Inside:

Managing Water Quality in Your Distribution Tanks

Emerging Water Loss Regulations in the United States
CASE STUDY

Winona's Wincrest Water Tank Continues to Perform Well

Installed: 2008
Tank Type: Composite Elevated Tank
Storage Capacity: 400,000 Gallons
Engineer: Short Elliott Hendrickson
Contractor: Engineering America

PROJECT OVERVIEW:
Engineering America crews completed the Wincrest water tower in August 2008 for the city of Winona, Minnesota. The 143-foot-tall structure has a capacity of 400,000 gallons and serves the far southwest quadrant of the city.

A life cycle maintenance analysis studied the cost of painting a welded steel water tower over a 50-year life cycle. City officials awarded the project based on a present worth analysis that showed a substantial savings by using Engineering America’s Aquastore composite glass-fused-to-steel elevated tank.

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98th Annual Conference Preview
Maximizing Water Tank Service Life
Mixer Keeps Elevated Tank Ice-Free During Polar Vortex
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State of the States – Emerging Water Loss Regulations in the US

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Visit us at www.mnawwa.org
Message from the Chair

Mark your calendars for the Annual Conference

From an extreme winter to an extremely wet spring to floods . . . you gotta love Minnesota, eh?? These are the times that we, as utility providers, wonder why we live here in the Upper Midwest. Challenges are what make life interesting, and the Minnesota Section of AWWA is here to assist all of our members in meeting their near- and long-term challenges.

I want to recognize all of the members of the ad hoc committee that made the recommendation to the section board for a revamping of the section website. The board approved the recommendation to partner with YourMembership.com in early April, and now a slightly revised group is working with the vendor to develop the new site. Progress is good and we are all looking forward to a sneak preview to be made at our conference in September.

Speaking of the Minnesota Section Annual Conference in Duluth, mark your calendars and get signed up for this event that promises to be better than ever! Many great presentations, an outstanding vendor show, and countless networking events are on tap to provide you, our members, with an opportunity to hone your skills and exchange ideas with colleagues. Tom Moulton from Ontario will be our association representative. I had the opportunity to meet and chat with Tom in Boston at the AWWA Annual Conference and Exposition (ACE), and he is very excited to come in Duluth. September 10-12, 2014 is the date of this year’s conference.

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Minnesota was well represented at the ACE in Boston this month. Thanks to Brad Forester for organizing a Minnesota Section lunch. It was nice to have the opportunity to see everyone from the section that was at ACE. Congrats as well to the East Side Tapping Team from Minneapolis for a great showing. Finally, Kevin Young placed second in the Fresh Ideas Poster competition. Congratulations!

As my term as chair is winding down, I will begin working with chair-elect Jeff Larson for a seamless transition at this year’s fall conference. I am very happy to see progress on some of my initiatives and we now turn our attention to developing a 2015 budget that will support the future of the organization.
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Celebrating three years of different.
June Board meeting updates

On behalf of the Minnesota Section, Uma and I would like to thank Bill Spain for serving as Section Director. Bill’s dedication and commitment at both the association and section levels have certainly improved the overall organization. From Affiliation Agreements, to Association Bylaw updates, to the Board Policy Manual, to the Special Presidential Panel (SP2) recommendations, the association and sections have begun to work closer to “Build one AWWA” thanks to Bill’s active participation.

A few for major things happened at the June Board meeting.

First, a resolution embodying the Special Presidential Panel report “AWWA 2020: A Path to One AWWA” was unanimously approved. The report recommendations were intended to provide the Board with a path to strengthen the business relationships between the Association and Sections of AWWA leading to increased value to AWWA’s members.

The Section Affiliation Agreement, signed in calendar year 2009, included a promise of a new business relationship between the Association and Sections. In 2012, then President Charlie Anderson assembled a panel, known as the “Special Presidential Panel” or SP2, comprised of key Section staff, AWWA staff, and AWWA volunteer leaders. The panels’ goal was to help operationalize this vision for a new business model; a vision that would bring relevant value added programs, processes, and services to rapidly changing member and water utility professional needs. The panel identified five strategic themes (branding, membership, education, finance, and communication) as critical areas of focus. The resolution is an extension of the affiliation agreement and promises to continue to build a strong relationship between the association and the section.

Second, AWWA is set to open an office in India. The organization will operate under the name “AWWA-India” and report directly to AWWA Chief Executive Officer (CEO) with regular updates to AWWA’s governance.

The mission of AWWA-India is to become an integral source of information, training, and membership support in the India water industry. The objectives are to:

- Increase the public and governmental officials’ awareness of water issues and concerns so that public health and economic development are advanced;
- Unite the water industry professionals to promote delivery of safe water;
- Establish training and certification opportunities for the water professionals at utilities; service providers and governmental agencies, and
- Develop country specific information, manuals, and conferences.

Last, Community Engineering Corps (CE Corps), an alliance between AWWA, American Society of Civil Engineers (ASCE) and Engineers Without Borders-USA (EWB-USA), has begun receiving proposals. The alliance combines the strengths of three organizations to provide technical expertise to underserved communities in the US and ensure that their infrastructure meets their community’s needs. One of the first projects will be here in Minnesota. Look for presentation about the project at the Fall Conference.

Congratulations to Bernie Bullert and Bill Spain on receiving their AWWA awards…

- Bernie officially became an Honorary AWWA Member! The honorary member award is presented each year to no more than three association members “whose knowledge and accomplishment in the field of water supply entitle him or her to special recognition.”
- Bill received the Minnesota Section’s Fuller Award! The award recognizes his distinguished service to the water supply field in commemoration of the life of George Warren Fuller.

Looking ahead, two individuals have declared their candidacy for AWWA President-elect. They are Jeanne Bennett-Bailey from the Virginia Section and current Public Affairs Council (PAC) chair, and Mike Simpson from the Illinois Section and current AWWA Vice-president. Jeanne’s candidacy speech focused on the three pillars of her philosophy; Service, Strategy, and Solution. Mike’s candidacy speech focused on membership (human capital) to join, participate, engage, and improve our organization... “Building one AWWA, one member at a time.”

This is an exciting time to represent our Section at the Association level. Thanks to all our section members for allowing Uma and me the opportunity to serve you, the member!
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**STANDARDS**

AWWA publishes over 165 standards that provide requirements for design, installation, performance, and manufacturing of products including pipe, chemicals, storage facilities, valves, meters and other appurtenances and industry-recognized consensus requirements and practices for water utility management and operations.

AWWA is accredited by the American National Standards Institute (ANSI) as an approved standards developing organization for the water industry. Accreditation signifies that procedures used by AWWA in connection with the development of American National Standards meet the Institute’s essential requirements for openness, balance, consensus and due process.

The following standards were approved by the Association at the June 2014 Board meeting:
- B404 Liquid Sodium Silicate
- B406 Ferric Sulfate
- C150/A21.50 Thickness Design of Ductile-Iron Pipe
- C502 Dry-Barrier Fire Hydrants
- C503 Wet-Barrier Fire Hydrants
- C516 Large Diameter rubber-Seated Butterfly Valves Sizes 7/8 In. (2,000 mm) and Larger
- C520 Knife Gate Valves, Sizes 2 In. (50 mm) Through 96 In. (2,400 mm)
- C800 Underground Service Line Valves and Fittings
- D102 Coating Steel Water-Storage Tanks
- C228 Stainless-Steel Pipe Flange Joints for Water Service—Sizes 2 In. Through 72 In. (50 mm Through 1,800 mm) (Standards Council ballot closes 5/23/14, public review closes 6/30/14)
- C651 Disinfecting Water Mains (Standards Council ballot closes 5/29/14, public review closes 6/30/14)
- D103a Addendum to D103-09, Factory-Coated Bolted Carbon Steel Tanks for Water Storage (Standards Council ballot closes 6/2/14, public review closes 6/22/14)
- G430 Security Practices for Operation and Management (Standards Council ballot closes 5/20/14, public review closes 6/30/14)
- C561 Fabricated Stainless-Steel Slide Gates (Standards Council ballot closes 6/4/14, public review closes 7/7/14)
- Fabricated Composite Slide Gates (Standards Council ballot closes 6/4/14, public review closes 7/7/14)

**POLICY STATEMENTS**

Policy statements provide a record of the Association’s stance on a variety of issues and reflect the diverse interests of the membership.

The policy statement development process for the Association is designed to be open to full participation of the membership and to ensure careful review by appropriate AWWA boards, committees and other membership entities.

The following policy statements were approved by the Association at the June 2014 Board meeting:
- Cross Connection (revised)
- Metering & Accountability (revised)
- Residential Fire Sprinklers (revised)
- Sustainability (revised)
- Water Use Efficiency (revised)
- Management Of Groundwater Policy Statement (revised)

View any of the AWWA policy statements by visiting the following link on the web; http://www.awwa.org/about-us/policy-statements.aspx

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**Message from the Director**

Jon Eaton

June 2014 AWWA Updates

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Think Big. Go Beyond.
Stew’s thoughts

Anyone remember The Larry Sanders Show? Larry’s sidekick, Hank Kingsley, had a fan club (called Kingsley’s Queens) that had a newsletter with a feature called Hank’s Thoughts, which contained gems like, “It’s October, and we all know what that means.”

Below are Stew’s Thoughts, including a few from famous people, some of whom are anonymous.

- Spite is underrated.
  – George Costanza

- A truly great library contains something in it to offend everyone.

- What gets us into trouble is not what we don’t know. It’s what we know for sure that just ain’t so.
  – Mark Twain

- If I knew I was going to live this long, I’d have taken better care of myself.
  – Mickey Mantle

- Being a sports fan means investing a ludicrous amount of time and mental energy into something that, by definition, bears no relevance to real life.
  – Will Leitch (founder of Deadspin)

- Don’t mislead toward the truth.
  – Peter Sandman
  (risk communication guru)

- Hooray, Hooray, the first of May. Outdoor matriculating starts today.

- Life is not about how fast you run, or how high you climb, but how well you bounce.

- It isn’t what you know that counts; it’s what you can think of in time.

- If you want to do something evil, put it inside something boring.
  – John Oliver

- Be thankful for problems. If they were less difficult, someone with less ability might have your job.

- I love mankind. It’s people I can’t stand.
  – Linus Van Pelt

Guest thoughts are welcome for future issues. No doubt readers will look forward to Carol’s Thoughts, Naeem’s Thoughts, Sloan’s Thoughts, Geraldino’s Thoughts, McLovin’s Thoughts, and Bulldog’s Thoughts. Send your favorite thoughts to stew.thornley@state.mn.us.

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1. CALL TO ORDER (SHEA)
Shea called meeting to order at 12:36 pm.

2. DISTRIBUTION OF BALLOTS FOR CHAIR-ELECT
3. DISTRIBUTION OF BALLOTS FOR DIRECTOR

4. FINANCIAL REPORT (MARTIN)
   · As of December 31, 2012, section income for the year was $328,213 and expenses were $331,289 for a net loss of $3,076. Investments were up since the beginning of the year by $36,470 for a net profit of $33,395.
   · Motion to approve 2012 finances made by Lyle Stai, 2nd by Jon Eaton. Passed unanimously.
   · As of June 2013, section income for the year was $143,280 and expenses were $151,323 for a net loss of $8,043. Investments are up since the beginning of the year by $23,289 for a net income of $15,246.
   · The reserve fund balance is currently at $196,628, which exceeds our goal of 50% of the budgeted expenses. The endowment fund balance is currently at $215,120, which exceeds our goal of 50% of the budgeted expenses. The endowment fund balance is currently at $215,120, which exceeds our goal of $180,000. Since we exceed our financial goals, the board has decided to invest in programs that benefit the section membership.

5. ANNOUNCEMENTS (SPAIN)
   · Spain is petitioning to the board to provide scholarships for the Saint Cloud community college.
   · Call for papers for next year’s conference will be sent out.
   · Pick up mug or water bottle if you have not done so already.
   · An early vendor registration form has been developed and is available for vendors to register for next year’s conference. Vendors are encouraged to register early.
   · David Weum is signing people up for the YP poker tournament.
   · AWWA has a mentor program that people are encouraged to participate in.
   · AWWA has developed a new strategic plan with the main goal being total water solutions.

6. ELECTION RESULTS
   - Chair-elect winner – Jeff Larson, city of Marshall
     Director winner – Jon Eaton, city of Eagan

7. COMMUNICATIONS
   Summary of the Awards Luncheon:
   · 2012 Leonard Thompson – Jim Sadler received plaque
   · Membership Achievement Award – to be handed out at dinner awards presentation
   · Operator Meritorious Award – Mark Nelson, city of Maple Grove
   · Best in Glass – City of Duluth (Mark Proulx accepting)
   · Meter Madness – 3rd place was Harvey Maas at 1:22, 2nd place was Chris Voeltz at 1:10, 1st place was Brent Massman at 48 sec.
   · Pipe Tapping – 4th place was WAM Club at 5:44, 3rd place was Duluth at 4:43, 2nd place was SPRWS at 3:01, 1st place was MPLS at 2:19.
   · Water For People Fundraiser – Sporting clays raised about $500 with 28 shooters. Fishing raised $1,555 with 38 participants and 6 boats. Golf raised about $8,000 with 95 golfers. Ribbon sales totaled $600. Canal Park Brewery donated $300 from Tues night social. Motorcycle ride raised $3500 with 26 riders. 5K raised $2000 with 92 runners.
   · Scholarship Awards – Jackie Edwards from NDSU, Kyle Leonard from Stanford, and Cole Nelson from U of ND.
   · MDH Fluoridation Awards – cities of Hopkins, Mankato, Pelican Rapids, Pipestone, St. Charles, Saint Paul Regional Water Services, Wadena, and Wayzata.
   · SUSA Donation – Mullhern announced that a donation of $1000 was made to WFP.

8. ADJOURNMENT
   Lyle Stai moved to adjourn, Schneider 2nd. Meeting adjourned at 12:52pm.
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- MN AWWA will provide Exhibitors with a FREE list of Conference attendees.
- It’s an opportunity to show off your goods and services while boosting the David B. Morris Scholarship fund.
- Being an Exhibitor is a great way to make your support of MN AWWA highly visible to its members.

Register Online for 2014

Links:
AWWA Member Vendor
Non-Member Vendor
http://www.mnawwa.org/training.asp

4th Annual MN AWWA All Star Jam Band

Current lineup:
Corey Lubovich – Drums
Josh Lubovich – Guitar & Drums
Ryan Mulner – Guitar & Vocals
Rod Volker – Lead Guitar & Vocals
Tim West – Bass Guitar/Rhythm Guitar & Vocals

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- Sponsors are appreciated as being supporters of MN AWWA at the highest level.

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- HD Supply
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- Moore Engineering
- Rice Lake Construction
- Short Elliott Hendrickson
- Stantec
- Swanson Flo
- TKDA
- Treatment Resources
- WSB & Associates

Note: No written materials will be mailed out. All documentation, materials, and application form will be made available via the MN AWWA website.

2014 AWWA Spouse Program

Hostesses: Brenda Spain (320-980-1153) & Monica Watry (320-221-0943)

Wednesday, September 10, 2014
8:45-9:30 am Meet and Greet @ Inn on Lake Superior Lobby
10:00-2:00 Valentini’s “Hands on” Cooking Class and lunch

Thursday, September 11, 2014
9:00-11:00 am Beaded Silver Serving Pieces (crafting) (Inn on Lake Superior Northern Lights 2 Conference Room)
11:30-12:30 Lunch at Amazing Grace Café and Bakery
1:00-3:00 Jockey Person-to-Person Style Show Mary Kay Fashion Tips (Inn on Lake Superior Northern Lights 2 Conference Room)
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<tr>
<th>Time</th>
<th>Tuesday 9th</th>
<th>Wednesday 10th</th>
<th>Thursday 11th</th>
<th>Friday 12th</th>
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<tbody>
<tr>
<td>8:00</td>
<td>Opening By MN AWWA Chair, Steve Schneider</td>
<td>AWWA National Representative - Tom Moulton</td>
<td>Opening/General Session</td>
<td>Beyond SCADA - Rudy Engert</td>
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<td>9:00</td>
<td>Keynote Speaker: Vicky Bhogal</td>
<td>Vendor Exhibition which runs from 10:15 to 3:30</td>
<td>Vendor Exhibition</td>
<td>Maximizing IT ROI in the Evolving Water Industry – Michael Rotunno</td>
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<td>10:00</td>
<td>Pre-Conference Board Meeting (10:30 start) Room 202</td>
<td>Water Utility Council Mtg. Room 202</td>
<td>Vendor Exhibition</td>
<td>Fire Flow Testing – Aaron Horbovetz, ME Simpson, Inc.</td>
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<td>11:00</td>
<td>Water For People Golf Tournament Lessor Park Golf Club</td>
<td>Water for People Committee Meeting Room 202</td>
<td>Lunch Provided</td>
<td>Asset Management Frameworks Increase Reliability and Reduce Costs – Sam Paske</td>
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<td>12:00</td>
<td>Water For People Sporting Clays Shooting Clear Creek Outdoors</td>
<td>Scholarship Committee Meeting Room 202</td>
<td>2 Prize Drawings</td>
<td>OpWorks! Going Digital: Treatment Facility Logs – Brian Barclay</td>
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<td>1:00</td>
<td>Water For People Fishing Tournament Depart from slips just north of DECC Dock to Dock 1:00 - 6:30</td>
<td>Vendor Exhibition</td>
<td>2 Prize Drawings</td>
<td>Integrating ArcGIS Online – Ed Garibian</td>
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<td>2:00</td>
<td>Water For People Fishing Tournament</td>
<td>Vendor Exhibition</td>
<td>Water for People Committee Meeting Room 202</td>
<td>Optimizing Maintenance Workforce – Ed Garibian</td>
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<td>3:00</td>
<td>Grand Prize Drawing</td>
<td>Vendor Exhibition</td>
<td>Research Committee Room 202</td>
<td>TBD</td>
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<td>4:00</td>
<td>Free Time</td>
<td>2 Prize Drawings</td>
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<tr>
<td>Research (Roger Scharf)</td>
<td>Tech - Case Studies/ O&amp;M (Miles Jensen)</td>
<td>Operations and Maintenance (Joe Zauner)</td>
<td>Administrative/Professional (Stew Thornley)</td>
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<tr>
<td>Rooms: 204-205</td>
<td>Room: 301-302</td>
<td>Room: 202</td>
<td>Room: Harbor Side Ball Room</td>
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<tr>
<td>Moderator: Roger Scharf</td>
<td>Moderator: Miles Jensen</td>
<td>Moderator: Joe Zauner</td>
<td>Moderator: Stew Thornley</td>
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<tr>
<td>Developing a Policy for Biological Water Treatment - A Government and Regulators Perspective: Brian Noma, P.E., MDH</td>
<td>Identifying and Reducing Transients in Water Distribution Systems - Doug Klamerus, Bolton and Menk</td>
<td>Arc Flash - Master Electric</td>
<td>Coca Cola - Bottled Water</td>
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<tr>
<td>Investigation of the Performance of Pilot-scale GAC Biofilters at Minneapolis Water Works for Taste and Odor Removal: Jacqueline Strait, U of M Grad Student</td>
<td>Benefits of Mixing Potable Water Tanks - Michael Christensen, Medora Corp</td>
<td>Perfect Storm - Bernie Bullert, SL Serco</td>
<td>MDH - Karla Peterson</td>
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<tr>
<td>Business Meeting, Lunch, Awards: Harbor Side Ballroom</td>
<td>Perfect Storm - Tom Mathistad, City of Crystal</td>
<td>Perfect Storm - Bert Tracy, City of Golden Valley</td>
<td>Governmental Update - DNR, WIPFI</td>
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<td>Characterization of Drinking Water Distribution System Biofilm Communities Using Next-generation Illumina Sequencing: Christa Kimloi Gomez-Smith, U of M Grad Student</td>
<td>Small Improvements, Big Impacts - Adam Markos, Black and Veatch</td>
<td>Fresh Ideas Presentation: TBD</td>
<td>Private Hydrant Maintenance Program - Eric Volk, City of Elk River</td>
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Pipe Tapping/Meter Madness

The Competitions Committee is seeking additional volunteers to serve on one or more of the individual competitions committees. If you are interested, please contact Chris Glassing or one of the individual competitions committee chairs for additional information.

**Competition Schedule:**
All events will take place in the Exhibit Hall

- **Best In Glass** – Wed 9/10/14, 11:00 am, Final Judging at 2:00 pm
- **Pipe Tapping** – Wed 9/10/14, 10:30 am – 3:30 pm
- **Meter Madness** – Wed 9/10/14, 1:00 pm – 2:30 pm
- **NEW THIS YEAR! Hydrant Hystria Demo** – Wed 9/10/14, 12:45 pm

**Best In Glass** (Water Taste Test)
Brian Bergantine
AE2S
218-299-5610
brian.bergantine@ae2s.com

**Pipe Tapping Competition**
Chris Larson
SEH, Inc.
651-765-2961
clarson@sehinc.com

**Meter Madness Competition**
Kirk Peterson
HD Supply Waterworks
612-202-7786
kirk.peterson@hdsupply.com

**Hydrant Hystria Competition**
(2014 Demo, 2015 Competition)
Rick Myskewitz
AMERICAN Flow Control
(612) 790-6240
rmyskewit@american-usa.com

---

#CELEBRATEwater

The Minnesota AWWA Annual Conference HAS GONE SOCIAL

Follow us on Twitter for a chance to win conference prizes
Twitter.com/MinnesotaAWWA

Join our LinkedIn Group: Minnesota AWWA Events
The Competitions Committee is seeking additional volunteers to serve on one or more of the individual competitions committees. If you are interested, please contact Chris Glassing or one of the individual competitions committee chairs for additional information.

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Media: Sludge (Primary, WAS, RAS, Digested, Thickened, etc.), Biosolids, Grease, Sewage, Scum, Lime Slurry, Alum Sludge, Permeate, Polymers, etc.

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Vice Chair Candidates

Jim Sadler
Jim’s career in the H2O business started 38 years ago. Born and raised in Osseo, he graduated from Osseo High School in 1970. Jim tried college but he discovered he wanted to work with his hands so he hired on as a laborer for Adolfson & Petersen and worked on several schools and the IDS tower. Jim began working for the City of Maple Grove – Public Utilities in 1976 and was promoted to Utility Supervisor in 1998.

Jim’s community involvement includes Hockey Coach, 4-H Leader, Fire Captain, Training Officer, County Fair Board, Church Board, State Fair PA Announcer for the Llama Show and is the current Northern States South Devon Cattle Association President.

Jim’s involvement with the water industry includes, Past Chair Metro Section, SUS Member, Advisory Council W/WW Chair, AWWA Member for 20+ years, House Committee Chair, “Trustee at Large” 2012 – Leonard N. Thompson Awardee and Water Operator “A” License.

Jim currently lives in Nowthen on a seven acre hobby farm where he raised two daughters and a son. His children are all married and he has three grandchildren.

Jim says, “It would be an honor and privilege to serve as MN Section AWWA Chair. I would not be where I am at today without the words of wisdom and encouragement from the members of this section. Thank you for your vote and I pledge to continue this sections business as set forth by our predecessors.”

Tony Belden
Tony has worked in the potable water industry for 32 years, joining Water Products Company (now HD Supply) in 1982 following graduation with a business degree in finance from the University of Notre Dame where he played Football and was a special teams captain. In 1989 he joined Engineering America and since 2000 has served as the Company’s President and CEO. Engineering America is a 100% employee owned, bolted steel, liquid storage tank and aluminum cover specialty installation contractor. As the Company’s President, he has a track record of sustained growth and success by developing strategic plans, monitoring the follow up action steps of those plans and paying attention to the results. Under his leadership the stock of the Company has risen significantly and the organization has been recognized individually by both the Twin Cities Business Journal and the Star Tribune with small business awards. Tony is married to his wife of 27 years Mary and they have two adult children; Cal & Liz. Tony is a long term AWWA member and has served on various committees of the MN Section the past twelve years. He has held chair positions with the MAC Committee and the Finance Committee and has been instrumental on the planning committee of the local Water for People Benefit concert. His non-profit, voluntary work outside the industry includes a position on the Minnesota Veterans Medical Research and Education Foundation Board and he chairs the Mahtomedi TreeHouse Community Development Team, leading and supporting the staff of TreeHouse that works with at-risk teens in his community. Tony will bring strong leadership skills and experience he has garnered from his professional and personal life to the Section Chair position. His open book, team first, have fun, mentality will bring continuity and effectiveness to the Section’s Leadership team. Tony says “I see this leadership opportunity in the Section as a means to give payback to an industry that has provided me with so much”.

As the section Chair Tony will strive to bring focus and continued improvement to the following areas;

• Advance the Section’s Scholarship program with expansion of scholarships and more secondary education training offerings
• Support and encourage YP activities throughout the section
• Bring Cohesion to the Section’s leadership Team so that activities of the Board will be relevant and meaningful in helping the section grow
• Leverage donations and fundraising activities to maximize the Sections Contributions to Water For People
• Encourage volunteerism throughout the section as a life choice that has many rewards
• Promote the section and its mission and vision throughout the state of Minnesota.
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### Exhibitor & Sponsor Registration  
**Due August 15, 2014***

#### Your Company Information

| Company Name: |  
| Contact Name: |  
| Street Address: |  
| City: | State: | Zip: |

| Phone: | Fax: |

| E-mail: |  

#### Trade Show Exhibitor Booth Registration

**Booths $320 (member), $475 (non-member) per booth.**

| Qty: | $: |

Two Exhibitor Registrations are included per booth. Please list name(s) of Exhibitor Registrant(s):

| 1. | 2. |

**Additional $60 per person**

| Qty: | $: |

(covers admission to the Vendor Exhibitor Show, lunch, and evening social).

Please list Registrations name(s) of any additional Exhibitor Registrant(s):

| Name: |  
| Name: |  
| Name: |  

#### Electrical Service $55 for each 110V service.

| Qty: | $: |

Booth Location List booth preferences here, if any. (See diagram on page 3 of Call for Exhibitors brochure.)

| 1: | 2: | 3: |

#### Booth Registration Total

| $: |

**Note:** This does not include registration costs for the full three-day conference. Conference details and a registration sheet will be distributed at a later date.

#### Conference Sponsor Registration

Please check below to indicate that your organization wishes to be a Conference Sponsor. Sponsors have first priority in Trade Show booth assignments. Sponsors receive recognition throughout the Conference via such items as Conference signage, a prominent thank-you in the Conference Program, and recognition during the Member Appreciation Dinner. Sponsors are appreciated as being supporters of MN AWWA at the highest level.

- [ ] We wish to register as a Conference Sponsor. **Cost: $550**  
  (RECOGNITION ONLY, Does not include booth)  
  | $: |

#### Donations

To donate to the following, indicate your choices below. Donations help MN AWWA's charitable efforts. Donors will receive special recognition at the Annual Conference.

- [ ] WFP Golf Tournament Hole Sponsor (Suggested Donation: $200)  
  | $: |
- [ ] WFP Fishing Tournament Boat Sponsor (Suggested Donation: $200)  
  | $: |
- [ ] YP Texas Hold’em Tournament (Suggested Donation: $100)  
  | $: |
- [ ] Pipe Tapping Contest (Suggested Donation: $100)  
  | $: |
- [ ] Water for People (Suggested Donation: $50)  
  | $: |
- [ ] David Morris Endowment (Suggested Donation: $50)  
  | $: |
- [ ] WFP Sporting Clays Sponsor (Limit 5) (Suggested Donation: $100)  
  | $: |

#### Total Due $:

| Booth Registration + Conference Sponsor + Donations | $: |

#### Authorization and Payment

| Authorized Signature: | Date: |

**MAKE CHECKS PAYABLE TO MN SECTION AWWA.**

- Registrations without payment will not be processed.
- By registering, you agree to abide by the rules listed on the “Exhibitor Registration Information” page in the Call for Exhibitors brochure.
- Application and payment must be received by August 15, 2014.

*Exhibitors registering after July 31st may not be listed in the Conference Program.*
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Visit tkda.com or call 800.247.1714
for more information. Saint Paul | Duluth
The Minnesota Associates Council (MAC) of the MN AWWA invites you to participate in our 26th Annual Golf Tournament. This year's golf tournament will be held once again at the Lester Park Golf Course.

The tournament format will be a four-person scramble. You pick the team you wish to play with, or we can assign you to a team. Individual prizes will be awarded for contest holes and team prizes will be awarded to 1st & 2nd places in both A flight & B flight. All prizes will be distributed at the clubhouse after the event.

Date: September 9, 2014
Course: Lester Park Golf Club
Times: Lunch @ 12:00 pm; Shotgun Start @ 12:30 pm
Cost: $65.00/person (Includes: Green Fees, Cart, Lunch)

RESERVATION DEADLINE:
SEPTEMBER 9, 2014
NO REFUNDS CAN BE MADE
Please complete and return as soon as possible to assure your reservation. Any Questions or to Volunteer contact Jeff Blakely.

Name: ___________________________ Representing: ___________________________
Street Address: ___________________________
City: ___________________________ State: ___________________________ Zip: ___________________________
Phone: ___________________________ Fax: ___________________________

Team Selection:
☐ I have a team of four.
The full names of the people on my team are:

Name: ___________________________ Company/City: ___________________________
Name: ___________________________ Company/City: ___________________________
Name: ___________________________ Company/City: ___________________________
Name: ___________________________ Company/City: ___________________________

☐ I would like to be assigned to a foursome

PAYMENT:
$65.00/golfer x _________ golfer(s) = $: ___________________________
Amount Enclosed $ ___________________________

Please mail your reservation form and check payable to MN AWWA to:
Jeff Blakely
American Ductile Iron Pipe
21695 Highview Avenue
Lakeville, MN 55044
I would like to be assigned to a foursome.

PAYMENT:
$65.00/golfer x   golfer(s) = $:

Amount Enclosed $

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Ulteig’s water resources professionals assist public- and private-sector clients in managing stormwater runoff and surface water resources to sustain or improve water quality, minimize flooding, and address regulatory challenges. We are experts in the field of hydrology and hydraulics, working on projects from simple drainage designs to major flood control works.

Bismarck • Cedar Rapids • Denver • Detroit Lakes
Fargo • Sioux Falls • St. Paul • Williston
The Minnesota Associates Council (MAC) of the American Water Works Association invites you to participate in the Annual Fishing Tournament. We have reserved nine of the top charter boats out of the Duluth Harbor. Remember to bring an ice chest!

**Date:** Tuesday, September 9, 2014

**Place:** Waterfront Plaza Marina - Canal Park, Downtown Duluth or Lake Head Boat Basin - 1000 Minnesota Ave. Duluth

**Time:** Arrive at the Marina at 12:30 pm – Boats will depart at 1:00 pm, return at 6:30 pm

**Cost:** $110.00/person ($50.00/student)
(refunds can be made if charter is cancelled due to bad weather)

**Includes:** All necessary fishing equipment, all required U.S. Coast Guard Safety equipment and fish filleting and bagging.

**Note:** a tip for the First Mate is not included. This is generally 10% - 15% of an individual’s portion of the Charter Boat Fee.

**What to Bring:** Warm clothing and soft soled shoes, rain gear, snacks and beverages, sunglasses, camera or video camera, cooler and ice for your fish, a current Minnesota fishing license with a trout stamp.

**Deadline:** August 15, 2014

The nine boats and captains are:
- Hooker Too – Peter Dahl
- Blue Haven – Gerry Downes
- The Office – Don Nelson

Additional boats will be reserved if available and as required. Each boat can take up to six customers. It’s first come first serve, so get your reservation in early.

All tournament questions should be directed to Doug Klamerus at (651) 704-9970.

Please fill out the reservation form below and send it with your check payable to MN AWWA to: Doug Klamerus – Bolton and Menk, Inc., 2035 County Road D East, Suite B, Maplewood, MN 55109-5314

Respond as soon as possible to ensure your reservation!

---

Name: __________________________ Representing: _______________________  
Address: __________________________  
City: __________________________ State: __________ Zip: __________  
Email: __________________________ Phone: __________________________

**Boat/Partner Selection:**

- [ ] I would like to be assigned to a boat.  
- [ ] I would like to fish with the following persons: _______________________

Boat Sponsorship to be paid with main registration (Note: Only boat sponsors will be guaranteed to fish with a preferred list)

Boat Sponsors: My Company would like to sponsor the following boat (Suggested Donation: $200/boat): __________________________ and the full names of the people on my boat are:

Name: __________________________ City: __________________________ Email: __________________________  
Name: __________________________ City: __________________________ Email: __________________________  
Name: __________________________ City: __________________________ Email: __________________________  
Name: __________________________ City: __________________________ Email: __________________________  
Name: __________________________ City: __________________________ Email: __________________________  
Name: __________________________ City: __________________________ Email: __________________________

**Payment:**

$110.00 per Fisherman x ____ Fishermen = $______  
$50.00 per Student x ____ Students = $______  
Total Amount Enclosed $__________________________

- [ ] Optional Dinner. Yes, I will attend the informal dinner at the Timber Lodge Steak House after fishing. Door prizes will be distributed during dinner at the Timber Lodge. The Timber Lodge will cook your catch or you can order off the regular menu. Cost of dinner not included in payment.
Boat/Partner Selection:

I would like to be assigned to a boat.

I would like to fish with the following persons:

Boat Sponsorship to be paid with main registration (Note: Only boat sponsors will be guaranteed to fish with a preferred list)

Boat Sponsors: My Company would like to sponsor the following boat (Suggested Donation: $200/boat):

and the full names of the people on my boat are:

---

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The Minnesota Associates Council (MAC) of the American Water Works Association invites you to participate in the 7th Annual Sporting Clays Event.

**Date:** Tuesday, September 9, 2014  
**Location:** Old Vermilion Trail - Check website at [www.oldvermiliontrail.com](http://www.oldvermiliontrail.com)  
**Time:** Arrive at the club at 10:00 am for morning shoot, lunch and additional afternoon shoot  
**Cost:** $45.00/PERSON FOR TWO ROUNDS OF 50 (will need four boxes of shells).

All questions should be directed to Shawn Mulhern at 651-773-5111 or smulhern@klmengineering.com.  
Please fill out the reservation form below and send it with your check payable to MN AWWA to:  
Shawn Mulhern  
KLM Engineering  
PO Box 897, Lake Elmo, MN 55042  
**Respond as soon as possible to assure your reservation!**

---

**Name:** ______________________________  
**Representing:** ______________________________  
**Street Address:** ______________________________  
**City:** ______________________________  
**State:** ______________________________  
**Zip:** ______________________________  
**Phone:** ______________________________  
**Fax:** ______________________________  

**Name:** ______________________________  
**Company/City:** ______________________________  

**Name:** ______________________________  
**Company/City:** ______________________________  

**Name:** ______________________________  
**Company/City:** ______________________________  

**Name:** ______________________________  
**Company/City:** ______________________________  

**Payment:** Total Amount Enclosed $ ________________
After years of research and development, Prinsco is proud to introduce the industry’s first high performance, recycled pipe: ECOFLO 100. It is a corrugated dual-wall HDPE product manufactured from an engineered blend of material with 40% recycled content. Yet, it compromises nothing in performance.

ECOFLO 100 is independently tested and verified to offer an unprecedented 100 year service life, along with more than 2 times the stress crack resistance required by AASHTO M294 standards. In addition, our integral bell and spigot technology continues to offer the same ASTM D3212 10.8 psi watertight standard. That combination makes ECOFLO 100 the highest performing pipe on the market today.

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Minnesota AWWA – YP Texas Hold’em Tournament Sponsorship

The 98th Annual Conference of the Minnesota Section American Water Works Association will be held in Duluth, MN September 10-12, 2014. For the sixth year the Young Professionals Committee will host a Texas Hold’em Poker Tournament to raise funds for the David B. Morris Endowment Fund. We are asking businesses to support the tournament with prize donations and/or table sponsorship.

The David B. Morris Endowment Fund is used to support education through scholarships that help advance the technology needed for providing safe drinking water to people of Minnesota. The primary objective is to increase the endowment so that scholarships will include vocational technical training in operations, professional studies in science or engineering, and advanced studies or applicable research in water related areas. Recognizing the significance of the scholarships provided by the endowment fund, we encourage you to participate and consider table sponsorship and/or prize donations.

Please join us as sponsors for the Texas Hold’em Tournament with a donation of $100 as a tournament sponsor and/or donate a prize. We will prominently display company sponsors at the tournament registration table and announce sponsors throughout the tournament. Send your $100 check and/or indicate your prize donations on the enclosed form and return by August 15th.

Thank you in advance for your consideration, and we look forward to seeing you at the conference.

Sincerely,
David Weum, Young Professionals Committee
Minnesota Department of Health
PO Box 64975, St. Paul, MN 55164
Phone: 651/201-4684 • Fax: 651/201-4701
David.Weum@state.mn.us

☐ Yes, I wish to support this year’s Texas Hold’em Tournament to benefit the David B. Morris Endowment Fund.
☐ I have enclosed my check for $100 for a tournament sponsor.
☐ I will bring my prize(s) to donate to the tournament. Please fax or email this form.

Contact Name: ____________________________________________________________
Company Name (to appear on acknowledgements): ___________________________
Street Address: ____________________________________________________________
City: __________________________ State: __________________________ Zip: __________
Phone: __________________________ Fax: __________________________
E-mail: __________________________

Please make checks payable to: MN Section AWWA
Mail your check with this form to:
David Weum
Minnesota Department of Health
PO Box 64975, St. Paul, MN 55164
Phone: 651/201-4684
Fax: 651/201-4701
David.Weum@state.mn.us

Thank you for your support!
# 2014 AWWA MN Section Annual Conference Registration Form

## Your Company Information

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<th>Field</th>
<th>Information</th>
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<td>AWWA Member</td>
<td>Yes/No/Member #</td>
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## Cost of Registration

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<tr>
<td>Full Registration</td>
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<td>Includes all conference technical sessions, Wednesday/Thursday/Friday luncheons, Wednesday evening social, and Thursday evening AWWA appreciation night.</td>
<td>Non-member* $325*</td>
<td>$360*</td>
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<tr>
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<td>AWWA Member $245</td>
<td>$280</td>
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<tr>
<td></td>
<td>Retiree $85</td>
<td>$90</td>
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<tr>
<td>One-Day Registration</td>
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<tr>
<td>Includes admittance to all conference technical sessions for that day and one luncheon ticket</td>
<td>Wednesday $140</td>
<td>$175</td>
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<td>Thursday $140</td>
<td>$175</td>
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<td>Friday $80</td>
<td>$95</td>
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<tr>
<td>Student Registration</td>
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<tr>
<td>Must be enrolled in an educational institution at least half time. Includes technical sessions and lunch for registered date(s).</td>
<td>Wednesday $25</td>
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<td>Thursday $25</td>
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<td>Friday $20</td>
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</tbody>
</table>

*Non-member Full Registration includes a free 1-year Operator-level AWWA membership (or the option to add a 1-year Individual AWWA Membership for just $99. Contact MN AWWA if you have questions about membership)*

## Additional Tickets

<table>
<thead>
<tr>
<th>Ticket Type</th>
<th>Before 8/22/2014</th>
<th>After 8/22/2014</th>
</tr>
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<tbody>
<tr>
<td>Guest Program</td>
<td>$80 per guest (before 8/22)</td>
<td>$85 per guest (after 8/22)</td>
</tr>
<tr>
<td></td>
<td>X _____ # Guests = $_____</td>
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<tr>
<td>Please note price changes on 8/22/2014</td>
<td></td>
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<tr>
<td></td>
<td>Guest Names:</td>
<td></td>
</tr>
<tr>
<td>Add'l Ticket(s) for Thursday’s AWWA appreciation night</td>
<td>$55 per ticket X _____ (#) Tickets = $___________</td>
<td></td>
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</tbody>
</table>

Make checks payable to MNAWWA and mail to:

MNAWWA  
c/o Dennis Rosemark  
City of St. Paul Water Utilities  
1900 Rice Street  
St. Paul, MN 55113  
Email: dennis.rosemark@ci.stpaul.mn.us

Registration total: $___________  
Additional banquet tickets total: $___________  
TOTAL ENCLOSED: $___________

**Cancellation Policy:** Written cancellation is required. Registration cancellations received by August 22: Registrant receives the registration fee back, minus a $10 processing fee. Registration cancellations received after August 22 but by August 29 – registrant receives 50% of the fee in a refund. Registration cancellations received after August 29 but by September 5 – registrant receives 25% of the fee in a refund.
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Water Tank Service Life Using a Design-Build Approach

By Daniel J. Zienty, Short Elliott Hendrickson, Inc. (SEH®)

There are numerous approaches to consider for the maintenance of your water tower, including direct select, traditional design-bid-build, and design-build. Each approach holds merit, and, before making the selection, a tower owner should carefully weigh the advantages and disadvantages of each.

The sole purpose in selecting from any of the above approaches is simple: the necessity to maximize the service life of the water tower’s applied coating system. Selecting an approach may be easier when the scope of work is based on the complete reconditioning/restoration of the facility. The contractor begins with a clean slate, and it is easy to identify where the responsibility lies should there be a premature failure. However, often times it is just not possible, and what may be referred to as aggressive maintenance is warranted at the system’s approximate half-life.

In 2006, Short Elliott Hendrickson, Inc. (SEH) embarked on the design-build method of delivery for water storage tanks, and partnered with Classic Protective Coatings, Inc. (CPC). One of the first projects in the program was a 300,000-gallon water spheroid in the city of Eagle River, Wisconsin. The tank was last painted in 1991, making the existing coatings system 15 years old. The first step, prior to developing the project proposal, was conducting a comprehensive inspection of tank surfaces in accordance with American Water Works Association (AWWA) D101, including interior immersion, interior dry (access tube, riser and base), and accessible exterior areas. Tank appurtenances were also evaluated for compliance with current AWWA and Occupational Safety and Health Administration requirements.

The inspection identified an immediate need for complete removal and replacement of the interior immersion coating system and spot repairs for the interior dry specific to the bottom bowl and platforms. The exterior also exhibited a need for spot-coating repairs and a complete overcoat, its condition verified by a 3A average result using adhesion testing. This would be preceded by a complete power-wash to remove loose coatings and other surface contaminants. Structural modifications would include a frost-free roof vent, an additional roof manway, new handrail system, and a mud-valve for draining the bottom bowl.

Next, the team developed a proposal and work order that outlined the specifications and materials to be used for the immediate work based on the results of the field inspection. Further, a service schedule was developed inclusive of subsequent inspections and follow up servicing of the facility during the duration of the agreement. For the city of Eagle River, the effective period of the agreement spanned 10 years.

It should be mentioned that expected service life of coating systems for water storage tanks is 15 to 20 years when periodic inspection and maintenance are completed. Though cities may include a maintenance schedule for these operations to take place, in many cases other activities of immediate need take precedence, and maintenance is held off until it is past the point of maintenance; at that point, reconditioning is warranted. One of the key advantages to a design-build approach is it includes regularly scheduled inspections and maintenance.

The service schedule, as presented to the city of Eagle River, included the completion of all major repairs as identified above in the first year of the agreement, scheduled for the summer of 2006. An annual visual survey would be conducted by a NACE/SSPC certified inspector in years 2007 through 2010. The 2010 survey would be completed following general maintenance (work
identified in 2009). Finally, a visual survey would be conducted in years 2011 through 2014, with final maintenance completed in the agreement’s final year, 2015. At that time, the city has the option to renew its contract following a final evaluation. The design-build approach provides the city with both planned periodic tank maintenance and budget forecasting.

In May of 2006, the contractor mobilized and began rehabilitation of the tank. Interior immersion surfaces were abrasive blasted to an SSPC SP-10, a “near white” level of surface cleanliness. This was followed by two coats of a modified epoxy meeting NSF Standard 61. The interior dry surfaces were equally spot blasted to an SSPC SP-10, with edges feathered to provide for a smooth transition, with affected areas coated with the same system as the immersion surfaces. The tank’s exterior surfaces were power-washed to remove loose paint and inherent dirt and mildew. Spot areas exhibiting rust or corrosion were mechanically cleaned to an SSPC SP-11 “Power-tool Cleaning to Bare Metal” level of cleanliness, which included about 20 percent of the total surface. Spot areas were feathered similar to interior dry surfaces to provide a smooth transition for the epoxy primer and intermediate coat. Finally, the tank was over-coated with polyurethane using two colors and incorporating a logo.

As the design-build approach was used, placing the tank under a full warranty for product and contract labor for 10-years, inspection by a NACE/SSPC certified inspector was limited to periodic observation at hold points with emphasis on surface preparation and prime coat application. The tank was completed and placed in service at the end of June 2006.

Subsequent visual surveys were completed on the following dates:
- May 14, 2007
- July 29, 2008
- August 24, 2009

In 2010, CPC completed general maintenance as identified in the service schedule included in the city’s agreement. This work included power-washing using heated water and 3,500 pounds per square inch pressure to remove dirt and mildew developing at the cone section of the bowl. They also rinsed the tank immersion area and removed two to three inches of sediment from the bottom bowl. At this time, the expansion joint was also replaced. It was also noted that portions of the exterior system were starting to fade and lose gloss (not considered a system failure but associated more so with color selection). Inspection of the completed work was made on May 26, 2010.

Again, SEH conducted visual surveys on the following dates:
- October 27, 2011
- October 4, 2012
- September 12, 2013

As part of the original agreement, any additions to the tank (e.g., telecommunications equipment) required review and inspection by SEH, and any coating repairs were to be made by CPC. The purpose of this was to maintain consistency in workmanship for the in-place warranty. In 2013, an equipment upgrade was made by one of the tenants and CPC was on site to complete repairs following installation of new penetrations at both the base of the tank and beneath the bowl. At this time, spot repairs were made on the exterior at the base and in areas accessible without special rigging. These spots were warranty-related and attributed to abrasions with subsequent undercutting that were exhibiting rust.

The annual visual survey was conducted during the completion of this work. Observations indicated continued good performance of the coating system in the tank’s interior immersion area. Interior dry maintenance work would be required at the two platforms. Most important, though, was that the exterior system was showing a significant breakdown, with numerous indications of spot cracking and peeling. This was prominent at the roof radial plates.

The overcoat is now eight years old, the total system 23 years old, and two more years remain on the city’s maintenance agreement. The recommendation made in the 2013 survey to the city was for final maintenance work to be completed in 2014 by CPC. Completion of this work would provide some remaining aesthetic value but more importantly protect currently exposed surfaces. This work would take the tank through 2015, when a final visual survey would be conducted to determine long-term restoration of the facility.

So was the expectation of long-term serviceability met for the city of Eagle River? On its perceived merits, is the design-build approach a viable option for tank maintenance? Can responsibility for the facility be fairly assumed at mid-service life? Can risk be minimized? Was a cost benefit ultimately achieved by the city?

For the city of Eagle River, Wisconsin, this has proven to be a successful project. At a cost of $265,000 over the length of its agreement, the city extended the service life of the coating system past the standard expectation of 15 to 20 years. Additionally, the tanks interior, reconditioned in 2006, has service life remaining. Finally, through its duration, the city was assured that their tank was being annually monitored and periodically maintained, exceeding the guidelines set forth by AWWA and Wisconsin Department of Natural Resources. Without the design-build approach, the responsibility for continuous maintenance rests with the city and an annual budget. It is a budget where adjustment must be made to consider other system priorities and address emergencies.

With respect to project risk, the risk is with the company providing the service. Therefore, it is most important that the initial facility evaluation be conducted by an experienced inspector, that the investigation is comprehensive, that historical information is provided, and that field testing in accordance with current applicable standards is done accurately.

The results must then be assessed by both the engineer (SEH) and the partnering contractor (CPC). To this end, project risk can at the very least be minimized, resulting in a successful project. •
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“The bitterness of poor quality remains long after the sweetness of low prices”
January 2014 brought a major weather event to the northern United States and Canada, and many challenges to water utilities in the region. An ultra-cold mass of air descended out of Canada into the United States, and temperatures fell to record levels. Water utilities struggled with dangerous work conditions, watermain breaks, and ice formation in water storage tanks.

The town of Atwater, Minnesota, 100 miles west of St. Paul, has seen its share of cold winter weather, but the polar vortex in January 2014 set new records. Atwater experienced average temperatures below 0°F for more than a week, and wind chill conditions down to -40°F. Atwater has had a history of problems with ice formation inside its single 100,000-gallon elevated storage tank (Figure 2). Ice formation in the four-foot riser pipe plugged the tank several times, causing loss of water pressure. When this happened, the utility had to call in a service crew to run a steam loop up into the tank to thaw the riser pipe and release the water. Typically, they could detect when the riser pipe was becoming constricted by ice because the fill and drain rate started to drop. If they caught it in time, the utility was able to run warm water in and out of the tank and keep the riser from plugging. They also kept the tank water level lower in winter to increase turnover, but this reduced the water reserve available for fire emergencies.

Atwater staff had researched various options for reducing the risk of ice. They considered passive mixing systems that involved pipes attached to the inlet but had heard horror stories about these systems being torn off the wall of the tank during severe ice events. They were also concerned about the impact of these permanent systems on tank maintenance. Atwater staff also considered insulating the riser pipe, but they were concerned about condensation between the insulation and the riser pipe accelerating corrosion.

Utility Service Company, which provides tank maintenance services for the town, suggested using an active mixer to prevent ice formation and improve water quality during the rest of the year. In late 2013, Atwater installed a PAX Water Mixer in the tank.

When the polar vortex hit Atwater in the beginning of January 2014, the utility was nervous. It had raised the water level in the tank to provide better reserve for fire emergencies, but the cold temperatures and high wind had them concerned. The operator climbed the tank after several days of below-zero conditions and peered inside and was amazed to see a big bowl of moving water that was mixing plenty.

With active mixing now ensuring that ice plugs don’t form in the future, Atwater has its fire protection back and was able to run their tank with higher water levels all winter long.

“The polar vortex winter storm of January 2014 produced record-breaking cold temperatures across most of the United States.”

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With active mixing now ensuring that ice plugs don’t form in the future, Atwater has its fire protection back and was able to run their tank with higher water levels all winter long.

Figure 1: Atwater, MN has one 100,000-gallon elevated storage tank that provides storage and water pressure for the town.

Figure 2: Interior conditions in January 2013, prior to installation of the PAX Water Mixer (PWM100).

Figure 3: Interior conditions in late December 2013, after installation and operation of the mixer.
Our concern for the environment is more than just talk

As we continue to deliver valuable information through the pages of this magazine, in a printed format that is appealing, reader-friendly and not lost in the proliferation of electronic messages that are bombarding our senses, we are also well aware of the need to be respectful of our environment. That is why we are committed to publishing the magazine in the most environmentally-friendly process possible. Here is what we mean:

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- Our computer-to-plate technology reduces the amount of chemistry required to create plates for the printing process. The resulting chemistry is neutralized to the extent that it can be safely discharged to the drain.

- We use vegetable oil-based inks to print the magazine. This means that we are not using resource-depleting petroleum-based ink products and that the subsequent recycling of the paper in this magazine is much more environment-friendly.

- During the printing process, we use a solvent recycling system that separates the water from the recovered solvents and leaves only about 5% residue. This results in reduced solvent usage, handling and hazardous hauling.

- We ensure that an efficient recycling program is used for all printing plates and all waste paper.

- Within the pages of each issue, we actively encourage our readers to REUSE and RECYCLE.

- In order to reduce our carbon footprint on the planet, we utilize a carbon-offset program in conjunction with any air travel we undertake related to our publishing responsibilities for the magazine.

So enjoy this magazine...and KEEP THINKING GREEN.
Managing Water Quality in Your Distribution Tanks

Reprinted with permission from the Winter 2014 issue of Straight From The Tap

By: Jeffrey A. Harrison, P.E., CDG Engineers, Inc.
Contributing: Dustin Dowdy, Southeastern Tank, Inc.

As I sat and listened to the conference speaker’s response, I could not believe what he was saying, “...the tanks in your system are just hand grenades getting ready to go off.” “Grenade in your tank! Ready to go off! How could he say that?” I mumbled to myself. I provide, sell, and build water storage tanks. This answer to a question by a water operator was undoing my every reason for being at the conference. It took me a minute to comprehend his answer to the simple question of why have we been told for so long by the regulatory agencies to have more storage, only now to face the daunting task of managing disinfection by-products (affectionately referred to as DBPs) at the risk of severe penalties. Bewildered, aggravated, and in shock, I searched for a way to respond to this claim with prospective customers that would surely come up to me after this presentation. The question asked by the operator was borne of frustration but the answer he received was ill timed and reckless.

After I took a deep breath and regained focus on this exchange, I realized there was a tremendous opportunity for me to place a positive focus on water storage tanks instead of the negative connotation of ‘grenade’ coined by this speaker. We can focus on using the existing tanks as a treatment process, distribution systems, and storage tanks are trihalomethanes (THM), halocetic acids (HAA5), bromates, and chlorites.

According to recent nationwide surveys, approximately 85% of ground water systems use chlorine as their primary disinfectant. The common misconception is that ground water systems do not have DBP problems but, as we have seen through sampling and testing, THMs are quite prevalent in both surface and ground water. Although organics should not be found in ground water, other contributing factors within the ground water distribution system can lead to the formation of THMs, such as tuberculated distribution piping (i.e., aged cast iron, galvanized, etc.), inorganic matter, microbial growth on the profile of the tank walls, and settled debris within the storage tanks. Given the type of THM species borne under these conditions, four (4) chemicals can be found and measured to ascertain the Total Trihalomethanes (TTHMs) in your system. These chemicals are trichloromethanes (most common), dibromochloromethane (most serious), bromodichloromethane, and tribromomethanes. Once formed, these THMs now can be classified as a volatile organic compound (VOC) that we can now identify, treat, and reduce in our distribution tanks thereby decreasing its occurrence in the distribution system.

In identifying how THMs are formed, it was discussed earlier that age and temperature of the water in the distribution system and tank(s) were two (2) main contributing factors. Either by water modeling the dynamics of the system or estimating the theoretical residency time, an operator must come to understand how long treated, potable water flows through and stays within the system. By having a better grasp of the residency time, the water system can now reduce the age of the water and reduce the temperature stratifications that occur when water lines and, more specifically, distribution tanks do not turnover properly. Each state regulatory agency differs in their design guidelines, but most require water systems to cycle their tanks anywhere from 20% to 50% daily and theoretically drain and refill the tank every 2 to 3 days. Given temperature stratification issues within tanks, the way water gets in and out is...
Achievable and attainable results are the goal for managing water quality issues like THM in your system. Dependent on concentration levels, THMs and the factors forming DBPs can be addressed at the distribution storage tanks by assessing and modifying tank piping, installing a mixing system, installing an in-tank or outside tank aeration system, or changing operational procedures to match system demands. Although each system offers varying measures of success, it is not the intent of this article to promote one system over another. The water system, the engineer, and the consultant must assess each option based on the specific concentration level of the THM and determine the method of treatment that meets the treatment and fiscal goals set forth by the water system.

**Tank Piping Modifications**

The most common issue related to poor water quality and temperature stratification in existing distribution tanks is inlet and outlet piping. The worst-case scenario, and one that can be easily remedied, is the single inlet and outlet in the bottom of the tank where the last fresh water in the tank is the first water to leave the tank. This layout allows the water above the draining zone to become aged and stratified. With the installation of an outlet check valve, tee, a vertical pipe to fill the tank, and a horizontal pipe towards the center of the tank, we can make a bad situation tolerable by breaking the temperature stratification and allowing the older water to be drawn out from the bottom while filling into the top of the tank.

In recent years, design of tank piping has evolved to address the issue of single inlet/outlet piping by separating the inlet and outlet piping into a high level fill line and bottom drain line. The principle is the same: fresh water in the top of the tank and older water leaving out the bottom. This is simplistic yet effective when THM levels are not excessive and the tanks are being cycled properly.

The tank piping and mixing combination that offers the most movement of water within the tank is the vertical fill line with specifically designed nozzles (e.g., Tideflex® Mixing System) used to enhance the entrance velocity of the water entering the tank.
quiescent tank. This piping and nozzle configuration also prevents water from being trapped in dead zones or stratified by temperature. Arrangement of the nozzles allows the incoming water to be distributed at various levels throughout the tank and to enter into the storage tank with a velocity greater than that of an open-ended pipe. By increasing the velocity at the nozzle, the water entering the tank now has a specific momentum that will allow the water to mix at a more rapid rate than a fixed open-ended pipe, thereby achieving a homogenous blend of old and new water.

**Tank Mixing Technologies**

In situations where a tank is cycling properly, water systems can deploy mixers either in the top or in the bottom of the tank to create mixing zones to combat several water quality and operational issues. These include blending old and new water, uniformly distributing disinfectants, reducing temperature stratification, keeping water in motion to prevent ice formation during the winter months, and moving THMs from the lower levels of the tank towards the surface so that the THMs can be brought in contact with air.

**In-Tank Mixing Systems**

The in-tank mixings systems can be classified into two (2) categories: (1) Surface (2) Submerged. Surface mixing systems (e.g., Solar Bee®) use a floating platform with a mixing motor attached and a draft tube that pulls water directly from the bottom of the tank and then evenly disperses it away from the floating mixing unit. This mixing system allows the cooler and denser water to be mixed with the less dense and warmer water in the upper elevations of the tank so that a blending occurs, thereby reducing temperature stratification. If properly sized for the tank capacity, the unit is effective in mixing the system in a short time frame. The unit is electric and powered through solar panels.

Submerged mixing systems (e.g., Pax, Tank Shark, GridBee®) are designed to be deployed on the floor of the tank and use various methods of mixing technologies to move the water from the floor upward to the top of the tank.

**Tideflex mixing in stand pipe**

**Solar Bee with ice**
water surface in the tank. By forcing the water upward, the heavier cool water is then pushed through the various temperature strata in the tank and then, once the water is in close contact with the surface, the water is redirected in all directions towards the walls of the tank. Once the water reaches the barrier of the tank wall, the water is forced down the sidewall and completes a full circuit of mixing. By circulating water in this manner, the cooler water is blended with the warmer water, thereby reducing temperature stratification and dead zones within the tank. From a practical installation viewpoint, these units are set on the bottom of the tank and do not require a physical connection to the floor. With the exception of one unit (i.e., Tank Shark), all other units require a nominal amount of power; therefore, availability and capacity of electric service at the tank site are critical considerations when selecting your submerged mixing system.

Aeration Technologies

In situations where mixing may not be the best method for either controlling or reducing THMs in your system, aeration of the water either entering the tank or within the tank is recommended. THMs are volatile organic compounds (VOCs) and a method of reducing THMs in your tank is by bringing them in contact with air. When in the presence of air, the VOCs will evaporate and then can be removed from the tank through a combination of blowers and vents. The two (2) methods recognized throughout the water industry for providing this air contacts are In-Tank and Outside Tank Aeration.

In-Tank Aeration: In-tank aeration solutions can be in the form of bubble aeration through course bubble diffusers, surface aeration with jets spraying into the water surface, or spray aeration with nozzles spraying water droplets into the headspace. By either a floating aerator or spray, the unit is designed to bring THMs into contact with air so that the THMs can be stripped from the water molecules, evaporate into the tank, and then be evacuated from the tank. In every installation, power is either to power the pumps to send it to the nozzles and aerators or to operate the blower to provide air for the bubbler diffuser system. Floating aeration units such as the GridBee™, Pax TRS, and the Air Shark include a mixing unit to provide a full mixing and aeration system. In addition to mixing and aerating equipment, each THM reduction system requires an adequately designed blower system to be...
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mounted on the tank, plus a properly sized ventilation system. Each unit is designed specifically for the installation but typical published THM reduction results in tanks actively using these systems vary from 25% to 60%.

**Outside Tank Aeration:** Outside tank aeration, also referred to as waterfall aeration, uses equipment on the outside of the tank for aeration and stripping of THMs from the incoming water. This can be accomplished either by induced or forced draft aeration (e.g., De Loach Industries, Tonka). By means of either blowing (i.e., forced draft) or drawing (i.e., induced draft) air through a structure with media, influent water contaminated with THMs are sprayed over the media and brought into direct contact with air. Once the THMs are forced into contact with air, the contaminant is released from the water and evacuates into the atmosphere. With the water free-flowing through the tower, water must either be collected and pumped into the tank or the unit must be built on a structure adjacent to the tank so that it can gravity-flow from the unit into the top of the tank. The outside tank aeration system requires the aeration tower, packed plastic media/slates, and blower. Each unit is designed specifically for the installation but typical published THM reduction results in tanks actively using a waterfall aeration system vary from 25% to 50%.

**Operations and Usage**

The most critical aspect of maintaining the water quality in your system is to understand the factors that contribute to poor water quality. As we have discussed, the age of water in the distribution system is one of the key components that leads to the formation of THMs. By altering drain and fill cycles in the distribution tanks based on system demands, tanks can be allowed to cycle more frequently, thereby allowing the tanks to turn over properly. This can be accomplished by using pump storage wherein water is pumped from the tank and pumped into the system based on the varying demands on the water system. Pumped storage can work to augment either elevated or set hydraulic grade line systems by allowing those systems to drain to lower levels and then be replenished by the pumped storage system, which can meet the instantaneous plus peak demands.

Mixing and aerating a tank can work only as effectively as the system cycles based upon usage. The best analogy I have heard is, “If I have a 5-gallon bucket with bad water, it doesn’t matter how much I stir it up if I don’t take out the bad water and put good in it!”

These are practical applications and solutions for consideration based on the technologies available today. I encourage you, the reader, to investigate each alternative and determine if it applies to your situation. In some cases, mixing may be the answer but, in others, you may need to take the next step in aeration. Know your system and choose the best, most practical and most affordable solution to manage your quality challenges.

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STATE OF THE STATES –
Emerging Water Loss Regulations in the United States

By Will Jernigan, PE

Water system regulations in the US have been around for 100 years. Forty years ago, Congress passed the Safe Drinking Water Act, which brought sweeping changes for America’s drinking water systems. For nearly all of that time, those regulations have been solely focused on water quality. Only in recent years has the issue of water quantity found its place in the regulatory arena.

It is important to recognize that resources – both environmental and financial – will become more restricted with time, not less. Management of water loss is supply-side conservation – that is, reducing wasteful losses that occur on the utility’s side of the customer’s meter. Historically, conservation has been a more common practice in the Western US, where arid climates and severely restricted supply set the stage. Recent water loss legislation in the Eastern US has begun to bring conservation and supply-side efficiency to the center stage, particularly in the Southeast. The EPA put out a report in 2013 articulating the importance of water auditing and water loss control, recognizing the emerging adoption of best practices to address an already prevalent issue.

Drivers can be different
So why do we care about water loss? Just in the US, the drivers that make water loss important can vary widely from state to state, even utility to utility. For some, there are extreme drought conditions or arid environments with constrained water supplies that make water loss management a necessary source of new supply and resource stewardship. For some, it’s about the bottom line. There are strained budgets, with expenses outpacing revenues and they see water loss management as fiscal shoring. They understand

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the inherent business case for system efficiency, including the complex but proven dependency between water and energy. For some, the driver is political – where pending rate increases fuel customer distrust and outrage “you’re asking me to pay more for your inefficiencies?” where water loss management provides defensibility and action, and an offset to the severity of the required rate increases. For others, as is the case in Georgia and Tennessee, the primary driver is regulatory. While there tends to be a primary driver, in most utilities, all of these drivers exist to some degree. For this reason, the cost of doing nothing far exceeds the cost of water loss management in both the short and long term.

**Water loss, exposed**

We must understand the nature of any problem to stand a chance of solving it. The tricky part about water loss is that it’s not a singular problem. Water loss has multiple components, each having multiple sub-components, and there is not a single tool or technique for universally addressing all components. Thus, a collective strategy must be developed, designed to appropriately target each sub-component.

So what is water loss made of? Chances are by now you have seen or heard much of this, but it bears repeating. The Water Audit Method developed by the International Water Association and the American Water Works Association (AWWA) defines water loss on the basis of the Water Balance (Figure 1). Water loss is derived as “real losses” plus “apparent losses.” Real losses are physical losses from the distribution network, via leakage from mains, services and storage tanks. Apparent losses are economic, non-physical losses that result from under-registering customer meters, under-billing of customers and theft. Imbedded into the Water Audit Method is the Data Validity score – a measure of confidence and reliability in the Water Audit outputs.

Data Validity must be your first consideration, in using the Water Audit to guide water loss management activities. Systems with low Data Validity scores must focus next steps on improving data. Those with high Data Validity should focus next steps on reductions in water loss. Those with medium Data Validity scores must examine closely to determine the appropriate balance of next steps for data improvement and water loss reduction.

All systems have water loss, and all systems have some of each component – real losses and apparent losses. The big question is how much of each, and what are the cost impacts of each? This is central to any effective strategy. Consider the importance of applying the right strategy for the right problem. Effective will implementing a comprehensive customer meter testing and replacement program be for solving a leakage problem? How about an active leak detection and repair program for solving systemic billing system issues? And consider the cost-effectiveness of any strategy, even if it’s the right “tool for the job.” Are we spending a $1,000,000 on a $500,000 problem? An effective strategy – for both results and cost – must match the problem in both scale and nature.

**State of the states**

In 2002, an analysis of state agency Water Loss reporting practices was conducted by Beecher Policy Research, Inc. Two primary conclusions came from this survey – the first was the widespread use of the performance term “unaccounted-for water percentage” and the second was a clear inconsistency in what was considered “acceptable

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Figure 2 – 2002 States Survey of “Unaccounted-for Water” Standards

Figure 3 – 2011 States Scorecard for Water Efficiency Policy
AWWA has long since denounced use of the imprecise term "unaccounted for water" (UFW), as well as percentage based metrics, as they have been deemed inconsistent and unreliable as performance measures. UFW has been abandoned as an old technology, joining the likes of the 8-track and rotary phone. In its place, the IWA/AWWA Water Auditing Methodology, as defined in the M362 Manual of Practice for Water Audits & Loss Control (M36 method), is recognized world-wide as best practice in the industry for the accounting and control of losses in drinking water systems. Central to the M36 method is the rational segregation of real (physical) and apparent (economic) losses, and analysis of the components of each type of loss, which informs an effective control strategy.

An analysis in 2005 on Water Loss policy and regulation further describes a highly fragmented and complex water supply and regulatory structure. The complexities stem from the sheer volume of regulated community water systems in this country (over 54,000), as well as the intricate framework of regulatory agencies – often multiple agencies in a given state with varying regulatory jurisdiction, and sometimes agencies that regulate water systems across multiple state borders. Further research was conducted by the Alliance for Water Efficiency in 2011-12 revealing that through the network of regulatory agencies, an indication of regulatory momentum is beginning to emerge in the Water Loss arena.

Clearly there have been significant evolutions in Water Loss policy and regulation in just the last 10 years. The scope of the research presented in this article is focused on identifying where a framework for Water Loss auditing and reporting exists today, where there are performance targets, and which of those states or agencies align their requirements with the best-practices of the M36 methodology. The research methodology consisted of compilation and review of regulatory texts (existing and proposed), statewide planning documents, sanitary surveys, state funding applications and policy memorandums as available from states across the US.

Figure 4 presents the landscape of states where at least some type of framework exists for Water Loss auditing, reporting and performance targets. The format of this framework varies widely from state to state. In some cases, Water Loss auditing reporting and/or performance targets are required by mandate, with varying degrees of penalty for enforcement. In other cases, Water Loss auditing reporting and/or performance targets are not required, but are otherwise incentivized through priority on state funding applications, consideration for new withdrawal permits, or other means.

Figure 5 presents those states where that regulatory framework exists, and it directly aligns with the best practices of the M36 Method for water auditing and loss control. California and Texas were the first states to adopt M36 as the required methodology. Most recently Georgia, Tennessee and Wisconsin are states where the requirement has been implemented statewide. In Florida, M36 auditing is a requirement, but not statewide – only two of the five Water Management Districts have this requirement. Similarly in California, the requirement only applies to those utilities who are part of the California...
Urban Water Conservation Council (CUWCC). The Delaware River Basin Commission (DRBC), while not a state, instituted a requirement in 2013 for all M36 auditing by most water systems under its regulatory purview – about 300 utilities including Philadelphia, Aqua PA and New Jersey American Water. M36 auditing is incentivized in New Mexico via consideration for new permit applications, in North Carolina via priority points for SRF (State Revolving Fund) applications, and in South Carolina via incorporation into annual surveys conducted by state inspectors. Among the states requiring M36 auditing, only California, Tennessee, Georgia and the DRBC use the AWWA Free Water Audit Software© as the required format for submittal. This software was developed and released by AWWA to provide the industry with a standard format for the water audit, along with a free compiler tool to allow ease of collection and analysis for large numbers of water audits. The current version of the Free Water Audit Software (v4.2) was release in 2010, and the next version (v5.0) is due out in early to mid-2014.

A trend that has been reported by most of the M36 early adopter states is an inherent challenge in the reliability of many of the audits submitted, citing examples of errors and anomalies such as water loss greater than 100% or less than 0%. These challenges are largely attributed to the lack of understanding for the auditing process (as many utilities are conducting these audits for the first time), quality control on the audit data inputs, and the top-down nature of the initial audit. The DRBC reported that approximately 100 of the 300 audits initially submitted in 2013 were not suitable for analysis, requiring extensive cleanup of errors and anomalies. In California, the CUWCC reported that among audit submittals from 2010, 36% were unsuitable for analysis due to errors. The Texas Water Development Board and Tennessee Comptroller’s Office have reported similar challenges since they began collecting water audits in 2005 and 2007, respectively. In Georgia, a statewide training and data validation initiative was conducted for the 200+ water systems subject to the water auditing and reporting requirement beginning in 2012, in recognition that the presence of un-vetted audits and their performance indicators undermines the credibility of the entire dataset, and the auditing process as a whole.

A survey of the regulatory landscape today reveals growing regulatory momentum for Water Loss in the industry, and a foundational need for education, training and validation per the AWWA M36 auditing and loss control methodology. A look back at prior research efforts on this topic reveal that much has changed in a short amount of time. A look ahead at leading indicators such as draft M36 legislation in New Hampshire, or M36 policy objectives established in statewide water conservation planning documents in Oklahoma and Hawaii, suggests that we may see an increasing rate of change in the future. ©
References
10. Draft Rule Amendments for PART Env-Wq 2101, eff. 5-14-05 (doc #8353). New Hampshire Administrative Code, proposed amendments 05-03-13.

Mr. Jernigan is the Director of Water Efficiency for Cavanaugh & Associates, P.A., and is an industry expert in Water Loss Control with a focus on revenue recovery. He is presently the incoming secretary for the AWWA Water Loss Control Committee, and is very active on its M36 Manual, Water Audit Software, and NRW Economics & Finances Subcommittees.

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Topics are subject to change.

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Kevin Young places in AWWA Poster Contest

Kevin Young of Moorhead Public Service finished second in the American Water Works Association annual poster contest at the organization’s Annual Conference and Exposition for his poster, “Prevention of Bromate Formation in the Moorhead Water Treatment Plant.”

2nd place winner Kevin Young with Kristen Rehg, a member of the AWWA Young Professionals Committee

Winning Water Posters

For the second year in a row the Minnesota Department of Health, H2O for Life, Dow Water and Process Solutions, Bongard Corporation/Elkay, and the Minnesota Section of American Water Works Association sponsored a contest for water posters from Minnesota students. For their artwork and insights, the winners earned a bottle-filling station for their school.

This year’s contest drew more than 900 entries from around the state. A group effort by Eli, Hannah, Kian, Caroline, Cash, and Caden of Garden of Hope Elementary in White Bear Lake won the prize in that category. Josie Valerius of Centennial Middle School in Lino Lakes had the best poster among middle schools. Laura Gallup (shown at the right with her poster) of Centennial High School in Circle Pines produced the top poster among high-school students.

The sponsors plan to continue the contest to promote tap water and bottle-filling stations.

Notices

Jim Sweeney, the utility superintendent for Inver Grove Heights, retired in May after 38 years with the city.

John Lapointe has moved to the Minnesota Department of Health Section of Drinking Water Protection, serving as district engineer for Ike Bradlich, who is on military leave.

John has been active in water projects with Rotary International and with the Minnesota Section of American Water Works Association, serving as the section’s chair in 2005-2006.

Send your updates to Stew Thornley
stew.thornley@state.mn.us
Industry News

A pile in the aisle: Watch your step at the EPA

Staff at the Environmental Protection Agency (EPA) Region 8 office in Denver didn’t have to wander far to find a toxic clean-up site. The Washington Post, USA Today, and other news outlets reported that a directive was issued to employees to cease inappropriate behavior in and around the office’s internal wastewater facility.

The deputy regional administrator noted “several incidents” on the part of a disgruntled employee (or employees) that included clogging toilets with paper towels and “an individual placing feces in the hallway” outside the restroom. Employees were advised that, “Management is taking this situation very seriously and will take whatever actions are necessary to identify and prosecute these individuals.”

The Government Executive blog added that EPA management consulted with a national expert, who confirmed that “hallway feces is in fact a health and safety risk” and that it was likely that the people involved would likely “escalate” their actions.

Employees with the poop on the incident were asked to notify their supervisor. Other than that, management said that the EPA cannot comment on “ongoing personnel matter” although they “are focused on ensuring a safe work environment for our employees.”

It wasn’t clear if the noxious mound had been deposited directly or produced elsewhere and transported to the location.

Where is the water in White Bear Lake?

A half-hour documentary on the shrinking of White Bear Lake has been produced by Amy Okaya, a former Minnesota Department of Health employee and a resident of White Bear Township. Where Is the Water in White Bear Lake? explores the reasons the lake’s water level has gone down by more than four feet in the last 10 years, and the documentary is intended to “stimulate broader public engagement in water issues by presenting the story of White Bear Lake in a more personal way,” according to Okaya.

Avoiding politics and legal issues, the documentary focuses on observations by residents and insights from researchers, hydrogeologists, and others. “The only real way to change the situation is to change how people behave when they use water,” Jeanette Leete, a manager at the Minnesota Department of Natural Resources (DNR), says in the film. Former legislator and DNR commissioner Gene Merriam, now president of the Freshwater Society, said of the cultural shifts, such as recycling, that he has seen in his lifetime, “It usually reflects educational efforts, letting people know there is a problem and there are alternatives.”

The documentary is available at https://www.youtube.com/watch?v=Bgt_s-07MvQ.
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