ..... 902.492.6753  
willard@cbcl.ca ..... F: 902.423.3938

##### WEF Delegate (2011-2012)

Gary Chew ..... 902.895.2885  
gary.chew@sansom.ca ..... F: 902.893.7584

##### AWWA Director (2011-2014)

Reid Campbell ..... 902.490.4877  
reid.campbell@halifaxwater.ca ..... F: 902.490.4808

##### AWWA Director Elect (2014-2017)

..... Vacant

#### AWWA PUBLISHING

Section Newsletters Editor ..... Dave Plank  
Production Editor ..... Daniel Feldman  
Proofreader ..... Martha Ripley Gray  
Advertising Sales ..... Cecilia Hendrix  
Director of Publishing ..... Liz Haigh

**GO WITH THE FLOW** is published four times yearly by the Atlantic Canada Water and Wastewater Association, PO Box 41002, Dartmouth, NS, B2Y 4P7. Copyright 2011 by the Atlantic Canada Water and Wastewater Association and the American Water Works Association. Published in the USA.

## 2 Chair's Corner

Membership has its benefits.

**by Jamie Hannam, MBA, P.Eng.**

## 3 WEF Delegate's Update

ACWWA gets its 5s Society.

**by Gary Chew**

## 3 AWWA Director's Report

A great conference, and news from the RMSO.

**by Reid Campbell**

## 4 CWWA Report

Committees are busy, even when the government looks like it's not.

**by Roland P. Richard, P.Eng., FEC**

## 6 ACWWA News

State of the science on lead, membership news and Fresh Ideas for ACWWA.

## 8 Understanding Regulatory Impacts in Small Systems: An Operations Perspective

Small systems face their own challenges when it comes to regulatory burdens.

**by Megan Kot, Heather Castleden and Graham Gagnon**

## 10 2011 Conference Recap

## 14 Replace Bleeders with Circulation Pumps to Improve Quality, Lower Costs

A small Ontario town kills two birds with one stone.

**by Shahram Tabe, John Cannard, Taher Jamal and Anthony CF Edmonds**

## 20 ACWWA Marketplace

Ads from your friends, neighbors and ACWWA supporters.

#### On the cover:

Nova Scotia's Peggys Point lighthouse, overlooking St. Margarets' Bay.

# Chair's Corner



## ACWWA – Membership Has its Benefits

by Jamie Hannam, MBA, P. Eng., Halifax Water

Welcome to the Winter 2011 edition of *Go With the Flow*, providing news about water and wastewater matters across Atlantic Canada. This informative newsletter is one of the many benefits of membership with ACWWA.

At recent ACWWA meetings I had the opportunity to discuss issues with senior AWWA and WEF officials and we always arrived at an interesting conversation on member benefits. As incoming Section chair, I am intrigued to get a full handle on what are the real benefits of being an ACWWA member and how best to promote them. The one summary comment that struck home was that our collective associations solve problems!

We solve problems by utilizing our contacts with industry peers, through skills

and knowledge gained from education programs and by reaching into the deep knowledge and experience base of AWWA and WEF.

This year's annual conference in St. John's was a shining example. Debbie Smith and her team delivered a truly energetic mix of technical and social activities that provided opportunities for networking, information exchange and fun (just ask those who kissed the cod!). Thank you, St. John's.

The knowledge exchange that is available from AWWA and WEF is provided through publications, standards, e-learning, conferences, website content, staff and more. However, access to these resources can be overwhelming for members. To help, ACWWA will be working

with AWWA and WEF staff to develop a roadmap or interface into the knowledge sources of these great organizations.

I encourage members at their jobs to fully utilize the resources of your ACWWA membership to find and resolve your issue with an industry best practice or solution that has worked for a peer. There is plenty of information available, either with a phone call or the click of a computer mouse.

Thank you to all ACWWA members for the opportunity to chair our association for the upcoming year. I look forward to working with you. If you have any comments or concerns, please email me at [jamie.hannam@halifaxwater.ca](mailto:jamie.hannam@halifaxwater.ca), or contact our association administrator Clara Shea at [contact@acwwa.ca](mailto:contact@acwwa.ca).

## ACWWA Executive and Committee Officers

### SECTION OFFICE

#### Executive Director

Clara Shea ..... 902.434.6002  
[contact@acwwa.ca](mailto:contact@acwwa.ca) ..... F: 902.435.7796

### BOARD

#### Chair

Jamie Hannam, MBA, P.Eng. .... 902.490.4804  
[jamie.hannam@halifaxwater.ca](mailto:jamie.hannam@halifaxwater.ca) ..... F: 902.490.1584

#### Past Chair

Robert Gillis, P. Eng. .... 902.469.2806 x103  
[robert@aps.ns.ca](mailto:robert@aps.ns.ca) ..... F: 902.463.3529

#### First Vice Chair

Brett Pugh, P.Eng. .... 902.421.7241 x 2270  
[brett@cbcl.ca](mailto:brett@cbcl.ca) ..... F: 902.423.3938

#### Second Vice Chair

Margaret Walsh, PhD, P.Eng. .... 902.494.8430  
[mwalsh2@dal.ca](mailto:mwalsh2@dal.ca) ..... F: 902.494.3105

#### Secretary-Treasurer

Willard D'Eon, MPH, P.Eng. .... 902.492.6753  
[willard@cbcl.ca](mailto:willard@cbcl.ca) ..... F: 902.423.3938

#### WEF Delegate (2011-2012)

Gary Chew ..... 902.895.2885  
[gary.chew@sansom.ca](mailto:gary.chew@sansom.ca) ..... F: 902.893.7584

#### AWWA Director (2011-2014)

Reid Campbell, P. Eng. .... 902.490.4877  
[reid.campbell@halifaxwater.ca](mailto:reid.campbell@halifaxwater.ca) ..... F: 902.490.4808

#### AWWA Director Elect (2014-2017)

..... Vacant

#### ABEA Representative Director (2011-2014)

Kelly Brown ..... 902.468.1500  
[kbrown@emcoltd.com](mailto:kbrown@emcoltd.com) ..... F: 902.468.2721

#### Gov't Relations Director (2009-2012)

Roland Richard, P. Eng. .... 506.387.7977  
[rrichard@gmsc.nb.ca](mailto:rrichard@gmsc.nb.ca) ..... F: 506.387.7389

#### Membership Involvement Director (2009-2012)

Scott Grasman, P.Tech. .... 506.460.2038  
[scott.grasman@fredericton.ca](mailto:scott.grasman@fredericton.ca) ..... F: 506.460.2461

#### Education Director (2010-2013)

Shawn Rowe, EIT ..... 902.450.4000 x5030  
[SRowe@dillon.ca](mailto:SRowe@dillon.ca) ..... F: 902.450.2008

#### Membership Director (2010-2013)

John Eisnor, P.Eng. .... 902.490.1930  
[johne@halifaxwater.ca](mailto:johne@halifaxwater.ca) ..... F: 902.490.1584

#### Communication Director (2011-2014)

Nicole Taylor, M.Eng, P.Eng. .... 506.658.4455  
[nicole.taylor@stjohn.ca](mailto:nicole.taylor@stjohn.ca) ..... F: 506.658.4740

#### Technical Director (2011-2014)

Jennie Rand, PhD, P.Eng. .... 902.585.1519  
[jennie.rand@acadiou.ca](mailto:jennie.rand@acadiou.ca) ..... F: 902.585.1067

#### Technical Papers Chair

Julie Stokes ..... 506.877.7702  
[julie.stokes@moncton.ca](mailto:julie.stokes@moncton.ca) ..... C: 506.871.4992

#### Scholarship Chair

Bing Chen ..... 709.737.8958  
[bchen@mun.ca](mailto:bchen@mun.ca) ..... F: 709.737.4042

#### Water For People Chair

Mike Chaulk ..... 902.421.7241  
[mikec@cbcl.ca](mailto:mikec@cbcl.ca) ..... F: 902.423.3938

#### Volunteer Chair

Doug MacKinnon ..... 902.895.2885  
[doug.mackinnon@sansom.ca](mailto:doug.mackinnon@sansom.ca) ..... F: 902.893.7584

#### Newsletter Chair

Amy McHarg, P.Eng. .... 506.633.6650  
[amym@cbcl.ca](mailto:amym@cbcl.ca) ..... F: 506.633.6659

#### Education Chair

Mark Butler, P.Eng. .... 506.633.5000  
[mbutler@dillon.ca](mailto:mbutler@dillon.ca) ..... F: 506.633.5110

#### Cross Connection Control Chair

Fred Sawyer ..... 506.658.6698  
[fred.sawyer@gnb.ca](mailto:fred.sawyer@gnb.ca) ..... F: 506.643.2853

#### Young Professionals Chair

Stephanie Gora, EIT ..... 902.421.7241  
[stephanieg@cbcl.ca](mailto:stephanieg@cbcl.ca) ..... F: 902.423.3938

#### 2012 Charlottetown Conference Chair

Craig Walker ..... 902.629.4014  
[cwalker@charlottetown.ca](mailto:cwalker@charlottetown.ca) ..... F: 902.894.7094

#### Website Chair

David Russell ..... 506.658.4763  
[david.russell@saintjohn.ca](mailto:david.russell@saintjohn.ca) ..... F: 506.658.4740

#### Operator Involvement Chair

Trent Brewer ..... 506.460.2038  
[trent.brewer@fredericton.ca](mailto:trent.brewer@fredericton.ca) ..... F: 506.460.2301

#### Government Affairs Chair

Stefan Furey ..... 902.424.4743  
[fureysm@gov.ns.ca](mailto:fureysm@gov.ns.ca) ..... F: 902.424.0501



# WEF Delegate's Update



## 5s Society Hits Atlantic Canada by Gary Chew

At the very successful St John's conference, ACWWA (after years of organizing) got its 5s Society off the ground. The Select Society of Sanitary Sludge Shovellers is a gold shovel award sponsored by WEF, with societies from Atlantic Canada to The Netherlands and even Japan.

The Society was formed to provide a means of recognizing those who have contributed freely of their time and talents to the growth, well being and success of their individual associations. Many of these hard workers do not become president of their association or receive one of the coveted awards associated with the wastewater industry and the association. The 5s Society provides a concrete method of expressing recognition and gratitude for their efforts. It is important

to appreciate that you cannot "join" the society, that members are "selected" on the basis of merit.

Tradition provides that the four senior members of the society who were selected this year in St John's, Gary Chew, Roland Richard, Rob Gillis and Susheel Arora, shall, at the ACWWA conference, select the new members who qualify by their activities and induct them in to the society at a ceremony held during the conference. This will create an opportunity to recognize our members and have a little fun at the conference. The formation of the Atlantic Canada Society means that all WEF member associations in Canada now have a 5s Society. I want to express thanks to Peter Nicol and Bill Borlase for attending our conference and getting our society off the ground. Great job, guys!

Betty Jordan from WEF was our representative this year, and I have to tell you, she had a great time in NL. She took the time to tour both Nova Scotia and NL while she was here and now has a great appreciation for our association and people. Betty is from Fort Worth, Texas.

Another new and exciting addition to the conference was the Top Ops for wastewater. Congratulations to the Michelin team for winning the competition.

I will continue through the 2011/2012 year to encourage new memberships and involvement in the WEF association and ACWWA, as we have some great training and information to offer to our members in both ACWWA and WEF. Contact me anytime at [gary.chew@sansom.ca](mailto:gary.chew@sansom.ca); your input is always appreciated.

# AWWA Director's Report



## 2011 Conference: A Good Time Had by All by Reid Campbell

I want to start off by congratulating Debby Smith and her St. John's conference committee for a tremendously successful conference, from attendance through to the social, technical, completion and tradeshow aspects. Well done and thank you on behalf of ACWWA.

I had the honour and pleasure of hosting AWWA Executive Director David LaFrance and Immediate Past-President Joe Mantua. Both of them asked me to pass on their compliments and thanks for the tremendous hospitality afforded them. They were also very impressed by the quality of the technical program and the enthusiastic participation of so many members at the conference.

I also want to congratulate our competition winners, who have the opportu-

nity to represent ACWWA at ACE 12 in Dallas. The City of Fredericton prevailed for the seventh consecutive time in one of the most competitive Top Ops events yet. Amina Stoddard of Dalhousie University was the winner of the Fresh Ideas competition; her technical presentation was judged to be the best among first-time presenters, and she will travel to ACE to present her research in a poster session. Well done, Amina.

The Quebec section of AWWA has agreed to operate a program for Canadian water utilities to monitor and measure their filtration performance. The program will be called the Canadian Water Treatment Alliance. The International Water Treatment Alliance was a simplified version of the Partnership for

Safe Water offered by AWWA to utilities outside of the US. Unfortunately, AWWA was not able to continue this program. The Quebec section has stepped up to operate this program for Canadian utilities as the Canadian Water Treatment Alliance. Thank you and congratulations to the Quebec section for this initiative. This is a tremendous opportunity for water treatment plants in Canada to benchmark their filtration performance against the best in North America. Stay tuned for the official announcement in the new year.

On Oct. 21 and 22, I attended the Region I, Regional Meeting of Section Officers (RMSO) in Moncton. Thirty-four volunteers and section staff attended from

*Continued on page 19*

# CWWA Director's Report

## Committees Busy, Even During a Quiet Fall

Roland P. Richard, P. Eng., FEC

The Canadian Water and Wastewater Association (CWWA) is the national body representing the common interests of Canada's municipal water and wastewater services, their private sector suppliers/partners and other stakeholders. It is recognized by the federal government and national bodies as the national voice of this public service sector. CWWA promotes a harmonized and rational policy and regulatory framework across Canada for municipal water and wastewater services and the appreciation of these services by the general public.

CWWA was founded in 1986 with the support of the Federation of Canadian Municipalities (FCM), AWWA's Canadian Sections and WEF's Canadian Member Associations. CWWA is the means for all utilities to have a voice on federal issues and regulations.

The following is a brief summary and highlights from CWWA activities for Fall 2011.

### FEDERAL POLICY AND LEGISLATIVE REGULATORY SUMMARY

Overall, the Federal government remained quiet, with the House adjourned for summer recess for most of this time. A quick summary of Federal initiatives follows:

- Environment Canada signed a promotional partnership agreement with the USEPA on the WaterSense program. WaterSense is a labeling program that promotes third-party certified water-efficient products. We look forward to collaborating more with EC on program implementation and communication with Canadian consumers.
- The Canadian Premiers have formed a new Water Stewardship Council, which will provide information and strategic advice to Premiers on key trends, issues and opportunities related to Canada's water resources. CWWA

invited someone from the Council to speak at the Annual Window on Ottawa, but no one was available. Staff will continue to monitor this initiative as it develops.

- The Canadian Environmental Assessment Agency has published in *Gazette II Regulations Establishing Timelines for Comprehensive Studies*. The Regulations set mandatory timelines for the Canadian Environmental Assessment Agency when it is responsible for conducting comprehensive studies in accordance with the 2010 amendments to the *Canadian Environmental Assessment Act*. During the consultation phase, CWWA supported the regulation development to streamline the EA process whenever possible.
- The new Guideline Technical Document for Carbon Tetrachloride in drinking water is now available on Health Canada's website. The document recommends a maximum acceptable concentration (MAC) for carbon tetrachloride in drinking water of 0.002 mg/L (2 µg/L). The new Guideline Technical Document for N-nitrosodimethylamine (NDMA) in drinking water is also now available on Health Canada's website. The document recommends a MAC for NDMA in drinking water of 0.00004 mg/L (0.04 µg/L). CWWA's Drinking Water Quality Committee submitted comments on both drafts prior to their release.
- The Canadian Commission on Building and Fire Codes (CCBFC) is considering developing a water use and efficiency objective to be incorporated into Canada's national building and plumbing codes.
- Health Canada published a new State of the Science and a separate Risk Management Strategy for Lead. CWWA,

with input from our Drinking Water Quality Committee, submitted comments on the documents.

### POLICY AND COMMITTEE WORK

#### Wastewater and Stormwater Committee.

In July, staff and committee volunteers reviewed the draft Wastewater Systems Effluent Regulation, prior to its publication in the Canada Gazette. The committee was pleased with the overall direction of the regulation, but submitted additional comments to Environment Canada on August 12. Staff also followed up with Environment Canada on some outstanding specific concerns raised by members.

#### Biosolids Committee.

The Biosolids Committee continues to monitor the progress of the CCME in developing a national approach for the management of biosolids. However, there has been no recent progress on this initiative.

#### Security and Emergency Management Committee.

The next Water Utilities Security Workshop will explore for the first time the interdependencies between different critical infrastructure (CI) sectors to improve dialogue and collaboration. The Association is trying to secure Public Safety Canada's continued sponsorship of this Workshop. Topics on the workshop agenda were finalized at the last teleconference on July 25.

In conjunction with the workshop, a half-day ICS 100 training session will be organized on November 22. ICS is an organizational system that provides an integrated and coordinated approach to effectively provide emergency response operations of all types and complexities. ICS for Critical Infrastructure is intended for field response and supervisory personnel assigned to an incident or event that require an understanding of ICS. This session reviews the ICS organization, terminology, and responsibilities so that the learner will acquire expertise and

function effectively during an incident. Please consult the CWWA website for more details on both events.

#### **Drinking Water Quality Committee.**

Health Canada has been actively consulting on a new State of the Science Report and Risk Management Strategy for Lead. This document reviews the pathway for lead exposure to the Canadian population and environment and identified key targets for reduction.

The Committee supported the recommendation to review the Canadian Drinking Water Quality Guideline for lead. CWWA recommended that Health Canada consider developing standards or regulation to govern the lead content of plumbing fixtures, as this can be a major pathway for lead entering potable water.

The committee is also reviewing a new proposed Guideline and Guideline Technical Documents for *Escherichia coli* and total coliforms in drinking water.

#### **National Water Efficiency Committee.**

The committee finalized the agenda for the Workshop on Water Efficiency and Conservation—Innovation to Implementation, held Oct. 18 in Ottawa. Attendees came in for in-person and webinar attendance. We're hoping to expand web-based events to accommodate members without the ability to travel.

**Energy Committee.** Following the May 16 Energy Audit, members discussed and suggested presentations for the next workshop in conjunction with the "Window on Ottawa." A teleconference on Sept. 14 finalized the workshop agenda. The presentations will highlight renewable energy technologies which have been successfully implemented to enhance energy management, and what are the technologies relevant to the water and wastewater treatment plants. Real life examples and possible future prospects will be highlighted.

#### **INTERNATIONAL WORK**

CWWA continues to share international business opportunities with our private

sector members, and to promote participation in international events and tradeshow.

As an update, CWWA will not be hosting the IWA 2013 combined conferences on Water Efficiency and Performance Indicators and Benchmarking in Toronto. Both conferences will be held elsewhere.

#### **INTERNAL**

CWWA sent the draft One Voice report for member association review and comment by the Boards.

CWWA continues to examine ways of improving member services and benefits. As part of this initiative, our board

of directors will be hosting owner-member and owner-stakeholder consultation sessions in conjunction with the Window on Ottawa. This will provide an opportunity for members and stakeholders to provide feedback on CWWA's activities and improve member services.

Should any other information be required regarding CWWA activities, please email me at rrichard@gmsc.nb.ca.



**CBCL LIMITED**

Consulting Engineers

EXPERIENCE  
VISION  
COMMITMENT

info@CBCL.ca  
www.CBCL.ca

"Atlantic Canada's  
Leading Engineering Firm"

## Engineering and Environmental Design and Consulting

CBCL Limited is the leading locally owned multidisciplinary engineering and environmental consulting firm in Atlantic Canada.

With a staff base of over 300 in our nine offices, we deliver high value and high quality professional services to our Clients throughout the region.

Halifax • Sydney • Charlottetown  
Saint John • Fredericton • Dieppe  
St. John's • Corner Brook • Goose Bay



## Health Canada Releases State of the Science Report on Lead

Health Canada has conducted an assessment of the most current science on lead and consolidated the information in a State of the Science Report. The report was prepared in response to recent scientific evidence indicating that health effects of concern are associated with blood lead levels below 10 µg/dL, the current Canadian blood lead intervention level. A risk management strategy was also released outlining current and proposed risk management actions.

Exposures through food, drinking water, air, dust, soil and other products were reviewed. Although blood lead levels have declined by more than 70 percent in Canada since 1978–1979, lead is still widely detected in the Canadian population. Health effects have been associated with blood lead levels as low as 1–2 µg/dL, levels which are present in Canadians.

In infants and children, neurodevelopmental effects are considered to be the health effect of concern, with a decrease in

IQ score being the most sensitive endpoint. Developing infants and children are more susceptible to lead's toxic effects than adults, owing to a greater gastrointestinal absorption rate and less effective renal excretion in addition to different behaviours. The relationship between lower IQ scores and blood lead levels represents the strongest evidence of adverse health effects from exposures to lead concentrations below 10 µg/dL in this vulnerable population.

The proposed risk management strategy for drinking water includes a review of the *Guidelines for Canadian Drinking Water Quality for Lead*. Research and monitoring will continue to support the assessment of lead in Canadians and, where appropriate, assess the performance of potential control measures identified during the risk management phase.

To download a copy of the documents, visit: [http://www.hc-sc.gc.ca/ewh-semt/pubs/contaminants/lead\\_sos-plomb\\_ecs-eng.php](http://www.hc-sc.gc.ca/ewh-semt/pubs/contaminants/lead_sos-plomb_ecs-eng.php)

## Membership Corner by John Eisnor, P.Eng., ACWWA Membership Director

The membership of the Atlantic Canada Water and Wastewater Association is comprised of members of both the American Water Works Association (AWWA) and the Water Environment Federation (WEF). As of October 2011, ACWWA has 535 AWWA members and 107 WEF members. The overall membership of ACWWA has been growing over the past year, and we hope to continue this trend into 2012. We encourage all members to recruit someone they know in the water and wastewater industry. AWWA has a great program in place to reward those who recruit new members. More information regarding these programs can be found on the AWWA website ([www.awwa.org](http://www.awwa.org)).

Effective January 1, AWWA will raise membership dues. This will be the first dues increase since 2009; the increase is necessary to maintain revenue levels, which have been decreasing due to an overall decline in AWWA membership. The dues

increase does not apply to student members and smaller utility and service provider members.

AWWA has also changed the eligibility for life membership, which previously was attained after 30 years of membership. Currently, life members account for 10 percent of AWWA members. This number is expected to rise to 25 percent of the membership in 10 years. This situation was simply not financially sustainable for AWWA. In September 2011, the AWWA Board approved a change to the eligibility for life membership. Life membership will now be attained when a member has reached 65 years old and has 30 years of membership. Membership dues for life members that are still working will be US\$85. For retired life members, dues will be US\$44 or US\$32, depending on whether they choose to receive printed publications. All current life members will be grandfathered, however they will have to start paying the new membership dues. On a positive note, for those members that are approaching life membership status, the dues for life membership are still less than full membership dues. AWWA will be announcing a new program in the near future to recognize members who have achieved thirty years of membership.

As always, the ACWWA Membership Committee is looking for enthusiastic individuals who have a desire to make ACWWA the leading professional association in Atlantic Canada. In particular we are looking for individuals representing Nova Scotia, Prince Edward Island and Newfoundland and Labrador, as well as representatives from various industry sectors. If you are interested in joining the committee or would like to discuss membership in general, please contact John Eisnor at [johne@halifaxwater.ca](mailto:johne@halifaxwater.ca) or (902) 490-1930.

**Canada Water Supply Limited**  
[www.canadawater.ca](http://www.canadawater.ca)  
Water & Wastewater Treatment  
G.A. (Sandy) Robertson • Manager & CEO  
P.O. Box 1225, Saint John, NB E2L 4G7 Phone 506 652 5885 • Fax 506 633 0031  
e-mail: [sandy@canadawater.ca](mailto:sandy@canadawater.ca)



## AWWA Looks for Fresh Ideas

The Fresh Ideas program is an AWWA initiative that seeks to engage new, energetic young members of the water and wastewater industry and give them opportunities to present their work to more experienced members of the association. This year's Atlantic Canada Fresh Ideas competition took place at the annual ACWWA conference in St. John's. Three young academics, Lin Xiao, Brad McIlwain and Amina Stoddart, were invited to give presentations on their research. A panel of judges reviewed their work based on the scientific methods employed; the novelty, or "freshness" of the work; and its applicability to industry.

Lin is currently working on a Master's of Civil Engineering at Memorial University in St. John's, NL. She is evaluating a small-scale water ozonation treatment system that has been adopted by the provincial government of Newfoundland and Labrador for use in small communities. Her initial work, which she presented at the conference, revealed two major technical challenges: 1) the occasional presence of color in the treated water; and 2) the robustness and cost-efficiency of the system under various operational and environmental conditions. The results indicate that the system will need to be optimized if it is to be successfully distributed and implemented in the province. This research will ultimately help to improve the quality and capacity of drinking water systems in Newfoundland and Labrador.

Brad presented some of the results of his assessment of the effectiveness of the Halifax Water corrosion control program. He used the Health Canada guidance protocols for residential and non-residential buildings to assess lead release in various buildings in Halifax. The residential testing program yielded a 90<sup>th</sup>-percentile lead concentration of 8 µg/L, well below the current action level of 15 µg/L. Typically, the higher concentrations of lead occurred in sites with lead service lines. Only five of 106 of the non-residential sites had lead concentrations above the action level. Some of the highest concentrations of the non-residential testing came from a particular fountain model that has been recalled in the United States because it contains a lead-lined reservoir. Further work is being conducted to determine whether the tested fountains do in fact have lead-lined tanks. Overall, the results of his study suggest that Halifax Water's corrosion control program is effective.

Amina presented the results of a pilot-scale investigation of alum dose, alum type and tapered flocculation tank velocity gradients for Halifax Water's JD Kline Water Supply Plant. The utility is considering installing mechanical mixers in its hydraulically mixed tanks to meet its strategic THM and HAA goals (80 µg/L THMs and 60 µg/L HAAs). Based on the parameters investigated (TOC, DOC, UV-254, organic size distribution using HPSEC, THMfp and HAAfp), she found that varying the type of alum used, the alum dose applied, or the velocity gradients during

cold or warm water conditions did not have a statistically significant impact on the amount of THM and HAA precursors removed. This suggests that the facility is currently optimized for natural organic matter removal and should be able to implement mechanical mixing with minor upset. DBP formation is still a concern, however, so in the future she will be investigating the use of biofiltration to improve organic removal at the plant.

After careful consideration, Amina Stoddart was chosen as the Fresh Ideas winner for 2011. She will receive a complimentary registration for the ACE 2012 conference, which is being held in Dallas in June of next year. While there, she'll participate in the association-wide Fresh Ideas Poster Competition. Good luck, Amina! Congratulations also go out to Lin and Brad, who both gave interesting, well-prepared presentations.

## Nova Scotia Funds Governance Study for Pictou County

The Province of Nova Scotia is offering \$100,000 toward a governance study that will help six Pictou County municipalities.

"Families, seniors and residents of Pictou County want to ensure their communities stay strong and vibrant for generations to come," said Service Nova Scotia and Municipal Relations Minister John MacDonell. "This study could help the six municipalities identify ways they can keep their communities great."

The study would look at possible governance models for the County of Pictou and the towns of Stellarton, Pictou, New Glasgow, Westville and Trenton. It would also suggest whether sharing municipal services between those municipalities could improve services and control rising costs.

A governance study looks at how municipalities are organized and offers suggestions to become more effective and efficient, in order to ensure the best use of residents' tax dollars.



**YOUR AD  
GOES HERE**

Call Cecilia Hendrix  
at 303.347.6147 to put  
this space to work for you!



## Understanding Regulatory Impacts in Small Systems: An Operations Perspective

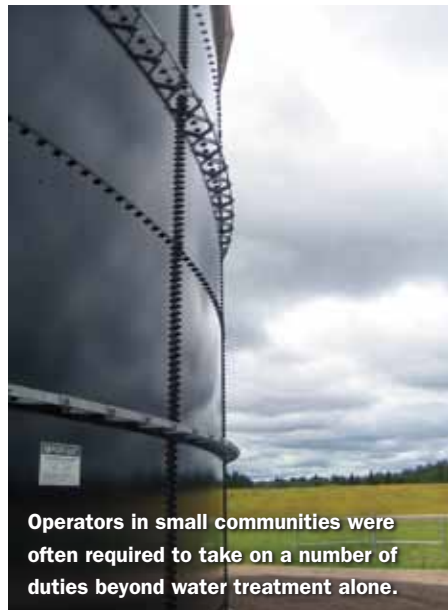
by Megan Kot, Heather Castleden and Graham Gagnon

Our research team recently has had the privilege of talking to operations staff at various communities in Atlantic Canada. The findings were reported in *Health & Place*, a peer-reviewed journal (the full citation appears at the end of this article). We have prepared the following executive summary, first as a way to thank and acknowledge our anonymous communities that took the time to meet with us and discuss their challenges, and second, as a way to communicate our findings from the research to the water community in Atlantic Canada.

Most small systems in Atlantic Canada are successful in providing safe drinking water to their customers on an ongoing basis, though many work under conditions that are constrained by financial and human resources. This research sought to explore some of the unintended consequences that arise among small systems in Atlantic Canada as a result of regulatory compliance. To gather this information, operators and managers of 10 small systems in Nova Scotia and New Brunswick, along with a regulator from each province, were interviewed. In total 19 employees associated directly or indirectly with small water systems were interviewed. Each person was asked to comment on some of the challenges they faced in meeting provincial regulations for water quality, and what they thought some of the key issues were for operators in particular when working in small communities.

Our analysis identified four key themes: 1) the challenge of regulatory compliance for emerging issues; 2) the challenge

of ensuring operator training and certification; 3) the challenge of recruiting and retaining operators; and, 4) the challenge of maintaining good community relations. Where challenges are amplified given a lack of resources, the opportunity for an unintended consequence to occur may arise. Each of these challenges is discussed in detail below.



Operators in small communities were often required to take on a number of duties beyond water treatment alone.



Much of the testing and maintenance required for safe drinking water takes place behind closed doors.

**1) Meeting Regulatory Compliance.** Those interviewed noted that operators working in small communities were often required to take on a number of duties beyond water treatment alone. For operators, this may include responsibilities for snow removal, general building maintenance, and other duties. While year after year the scope of many of these duties remains constant, water treatment is a continuously evolving field, influenced by both new and emerging regulations and changes in consumer demand.

Some operators noted they struggled with balancing the demands of all duties within a regular eight-hour workday. It was noted that many of the operator's non-water related duties are highly visible to the public (e.g. snow removal), and that much of the testing, maintenance and training required to ensure safe drinking water takes place behind closed doors. Indeed, one operator was under the impression that many of his customers "think I drive around in a truck all day." To maintain customer satisfaction, operators must prioritize their responsibilities within the community in a way that does not compromise customer health and safety.

**2) Training & Certification.** Education was mentioned as a challenge for those in more rural locations, particularly in light of dynamic regulatory changes. One operator explained: "[W]e have our call-in [operator]... but he's not here all the time; to leave him in control of everything alone for the day is kind of scary." When the stand-in operator runs into problems, the full-time operator may be called back from training sessions, and the training must be completed on another occasion.

**3) Employee Recruitment & Retention.** Many communities reported challenges with recruitment and retention of operators, and with many operators looking to retire in the coming

years, new operators are in high demand. For those working in small systems, it is not a surprise that operators receive little pay in exchange for the amount of responsibility they hold for community health, particularly in contrast with those operators working in larger water systems where these responsibilities are shared. In addition to pay issues, many younger people look to cities to provide them with the lifestyle and amenities that cannot be found in more rural and small town environments. “No movie theatre, no nothing. Would you want to live here?” one operator asked. Even when younger operators are successfully recruited, there is a high probability they will take a job in a larger community if one becomes available.

**4) Community Relations.** Unlike operators who work anonymously in the urban environment, operators in rural settings are often well known by their customers. This can cause issues when there is community dissatisfaction over the quality of water (i.e. smell, taste or price). One operator half-joked: “They know where I live, I can’t get away.” None of the operators interviewed reported hearing any positive feedback from their customers, and in many communities it was noted that a number of individuals purchased bottled water instead of drinking tap water. This occurred for a range of reasons. One operator noted: “In the past [consumers] had no faith in the drinking water [...] now they’ve got perfectly good drinking water, but some people are hard nuts to crack; they will not drink that tap water.” Although many larger centers are now actively promoting tap water, small communities lack the resources, and, in some cases, the support, from local councillors to do so. This lack of support left some operators with a sense of frustration and a feeling that their efforts to provide safe drinking water to the community were being undermined.

The research team found that although the small systems who participated in this research were achieving regulatory compliance, a number of unintended consequences could be identified. While there is no “silver bullet,” the research findings suggest rural communities work to recognize the significant role that operators play in their community and encourage these community employees to be engaged in organizations like the ACWWA to stay in touch with regulatory changes, training opportunities, and most importantly, to network with colleagues in the water treatment community.



**Operators in rural settings are often well known by their customers.**

**Reference:** Kot, M., Castleden, H., & Gagnon, G. a. (2011). Unintended Consequences of Regulating Drinking Water in Rural Canadian Communities: Examples from Atlantic Canada. *Health & Place*, 1-8. doi:10.1016/j.healthplace.2011.06.012

## Target Your Sludge with the Sludge Gun®

Simple, portable sludge level detector

Press the trigger and lower the probe!  
Audible tone varies with sludge density.  
Markers on cable indicate sludge depth.

**Used in lagoons, clarifiers and DAFs.**



Set your sights on more products from the Markland family of process control instrumentation products:

**Automatic Sludge Level Detectors • Suspended Solids Meters  
Automatic Duckbill Samplers**

Contact us **Toll Free: 1-855-873-7791** or [markland@sludgecontrols.com](mailto:markland@sludgecontrols.com)  
**Reliable Products • Factory-direct Support • Fast Delivery**

♦ A Canadian company - Products designed and manufactured in Canada

**MARKLAND**  
Specialty Engineering Ltd.

*Reducing the waste in  
waste management since 1967.*

[www.sludgecontrols.com](http://www.sludgecontrols.com)

# “ Got Water ? ”

And indeed we did, special thanks to Hurricane Ophelia for dropping by during our opening ceremonies, Ophelia dropped 27 mm of rain on our City during her short stay, but that did not dampen the interest in our Water for People Hike down the Signal Hill Trail. Many delegates made donations to this worthy cause in the form of “fee” as they got on the bus to be brought to the start of the Signal Hill trail, many of the hikers even walked back to the conference hotel. Unfortunately, as participants searched the far horizons Dr. TA Loeffler, icebergs or whales were not spotted.

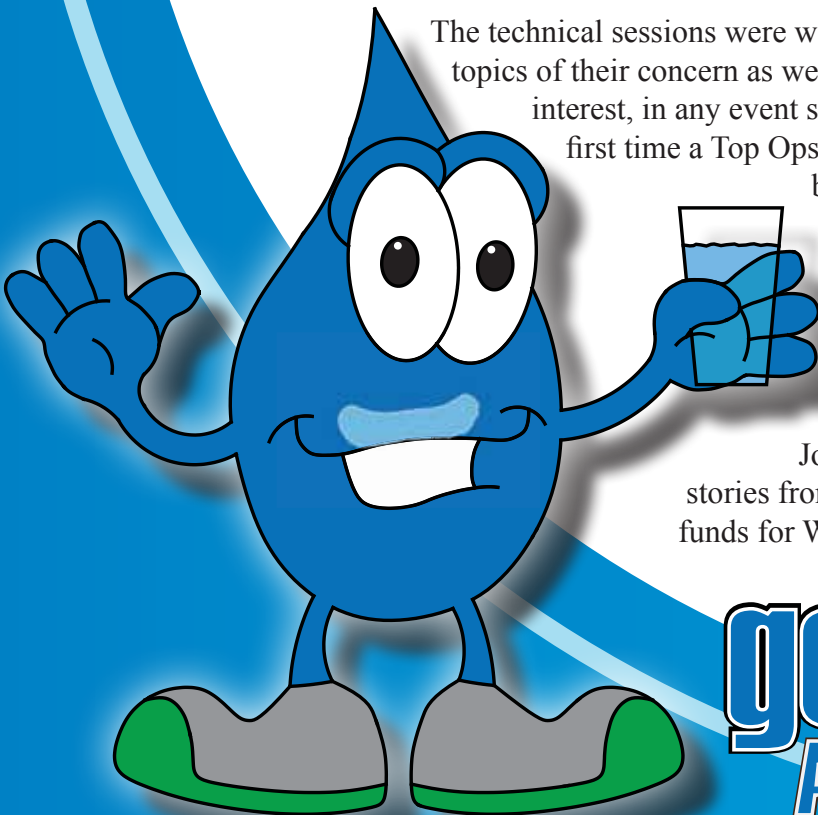
The 64th Annual ACWWA water and wastewater conference was a huge success. Old friends met new friends at our meet and greet, where many BUTTS were sketched by Krandel Newton. Approx \$1000 for Water for People was raised from butt sketching. Apparently O’ Reilly’s Pub, ABEA hospitality night had the best Butt sketches as Krandel sketched well in to the night barely making his early morning flight. Special thanks to Fabienne Martin and Jean-Claude Lauret at Master Meter Canada, and the Atlantic Canada branch of Brunet Distribution, for bringing “ The Original Butt Sketch” to St. John’s. One butt sketch is still MIA so if you have a Butt sketch that is not yours, please contact Clara Shea.

Sunday night, the brave dared to venture into the foggy night as they crept through our city alleys and lane-ways, looking for the ghosts from our past. Unfortunately, or I should say fortunately, no ghosts were seen but we do know the street lights did flicker many times, was this a coincidence or was this a sign that they were being watched?

Our keynote speaker for the opening ceremonies was Dr. TA Loeffler. Dr Loeffler had us all in awe as she explained the challenges and the amount of training and endurance that is needed to undertake such an insurmountable feat. Her inspired speech and encouragement for all of us to climb our own Everest, made us realize that no matter what form our own personal “Everest” takes, we must do it one step at a time and keep focused on the goal ahead.

The technical sessions were well attended by delegates interested in the particular topics of their concern as well as topics that may have held intrigue or of personal interest, in any event some of the sessions had a very large turnout. For the first time a Top Ops for wastewater was held. It was a very tight battle between Riverhead and Michelin, but in the end the Michelin team walked away with the new trophy. Congratulations to Fredericton, who again won the Top Ops for water.

Our own ACWWA Academy Awards were the highlight of Monday night, but who could top Betty Jordan from WEF? She kept us enthralled with her stories from the wastewater world and her enthusiasm for raising funds for Water for People. Joe Mantua, from AWWA, had a hard



**got water?**  
**ACWWA St. John's 2011**

act to follow. Congratulations to Rob Gillis, Bedell Award winner and Ensor Nicholson, Ira P. MacNab Award winner.

After a late night at O'Rielly's, the early morning risers were treated to a fantastic breakfast as we celebrated our Silent Heroes; Joey Fernetto, Shediac NB, Bob Cass, Port Hawkesbury, NS, Betty Pryor, Charlottetown, PEI and Tony Skiffington, Gambo, NL. The ACWWA now also has its own 5S Society. Gary Chew is the first keeper of our new Gold Shovel, while other members are Roland Richard, Robert Gillis and Susheel Arora.

Our tradeshow, with 63 booths, was well attended, both suppliers and attendees were impressed with the set up and the continued interest of the delegates throughout the afternoon. Add in a traditional Newfoundland screech in, complete with "Kiss Ms. Cod" and you have to have a great afternoon. (and yes your Honourary Newfoundlander certificates will be mailed to you ). Even our Water for People Silent Auction display benefited from being at the tradeshow thanks to the wonderful suggestion of our suppliers. There were many fantastic items to bid on with people bidding right up to the last minutes.

The golfers, while no one made a hole in one due apparently to the pea soup fog, had a great time. Riverhead wastewater treatment facility opened its front door to delegates and the Marine Institute hosted a coagulation workshop, a first for our section.

Our Companions, checked our City's heritage and looked into our province's past, Feasted upon Ches's fish and chips, trekked around the downtown stores and even had time for a Zumba class.

We ended our conference on a high note, thanks again to the amazing buffet, served by the Delta staff and the entertainment provided by Spirit of Newfoundland. Our AWWA rep must have had some inside information as he was discreetly unavailable when "name that tune "contestants were picked. David LaFrance, our AWWA executive director, was left to defend the dignity of water over "that other water" , but unfortunately even though we are all working together, thanks to Betty Jordan , the waste water won. In Betty's own words "S--- Rules"

I have to say a special thank-you to my committee, for making our conference an enjoyable Newfoundland event. For many of them this was their first time playing a key role on the committee level. They have gained some experience from the people who have been involved for some time and they also brought some fresh new ideas and energy to the planning of the events that made the ACWWA conference in St. John's as successful as it was.

Make plans now to come back over in 2015. I'll leave you now with one final butt sketch, we would not want our mascot, Mr. Drop, to feel left out.







Shahram Tabe is with the Standards Development Branch, Ministry of the Environment, Toronto. John Cannard is with J.L. Richards & Associates, Sudbury, Ontario, Canada. Taher Jamal and Anthony C.F. Edmonds were formerly with the Standards Development Branch, Ministry of the Environment.

## Replace Bleeders With Circulation Pumps to Improve Quality, Lower Costs

A small town in Canada improved delivered water quality by replacing bleeders with circulation pumps, saving money in the process.

BY SHAHRAM TABE, JOHN CANNARD, TAHER JAMAL, AND ANTHONY C.F. EDMONDS

**I**N WATER DISTRIBUTION systems, bleeders are installed at the end of dead-end mains to discharge some flow to waste to maintain water quality and prevent stagnation. Although bleeding is recommended by the Ontario Ministry of the Environment (MOE), it should be used as the last option. The number of bleeders and the amount of water wasted could be minimized by proper distribution system design. For example, keeping dead-end water mains as short as possible to maintain adequate flow and turnover has been recommended by the Walkerton

(Ontario) Commission, US Environmental Protection Agency, Water Research Foundation, and AWWA.

Wasting drinking water from bleeders imposes significant economic losses and adversely affects the environment. Economic losses include increased energy and chemical consumption to treat and transport drinking water and the resulting wastewater, stress on equipment, and premature system failure. Environmental impacts include a larger carbon footprint, increased chemical use, and an increased volume of treated wastewater that's discharged to surface water. As illustrated

in Figure 1, replacing bleeders in dead-end mains with circulation pumps (CPs) prevents stagnation by maintaining flow continuity without discharging water into sanitary or storm sewer systems.

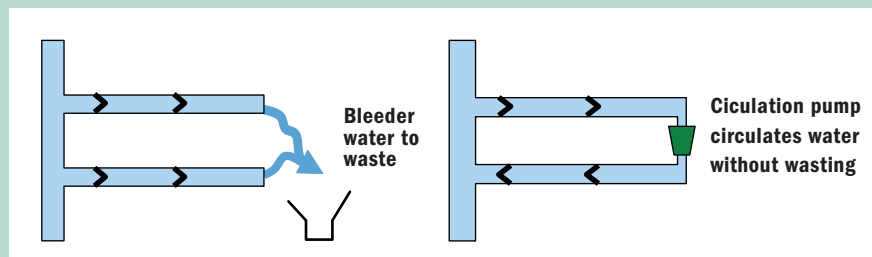
To maintain suitable water aesthetics, Espanola—a small town in Northern Ontario, west of Sudbury, with a population of 5,500—operated seven bleeders within its water distribution system. Water wasted from these bleeders was estimated to be about 30 percent of total annual production. In addition, the wastage contributed about the same percentage to the load of the sewage treatment plant. By removing one bleeder from the system, savings were estimated to be about \$50,000. The savings assumed a conservative cost of \$0.50/m<sup>3</sup> for treating water and wastewater. Espanola and MOE set out to determine if CPs could successfully replace bleeders in certain scenarios and to compare the system's water quality and costs of bleeders vs. CPs.

### BLEEDERS vs. CPs

The trial focused on installing CPs in housing chambers on two looped water

**Figure 1. Bleeder and CP Comparison**

Replacing bleeders with circulation pumps in dead-end mains prevents stagnation.







Representatives from Espanola, a small town in Northern Ontario, and Canada's Ministry of the Environment set out to determine if CPs could successfully replace bleeders (inset) in dead-end mains.

mains and evaluating CP performance in maintaining water quality. Figure 2 shows the arrangement of the experimental loops, sampling point locations, CP chambers, and existing bleeders. The bleeders served six streets and were looped by 150-mm polyvinyl chloride pipe marked as Loops A, B, and C. In baseline evaluation using only a maintained flow from the bleeders, water quality remained satisfactory. However, when the bleeders were shut off, dirty water appeared.

After the baseline evaluation and construction of two CP chambers with 1/3-hp circulation pumps on Loops A and B, the study began. To eliminate seasonal or operational water quality variations and to help compare bleeder and CP performance, the Loop C bleeder remained in operation as a control. Figure 3 (page 24) diagrams the CP installation.

The study was conducted in three phases:

- Phase 1 established baseline information.
- Phase 2 optimized CP operating parameters.
- Phase 3 evaluated and fine-tuned long-term CP operation.

**Phase 1.** A baseline study was conducted with Bleeders A, B, and C in

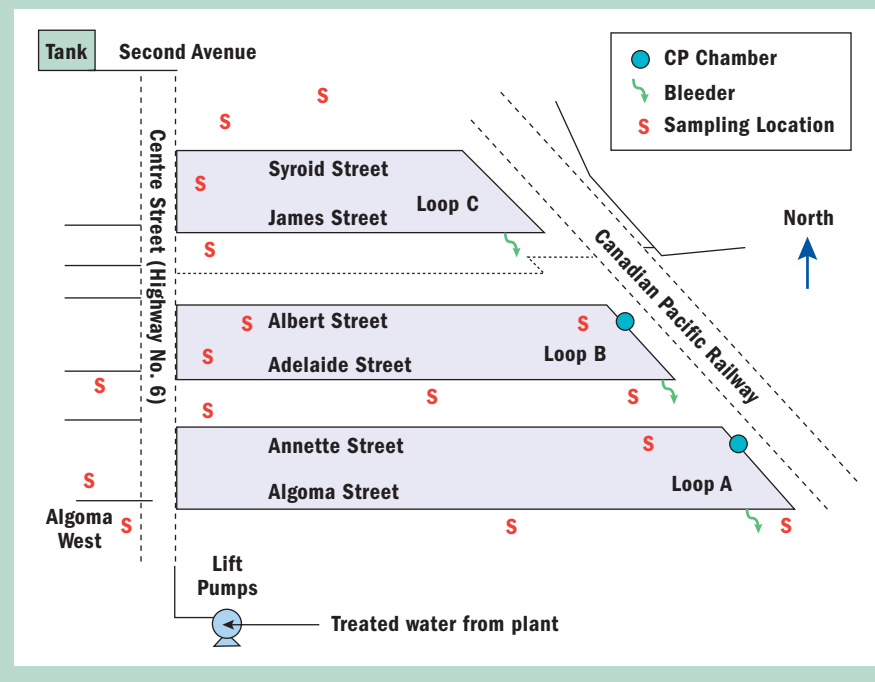
operation. The flow rates were 3.5, 3.1, and 3.1 L/s, respectively. Before the baseline study began, the experimental loops were isolated from surrounding water

mains and interconnections to prevent potential interference.

Sample analysis included pH, chlorine (free and total), color, metals (iron

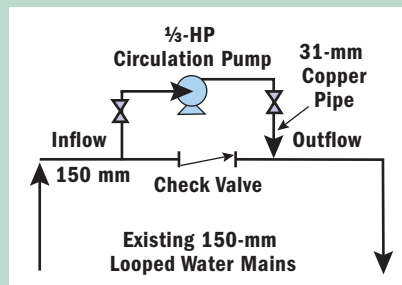
### Figure 2. Pump Chamber and Bleeder Locations in Loops

The bleeders served six streets and were looped by pipe marked as Loops A, B, and C. The Loop C bleeder remained in operation as a control.



## Figure 3. Circulation Pump Operation in Looped Mode

Experimental loops were isolated from surrounding water mains.



and manganese), and high-lift pump (HLP) status (on or off), as well as time of day, water tank level (high and low), and bleeder flow rate. Grab samples and water quality questionnaires were collected from volunteer residents (shown as “S” on Figure 2). Also, hourly samples were collected from an automatic sampler for 24 hr. Consumer feedback and water quality parameters collected from bleeders and CPs were recorded. Sample analysis was conducted at the site, as well as at MOE and University of Waterloo laboratories. Samples were analyzed to verify compliance with Ontario Drinking Water Quality Standards (ODWQS) and to compare qualities under different operating conditions—i.e., with and without bleeders and CPs in operation. Water velocity characteristics with the lift pump off and on in the 200-mm Centre Street trunk main were taken into consideration during sampling.

**Phase 2.** Before decommissioning the bleeders on Loops A and B, corresponding CPs on Loops A and B were operated. The Loop C bleeder was used as control. Water mains were flushed before starting the CPs. A lengthy trial-and-error process was carried out to achieve continuous pump operation with acceptable levels of chlorine residual and turbidity. During this process, pump flow rate was varied, with adjustments made between pump start and bleeder iso-

## Table 1. Phase 1 Baseline Records

Water met ODWQS when the bleeders were operating.

HLP Status, Test Time	pH	Cl <sub>2</sub> (free) mg/L	Cl <sub>2</sub> (total) mg/L	Color TCU	Fe mg/L	Mn mg/L
ODWQS	6.5–8.5	min. 0.2	min. 1.0	5	0.3	0.05
HLP on, midnight	7.4–7.8	0.52–0.88	0.66–1.05	0–4	0.05–0.21	0–0.002
HLP off, midday	6.8–7.3	0.37–0.65	0.51–0.83	3–13	0.02–0.18	1–0.018
HLP on, midday	7.5–7.8	0.36–0.64	Not available	0–6	0.03–0.11	1–0.006
HLP off, midnight	7.5–7.8	0.36–0.64	0.49–0.79	0–6	0.03–0.11	1–0.006

## Table 2. Phase 2 Optimization

Optimized conditions were established for smooth circulation pump operation.

Auto Sampler	pH	Cl <sub>2</sub> - free mg/L	Color TCU	Fe mg/L	Mn mg/L
Trial 1	7.3–7.5	0.03–0.14	11–13	0.20–0.26	0–0.001
Trial 2	7.0–7.5	0.03–0.08	9–16	0.16–0.37	0–0.001
Trial 3	7.3–7.5	0.03–0.17	4–20	0.03–0.07	0–0.001
Optimized	7.7–8.1	0.97–1.14	0–1	0.10	0–0.002

## Table 3. Phase 3 Evaluation Results

Circulation pumps ran continuously to evaluate and fine-tune long-term operations.

Auto Sampler	pH	Cl <sub>2</sub> -free mg/L	Color TCU	Fe mg/L	Mn mg/L
Trial 1	7.7–8.1	0.97–1.14	0–1	0.00–0.05	0–0.002
Trial 2	7.6–8.0	0.96–1.58	0–1	0.00–0.03	0–0.002
Trial 3	7.7–8.1	0.84–1.47	0	0.00–0.04	0–0.002
Trial 4	7.0–8.3	0.80–1.42	0	0.00–0.04	0–0.002

lation. The flow rate of each circulation pump was initially set about equal to that of the corresponding bleeder it replaced and was subsequently optimized over time. Water samples were collected immediately before and after the CPs were started.

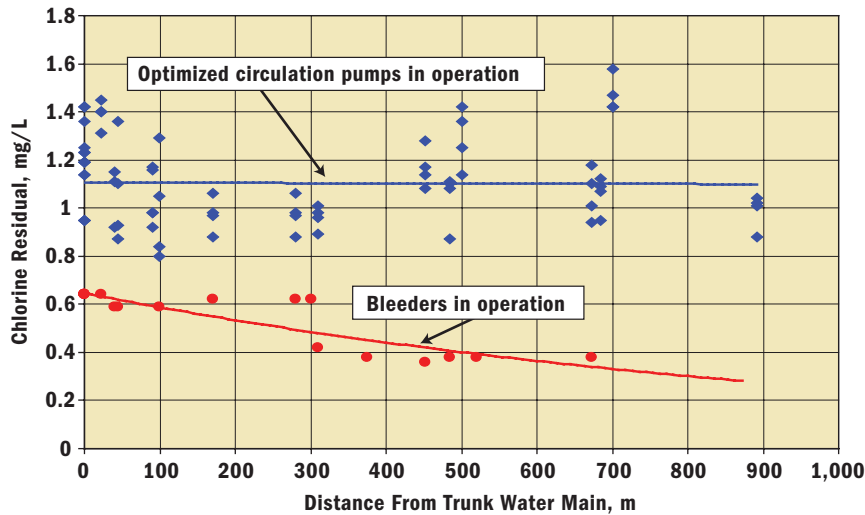
**Phase 3.** Circulation pumps were operated with optimized flow rates of 2.7 and 3.0 L/s in Loops A and B, respectively. Sampling and testing were conducted for several months during continuous

CP operation. Water samples were collected from control Loop C and CP-operated Loops A and B. To ensure water at the sampling tap was from the water main, grab samples were used to maintain sufficient preflow until water temperature equaled the temperature of water from the main. During this phase, testing for color, chlorine, pH, and turbidity was also verified by Ontario Clean Water Agency personnel and an independent lab.

Wasting drinking water from bleeders imposes significant economic losses and adversely affects the environment.

**Figure 4. Chlorine Residual Reductions Between Bleeders (Phase 1) and Pump Operation (Phase 3)**

CPs were more effective than bleeders in maintaining chlorine residual.



Two pump chambers with 1/3-hp CPs were constructed on Loops A and B,



A volumetric flowmeter was used to evaluate variations in pump flow rate.

### TEST RESULTS

**Phase 1.** With few exceptions, the water's physical and chemical characteristics met ODWQS when the bleeders were operating. HLP status (on or off) and sampling time had little effect on water quality. Table 1 summarizes data analysis from the three experimental loops.

Although high values—color, 252 true color units; iron, 5.34 mg/L; and manganese, 0.050 mg/L—were recorded on one occasion, these data were excluded from the table, because they weren't observed again during the study. The data were assumed to have resulted from settled corrosion products that became resuspended in transitional flow when the HLPs were started.

**Phase 2.** These operations were conducted mostly on a trial-and-error basis to establish optimized conditions for smooth CP operation. During the trials, it was observed that increasing the flow rate to 5.0 L/s or more resulted in increased turbidity and decreased chlorine residual in the pumped loops. As

a result, some water quality parameters declined during the initial stages of Phase 2. Reducing the circulation rate to 3.0 L/s restored water quality in the water main loops. Table 2 summarizes Phase 2 results.

**Phase 3.** Iron and manganese concentrations were far below ODWQS, but color remained at zero, which indicated clear water supplies. Table 3 summarizes Phase 3 results. A comparison of Phase 1 and Phase 3 results is presented in the following sections.

**Metal Contents.** During Phase 1, as shown in Table 1, iron and manganese contents were satisfactorily below standards of 0.3 mg/L and 0.05 mg/L, respectively. Phase 1 and Phase 2 water quality results improved significantly during Phase 3, in which values for these parameters declined to near-zero levels. The water's maximum iron content in Phase 3 was 0.05 mg/L, far below the 0.3 mg/L aesthetic objective. Manganese content was also near zero most of the time and below 0.002 mg/L in general.

**Table 4. Physical Data on the Three Experimental Loops and Surroundings**

Length, number of residents served, and water demand influenced water quality and CP operating conditions.

Loop	Pipe length, m	Pipe volume, L	Population	Water demand L/d	Drain/circulation, L/s	Pipe Volume Exchange			Residence Time	
						Circul'n pipe/hr	Demand pipe/hr	Total pipe/hr	High demand, min	Low demand, min
A	1,190	21,038	250	112,500	2.7	0.46	0.33	0.80	75	130
B	850	15,027	175	78,750	3.0	0.72	0.33	1.05	57	83
C	454	8,026	77.5	34,875	3.1	1.39	0.27	1.66	36	43

Note:

A. Population is assumed to be 2.5 residents/household

B. Piped water usage: 450 L/d/consumer (Stat Canada, 1988)

C. Consumer demand occurs over a 16-hr-period/day

D. Water-main diameter: 150 mm

E. Loop A and Loop B are on CPs; Loop C is on bleeder operation

*Residual Chlorine.* Figure 4 (page 25) data illustrate that CPs (Phase 3) were more effective than bleeders (Phase 1) in maintaining chlorine residual. Although the length of each loop nearly doubled in Phase 3, there was no apparent reduction in chlorine residual over the full length of the loops. Chlorine residual ranged from 0.36 mg/L to 0.88 mg/L during Phase 1 and ranged from 0.80 mg/L to 1.58 mg/L during Phase 3. Phase 1 results also indicate that the chlorine residual dropped significantly (up to 40 percent) as water traveled toward the bleeders. However, chlorine residual remained virtually constant throughout loops A and B; a gradual reduction in chlorine residual with distance and time is normal.

It should be noted that system hydraulics, especially in a trunk main, play a vital role in sampling protocol and water quality from different parts of water mains. A computerized study indicated that water normally flowed from the HLPs to the storage tank at a rate of 12 L/s. When lift pumps were off, flow reversed and the system was fed from the elevated storage tank at a rate of 0.7–1.3 L/s, which is an order of magnitude lower than when the lift pumps were on. Because of a difference in residence time during HLP on or off, chlorine residual varied in the water main.

**Observations.** Significant variability exists in length, number of residents served, and water demand for the three

experimental loops—factors that influence water quality and CP operating conditions. As detailed in Table 4, Loop A is the longest, serves the most people, and has the highest water demand. The CP in this loop operates at a lower flow rate (2.7 L/s), providing a pipe volume exchange of 0.46 pipe volume/hr or a maximum water residence time of 130 min. Although Loops B and C are shorter and have lower water demands, they have somewhat higher circulation rates. The corresponding maximum residence times in these loops are 83 min and 43 min, respectively. Although the chlorine residual exceeded requirements in all cases, it can be concluded that pump circulation rates were set conservatively high and can be reduced accordingly. As a starting point, results indicate that a residence time of 130 min is satisfactory to calculate optimum pump circulation rate.

In addition, the Phase 2 trial provided guidelines for future evaluation of bleeder replacements. Suggested steps for CP precommissioning and commissioning include

- Flush an entire water main before initiating a pump.
- Confirm proper functioning of all isolation valves and their open-closed status.
- Gradually increase CP flow rate, with water quality testing at each level.
- Monitor turbidity and chlorine residual until CP flow is finely adjusted.

**FUTURE STUDY**

A larger-scale follow-up study is planned to investigate more complex CP operations and the economic threshold of replacing bleeders with CPs. In addition, the environmental impacts of replacing bleeders with CPs will be evaluated.

**ACKNOWLEDGMENT**

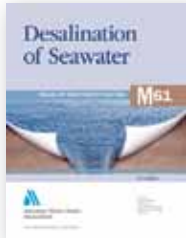
*The authors acknowledge the contribution of Dennis O'Dowd for developing the project concept; financial support from the town of Espanola and the Ontario MOE; and volunteer support from consumers and OCWA personnel.*

**RESOURCES**

- AWWA Standard G200-09, Distribution Systems Operation and Management.
- Ontario Ministry of the Environment, 2008. Design Guidelines for Drinking-Water Systems (draft).
- Song, Vivian, 2008. Canada's water supply drying up? *Edmonton Sun*, June 29, 2008
- US Environmental Protection Agency, 2000–2003. Distribution System White Papers, Water Age and Distribution System Inventory and Condition Assessment.
- Walkerton Commission of Inquiry, 2002. Part Two, 234.
- Water Research Foundation, 2000. Guidance Manual for Maintaining Distribution System Water Quality.

# New desalination-plant planning manual

AWWA's new *Manual of Water Supply Practices Desalination of Seawater* (M61) provides industry-approved best practices and the latest information for drinking water utilities that are actively planning or are considering desalination facilities.



\$79 AWWA members,  
\$125 nonmembers.  
Published by AWWA, 2011,  
softcover, 110 pp.  
ISBN 978-1-58321-833-4.  
No. 30061

It brings you up-to-the-minute on seawater treatment technologies, pre- and post-treatment, source-water and finished-water quality, environmental impacts, residuals management, construction, operation and maintenance costs, safety, and more.

AWWA Bookstore  
[www.awwa.org/store](http://www.awwa.org/store)

1.800.926.7337 or 303.794.7711



American Water Works Association

# AWWA Director's Report

*Continued from page 3*

the Atlantic Canada, Quebec, New England, New York, New Jersey, Pennsylvania and Chesapeake Sections. The meeting was chaired by AWWA President-Elect Charlie Anderson of Texas. These annual meetings are a chance for AWWA Sections to share ideas and learn from each other. Our Chair, Jamie Hannam, presented on successes and challenges in Atlantic Canada and demonstrated that ACWWA is as vibrant and active an organization as any of the sections in Region I. AWWA staff presented on their efforts to recruit and maintain members. Chris Jarrett, Vice Chair of AWWA's Manufacturers and Associates Council, made a presentation on the role of the MAC in each section. His presentation reinforced the importance of

the activities of our own Atlantic Branch Equipment Association.

Finally, AWWA has launched the first in a series of initiatives called Communities of Interest. COI's are websites designed around a specific water industry topic, designed to provide "one-stop shopping" on that topic and a forum for discussion among members with a common interest. This is an important member benefit designed to provide easy access to the latest technical information and expert advice. The first community is the Conservation Community, launched in early October. Customer Service will be launched shortly. You can check out the conservation community by Googling "AWWA Conservation Community," or just heading to [AWWA.org](http://AWWA.org).



**Anthracite Filter Media**  
Filter Sands  
Filter Gravels  
Activated Carbon  
Ilmenite  
Greensand

20 Sharp Road  
Brantford, Ontario N3T 5L8  
T: 519.751.1080  
F: 519.751.0617  
[swildey@anthrafilter.net](mailto:swildey@anthrafilter.net)  
[www.anthrafilter.net](http://www.anthrafilter.net)







**Now you can join AWWA or WEF!**

Visit the ACWWA website at  
[www.acwwa.ca](http://www.acwwa.ca) for application forms



## McLENNAN SALES

A DIVISION OF **EMCO CORPORATION**  
[www.mclennansales.com](http://www.mclennansales.com)

**Atlantic Canada's Underground Water & Sewer Piping Specialists**

**McLENNAN SALES**  
303 Golden Grove Rd.  
Saint John, N.B., E2H 2V5  
Phone: (506) 634-3112  
Fax: (506) 634 0480

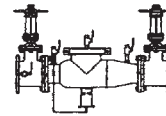
**McLENNAN SALES**  
40 Loftus St.  
Moncton, N.B., E1E 2N2  
Phone: (506) 857-1082  
Fax: (506) 857-9006

**McLENNAN SALES**  
111 Wright Ave.  
Dartmouth, N.S., B3B 1K6  
Phone: (506) 468-1500  
Fax: (506) 468-2721

## Atlantic Backflow Specialists Ltd.

Serving Atlantic Canada

Surveys  
Tests



Installations  
Repairs / Parts

**Certified Cross Connection Control Specialists**

Albert S. Jones CET.  
Bus: (902) 499-7748

web site  
[www.atlanticbackflow.com](http://www.atlanticbackflow.com)

Fax (902) 434-3990  
69 Mt. Edward Rd.  
Dartmouth, N.S.  
B2W 3K6

## Engineering Solutions

Municipal  
Water / Wastewater  
Transportation  
Land Development  
Building Services

1077 St. George Blvd. Suite 400  
Moncton, NB E1E 4C9 (506) 857-2777

133 Prince William St. Suite 703  
Saint John, NB E2L 2B5 (506) 693-5893



Toll Free: 1 866 857-2777

[www.crandallengineering.ca](http://www.crandallengineering.ca)



Infrastructure  
Environment

Communities  
Facilities

*Serving Clients in Atlantic Canada from Offices in  
Halifax, Sydney, Fredericton and Saint John*

[www.dillon.ca](http://www.dillon.ca)



**Truro N.S.**  
902-895-2885

**Fredericton N.B.**  
506-444-0344

**St John's NL**  
709-726-4344

- Pumps, Water/Wastewater treatment plants & equipment
- Chemical Feed systems
- On-line instrumentation
- Gas & diesel Generators
- Aerzen Blowers & aeration equipment
- Packaged Sewage pumping systems
- Full parts, service & technical support

**Website:** [www.sansom.ca](http://www.sansom.ca)

**E-mail:** [sansom@sansom.ca](mailto:sansom@sansom.ca)



engineering · environment · infrastructure

**toronto**  
**niagara**  
**ottawa**

**sudbury**  
**london**  
**moncton**

**fredericton**  
**st. john's**  
**mumbai**

tel 416 497 8600

[www.rvanderson.com](http://www.rvanderson.com)



- Water & Wastewater Treatment & Disinfection
- Water & Wastewater Analysis & Instrumentation
- Pumps and Fluid Handling Systems
- Wholesale Water Conditioning & Pumps
- Industrial Spray Paint & Sand Blast Equipment
- Industrial Air Systems and Air Filtration

**NS/NFLD:** 10 Ferguson Road, Dartmouth, Nova Scotia, Canada, B2Y 3Z5;  
Phone: 902-469-2806; Toll Free: 800-265-2300  
Fax: 902-463-3529; email: [sales@aps.ns.ca](mailto:sales@aps.ns.ca)

**NB/PEI:** Contact Luke Delehanty or Craig Cattle at APS/Delehanty Fluid Solutions  
695 Malenfant Blvd., Dieppe, NB, E1A 5T8; Phone: 506-857-2880;  
Toll Free: 888-863-7867; email: [luke@aps.ns.ca](mailto:luke@aps.ns.ca) or [craig@aps.ns.ca](mailto:craig@aps.ns.ca)

*"Celebrating over 40 years of Service to Atlantic Canada in 2011"*

[www.aps.ns.ca](http://www.aps.ns.ca)



Halifax  
Regional  
Water  
Commission

450 Cowie Hill Road  
P.O. Box 8388 Stn A  
Halifax, Nova Scotia B3K 5M1  
490-4840

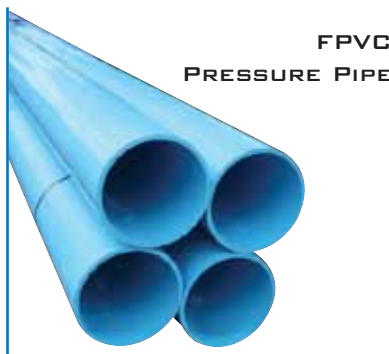
**Delivering  
Value and  
Quality for  
over 60 years**

Why swim with  
all the other fish?



IPEX Municipal Water Systems...innovation at its best!

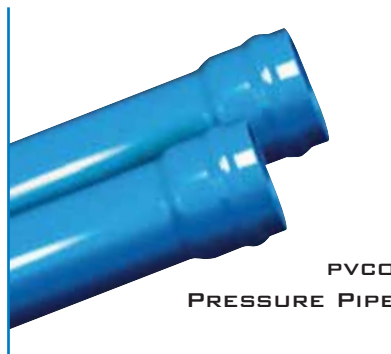
### IPEX FUSIBLE™



FPVC  
PRESSURE PIPE

- ✓ Available in CIOD & IPS sizes 4" to 36"
- ✓ Achieves higher flow rates
- ✓ Connects directly to existing PVC systems for material consistency
- ✓ Use standard CIOD or IPS fittings

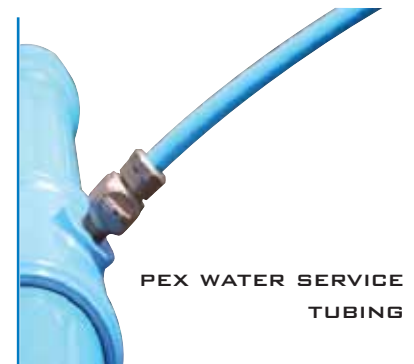
### BIONAX®



PVC  
PRESSURE PIPE

- ✓ Molecularly Enhanced
- ✓ 2X Stronger
- ✓ 3X Tougher
- ✓ 2X More Flexible
- ✓ Code Compliant

### BLUE904®



PEX WATER SERVICE  
TUBING

- ✓ Corrosion Resistant
- ✓ Lightweight & Flexible
- ✓ Jobsite Safe
- ✓ Fewer Connections



Municipal PipingSystems

Tough Products for Tough Environments®

Products manufactured by IPEX Inc.  
Bionax®, IPEX Fusible™ and Blue904® are trademarks of IPEX Branding Inc.

Toll Free: 1-866-473-9462 • [www.ipexinc.com](http://www.ipexinc.com)



*The Metropolitan Water District of Southern California, AWWA utility member since 1944.*

# Think **water.** Think **AWWA.**

When it comes to water, no one has you covered like the American Water Works Association. From treatment to distribution to regulations to training, we're the water community's go-to source for information, education, and involvement. When you think water, think AWWA.



American Water Works  
Association

The Authoritative Resource on Safe Water®

**130** Years  
of Safe Water  
**AWWA** 1881-2011

[www.awwa.org](http://www.awwa.org)