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The Official Magazine of the Central States Water Environment Association, Inc.

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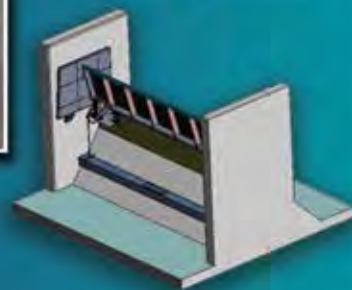
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Tel: (866) 985-9780 Fax: (866) 985-9799

www.kelmanonline.com

Managing Editor: Cheryl Parisien, [cheryl@kelman.ca](mailto:cheryl@kelman.ca)

Design/Layout: Kristy Unrau

Marketing Manager: Al Whalen, [awhalen@kelman.ca](mailto:awhalen@kelman.ca)

Advertising Co-ordinator: Stefanie Ingram

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Send undeliverable addresses to: CSWEA, 1021 Alexandra Blvd, Crystal Lake, Illinois 60014



## President

Patti Craddock  
Short Elliott Hendrickson, Inc.  
651-490-2067  
[pcraddock@sehinc.com](mailto:pcraddock@sehinc.com)

## 1st Vice President

Jim Huchel  
City of Crystal Lake  
815-459-2020 Ext 4168  
[jhuchel@crystallake.org](mailto:jhuchel@crystallake.org)

## 2nd Vice President

Keith Haas  
Racine Water & Wastewater Utility  
262-636-9181  
[keith.baas@cityofracine.org](mailto:keith.baas@cityofracine.org)

## Treasurer

Tim Tack  
LAI Ltd  
847-392-0990  
[TTack@lai-ltd.com](mailto:TTack@lai-ltd.com)

## Immediate Past President

Randy Wirtz  
Strand Associates, Inc.  
608-251-4843  
[randy.wirtz@strand.com](mailto:randy.wirtz@strand.com)

## WEF Delegate '14

Ralph B. (Rusty) Schroedel  
Brown and Caldwell  
414-203-2925  
[rschroedel@brwnclald.com](mailto:rschroedel@brwnclald.com)

## WEF Delegate '15

Eric Lecuyer  
Northern Moraine WRD  
847-526-3300  
[elecuyer@nmwrld.org](mailto:elecuyer@nmwrld.org)

## PWO Representative '15

Todd Carlson  
City of Duluth  
218-591-2343  
[tcarlson@duluthmn.gov](mailto:tcarlson@duluthmn.gov)

## YP Representative '14

Eric Lynne  
Donohue & Associates  
920-208-0296 ext 7375  
[elynne@donohue-associates.com](mailto:elynne@donohue-associates.com)

## Illinois State Section Trustee '15

Dean Wiebenga  
Peterson and Matz, Inc  
847-624-5226  
[Deanpmi@aol.org](mailto:Deanpmi@aol.org)

## Minnesota State Section Trustee '14

Doug Henrichsen  
Brown and Caldwell  
651-698-2077  
[dhenrichsen@brwnclald.com](mailto:dhenrichsen@brwnclald.com)

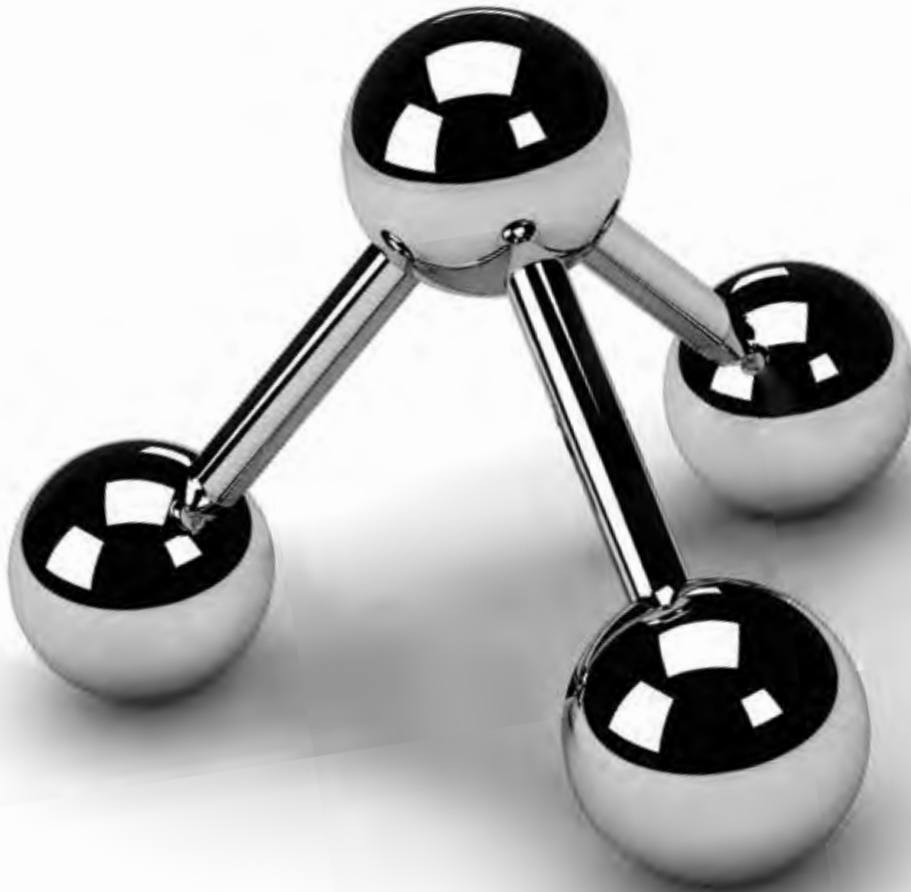
## Wisconsin State Section Trustee '15

Brandon Koltz  
Brandon Koltz Water & Environmental  
Consulting  
414-453-6669  
[brandon.koltz@gmail.com](mailto:brandon.koltz@gmail.com)

## Executive Director

Mohammed Haque  
CSWEA  
855-692-7932  
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# Water: My Passion, Our Passion

By Patti Craddock



I am fortunate to have a career fueled by a passion that stems back to my youth. As a grade-school kid in the '60s and secondary schooler in the '70s, amidst all the counterculture influences, the media attention on our water-quality problems resonated with me. While the scenes of Woodstock news clips (I was living in upstate New York at that time) and my first rock concert (Led Zeppelin) are still in my memory recall, I also have vivid memories of the Cuyahoga River on fire and learning about water pollution. Water quality and environmental issues made it into school curricula and formed an imprint on my still-developing brain and sense of self. I am fortunate to have parents who enjoy the outdoors – my fondest childhood memories are of camping trips with hikes along creeks, rivers, and vistas that took my breath away. Of rock skipping contests, finding tadpoles at every stage of development, and beach bonfires with ocean waves as our background music. As a parent, I now know my parents had an ulterior motive – a day outdoors with constant action tired me and my siblings out, and we typically got along in the serenity of nature. I thank them for their choices, whatever the motive, because they were of immense benefit to me.

My connections to water may be similar or very different to yours – regardless, we all have a story and I encourage you to share it with others. The fact that you are reading this magazine is a testament to your commitment to our organization and our mission. Thank you for taking the

**“CSWEA is ready to provide you the opportunity to share YOUR PASSION. We have a lineup of activities for you to learn, teach, engage, and grow. We have members working diligently to provide you events at the state section and CSWEA level.”**

time to read this, because I know you are busy. I know you are inundated with information to sift through and determine if there is value in absorbing the message, recording key information, and quickly absorbing the takeaways.

If you got this far in the article, the takeaway is – pass on your passion for water to others. If you were able to attend or see a clip of the opening address at WEFTEC, you can visualize this takeaway as, “tag, you are it.” Building off Kevin Carroll’s message to WEF members: “isn’t that what we are doing, we are chasing our Why, our significance, how we are going to leave the world a better place.” The reference to “tag, you are it” means pass it along, and also builds on Kevin’s other message and the Nike film clip he showed – the importance of creative time, of play time, to allow us to come up with those big ideas, to have sustenance for the long days that come with keeping our water infrastructure running during extreme climatic events, and to have the capacity to stop in the day to absorb that nugget of information to solve a problem or provide a teaching moment to others that will lead to a

solution, to leaving “the world a better place.” So pass it along, create time to inspire, and allow you to perform at your best – your passion can spark and fuel another’s passion. Tag, you are it!

CSWEA is ready to provide you the opportunity to share your passion. We have a lineup of activities for you to learn, teach, engage, and grow. We have members working diligently to provide you events at the state section and CSWEA level. The upcoming CSWEA events include.

- (1) Midwest Water Industry Expo, February 4-5, 2014, Wisconsin Dells, Kalahari Resort.
  - Co-hosted by Wisconsin WWA, 8 CEUs.
  - 100 exhibits, 400 attendees, 32 vendor demonstrations.
- (2) Student Paper/Design Competitions, April 7, 2014, Monona Terrace, Madison.
  - Judging the WEF student paper and design competitions.
- (3) Education Seminar – Sustainability, April 8, 2014, Monona Terrace, Madison.
  - New topic this year on wastewater

Continued on page 8



“In our fall issue of *Central States Water* I described ‘Ideas to Sustain our Association.’ While event committees were already considering changes independently and have a stellar record of delivering quality events, I have been impressed at the flexibility they have shown in incorporating recommendations developed from Executive Committee work the past few years to sustain our association.”

Continued from page 7

- treatment sustainability practices.
- Excellent line-up of national experts and local case studies.
- (4) Annual Meeting, May 12-15, 2014, Crowne Plaza Riverfront, St. Paul
- New venue in downtown St. Paul along the Mississippi River.
- Featuring a Safety Workshop, Monday May 12. Main conference activities begin on May 13.
- New technical sessions focusing on Operations and Utility

Management.  
This issue of the magazine, e-blasts, and separately mailed brochures provide you detailed information on these events. I am inspired by the committee members developing these programs. The synergy of the team members is exciting to see – ideas shared on technical content, advertising changes that will attract more attendees, and the overarching goal to provide a quality experience

for our members. In our fall issue of *Central States Water* I described “Ideas to Sustain our Association.” While event committees were already considering changes independently and have a stellar record of delivering quality events, I have been impressed at the flexibility they have shown in incorporating recommendations developed from Executive Committee work the past few years to sustain our association. Thank you, committee members! Come share our passion – Water. Tag, you are it! [CS](#)



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# Be A Water Advocate

By Rusty Schroedel and Eric Lecuyer



The WEF House of Delegates (HOD) conducted its annual business meetings all day Saturday at the start of WEFTEC 2013. The morning sessions were devoted to concluding the work of the past year with various WEF leaders reporting on the status of various projects and programs currently under way. The opportunity for WEF and other water related associations and businesses to leverage our public awareness campaign with the Ad Council has fallen by the wayside. WEF is still committed to an aggressive campaign aimed at raising public awareness of the Value of Water. The campaign is envisioned to include print, radio, and TV ads stressing the critical need to protect and preserve our most precious resource, Water. While unable to reach a consensus with the Ad Council on the most appropriate message, the work that went into the process is highly valued and has led to a strong group committed to common goals with respect to public awareness.

Another top topic was WEF's business plan, a new approach to planning geared to putting in place programs, funding, and setting priorities needed to achieve the goals established in the strategic plan. A key component of that plan is to close the gap on the cost of serving our members and WEF's current dues model. A series of dues increases are needed to offset the cost of service, placed at \$159.69 per member, while WEF dues lag far behind at \$88.

**“WEF is still committed to an aggressive campaign aimed at raising public awareness of the Value of Water. The campaign is envisioned to include print, radio, and TV ads stressing the critical need to protect and preserve our most precious resource, Water.”**

Closing this gap will bring WEF in line with other similar water-related associations whose dues are currently in the \$160 range. The need for full cost pricing, similar to our rate structures, will help close this gap and represents the awesome value that WEF has on our professional lives.

Concluding the morning session, each of the HOD's Work Groups (WG) reported out on the accomplishments achieved and future goals for successor workgroups. Outgoing WEF Delegate Dave Raby served as vice chair of the MA (Member Association) Sustainability WG and Rusty Schroedel served as chair of the Strategic Planning WG, with the remaining WGs being Non-Dispersibles and Operator Outreach. While most of the WGs focus on strengthening WEF, the HOD, and MAs, the Non-Dispersible WG has accomplished much, including AP articles picked up by newspapers around the country on the problem utilities face with flushable wipes, and in developing public education materials on this growing problem.

Delegates were treated to a Water Heroes luncheon where the stories of how so many operators in the path of Super Storm Sandy rode out the harrowing experience and restored their facilities to service soon after the storm surge had receded. Sadly, several of our professional brethren lost their lives during this biblical-scale event, putting our own daily trials and tribulations into perspective.

As the new HOD took up its business in the afternoon, outgoing Delegates, including our own Dave Raby, were thanked for their many years of service to WEF and their MAs. CSWEA is truly indebted to Dave for the leadership he has provided to both our MA and to WEF. The HOD leaders were officially elected, with Janet Hurly Cann elected to Speaker of the House and Duyen Tran as Speaker Elect. Also approved were the nominations to the HOD's four standing committees; Steering, Budget, WEFMAX, and Nominating. Eric Lecuyer will serve on the Budget Committee and the WEF Audit sub-committee. HOD WGs were



established or renewed, including MA Leadership Development, MA Financial Sustainability, Strategic Planning and Non-dispersible with delegates free to choose which WG(s) to serve on. Rusty will continue to serve on the Strategic Planning WG while Eric will serve on the MA Financial Sustainability WG. The key function of three out of four WGs is to help MAs of all sizes with the management, leadership, and future planning tools they may need to better serve their members and continue to thrive in the future. This focus is critical since WEF's members are within MAs like Central States and MAs vary greatly in size and sophistication in North America and throughout the world.

Two initiatives were announced by Speaker Janet Hurley Cann for the Delegates: increased membership, and

the identification and development of water advocates. Our role as Delegates is to be the communication link between CSWEA and the WEF HOD. We are committed to communicating the concerns and goals of CSWEA and its members to WEF and keep our members up to date on WEF programs, initiatives and challenges. The HOD is the deliberative body that helps guide the WEF Board of Trustees on critical decisions. The HOD helps lead WEF and does not simply serve as a rubber stamp for WEF staff and top leadership. Please reach out to your WEF Delegates with any questions or concerns you may have and help continue our grassroots representation of our member's needs to WEF. Be a water advocate and help introduce new people to the value of CSWEA and WEF. **CS**

**“Please reach out to your WEF Delegates with any questions or concerns you may have and help continue our grassroots representation of our member's needs to WEF.”**



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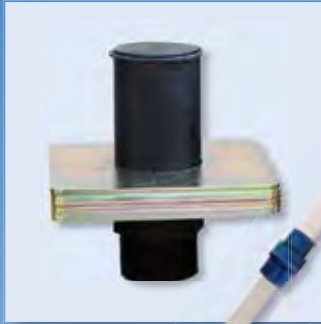
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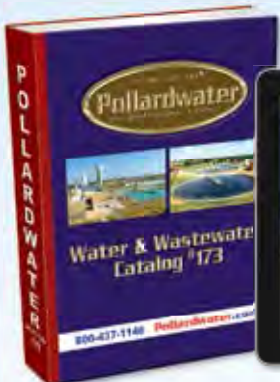
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Mohammed Haque

# New Initiatives

**D**uring November, I had the opportunity to reflect on CSWEA and our first year managing the association. It's been a very interesting, challenging, and fun time. Amy and I have learned a lot about the inner workings of CSWEA and the immense power of our organization. CSWEA is truly a progressive association with a tremendous membership of highly professional and talented water professionals. The volunteers in the organization really give an immense amount of time to organize meetings, events and activities that promote CSWEA and our water environment. They are really remarkable individuals.

We were fortunate to be given the latitude to look at CSWEA through a different set of lens and to use it to form some new initiatives. You can look forward to a few of those in 2014. Here is a brief summary on some things that CSWEA will be doing in 2014.

## Education Seminar topic

On April 8, 2014, we will be hosting the 19th Annual Education Seminar in Madison. This year's topic is new and very exciting. Sustainability is the topic for 2014. This will be a break from our traditional Activated Sludge/Biosolids/Nutrients topics. Presentation topics include social innovations, regional/international collaboration, energy neutral facilities, energy balance, CSO

control using green infrastructure, organizational succession planning and other topics that look at the overall sustainability of our market sector. We are looking forward to becoming a national leader in this topic, as we have previously shown with our past topics at the Education Seminar.

## Website

If you have not seen it yet, our new website was launched at the end of November. Considerable planning and effort went in to re-designing the website after nearly 10 years of the last site. We hope you like it. Feel free to suggest enhancements that would make the site more usable and effective.

## Utility registration pricing for Annual Meeting

Utility members will be able to enjoy a flat fee pricing beginning at the 2014 Annual Meeting from May 12-15, 2014 in St. Paul, MN. After considerable research and interviews of our membership, pricing tiers have been developed to encourage utilities to send more employees to the meeting. Utility members should look out for the special utility registration forms for the annual meeting to register based on the new utility pricing model.

## Utility track addition for Annual Meeting

Based on the same research and interviews that led to the revised Utility

pricing tiers, we have also added a utility track to our normal three (3) presentation tracks at the Annual Meeting. The utility track will feature soft topics such as human resources, leadership, ethics and succession planning to appeal to utility managers. In addition, we will be featuring topics on problem solving, troubleshooting and hands-on discussions for utility operators.

## International project initiative

CSWEA has a unique skill set among its members. There is no group of professionals that knows more about creating a cleaner, more sanitary world than us. We are also fortunate to have a great wealth of student chapters. In 2014 we hope to launch an international project that will take our skills and use them to help students develop a design project in Costa Rica. The initial planning stages of this are currently in the works. Eric Lynne, our current YP Representative, has volunteered to chair the committee and we are looking forward to kick-starting this effort and roll it out for 2014. If you are interested in this, please let Eric or me know and we will get you on the committee.

To say the least, the new initiatives we have planned are exciting. We are looking forward to a great 2014 and taking CSWEA to new places and creating more value for the great members we already have. Here's to a memorable 2013 and an adventurous 2014! [CS](#)



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# Local Students Win National Award at Prestigious Water Science Competition



**Isabella Cafaro** and **Sarah Organ**, students at Divine Savior Holy Angels High School in Milwaukee, WI, have been named the state winners of the 2013 Stockholm Junior Water Prize (SJWP) competition – the most prestigious youth award for a water-related science project. Selected for their project, *Reducing Escherichia coli and*

*Fecal Coliform Contamination at South Shore Beach*, Ms. Cafaro and Ms. Organ represented Wisconsin at the national competition, June 14 and 15, 2013, at the Red Lion Hotel on the River – Jantzen Beach, Portland, Oregon.

Ms. Cafaro and Ms. Organ won the Bjorn von Euler Innovation in Water Scholarship at the National SJWP event in

Portland. The \$2000 scholarship was awarded to “students who demonstrate a passion for education, spirit of creativity, and are innovated in their thinking when it comes to developing sustainable clean water solutions that can be passed on to future generations.” There were only four awards given at the national competition. **CS**



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Winter 2013 | CSWEA 15



## WEFTEC 2013 CSWEA/IWEA Welcome Reception *A Record Year*

The 2013 WEFTEC CSWEA/IWEA Welcome Reception was a success once again. Thanks to our many sponsors and all other members who worked the phones, emails, and sign-in table to make this event a success. This year's event, held at the Hilton Chicago, was the 18th year that CSWEA and IWEA joined to host this event. A record turnout of over 400 members, sponsors, and friends were in attendance, which is a great turnout in spite of the pounding that the Bears took by the Saints earlier in the day. There was food and drink aplenty, and the noise level was high as friends met and made plans for the week of WEFTEC. Of course, this was all made possible by our generous sponsors. Even with the record turnout, their donations allowed us to increase the food and sustain our thirsty members and still manage to nearly break even for the event. Make a note now to plan to attend the 19th Annual Welcome Reception at WEFTEC 2014 in New Orleans, September 28, 2014. [CS](#)

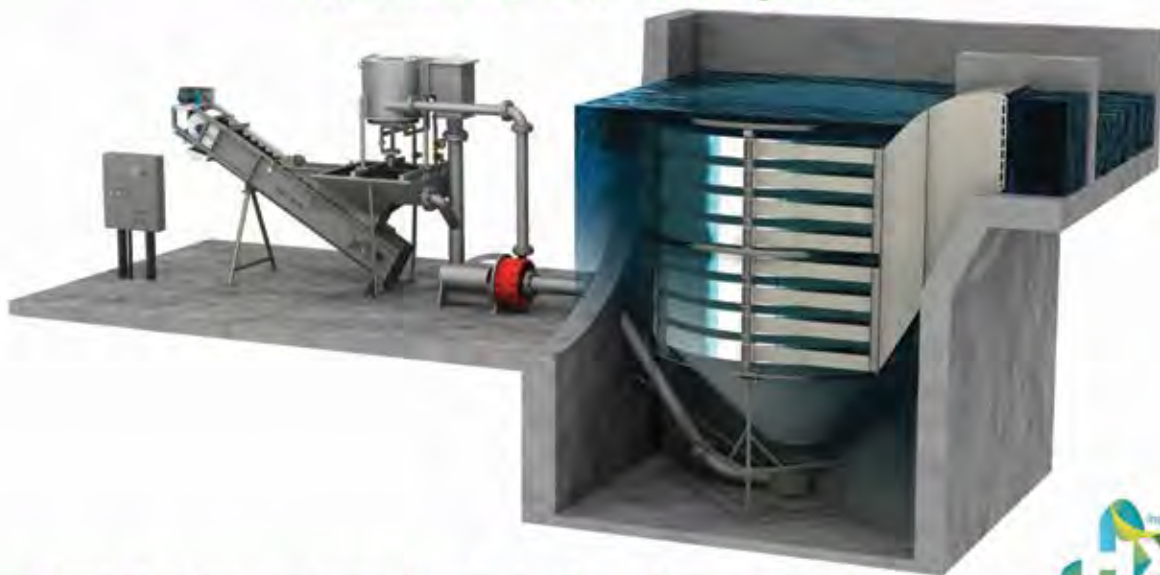
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## Student Paper / Design Competition

Central States was once again well represented at the WEF Student Paper and Design Competitions at WEFTEC 2013 in Chicago.

CSWEA developed the competition criteria based on WEF guidelines, and student chapters were notified of the competition during the fall semester of the 2012-13 school year. The Student Paper Competition was intended to promote the education of undergraduate and graduate students in water pollution control, water quality problems, water-related concerns, hazardous wastes issues and other related areas to provide the opportunity for national recognition of participating students. There were two competition categories, undergraduate and graduate students.



CSWEA sponsored one student to compete in the 2013 WEF Student Paper Competition, Amanda Heller, a graduate student in Milwaukee School of Engineering. Amanda entered her paper titled *System Design and Economical Study of Wastewater Reuse for Northwestern Mutual Life* in CSWEA's student paper competition and presented her paper at the paper competition held during the same time as the Leadership Conference in April of 2013. The competition judges all agreed that her paper was of the quality necessary to represent CSWEA at the WEF level and was worthy of being awarded the winner of the student paper completion. As part of winning CSWEA's student paper competition, Amanda's expenses for attending WEFTEC in Chicago were covered by CSWEA and she was given the chance to enter her paper in WEF's paper competition, representing CSWEA. Amanda completed the entry provisions for the WEF paper competition and presented her paper at the CSWEA Annual Conference in Madison. Although Amanda's paper did not win the Graduate Division of the WEF competition, she was invited to present a poster on her paper at WEFTEC. Congratulations, Amanda!

The Student Design Competition is intended to promote real-world and hands-on design experience for students interested in pursuing an education and/or career in water/wastewater engineering and

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sciences field. There are two levels of competition: conventional wastewater design, which includes traditional wastewater design project; and environmental design, which includes contemporary engineering design topics such as sustainability, water reuse, wetland construction and Engineers Without Borders projects. This year CSWEA had entries in both levels of the competition, which also was held during the Leadership Academy in Madison. The team from the University of Wisconsin – Madison consisting of Sally Shumaker, Antonio Garcia, Ben Kultgen and Dan Schwartz presenting *Closing the Loop on PET Recycling: Waste Treatment at Placon Corp.* at the Wastewater Design level. At the Environmental Design level was the team from the University of Illinois – Urbana/Champaign consisting of Alyssa Sohn, Hector Briceno, Michael Azzarello and Donnie Manhard presenting *Combined Sewer Overflows in Mishawaka, Indiana*. Both teams presented their projects at the WEF competition held during WEFTEC where they faced stiff competition



from schools throughout the country. Both teams were awarded fourth position in their respective competitions, and received \$750 as an award. They did a great job and should be very proud of their accomplishment as we are in having them represent CSWEA at the WEF level. [CS](#)



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# Operations Challenge 2013

This year's 2013 Operations Challenge (OC) was held in one of our home cities, Chicago IL. After two successful practices, our teams were prepared for battle. The expectations were high; a new format for practice and team bonding had been established the prior year, and the excitement of the previous year's success helped to drive these expectations. The plan was to concentrate on three of the five events that we could duplicate in practice. For the other two events, the teams would watch videos and discuss the procedures each team member would memorize and then preform at WEFTEC. The events that we would concentrate on were Laboratory, Process Control, and Collections.

During the practice sessions the teams worked together (almost as one team) using a greater knowledge base that helped to refine procedures and find better and faster ways of preforming each task for each event. Watching the team's relationships form over the course of three practice days is remarkable. This year we had four returning veterans and four new OC team members who had never met, or witnessed a WEFTEC Operations Challenge event.

During practice, the teams worked closely with Montgomery Baker of the Madison Metropolitan Sewerage District who facilitated and duplicated the set-up for the Laboratory event. He works with each team member on proper technique of established laboratory procedures and answered questions that were brought up as the teams looked to shave seconds off of each required task. During the practices, team members worked closely offering support and a watchful eye looking to save precious seconds. This provided for great dialog between team members while at the same time each person gained new skills and knowledge that will benefit them long into their careers. All of this preparation paid off with a fourth-place finish for the Shovelers, only three seconds out of third place, woo-hoo!

The Collections event is a very competitive event where seconds count. This year the teams worked on cutting and drilling technique and pipe replacement skills to ensure that when it came time to put all together, it would all come together, and it did! The Pumpers posted an outstanding (if not a Central States record) time of 2:08 – GO PUMPERS!

The Process Control event has always been a great event for CSWEA, with our Midwest work ethic, get-it-done mentality, and great wastewater and collection system knowledge base, we have and continue to perform outstanding in this event with a fourth-place finish in 2013.

This year, I was able to watch eight wastewater professionals work together as one team with the goal of forming two teams that would travel to the 2013 WEFTEC Operations Challenge, competing against others who have been working together for hundreds of hours. The way Central States brings in award winners to be part of the team and using the veterans to fill the remaining spots gives us an advantage in some respect; it pushes our members to be comfortable with the competition while performing unfamiliar tasks and then bringing those skills back to their facilities continuing to be outstanding wastewater professionals.

I would like to say thank you to our sponsors and the facilities that our team members represent for their support and commitment to expanding the knowledge and skills of our Central States WEA members.

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## *Team members and facilities:*

### **Team Pumpers:**

Captain: Justin Pratt,  
City of Moline, IL

Christopher Lefebvre,  
Stevens Pt., WI WWTP

Doug Haacker,  
FRWRD, IL

Ronald Brenny,  
GNP Company, MN

Coach: Todd Carlson,  
City of Duluth, MN

### **Team Shovelers:**

Captain: Brian Skaife,  
Janesville, WI WWTP

Tom Dickson,  
City of Oconomowoc, WI

Chris Kleist,  
City of Duluth MN

Carrie Clement,  
Western Lake Superior Sanitary District, MN

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# The Value of Water

## COALITION LAUNCHES NATIONAL CAMPAIGN

### THE ISSUE

The Value of Water Coalition is made up of both public and private members of the water sector who have come together at a time when our water – and the infrastructure that is a fundamental part of our economy – is at great risk. Our aim is to educate the public on the importance of clean, safe, and reliable water to and from every home and community, and to help ensure quality water service for future generations.

We want to help you understand the real value of water in your daily life, and recognize that water is shared. That it is irreplaceable. And that it belongs to you. And us. And to our children, and to the environment in which we live.

Our diverse group knows the value of water. Do you?

### THE CAMPAIGN

This is the first time the water sector has come together as a single voice, uniting public and private interests to address the current state of water infrastructure

through a national campaign.

The campaign lives on an interactive website filled with all of the most relevant and compelling water-related content from the coalition and sourced from third parties. This content, updated on a regular basis, is designed to facilitate easy sharing across social networks. The coalition's own channels include:

**Twitter:** <https://twitter.com/TheValueofWater>

**Slideshare:** <http://www.slideshare.net/ValueofWater>

**Flickr:** <http://www.flickr.com/photos/99454892@N06/>

**YouTube:** [http://www.youtube.com/channel/UCq0jQjaUb6twPF7dfl1\\_rw](http://www.youtube.com/channel/UCq0jQjaUb6twPF7dfl1_rw)

**Google+:** <https://plus.google.com/b/11889055113274988349/111889055113274988349/about>

### MEMBERS

Current coalition members, representing city water utilities, non-profit water associations and water services and

technology companies, work daily to ensure our homes and workplaces are supplied with clean and safe water for drinking and other uses, and that after its use, this same water is cleaned and made safe again before being discharged into the environment. Our members include:

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American Water Works Association  
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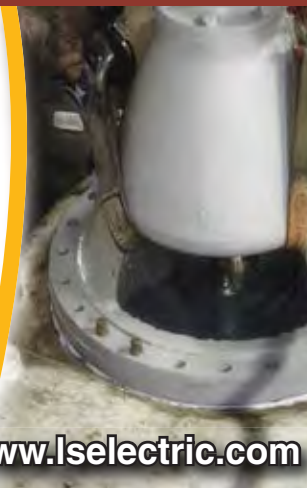
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FRWRD's 5 mgd West Water Reclamation Facility – facilities were laid out for capacity expansion to 25 mgd.

# Fox River Water Reclamation District West WRF, Elgin, IL

## Using BNR capability in advance of nutrient limits to reduce energy usage and gain operating experience before it is required

The Fox River Water Reclamation District (FRWRD), located in Elgin, IL owns and operates three water reclamation facilities (WRFs) with combined capacity of 38 mgd, 14 pump stations, and one CSO discharge location. FRWRD serves over 180,000 customers in Elgin, South Elgin, West Dundee, and portions of Sleepy Hollow, Streamwood, Hoffman Estates and unincorporated St. Charles Township. The District's West WRF was originally constructed in 1927 but was completely replaced and expanded in 2003. The plant was designed to treat flows from west of the Fox River, including areas of significant near-term and projected long-term development. The plant has a current design capacity of 5.0 mgd with a modular design allowing

for expansion in 5 mgd increments to 25 mgd. The facility includes screening, grit removal, primary treatment, secondary treatment, and effluent disinfection. Sludge generated at the facility is pumped to FRWRD's Pagorski WRF for further treatment. The aeration tankage was designed as a conventional activated sludge process configured to allow switching to a five-stage Bardenpho BNR operating mode. The plant was operated as a conventional activated sludge facility until early 2012.

### More than one driver led to implementing BNR now

Since 2001, FRWRD has participated in the Fox River Study Group (FRSG) — a compendium of local stakeholders in

the Fox River watershed that includes the Sierra Club, Friends of the Fox River, Fox River Ecosystem Partnership, Illinois Environmental Protection Agency (IEPA), Kane County, and most of the major wastewater dischargers on the 100 miles of the Fox River between the Stratton Dam on the north end and its confluence with the Illinois River. The FRSG has been collecting data and modeling the Fox River particularly related to impairments of low dissolved oxygen (DO) concentrations and high algae levels. The group is now developing a Fox River Implementation Plan (FRIP) which will focus on resolving DO and algae impairments by reducing phosphorus loadings from both point and non-point sources. As part of a



FRWRD's Superintendent Doug Haacker stands at the West plant aeration system, which is divided into five zones by concrete baffle walls.

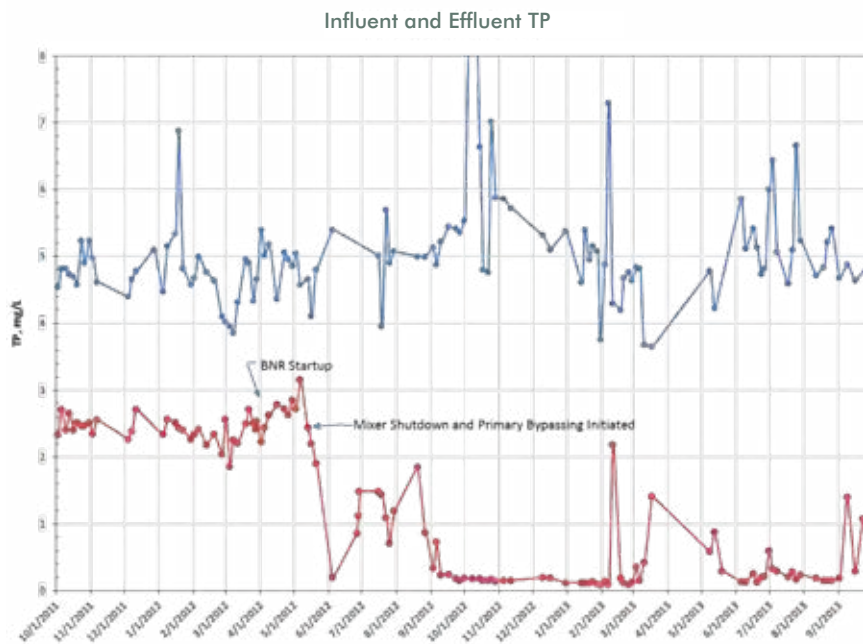
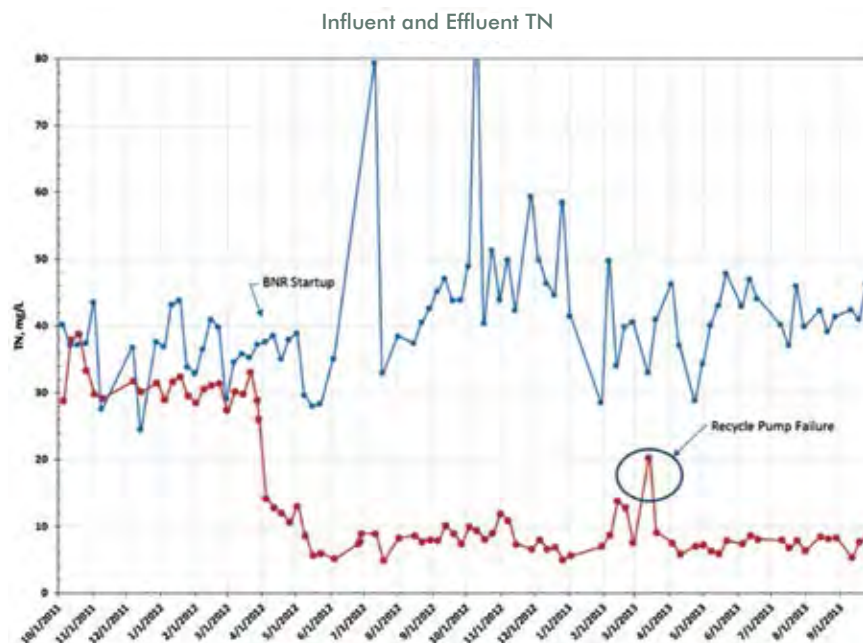
special NPDES permit condition, FRWRD will have to reduce total phosphorus (TP) in the effluent of all three of its WRFs to 1.0 mg/L in the permits that are about to be issued. Future limits could be more stringent depending on the results of the Fox River Implementation Plan.

In 2011, with efficient high speed blowers available, the startup of energy grant programs, and knowing that the existing blowers could not be turned down low enough to match current diurnal air demands, FRWRD initiated a project to add a high speed blower to the plant. In developing the project, it was determined that switching to the BNR mode would save more energy (and allow for additional grant funding) for the low additional capital cost of some additional mixers (the internal recycle pump had been previously purchased). As a result, mixers and one new high-speed blower have been installed at the plant.

#### System performance and energy savings

Given the impending 1.0 mg/L TP limit and the energy savings available, the West WRF was switched into BNR operating mode in April 2012. Following a pretty significant startup period, phosphorus levels have been reduced frequently down to 0.2 mg/L and total nitrogen has been reduced from 30 to 8 mg/L. Having the necessary tankage arrangements in place from the original design made the change very cost effective.

“Based on actual power data from October 2012, the estimated power reduction for the aeration system was over 380,000 kW-hrs per year, or a 35% reduction in power drawn.”





FRWRD was awarded two separate grants for a total of approximately \$90,000 based on energy savings. By going to BNR, the air demand was reduced by approximately 16 percent in addition to the energy savings of the more efficient blower.

Because the plant was designed for BNR, the capital cost for putting the Bardenpho process in place was only \$218,000, which includes the new 150 horsepower blower and three additional tank mixers. With the grant funding obtained, the net cost to the district was approximately \$128,000.

Operating data has shown that energy use has been reduced as anticipated. Since operating the Bardenpho system, the aeration tanks require about 16% less air for treatment than previous operation and the air is provided by the very efficient high-speed blower that can operate at much lower outputs than the existing centrifugal blowers. Based on actual power data from October 2012, the estimated power reduction for the aeration system was over 380,000 kW-hrs per year, or a 35% reduction in power drawn. Even considering the estimated energy to run the mixers and internal recycle pump, the power savings are over 15%.

"By going to the high-speed blower, it gave us a better range to work with, and we're able to better target the actual air demand that we have, versus the conventional blower," FRWRD Executive Director Bob Trueblood explains. "We could have made the BNR work without it, but it works so much better with the high-speed blower." This is especially true because of the need to keep the DO out of the anaerobic and anoxic zones. In the past, DO values over 5 mg/L occurred often in the aeration tanks because the blower output just couldn't be reduced any further. Return sludge flows containing high DO concentrations would have reduced the available anaerobic volume of that zone.

#### Early lessons learned

Getting the process up and running took longer than staff expected. A couple of additional operational

modifications were made before biological phosphorus removal really took off. The first was bypassing some influent flow around the primary tanks, taking it directly to the aeration system. The second change was based on advice from another municipality that has been operating bio-P longer – Algonquin, IL. They found that reducing the run time of the mixer in the anaerobic zone improved

their phosphorus removal. FRWRD staff implemented the same strategy, automating a reduced mixer run time schedule of 30 minutes on followed by 90 minutes off. With these changes implemented, plant effluent TP dropped dramatically.

The other lessons learned were the same as many other facilities have reported: bio-P performance drops off during rainy periods and there seems



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New laboratory in the Administration Building – 95% of normally occupied spaces have views to the outside. (Photograph Courtesy of A. Romanovsky of DLA Architects, Ltd.)

to be an annual bio-P “reset” in late summer to early fall. The reason for the performance upset is unknown, but seems consistent with what others are reporting.

In March of 2013, the mixed liquor recycle pump malfunctioned, sending effluent nitrogen levels back up to 18 mg/L until the pump was repaired. This situation served as a valuable lesson for staff in preparing for upcoming nutrient regulations. It also provided an opportunity to have a refresher with operations staff and others on how the process works and why TP values could still be maintained.

#### New district headquarters

As previously noted, FRWRD has three WRFs. The Pagorski WRF is currently the largest at 25 mgd and was the home of the District’s administration building. During the assessment on renovating or replacing the aging Administration Building, it became clear that a new building would allow for upgrading the laboratory facilities and creating a better work environment.

Locating the new Administration building next to the West WRF had

“During the assessment on renovating or replacing the aging Administration Building, it became clear that a new building would allow for upgrading the laboratory facilities and creating a better work environment.”

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The building was designed to respect the natural prairie and river view setting. (Photograph Courtesy of A. Romanovsky of DLA Architects, Ltd.)


advantages in construction sequencing, staging the relocation of staff and equipment, and freeing up space for future process facilities at the land-locked Pagorski WRF. The site chosen – along the Fox River and across the street from the West WRF – allowed FRWRD to incorporate Green Building concepts beyond those typically provided. The facility includes traditional green elements such as using recycled materials, low flow fixtures, energy efficient building envelope design, permeable pavers, bioswale stormwater management, reflective roofing, and construction waste recycling as part of submission for LEED Silver Certification. An innovative design element is the engineered solar louvers on the south façade that are angled to minimize heat gain in the hot summer months while maximizing sunlight penetration in winter months. Finally, in a true tie-in to FRWRD's core business, all heating and cooling (including the hot water in the sinks) is provided by the plant's effluent water loop. During winter months, the heat exchanger extracts heat from the effluent water to run the water-to-water heat pump and in the summer, heat is rejected to the plant effluent loop. The system also recovers energy from the laboratory exhaust air since those airflows are not recycled within the building. Having these elements incorporated into the building adds another way FRWRD can demonstrate to the public our commitment to sustainability. [CS](#)



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## Sauk Centre WWTF *Improvements:* Energy-efficient and Cost-effective Design

**T**he Sauk Centre Public Utilities Commission (SCPUC) operates a 0.9 million gallon per day (MGD) wastewater treatment facility (WWTF) that serves the City of Sauk Centre, Minnesota. Stricter effluent limits and aging infrastructure and equipment required the SCPUC to upgrade and expand the existing treatment system. The SCPUC and SEH project team determined that there was a need to minimize electric utility costs due to expansion without increasing the lifetime cost of the WWTF. SEH and the SCPUC worked together with the wholesale electrical provider to make energy efficiency a leading consideration in process, equipment, and material selection.

The WWTF was constructed in 1971 and included influent pumping, preliminary treatment, contact stabilization-activated sludge, chlorine disinfection, effluent re-aeration, and aerated sludge holding tank. Later additions to the WWTF included lime stabilization for solids treatment and ferric chloride feed system for phosphorus removal.

### Engineering problems faced and solved by the project team

The improvement project faced two key engineering problems: 1) working within a constrained site and 2) expanding facilities and addressing more stringent effluent limits while minimizing electric

utility costs and without increasing the life time costs of the WWTF.

The WWTF site is located between the Sauk River (with structures in the floodplain) and a power line utility easement, constraining the space available for improvements. Meeting the new effluent ammonia limit requires additional tank volume to increase hydraulic retention time. The aged facilities posed safety risks for the operators and required complete replacement. Finally, redundant facilities needed to be added in the event a treatment system or piece of equipment needed to be taken out of service to ensure uninterrupted treatment of wastewater. The footprint required for



**“Annually the WWTF will save 645,000 kWh (equivalent to the energy use of 60 homes), and save \$30,000 on their utility bills.”**

new facilities was limited by using existing tanks. Walls within the existing treatment system were rearranged and the existing aerobic digester was combined with the aeration basins. Since redundant treatment units did not exist, the project had to be designed and constructed so that continuous treatment could be accomplished.

Approximately 30% of a WWTF's operation and maintenance budget is spent on energy. SEH evaluated the treatment processes and construction

materials for opportunities to increase energy efficiency at the WWTF and decrease operating costs. The systems and construction materials evaluated included the activated sludge aeration system, UV disinfection system, sludge handling system, lighting, motors, variable frequency drives, roofing, and wall system. Annually the WWTF will save 645,000 kWh (equivalent to the energy use of 60 homes), and save \$30,000 on their utility bills. In addition to cost savings realized through energy efficiency,

SEH worked with the wholesale electrical provider to maximize rebates available to the SCPUC. The rebates included both prescriptive and custom. Custom rebates required an in-depth energy evaluation to determine energy savings between system alternatives. The systems selected resulted in a rebate from the electrical provider of \$46,000.

#### **Engineering methods, systems, and skills used by the project team**

The use of the existing tanks required a structural evaluation prior to the WWTF improvements project design, to ensure the tank was structurally sound to last the life of the WWTF. The piping systems, walls within the existing tank, and the new clarifier were designed so that continuous treatment could occur despite not having redundant systems. A sequencing plan was also created to limit construction activities to certain time periods and require completion of certain construction activities to ensure wastewater was treated to the permit limits.

An energy evaluation was conducted for wastewater treatment processes, equipment, and construction materials at the WWTF. The energy evaluation involved establishing benchmarks, which were equipment and processes considered standard in wastewater treatment, and comparing alternative systems to the benchmarks. The SCPUC was able to obtain rebates from the electric wholesale provider relative to the energy savings compared with the benchmark process or item. In addition to being energy efficient, the process, equipment, or construction material had to be cost effective throughout the life of the system to minimize the operating



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# Sauk Centre Wastewater Treatment Plant

## DESIGN FLOW

Average Dry Weather	0.431 mgd
Average Wet Weather	0.888 mgd
Peak Hourly Wet Weather	2.652 mgd
Peak Instantaneous Wet Weather	3.224 mgd

## BIOLOGICAL OXYGEN DEMAND

Average Day	810 lb/day
Peak Month	1,094 lb/day

## TOTAL SUSPENDED SOLIDS

Average Day	965 lb/day
Peak Month	1,360 lb/day

## AMMONIA

Peak Day	161 lb/day
----------	------------

## PHOSPHORUS

Average Day	40 lb/day
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## EFFLUENT STANDARDS

Five-Day Carbonaceous	
Biochemical Oxygen Demand	10 mg/L
Total Suspended Solids	30 mg/L
Fecal Coliform	200 MPN/100 mL
<b>Ammonia Nitrogen</b>	
December thru March	18.0 mg/L
April thru May	Monitor
June thru September	1.9 mg/L
October thru November	11 mg/L
Total Phosphorus	1 mg/l
pH (Standard Units)	6.0-9.0
Dissolved Oxygen	4.0 mg/L

## PROJECT FUNDING

State of Minnesota Clean Water Revolving Fund Loan  
\$6,500,000 @ 1.91% interest

## LIQUIDS TREATMENT

Wastewater from the City sewer system flows into the Sauk Centre Wastewater Treatment Facility where a fine filter screen removes large particles and disposes of them into a garbage bin. Grit is removed from the wastewater and then it flows to two aeration basins where microorganisms consume any organic matter and nutrients. Chemicals are added to the wastewater stream to remove phosphorus and the water is sent to two final clarifiers where microorganisms and other particles are left to settle to the bottom of the tanks. The water is disinfected, microorganisms are inactivated, and the treated water is discharged to the Sauk River.

## SOLIDS TREATMENT

The settled solids and microorganisms from the final clarifiers are pumped to the solids treatment system. Small air bubbles are introduced into a large tank where solids particles adhere to the bubbles, float to the top of the tank, and are skimmed off. The thickened solids are stored in three underground storage tanks, where lime is added to raise the pH levels to kill pathogens. Finally, the solids are pumped into tanker trucks for application as fertilizer onto farm fields.



## PROJECT PARTICIPANTS

Dennis Ryken, President	Rich Bullard, Commissioner
Ted Spanier, Vice President	Roy Waltz, Commissioner
Mike Bick, Commissioner	Marty Sunderman, Superintendent
Glenn Bauer, W/WW Supervisor	Mark Rachev, Office Manager
Staab Construction, General Contractor	SEH, Engineer

budget at the WWTF. A present worth analysis was conducted on the equipment and processes and the selection was made based on the lowest present worth.

## Effluent limits and energy consumption

Meeting an effluent ammonia limit is accomplished through additional aeration in an activated sludge system. While additional aeration typically results in increased capital and operating costs, SEH and the SCPUC saw this as an opportunity to increase the energy efficiency at the WWTF. SEH and the SCPUC worked together with the wholesale electrical provider to make energy efficiency a leading consideration in process, equipment, and material selection. The project demonstrated the fact that improvements to wastewater treatment facilities can be energy efficient as well as cost effective.

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**“The entire project was completed at a cost of approximately \$6.5 million, which is less than what was budgeted in the facility plan. Operation costs also were reduced through the design for energy efficiency.”**

SEH was challenged by working within the confines of the aeration tank and site, while utilizing modern and efficient equipment and processes to meet new effluent limits. SEH evaluated alternative systems compared to those in operation that could reduce the footprint and increase energy efficiency of the aeration system.

The existing solids handling system included an aerated sludge holding tank and lime stabilization system. The aerated sludge holding tank provided a location where decanting could occur to thicken sludge to 2%. After decanting, sludge was pumped to sludge holding tanks where additional decanting takes place to thicken sludge to 4% (as well as

the addition of lime for stabilization). A dissolved air flotation thickening (DAFT) system was constructed that thickens sludge to the target 4% without the need for large blowers to provide oxygen to the aerated sludge holding tanks.

#### Overall goals met

The leading driver for the project was a new effluent ammonia limit, which is a constituent of wastewater that is toxic to aquatic species in the Sauk River. The SCPUC now meets the new effluent limits, ensuring the health of the Sauk River, which is an important recreational waterway in the region. Meeting the new limit, failing equipment coupled with lack of redundancy, required improvements at the WWTF. The project was designed and constructed to minimize the capital and operating cost of the WWTF, which is paid through user fees. Also, the capital cost was reduced by using the existing tanks. Operating costs were reduced by using energy efficient equipment and processes. Reducing the electricity usage also has an environmental benefit to society because it reduces air emissions resulting from the generation of electricity.


The entire project was completed at a cost of approximately \$6.5 million, which is less than what was budgeted in the facility plan. Operation costs also were reduced through the design for energy efficiency. As a result, the SCPUC is able to set sewer fees at an affordable rate. The SCPUC also operates the local electrical utility and is subject to meeting the energy reduction requirements set through the Conservation Improvement Program. Through the project, the SCPUC is closer to their energy reduction goal for the year. The project also sets a good example for their customers. **CS**

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# DNA-based Microbial Analysis

to Troubleshoot **Foaming, Bulking,  
Nitrification, Biological Phosphorus  
Removal** and **Anaerobic Digestion**

Trevor Ghylin<sup>1\*</sup>

<sup>1</sup> Microbe Detectives

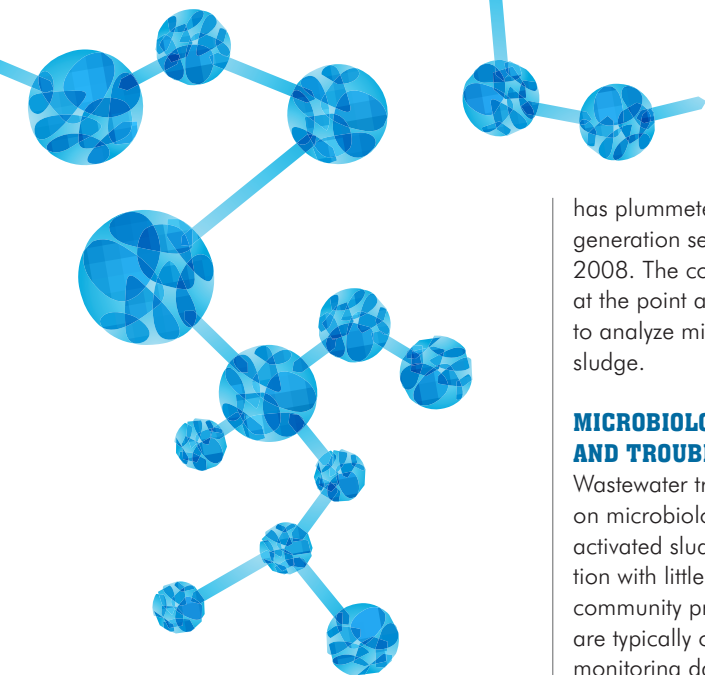
Global Water Center Suite 320; 247 Freshwater Way, Milwaukee, WI.

\*[trevor.ghylin@microbedetectives.com](mailto:trevor.ghylin@microbedetectives.com); [www.microbedetectives.com](http://www.microbedetectives.com)

## ABSTRACT

Recent developments in DNA sequencing technology now allow us to fully characterize the quantity and identity of nearly all microbes in any given system at a cost-effective price. This capability has greatly enhanced our capabilities for understanding and troubleshooting activated sludge, anaerobic digestion and other biological wastewater treatment systems. Currently, troubleshooting relies primarily on microscopy, which is time-consuming, requires a trained operator, and is limited to identifying only large microbes with unique shapes and staining features. Additionally, generating quantitative data based on microscopy is difficult or impossible. Fortunately, DNA-based microbial analysis can provide quantitative data on the entire microbial community in the form of a spreadsheet without the need for a trained operator. This data format allows easy tracking of microbial populations over time to determine whether a system has its normal healthy community or an atypical community that may be associated with treatment issues. This service can be used to troubleshoot wastewater problems with foaming, bulking, nitrification, phosphorus removal, odors, anaerobic digestion and pathogens in effluent and biosolids. This technology can also be used to troubleshoot problems in drinking water systems such as backflow/cross-connections in distribution systems, biofilms in distribution systems, fecal contamination of source water, microbial fouling of wells, and taste/odor/color issues.

**KEY WORDS:** Microbial analysis, biological phosphorus removal, foam, bulking, filaments, anammox, nitrification, activated sludge, anaerobic digestion



## INTRODUCTION

The rapid progress of biotechnology has gradually opened the black box of biological wastewater treatment. DNA sequencing technologies in particular have improved so significantly that we are on the verge of a revolution that is ushering in a new era in which we can easily and cheaply probe microbial communities to learn nearly anything. Figure 1 shows how the cost of DNA sequencing

has plummeted since the adoption of next generation sequencing technologies in 2008. The cost of DNA technology is now at the point at which it is cost effective to analyze microbial DNA in activated sludge.

## MICROBIOLOGICAL PROBLEMS AND TROUBLESHOOTING

Wastewater treatment typically relies on microbiological processes such as activated sludge and anaerobic digestion with little knowledge of the microbial community present. Instead, these systems are typically operated based on empirical monitoring data such as dissolved oxygen and effluent BOD. This simple operational strategy generally works for most plants most of the time. However, problems can arise when plants are stressed due to high loading, low temperatures, toxic influent, and growth of filaments and foam producing organisms. Digester gas production can be inhibited by reduced pH and foaming, which can hinder the capture of digester gas. When problems arise, troubleshooting can be difficult due to the lack of data on the microbial community.

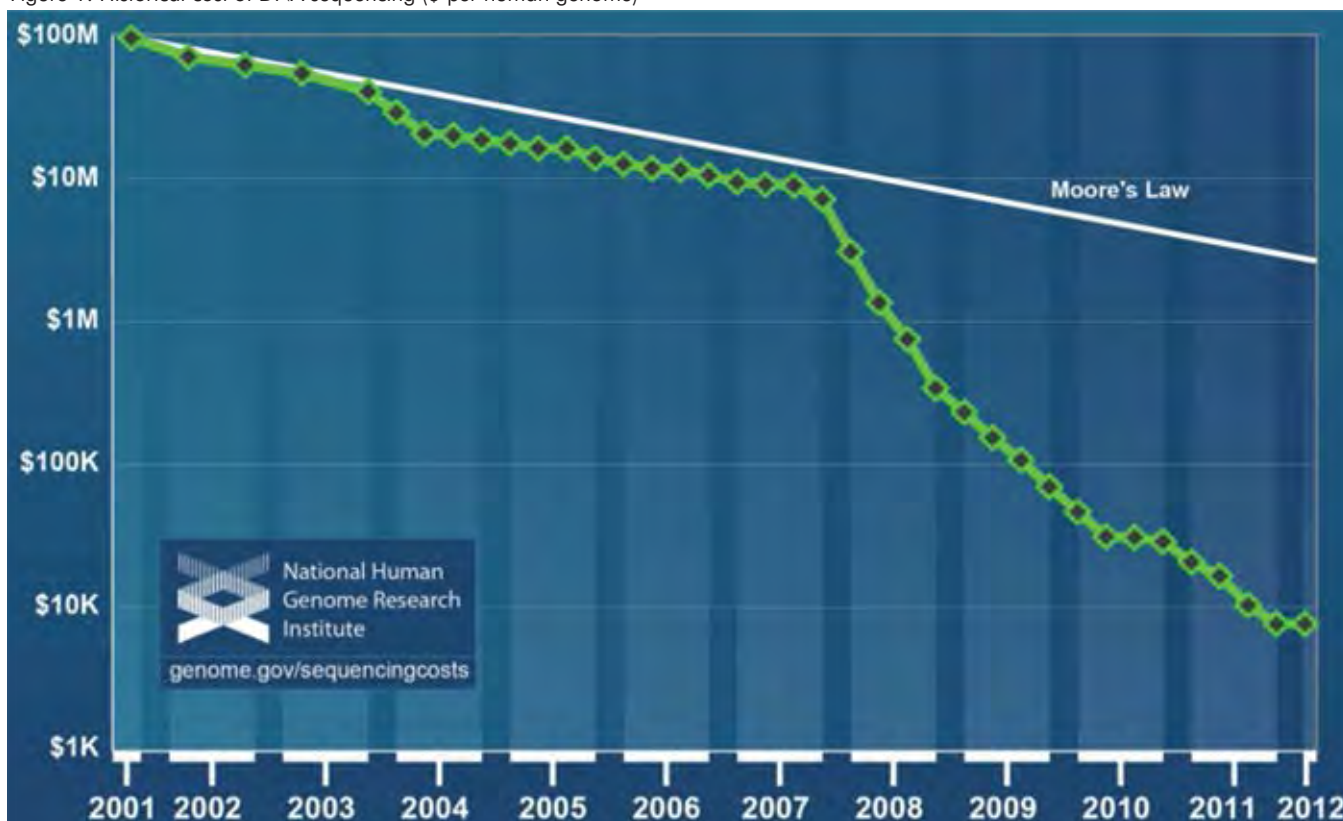
## MICROSCOPIC CHARACTERIZATION AND STAINING

There are several companies and individuals that provide microbial analysis based on microscopic observation and staining. However, this service is limited because it cannot identify most microbes that are important to treatment and digestion (i.e., nitrifiers, anammox, phosphorus removers (PAOs), methanogens). These services attempt to identify problem filaments and foaming organisms, however, this task may be impossible as the problem organisms can be hidden inside flocs and also because many different species of filaments and foaming organisms have identical morphologies. In addition, morphologies can change under varied nutrient conditions (Blackall 1994).

## DNA SEQUENCING

New DNA technologies are able to characterize entire microbial communities based on the DNA of individual organisms. This method is able to provide quantification of nitrifiers, PAOs, filaments, foamers, and other organisms in a sample in one pass.

Figure 1. Historical cost of DNA sequencing (\$ per human genome)





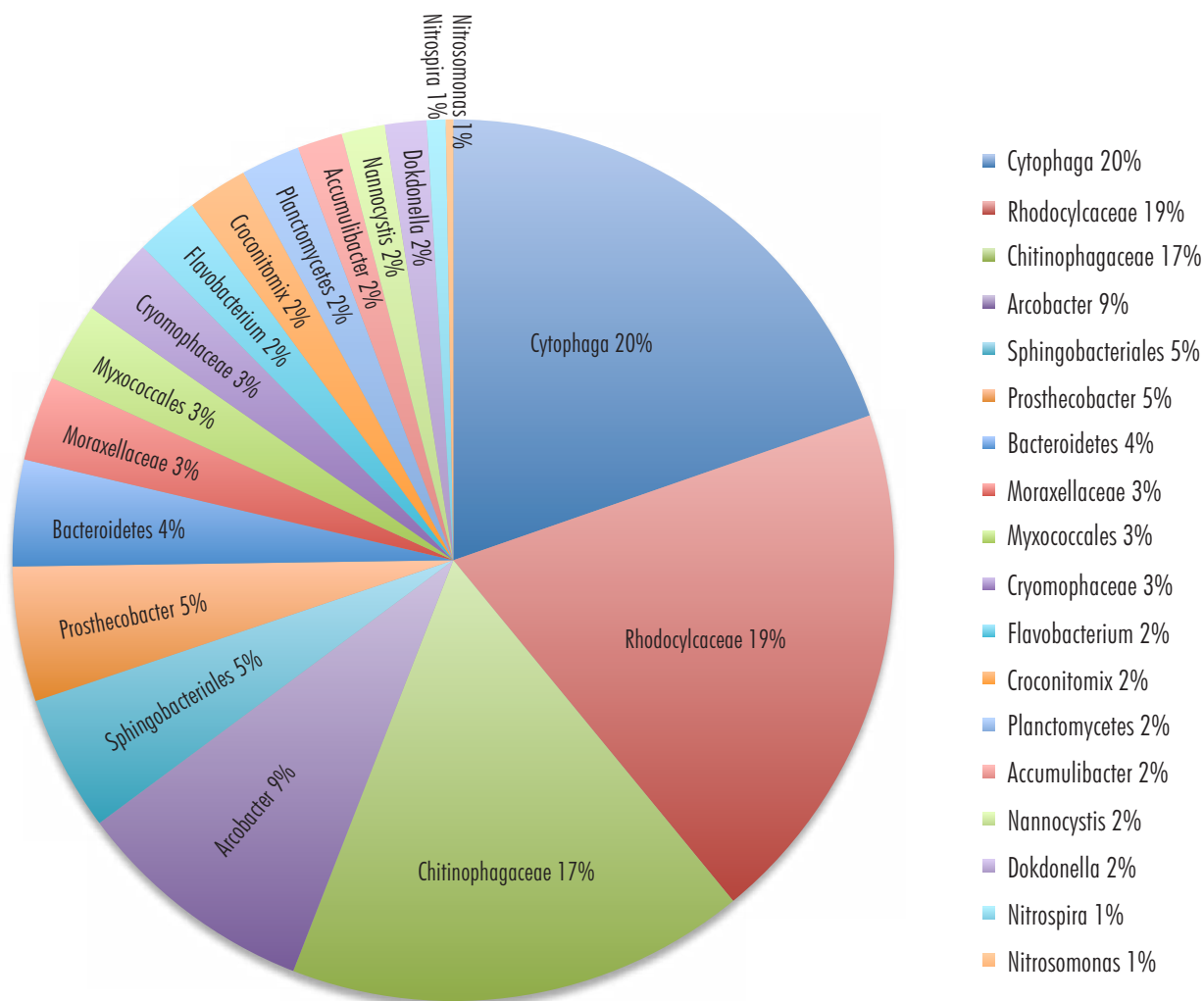
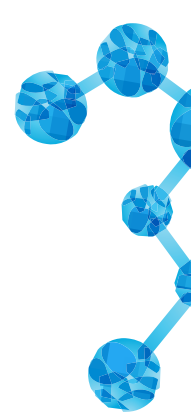


Figure 2. EBPR MLSS Sample Bacterial Community Composition

## ANALYSIS OF WASTEWATER SAMPLES

Figure 2 shows the results from the analysis of an activated sludge sample from a Wisconsin Biological Phosphorus Removal plant. This sample was dominated by *Rhodocyclaceae*, a group of bacteria that includes *Accumulibacter*, which is known as the primary organism responsible for biological phosphorus removal. Other prominent groups, *Cytophaga* and *Chitinophagaceae* are likely involved in general breakdown of organic carbon substances. *Nitrosomonas* and *Nitrospira* are also shown in this figure at about 1% of the population each. These organisms are responsible for converting ammonia to nitrite then nitrate.



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**Table 1.** Phosphorus and Nitrogen Removal Microbes found in activated sludge samples

Canonical Name (Previous Name)	EBPR	MN Rendering Aerobic	MN Rendering Anoxic (downstream of Aerobic)	WI Rendering Anaerobic	WI Rendering Anaerobic Foam	WI Rendering Aerobic (downstream of Anaerobic)	WI Rendering Aerobic (downstream of Anaerobic)
<b>Phosphorus</b>							
Accumulibacter	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Rhodocyclus order (Accumulibacter)	11.6%	0.2%	0.2%	0.0%	0.0%	0.1%	0.0%
Defluviicoccus (GAO)	0.0%	0.2%	0.2%	0.0%	0.0%	0.0%	0.0%
Competibacter (GAO)	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%
Tetrasphaera	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Dechloromonas	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
<b>Nitrogen</b>							
Nitrosomonas (AOB)	0.1%	0.2%	0.5%	0.0%	0.0%	0.0%	0.0%
Nitrospira (NOB)	0.4%	0.5%	0.7%	0.0%	0.0%	0.0%	0.0%
Nitrospina (NOB)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Nitrososphaeraeae (AOA Ammonia oxidizing archaea)	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%
Nitrosococcus (AOB)	0.0%	0.0%	0.0%	0.5%	0.2%	0.4%	0.6%
Pirellula (Anammox)	0.0%	1.4%	2.9%	0.1%	0.2%	0.2%	0.1%
Planctomyces sp. (Anammox)	0.0%	0.6%	0.3%	0.0%	0.0%	0.0%	0.0%
Planctomycetaceae (genus) (Anammox)	0.1%	4.8%	8.5%	0.1%	0.2%	0.3%	0.2%
Thauera (nitrate reduction)	0.1%	0.8%	0.8%	0.0%	0.1%	0.0%	0.0%

Table 1 shows the microbial results for phosphorus and nitrogen removal for samples taken from three plants (EBPR, Minnesota rendering plant and Wisconsin rendering plant). This table shows that the EBPR plant is the only one containing significant phosphorus removing organisms. It also shows that ammonia and nitrite removal in the EBPR plant are primarily done by Nitrosomonas and Nitrospira while the Minnesota rendering plant is dominated by Anammox bacteria indicating anaerobic ammonia removal. The Wisconsin rendering facility has a substantial population of Nitrosococcus and some Anammox bacteria as well.

Table 2 shows the microbial results for foaming bacteria for the activated sludge samples. The EBPR plant contained trace amounts of foaming bacteria *Microthrix* and mycolic-acid bacteria (Actinomycetales). This plant was operating normally at the time of sampling but has foaming problems every fall and winter. It's likely that the small population of *Microthrix* and or mycolic-acid bacteria becomes more prominent as conditions change in fall. The Minnesota rendering plant had a

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**Table 2.** Foaming Microbes found in activated sludge samples

Canonical Name (Previous Name)	EBPR	MN Rendering Aerobic	MN Rendering Anoxic (downstream of Aerobic)	WI Rendering Anaerobic	WI Rendering Anaerobic Foam	WI Rendering Aerobic (downstream of Anaerobic)	WI Rendering Aerobic (downstream of Anaerobic)
<b>Foaming</b>							
Mycolic-acid Bacteria (Actinomycetales)	0.1%	2.0%	0.7%	0.0%	0.2%	0.1%	0.4%
Acidimicrobiales (Microthrix Order)	0.1%	0.0%	0.0%	0.8%	0.5%	1.8%	0.6%
Dietzia	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Skermania piniformis (Pine tree like organisms PTLO)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Gordonia	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Microthrix	0.1%	0.0%	0.0%	0.0%	0.3%	0.5%	0.1%
Mycobacterium fortuitum	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Rhodococcus globerulus	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Rhodococcus ruber	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Skermania piniformis	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tsukamurella pseudospumae	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

**Table 3.** Filamentous Microbes found in activated sludge samples

Canonical Name (Previous Name)	EBPR	MN Rendering Aerobic	MN Rendering Anoxic (downstream of Aerobic)	WI Rendering Anaerobic	WI Rendering Anaerobic Foam	WI Rendering Aerobic (downstream of Anaerobic)	WI Rendering Aerobic (downstream of Anaerobic)
<b>Foaming</b>							
Acinetobacter (Eikelboom Type 1863 (some))	0.2%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
Trichococcus (Nostocoida limicola I)	0.2%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%
Caldineia (Eikelboom 0803)	0.1%	0.5%	0.5%	0.0%	0.1%	0.1%	0.0%
Halscomenobacter (Saprospiraceae)	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Microthrix	0.1%	0.0%	0.0%	0.0%	0.3%	0.5%	0.1%
Flexibacter	0.0%	1.6%	2.3%	0.0%	0.0%	0.1%	0.1%
Leptolinea	0.0%	0.0%	0.0%	3.3%	4.6%	3.6%	3.8%

**Note:** Only 7 of 18 tested filaments are shown for brevity.

significant population of mycolic-acid bacteria while the Wisconsin rendering plant had significant *Microthrix*. Both plants had foaming issues at the time of sampling even though the populations of these organisms was less than 2% of total.

Table 3 shows the microbial results for filamentous bacteria for the activated sludge samples. The EBPR plant contained small amounts of five different filaments indicating a healthy floc. The Minnesota rendering facility had bulking issues due to abundant *Flexibacter*, while the Wisconsin rendering facility had bulking issues due to *Leptolinea*.

## CONCLUSION

DNA technologies have improved

dramatically since the human genome project completed the first genome 10 years ago at a cost of \$3B. DNA technologies provide a new robust tool to monitor and troubleshoot microbes in water and wastewater systems. This data provides an unprecedented view into the microbial communities that inhabit these systems, allowing us to finally know what's living in our water, wastewater, and biosolids.

Microbe Detectives ([www.microbedetectives.com](http://www.microbedetectives.com)) has been applying this technology to help clients better understand and solve their microbial problems in wastewater treatment and drinking water systems. **CS**

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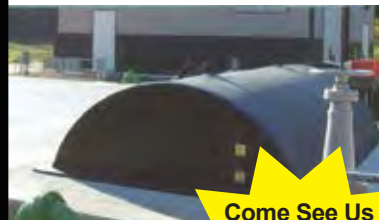
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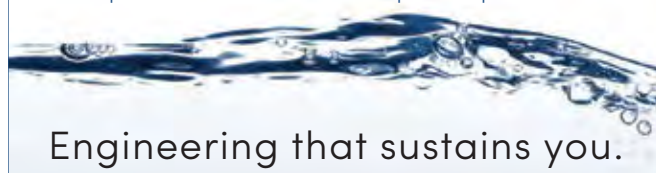
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## 87th ANNUAL MEETING CHANGES

The 87th Annual Meeting of the Central States Water Environment Association, Inc., will be held May 12-15, 2014 at the Crowne Plaza, St. Paul, Minnesota. This year, we will be introducing a new track for the Technical Program as well as a New Utility Registration Pricing Model.

### NEW UTILITY TRACK TECHNICAL SESSION

This fourth track will consist of operations and utility management topics. Troubleshooting, optimization studies, case studies, completed projects are an example of the topics that will be included for operators in the Utility Track. Leadership, financial planning, retention and sustainability practices are examples of topics that will be included for managers in the Utility Track. Two hours of ethics training, as required by WI Professional Engineer Certification Requirements, will be added to the program as well for those engineers who require this to maintain their license.

Below is a list of topics that are being considered for the Utility Track.

#### OPERATIONS and MAINTENANCE:

- Resource Recovery – Nutrients and Energy
- Technology/SCADA/Web-based Maintenance Programs/GIS Applications
- Troubleshooting
- Case Studies
- Summary of completed projects
- Optimization
- Nutrient Removal
- Process Control
- Start-up Issues

#### UTILITY MANAGEMENT:

- Succession Planning
- Project Funding
- Utility Rate Development and Reviews
- Employee Retention
- Communication

#### GENERAL:

- Regulatory Issues
- Security Issues
- Engineering Ethics Training

### NEW UTILITY REGISTRATION PRICING

Based on market studies and extensive interviews with our membership, CSWEA will offer a flat rate pricing model for the Annual Meeting for utilities beginning in 2014. The new pricing allows utilities to pay a flat fee for registration depending on their treatment plant design size. **For that price, they can send as many people as they want to the annual meeting.** They would still have to purchase event and meal tickets separately for each individual.

Five tiers have been setup for the utility registrations depending on the size of the utility.

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- SMALL UTILITY (1- 5 MGD)  
@ \$250 for Annual Meeting
- MEDIUM UTILITY (5 – 10 MGD)  
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- LARGE UTILITY (10 – 25 MGD)  
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- MEGA UTILITY ( $> 25$  MGD)  
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- Optional 1/2" PVC Inlet Y -Strainer
- Optional Pressure Relief Valve

Customized configurations offer feed verification, automatic switchover and the addition of on-board controllers or timer packages. Installation and Start Up is available for these systems.

Call to see how EZDOSE blends economy, technology, simplicity and availability.



APRIL 8, 2014



New Topic this year  
**Sustainability**

# MARK YOUR CALENDARS for the **CSWEA Education Seminar**

## FEATURED SPEAKERS



**SUDHIR MURTHY**



**STEVE TARRALLO**



**JOHN LYONS**



**JERRY BISH**



**GREG FORD**



**OTHER SPEAKERS**



# APRIL 8, 2014



Mark your calendars and budget for the **CSWEA 19th Annual Education Seminar** to be held on **April 8, 2014** at Monona Terrace in Madison, WI. An exciting program focused on sustainability is being developed. This is an excellent, affordable, event to learn about issues and technical advances from national and local experts. In addition, attendees will earn approximately seven (7) professional development hours (PDHs) for professional engineers and operator's license requirements. Early registration will open by February, and the registration cost will be \$200 for full registration, and \$30 for students. Speakers and topics include the following:

SPEAKER	COMPANY	TOPICS
<b>Sudhir Murthy</b>	<i>District of Columbia Water and Sewer Authority</i>	<ul style="list-style-type: none"> <li>Integrating solids and liquid stream planning using deammonification technology to reduce energy demand and increase process efficiency.</li> <li>Examples of social innovations at DC Water to increase sustainability.</li> <li>Using regional and international collaboration among utilities and others for increased sustainability.</li> <li>Public utility patent and commercialization approaches to support new technologies.</li> </ul>
<b>Steve Tarrallo</b>	<i>Black and Veatch, Global Practice Leader for Energy and Sustainable Solutions</i>	<ul style="list-style-type: none"> <li>Case studies of energy-neutral wastewater facilities and the triple-bottom-line.</li> <li>Energy balance and reduction opportunities</li> </ul>
<b>John Lyons</b>	<i>Strand Associates, Inc., Director of Operations Cincinnati</i>	<ul style="list-style-type: none"> <li>Cost effective CSO control using green infrastructure and integrated planning.</li> </ul>
<b>Jerry Bish</b>	<i>Greeley and Hansen</i>	<ul style="list-style-type: none"> <li>Using innovative project delivery methods to provide sustainable alternatives.</li> </ul>
<b>Greg Ford</b>	<i>Voorhees Associates</i>	<ul style="list-style-type: none"> <li>Organizational succession planning fundamentals and public utility case studies.</li> <li>Preventing loss of institutional knowledge from poor retirement planning.</li> </ul>
<b>Other Speakers</b>	Water reclamation facility case studies showing sustainability practices in Illinois, Wisconsin, and Minnesota.	



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# CSWEA LEADERSHIP ACADEMY

By Eric Lynne, YP Representative

**T**ake a trip down memory lane for a second – remember what it was like working on your first REAL job in this industry? Forget about the blood, sweat, and tears for the moment; I’m looking for those first connections, first communications to an angry foreman, or first compliment. Remember what that felt like and/or what it took to get there (or out of there)? CSWEA has been serving up these experiences for our young professionals (YPs) for the past few years at our annual YP Leadership Academy.

For 2014, we are looking to boost attendance by moving the YP Leadership Academy across state lines to become a pre-conference workshop to the Annual Conference held in Minnesota next May. Although much of the details need to be finalized, we are looking to have a few jam-packed sessions prior to the meet and greet. So when registration time comes, ask your YPs to consider attending the YP Leadership Academy workshop to meet other YPs and hone those skills not taught in college.

Each year will focus on different topics, which allows attendees to benefit year after year. Intended to be a local, low cost version of the successful WEF YP event WEFMAX, past topics have included:

- Taking Your Network to the Next Level
- Applied Leadership and Examples
- Leadership at Different Career Stages and Points of View
- Leading Regulatory Change
- Knowing Your Role

New this past year was Speed Networking, which effectively forced the lines of communication between attendees. This, or a variation of it, will surely be reiterated. Other ideas for new topics have ranged from political or legal representatives, CAD trainers, to front-end/bidding experts.

Registration fees are designed to be affordable, and encourage attendance at both the Leadership Academy and the Annual Conference, which we believe will serve our members well by allowing some of their younger staff to attend both this program and one of the best technical seminars in the region, at a reasonable rate. Keep an eye open for the registration announcement next spring.

Senior members are encouraged to challenge younger staff to attend this event. The program has seen growth over the first few years, and we are anticipating additional growth for 2014. The conference has been attended by young professionals in consulting services, municipalities, manufacturers, and contractors. Here are a couple comments from young professionals who attended a past Leadership Academy:

*“This was my second year attending the YP Leadership Academy and I feel like I learned more this year than last because I was more relaxed going into it. I really enjoyed the networking opportunities that come along with attending these conferences. I made some great new contacts and was able to find out*



*more ways I could get involved in my profession. Madison is a beautiful city and a great location for the conferences; it really encompasses the fresh and innovative excitement that being a young professional is all about. I find that whenever I attend the YP Leadership Academy I come back to work feeling more motivated and inspired to see what changes I can make within myself and my company.”*

– Jaime Thompson, Dekalb Sanitary District

*“Going into the YP Academy I did not expect the event to have such a thoughtful blend of industry trends and professional insights. What made the professional insights so poignant was the diversity and depth of the presenters’ careers. As a young professional, it was valuable to hear from seasoned professionals regarding lessons they have found to be important in their career and to the success of their organization. This worked to both broaden my understanding of the water/wastewater field and to provide a focus on the necessary skills for my professional development.”*

– John Ross, Brown and Caldwell

If you wish to suggest a topic or presentation and/or would like to suggest a speaker for the Leadership Academy, please contact me via email: [elynne@donohue-associates.com](mailto:elynne@donohue-associates.com). We are actively seeking presenters and suggestions to make this program valuable for our members. We hope to see you there! [CS](#)

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# MIDWEST WATER INDUSTRY EXPO

# 9TH ANNUAL

**Kalahari Resort & Convention Center  
Wisconsin Dells, WI – February 4-5, 2014**

It is time once again for the Midwest Water Industry Expo. This year's expo will prove to be an exciting, fun and interactive opportunity to meet water professionals from the three state areas: Wisconsin, Minnesota and Illinois. We are now accepting vendor registrations for the 9th Annual Midwest Water Industry Expo. Floor space is limited, so register as soon as possible.

## **Exhibit hours:**

Tuesday, February 4:  
8:00 a.m. to 3:00 p.m.  
Wednesday, February 5:  
8:00 a.m. to 3:00 p.m.

## **Room rates:**

\$104.00/night (includes water park passes)

## **Expo highlights**

- Continental breakfast and lunch in the exhibition area on Tuesday and Wednesday.
- 10-minute scheduled vendor talks at booths and 25-minute classroom sessions in designated rooms adjacent to the exhibit hall: both designed to enhance participation.
- Fun and friendly activities throughout the day in the exhibit hall designed to engage the crowd and provide quality interactions with your potential customers.
- Raffle prize drawings for participants on both Tuesday and Wednesday.
- WWA's Annual Distribution Conference will be held in conjunction with MWIE.
- CSWEA's Operations Seminar will be held in conjunction with MWIE.
- Young Professional Bowling Event will again be held on Tuesday night.

## **Exhibit registration**

Exhibitor registration is open online at [www.wiawwa.com](http://www.wiawwa.com), early registration ends on December 31, 2013. Please register early, as space is limited.

## **Attendee registration**

Registration is open online at [www.wiawwa.com](http://www.wiawwa.com). Full expo registration is only \$45.00, \$30.00 each for either

Tuesday or Wednesday. Guest expo registration is only \$15.00. Please register early!

## **Continuing education credits**

Again for 2014, it is expected that a total of four water/wastewater credit hours will be available. Once again, very cost-effective CEUs are being offered!

We are looking forward to seeing you at the expo. If you have any questions, please contact Jill Duchniak at 414-423-7000 or [jill@wiawwa.org](mailto:jill@wiawwa.org).

## **Midwest Water Industry Expo Committee**

**Chair:** Tom Mulcahy, CSWEA

**Vice-Chair:** Reid Snedaker, WWA

**CSWEA Members:** Carol Strackbein, Dean Falkner, Eric Lecuyer and Mohammed Haque

**WWA Members:** Ross Brzycki, Laura Daniels and Joe Finn  
[www.cswea.org](http://www.cswea.org)  
[www.wiawwa.org](http://www.wiawwa.org)

## **Central States Water Environment Association Operations Seminar**

Central States Water Environment Association will be hosting an activated sludge operations workshop on February 4, 2014 at the MWIE in the WI Dells, WI. The workshop will focus on diagnosing and implementing corrections for common activated sludge problems including flocculation issues, toxicity, and settling issues. Leading experts will be featured including:

- Toni Glymph – Metropolitan Water Reclamation District of Greater Chicago
- Jeff MacDonald – MacDonald Environmental Services

- Sharon Long Ph.D. – University of Wisconsin

The Ad Hoc Committee will lead breakout sessions to allow a sharing of thoughts and ideas related to the presentations or any topics of interest. This interaction in smaller groups has been a popular feature of this workshop. Operators, regulators, students, and consultants are encouraged to participate.

Following the presentations, there will be breakout sessions designed to allow the attendees to share tactical knowledge on anything pertaining to activated sludge wastewater treatment. Operators, regulators, students, and consultants are all encouraged to participate.

## **Wisconsin Water Association Distribution Seminar**

The Wisconsin Water Association will be hosting their 2014 Distribution Conference during the 9th Annual Midwest Water Industry Expo on Tuesday, February 5, 2014 at the Kalahari Resort and Convention Center in Wisconsin Dells, Wisconsin. Topics on the agenda for this seminar include:

- Trench spoils recycling
- Pipe lining as an alternative to pipe replacement
- Water laterals, including discussion on no lead brass, copper corrosion on laterals attached to PVC main and other related lateral topics

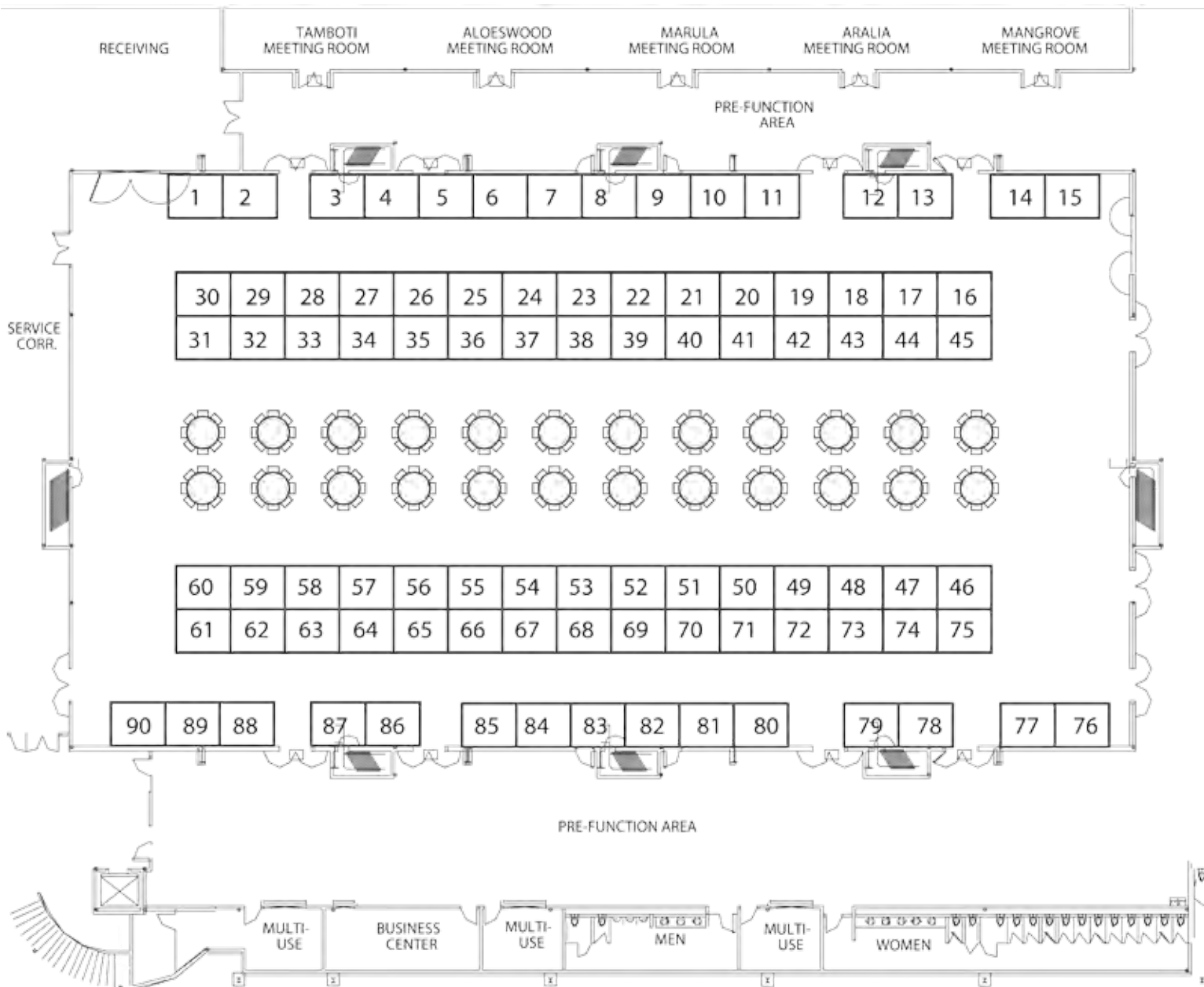
In the afternoon following the seminar a Meter Madness program will be presented showing how quickly a residential water meter can be disassembled and reassembled. [CS](#)



# MIDWEST WATER INDUSTRY EXPO

# FLOOR PLAN

**Kalahari Resort & Convention Center**  
**Wisconsin Dells, WI – February 4-5, 2014**



# MIDWEST WATER INDUSTRY EXPO

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# MIDWEST WATER INDUSTRY EXPO

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**JANUARY****IL Section Government Affairs Seminar (w/IWEA)**

January 10, 2014

Chicago Marriott Southwest, Burr Ridge, IL

**FEBRUARY****Midwest Water Industry Expo (w/WWA)**

February 4-5, 2014

Kalahari Resort, Wisconsin Dells, WI

**MN Section Innovative Conference**

February 11, 2014

Holiday Inn, St. Cloud, MN

**WI Section Government Affairs Seminar**

February 27, 2014

Madison Marriott West, Madison, WI

**APRIL****Education Seminar on Sustainability**

April 8, 2014

Monona Terrace, Madison, WI

**MAY****87th Annual Meeting**

May 12-15, 2014

Crowne Plaza – Riverside, St. Paul, MN

**JUNE****IL Section Technology Conference (w/ISAWWA)**

June 5, 2014

College of Lake County, Grayslake, IL

**IL Section Collection System Seminar**

June 26, 2014

Aurora University, Aurora, IL



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# CSWEA Welcomes Our New Members

## August, 2013

- Antonio Garcia
- Kim Kriewald
- Eric Larson
- John Larson
- Erin McMahon
- Matt Messley
- Armando Ortiz
- Daniel J. Schwartz
- Clifford White

## September, 2013

- Jeffrey S. Allen
- Warren Ault
- Natalie Cook
- Dave Erickson
- Tricia Garrison
- Steve Godfrey

- Thomas Hoffman, III
- Don Jaynes
- John A Kilinskis
- Tammy Lee Kuehlmann
- Ben J. Kultgen
- Johnthan D. Lefers
- Stephen Lyon
- Michael S. Maierle
- William Makeham
- Patrick O. Malley
- Mike Petersen
- Tim Rubis
- Dale D. Stieglbauer
- Kelly Vance
- Brendan C. Wolohan
- Jeremy Wurpts

## October, 2013

- Keith Anderson
- Travis J. Anderson
- Chad T. Beltrand
- Kevin Berg
- Lynn E. Broaddus
- Caroline J. Burger
- William K. Cheng
- Carl J. Dahn
- Han Gao
- Kyle S. Jacobson
- Natalie Keene
- Marcy R. Knysz
- Youen Lin
- Tommy Mai
- Joe M Martirano
- John Mason
- Kelly S. Mattfield

- Brooke Mayer
- Jacqueline Mejia
- Amy Patterson
- Kaitlin Peterson
- Matthew A. Powers
- Giridhar Prabhukumar
- Gary Reidelberger
- Noah W Stern
- Michael T. Sullivan
- Michael Syverson
- Ardean J. Veldkamp
- Aaron Volkening
- Nathan Wells
- Lana Wiedrich
- Mason Tucker Willis
- Yufei Zhou [CS](#)

CSWEA Member List current as of October 12, 2013

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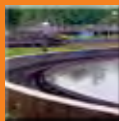
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# The De-compartmentalization of the Water Environment

By Dave Arnott

Our association and federation focuses on the water environment. Traditionally, that has meant wastewater. My main responsibilities at my firm are the conveyance and treatment of wastewater (or as I'm teased by my water supply co-workers, "dirty water"). Watershed non-point source pollution and stormwater have been under our umbrella, but only minimally.

My sense is this is starting to change. Through the years, I have seen the importance of watershed and storm water issues increase. The emphasis on storm water was evident at WEFTEC in Chicago this year. There were many displays, booths and equipment items that dealt with stormwater treatment.

For wastewater stakeholders, we now have Total Maximum Daily Load (TMDL) mass limits in our treatment facility permits that change by the month. With the recent changes in Wisconsin to the Administrative Code Chapters NR102 and NR217 dealing with phosphorus, we now have compliance options that involve storm water and the watershed. These compliance options are Nutrient Trading and Adaptive Management. Through these programs, the Wisconsin Department of Natural Resources is encouraging municipal point sources to work with other point sources and non-point sources in the watershed. To take advantage of these compliance strategies, one must have a thorough understanding of the watershed including land types, surface waters, soil types, drainage patterns, farming practices, other point sources, and special features of surface waters including dams and impoundments. In short, for wastewater stakeholders it is becoming more and more important to have a watershed frame of reference instead of just an outfall frame of reference. As a result, I have found myself talking with our firm's stormwater experts more and more the last couple years as I deal with wastewater issues.

For watershed issues, the County Land and Water Conservation Departments are key players. They know how to communicate with farmers and they speak the agricultural language. The last couple years, I have engaged with the Land Conservation Departments for a couple counties. Through this exchange, I have learned



more about farmers' concerns. The Land Conservation Departments in turn are learning about the challenges faced by municipal wastewater point sources specifically with regards to TMDLs and Chapter NR217 requirements.

For stormwater stakeholders with TMDLs, it is becoming more important to understand the pollutant loadings that come from point sources. It is important to understand the seasonal fluctuations in effluent quality from municipal treatment facilities, the nature of industrial discharges, and how municipal permit limits and pollutant effluent loadings may be changing in the future. A sound understanding of point sources will be critical to TMDL long-term planning and successful implementation.

With this in mind, our Section discussed the formation of a stormwater committee as part of our Annual Business Meeting on November 20, 2013. We're not sure where this will go, but we feel that this type of committee could be an asset to wastewater and stormwater stakeholders as the two areas move together. Wisconsin Section, to its credit, has a strong and vibrant Watershed Management Committee.

The traditional approach to water quality has been compartmentalized. The wastewater, watershed and stormwater stakeholders have worked independently to solve problems and improve water quality. I would argue that all stakeholders have been very successful. One need only look at the improvements to our water environment since the *Clean Water Act* implementation in the early 1970s.

However, to improve water quality to the next level (e.g., implementing TMDLs and low level phosphorus in surface waters), it will be critical to take a comprehensive approach. The successful approach will demand an understanding of the nature and quantity of pollutants from wastewater point sources, watershed non-point sources and urban storm water pollution. All stakeholders will need to break out of their compartments and learn about the other areas of the water environment. The next time you wonder what exactly that other person at your work does with regard to water, go ask and learn! **CS**



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# Learn, Evolve, Pass On Our Knowledge to Others

By Tracy Ekola

The 28th Annual Conference on the Environment (COE) was held on November 12 at the University of Minnesota's St. Paul Campus. Attendance exceeded expectations! Thankfully there was enough food to go around. I would like to thank the conference planning committee, speakers, sponsors, exhibitors, presenters, student contributors, and moderators who volunteered and made the conference a success. Special thanks goes to Rob O'Connell, current past chair of the Minnesota Section, who coordinated the conference on behalf of MN-CSWEA. The COE includes concurrent sessions covering air, water resources, wastewater, and regulatory issues. Conference attendees were informed about changes to Minnesota regulations as well as hear about the advances in technology and research that affect the wastewater industry. Energy recovery, water reuse and wastewater recovery/reuse were among the topics presented. The conference was concluded with networking and reminiscing with friends and colleagues at the local pub.

In conjunction with the conference, the Minnesota Section Annual Business Meeting was also held. The meeting included several noteworthy discussions and therefore I would like to take this time to review a few highlights of the meeting.

The following people were voted for section officer positions:

- Incoming Vice Chair: Lanna Tullis, Bolton & Menk
- Secretary/Treasurer: Alison Sumption, HR Green
- CSWEA Trustee: Jason Benson, AE2S

Changes to committee membership:

Discussion to consolidate committees to better align with the current needs of the MN Section consisted of recommendations



to combine Operations Committee with laboratory, safety and biosolids. In addition, there was further suggestion to combine Government Relations and COE planning, as well as YP and student committees to provide better coordination. A conference call will be scheduled with officers and committee chairs to review suggestions from the meeting and draft a resolution to be adopted at the May business meeting.

Committees reported on recent activities. Full minutes of the meeting will be posted on the CSWEA-MN Section website.

Upcoming events in the MN Section include:

- Innovative Conference, February 11, 2014, St. Cloud, MN.
- Collections Systems Workshop, date/location to be announced for summer 2014.
- Student/YP events and tours to be announced.

Note from Steven Norton from the YP Committee:

The 2014 YP Summit will be held on February 25, 2014 in Savannah, GA in conjunction with the Utility Management Conference. This is a great chance to learn, meet new people and get involved.

Finally, the CSWEA 87th Annual Meeting will be held at the Crowne Plaza in St. Paul, Minnesota, May 12-15, 2014. The MN Section is hosting the event and the Local Arrangements Committee would happily accept volunteers and ideas. If you would like to get involved, please contact Patti Craddock at [pcraddock@sehinc.com](mailto:pcraddock@sehinc.com).

As always, if you are interested in learning, helping, or passing along your knowledge, please join us. For information or questions, feel free to contact me at [tekola@sehinc.com](mailto:tekola@sehinc.com) or check out MN Section information at [www.cswea.org](http://www.cswea.org). 

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# Get Involved: Join a Committee

By Derek Wold

With WEFTEC behind us and the Annual Conference a long winter away, this is a good time to update everyone on our committees. A business meeting was held on September 18 to discuss current and upcoming activities. Thanks to Erik Lanphier and Glenbard Wastewater Authority for hosting the meeting.

Another business meeting will be held on December 5 before this publication appears, however, a winter meeting will be scheduled for January-February. An announcement will be included in the regular CSWEA emails. The section business meetings can be attended by any member. Even if you are not on a committee, this is a good opportunity to meet some new people and hear about areas to get involved. The committees are the core of our organization and offer unique experiences to gain both technical knowledge and professional contacts. With the many pending regulations in Illinois, joining a committee is a great way to stay current. A list of our committees and quick recap of their activities is:

- **Collection Systems** – The June 2013 seminar had almost 100 attendees. Two new committee members have been added: Bob Swirsky and James Kerrigan. The committee is actively planning for a June 2014 seminar at Aurora University.
- **Operations** – The September 2013 seminar also had a strong attendance with over 50 registrants. Thanks to the Algonquin wastewater treatment plant for providing a tour and hosting the event. The committee has added members Jamie Thompson, Jason Neighbors and Todd Sheridan. This is a great group to get involved with as our treatment plants face tighter regulations, while being pushed to be more energy efficient.
- **Young Professionals** – Some great events were organized last fall at Top Golf and Haymarket Brewery. Katie Richardson and Jillian Goodlove have joined the committee, which is compiling an email list of YPs to communicate directly for organizing events.



- **Biosolids** – A seminar was held on November 20 at MWRDGC. The committee has done a great job of selecting interesting topics as evidenced by the standing-room-only event!
- **Maintenance and Safety** – Bob Trueblood has stepped up to take on the committee chair. Please let Bob or me know if you have an internal safety committee and can recommend topics that would be ideal for inclusion on a seminar program.
- **Government Affairs** – A joint seminar with IWEA will be held on January 10. This is always the premier event to find out the latest on regulatory issues.

- **Student Chapter** – Mike Holland has made several trips to University of Illinois. There has been a strong turnout and we have provided a lot of pizzas! I am sure Mike would appreciate a volunteer for anyone interested in making the trip to Champaign. The group was also well represented at WEFTEC and we plan to build on this by organizing more student events.
- **Industrial Pretreatment** – The committee is planning for a seminar in 2014, which may be held with the laboratory committee. Ideas for topics and assistance with organizing would be welcome!
- **Laboratory** – A 2014 seminar is in the works. Several committee members have left so additional volunteers are needed. Please contact Mary Dressel or me if you are interested.
- **Membership** – This committee has met with Minnesota and Wisconsin in an effort to boost Committee volunteers. Illinois continues to see increases in membership.

Thanks to all the committee members and chairs for their dedication to the organization. Although many people are sacrificing their own time, participation in the committees is a rewarding experience that helps make CSWEA a great organization. Happy New Year, and I look forward to seeing everyone at the Education Seminar in April! **CS**



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