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Published by:

Craig Kelman & Associates

Tel: (866)985-9780 Fax: (866) 985-9799
www.kelmanonline.com *info@kelman.ca*
Design/Layout: Jackie Magat
Marketing Manager: Darrell Harris, *darrell@kelman.ca*
Advertising Co-ordinator: Stefanie Hagidiakow
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Calling All Young Professionals

By David Arnott

One of the main topics at the Central States Exchange (CSX) meeting at the end of July was Young Professionals (YPs). The Association realizes that engagement of YPs is critical since they are the future of our Association. YP activity is solid, however, there is always room for improvement. Energizing YP involvement is one of my goals as president. To that end, this column is dedicated to YPs.

"To all seasoned professionals reading this column, I encourage you to take some time in the next two weeks and talk with a couple YPs at your place of work. Reach out to them and talk with them about the CSWEA."

The YP 'team' at CSWEA is made up of the following individuals:

- *Jillian Kiss*, CSWEA Students and Young Professionals Committee Chair (*j.kiss@trotter-inc.com*)
- *Liz Bohne*, IL Section Students and Young Professionals Committee Chair (*ebohne@trotter-inc.com*)
- *Amy Patterson*, MN Section Students and Young Professionals Committee Chair (*amy.patterson@tkda.com*)
- *Mark Van Weelden*, WI Section Students and Young Professionals Committee Chair (*mvanweelden@ruekert-mielke.com*)

At the CSX meeting, we did some brainstorming on possible events for YPs to attend. We came up with the following ideas:

- To attend a manufacturer or manufacturer representative open house or presentation.
- To tour a wastewater treatment facility.
- To tour a wastewater wet weather storage facility.
- To visit an industrial wastewater pretreatment facility.
- To tour a large lift station.
- To visit a materials testing or hydraulics lab at a university.
- To tour Storm Water Green Infrastructure Facilities.
- To attend a webinar about the relationship of the Water Environment Association, CSWEA and the State Sections.

I see it as the responsibility of seasoned professionals to support young professionals and their committees. Is there an activity above that you could help facilitate? If so, please reach out to the respective YP Chair for your state.

I believe that YP events have a larger impact than we realize. My favorite YP event was visiting the Sanitaire facility in Brown Deer, WI, maybe 13 years ago. The event consisted of a 'classroom' session where the basics of aeration were reviewed. Food was provided at this time, which was nice. A facility tour followed. I remember seeing impressive diffusion devices during the tour. The Sanitaire staff really took the time during the tour to answer questions, which was neat. Then, the group convened at nearby establishment to 'debrief'. I remember that the event was very well-done and well-organized. Even though there was a snow storm that night, I believe there were still approximately 25 people that showed up. Other memorable YP events for me were touring the Milwaukee Metropolitan Sewerage District's Jones Island Treatment Facility and touring the Flygt Testing Facility in Pewaukee, WI. It was during these events where I met new people, reinforced or learned new technical concepts, and had fun from the change of pace from my normal workday.

At CSX, we highlighted several challenges in getting YPs more involved. These included not having support from their employer, not knowing where to get started, feeling like they don't have enough knowledge to contribute, and not understanding the organization of the Water Environment Federation, the Association, and the State sections. We need to overcome these challenges.

There is plenty of positive news on the YP front. I see enhanced YP involvement on State Section and Association committees. We have committee leaders with energy and enthusiasm, as well as a large group of young professionals entering the industry. Global Water Stewardship, the CSWEA sister organization, has attracted numerous YPs eager to get involved in that cause. Lastly, the recent YP Brewer Game attracted a great crowd of YPs and students. We need to keep the positive momentum rolling on the YP front.

The Local Arrangements Committee is considering a YP track for the technical sessions at the 2019 Annual

"I guarantee that as you get involved, you will discover that many of the seasoned professionals faced the same issues as you did when they were younger. I encourage you to take the leap and take a risk. You will be surprised at how welcoming and friendly the rest of us are. You are the future of this 91 year-old Association and the legacy of the Association is gradually being shifted – to you."

Meeting in Madison, WI. The track would address YP concerns and issues in our Association. Some of the topics we are considering involve the soft skills of the business that are not taught in technical schools or universities. Topics could include: how a public meeting works, emotional intelligence, responding to and evaluating proposals, and dealing with workplace conflict.

To all seasoned professionals reading this column, I encourage you to take some time in the next two weeks and talk with a couple YPs at your place of work. Reach out to them and talk with them about CSWEA. Share a CSWEA story or experience with them. Talk with them about how they may be able to get involved. It is important to describe *specifically* how CSWEA can help their career. It is also important to talk with management at your place of work and encourage them to support CSWEA and YP involvement. Our charge as seasoned professionals is to be ambassadors of the Association. We need to aggressively highlight the benefits of WEF, CSWEA and the State Sections. There is plenty of competition from other professional organizations.

To all the YPs reading this column, I encourage you to get involved with your State Section or the Association. Keith Haas from the Racine Water and Wastewater Utilities always encouraged seasoned professionals to "drag someone along" to a CSWEA event. The result to this concept for YPs is the "invite yourself" along. You do not have to have all the answers or be perfect. It is acceptable and expected that you will have many questions. I guarantee that as you get involved, you will discover that many of the seasoned professionals faced the same issues as you did when they were younger. I encourage you to take the leap and take a risk. You will be surprised at how welcoming and friendly the rest of us are. You are the future of this 91 year-old Association and the legacy of the Association is gradually being shifted – to you. CS

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Water Environment Federation
the water quality people

Policies, Procedures, and Priorities

By Eric Lynne and Derek Wold

Eric Lynne

Derek Wold

WEF recently updated the policies and procedures for the House of Delegates, which were voted on at WEFTEC. The most significant changes clarify the responsibilities and expectations for a WEF delegate. This is a timely topic as Derek is a new WEF delegate and was discussed at CSX. The role of delegate is one of service, of promoting communication and two-way knowledge between WEF and CSWEA. The role of the delegate is crucial as WEF transitions into a new Executive Director.

The policies and procedure revisions for our role are summarized below:

- Function of the Delegates – Acting on behalf of CSWEA, we serve as the conduit of information exchange between CSWEA and WEF. We advise the WEF Board of Trustees on strategic direction and public policy development.
- Remain in good standing with WEF (we hope this one is the easiest!).
- Be willing and able to devote the time, energy, and effort to participate in HOD activities.
- Represent the interests of CSWEA to WEF.
- Provide for timely two-way communication between HOD and CSWEA.
- Work with CSWEA Board and WEF staff to bring forward issues of importance to CSWEA.
- Attend WEFTEC, representing CSWEA, and participate in HOD meetings and orientation.
- Participate in one WEFMAX annually.
- Participate in CSWEA annual conference and board meetings.
- Participate in at least one HOD Workgroup, and an optional committee.

As part of our duties and to serve as conduit of information between CSWEA and WEF, we attended HOD meetings on September 29 at WEFTEC. Our primary topics for the day were:

1. What are CSWEA's greatest needs?
2. What do you think CSWEA does really well?
3. In a dream world, what would CSWEA accomplish in the next five years?

At CSX, we solicited feedback from attendees on what they would like to see from delegates in the next year. Our greatest needs appear to be in the area of operator training and organization engagement. Our strengths include providing high-quality technical training and networking opportunities for our members. In addition to ever-continuing mission of fine-tuning the annual meeting, we discussed engaging students and young professionals, and organizing meetings similar to CSX at the state level.

The Steering Committee devotes time and thought on each call toward optimizing HOD activities, elevating the importance and service of the Delegate, and maximizing communication potential and pathways between MAs and WEF. Based on these discussions, the draft update to the HOD Policies and Procedures was prepared for presentation and approval at WEFTEC. The committee is also forming a small group of delegates to develop a mentoring program and hosted two webinars to implement the program at WEFTEC.

The Nominating Committee prepares the forms, receives and reviews the applications, and ensures that all committee positions are filled.

The WEFMAX Committee has been busy debriefing from this year's WEFMAXs and reviewing the survey feedback to identify where to improve in the future. All members may attend a WEFMAX to network, learn, and share experiences with other MAs. The locations for 2019 WEFMAXs are as follows:

- Alabama (Floribama)
- Arizona (TBD)
- British Colombia (TBD)
- Kentucky-Tennessee (Nashville)

And for those of you planning ahead, 2020 will feature a Hawaii WEFMAX.

> "Our greatest needs appear to be in the area of operator training and organization engagement. Our strengths include providing high-quality technical training and networking opportunities for our members."

HOD COMMITTEES

One of the responsibilities of a delegate is to serve on a HOD committee or workgroup, which include the Nominating Committee, Steering Committee, Budget Committee, WEFMAX Committee, and Outreach Committee. The term for the committees is one year and generally consists of attending regular conference calls or meetings and attending to their outcomes.

The Outreach Committee focuses on improving communication potential and pathways not only within the HOD, but from the Delegate to the MA and back from the MA to WEF. The committee has led the development of an informal delegate job description. The group is also revising the HOD Orientation Presentation/Video using feedback from the role of the delegate exercise and mentoring survey data obtained at the 2018 WEFMAXes.

The Budget Committee recently met with the WEF Finance Committee in D.C. to finalize the WEF budget and presented to the board of trustees in July. The committee also presented a short presentation at each of the four WEFMAX's on budgeting and the dues strategy.

For the upcoming year, Eric will continue serving on the Outreach Committee as past chair to improve communications of HOD activities, progress, and work products to the HOD and CSWEA. Derek will be serving on the Steering Committee, which is responsible for reviewing and prioritizing information received from the committees and work groups, developing and summarizing the information, and providing advice and direction to the Speaker of the House and the HOD. Updates on our activities in these committees will provided in our upcoming reports.

HOD WORKGROUPS

In addition to the HOD committees, there are also several HOD workgroups, including Membership Relations, Operator's Initiative, and Student Chapter.

The Membership Relations Workgroup prepared and presented on the WEFTEC Membership Initiative and Reciprocal Program at the four WEFMAX's this spring. The other two sub-groups continue to work with WEF staff on providing messaging and tools for Delegates and MA's for communicating the Dues Strategy.

The Operator's Initiative Workgroup continues to work with the Operator Advisory Panel (OAP) on pulling together information and materials to further the mission of the OAP. The national Operator Census is almost completed and the group prepared and presented an hour-long operator-focused discussion the WEFMAXes. They also prepared and issued a social media toolkit for the Operator Ingenuity contest. The group continues to work with the OAP and has a subgroup working on communicating the value of the operator to management and HR.

The Student Chapter Workgroup conducted a census of student chapters in the US and gathered information from MA leadership and delegates at each of the WEFMAX's. With this information the group is preparing an analysis of roadblocks, challenges, and successes to student chapters to present to the SYPC Committee for consideration. They also provided feedback on the current student chapter policies and procedures and are reviewing the WEF Student Chapter Policy document.

These workgroups will change at WEFTEC, but overall these three categories continue to be high priorities, vocalized by the associations. We will be monitoring and communicating with these workgroups as their initiatives reflect the needs and goals identified at CSX.

With WEFTEC comes a new year at the HOD, and we are excited about the opportunity to serve CSWEA. Our next report will contain our WEFTEC recap, upcoming goals, and preparations for WEFMAX 2019. CS

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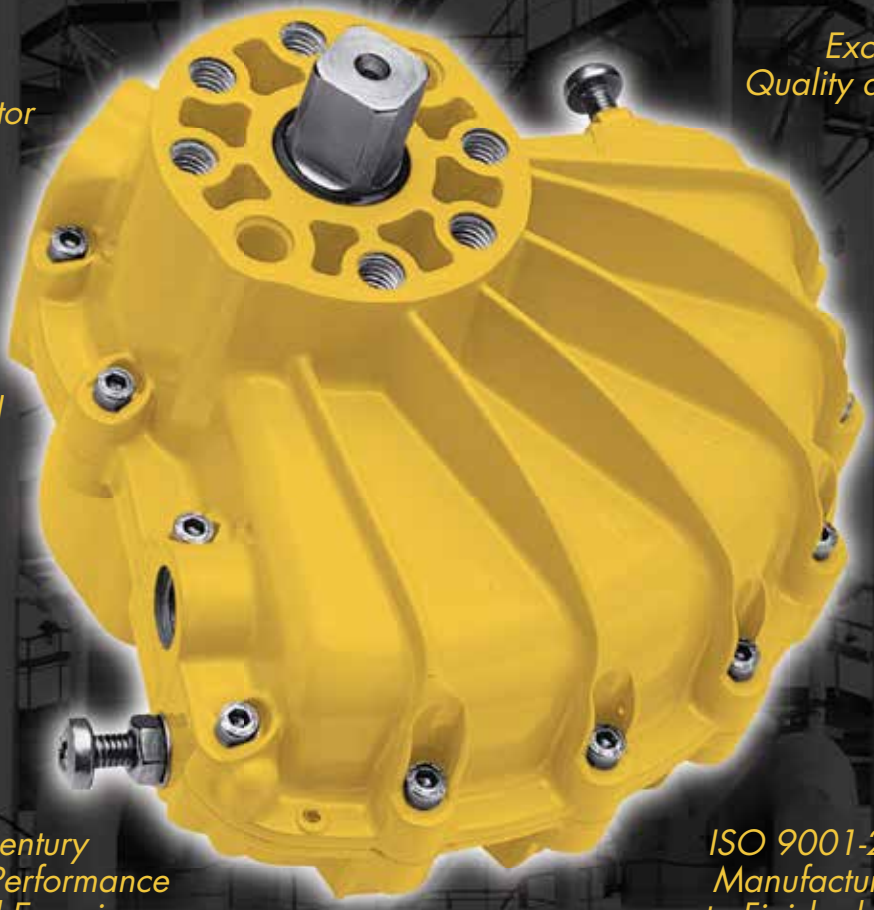

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What's Your Water Outreach?

By Mohammed Haque

Lately I have seen more implementation of a new way of thinking about water, resource recovery, and outreach. For me, it's a refreshing change. Perhaps, this way of thinking was always there. The people that work at facilities that transport and treat wastewater have always understood the importance of their jobs and taken their work to heart. That's just the way the industry is. The ones with passion never questioned why they would give up most anything to avoid a sewer backup or to make sure their facility took on and endured through every wave of water that hit their plants during a storm. For most of us, it's what we do and, like all other things, we want to do it well. The passion was always there.

So how did water become cool to everyone else? We decided a long time ago that it was cool, but it took a lot of us introverts some time to be okay with expressing it to the public. More and more facilities are having tours and open houses. Special days like *Imagine a Day Without Water* (October 10), *World Water Day* (March 22), and *World Toilet Day* (November 19) are opportunities for us to go into classrooms and teach everyone about the importance of water management, resource recovery, and the great work we do in the water industry. A change in how we value water and how we communicate that value is taking hold in the entire industry. As many facilities are faced with aging infrastructure and the high costs of replacing them, we have to make sure our communities understand the value of the services they are paying for. Outreach is a great tool and I promise you that many of the kids you teach will end up teaching their parents. It's a great unintended consequence of doing outreach to children in our communities.

I urge us to start thinking differently and to create the right water culture in our organizations. We need to let our communities know the great work that we do and the impacts we have on their lives. There are great examples of this in our publication this quarter. NEW Water is doing amazing work on all of these aspects and both CSWEA and Global Water Stewardship are dedicated to those that are truly impassioned by water. Get involved and be the example or follow by example – both are okay. And don't forget to let our elected and appointed officials know that, as I found out on a recent beautiful fall day, the pot of gold at the end of the rainbow is the resource recovery facility. CS

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Cheering for Clean Water

By Troy Larson

Writing this article in mid-August leaves me wondering several things about the days to come. Will the Brewers catch the Cubs and win the division? Will the Badger football team's offense be as good as projected? Who will the Hatfield Award Winner be? Who will win the Lab Excellence Award? The awards that are given out by CSWEA and the WI Section of CSWEA will not attract the press coverage that the Badgers and Brewers will and yet, even the most rabid of sports fans would admit that the outcome of a sporting event is not as important as clean water. We belong to an industry where most of the work goes on behind the scenes, people generally don't get rich or famous, but everyone we know is affected by the work that we do. Thus, I find the awards that we give incredibly important and meaningful. There is far too little recognition to go around for all the great work that is done by those who work in our industry and are members of CSWEA. Please look at those that you work with and are connected to within our industry and if you see someone doing exceptional work, help to get them recognition. A great way to do this is to nominate them for an award, to be given at the annual conference in May. These awards are important and meaningful. The recipient will be honored and receive the gratitude and appreciation that they deserve. As their story is told through their nominations, others will be inspired by the example that is their work. Nominations are due by December 1 each year, and more information can be found on the CSWEA website.

Another great competition that will occur in the upcoming days is the Operations Competition at WEFTEC. Wisconsin's Chris Lefebvre is the PWO representative, and he asks that we recognize the Janesville Wisconsin Staff for opening their facility for the multiple practices that will occur between now and WEF Tech in New Orleans. The ten members that make up the two teams are excited to build on recent success in the competition. Good luck to the Pumpers and the Shovelers.

I attended the Young Professional Brewers outing on August 8.The Brewers hit *back-to-back-to-back* homeruns in the first inning of the game but that is not what I will remember the most from the outing. I took my eight-year-old daughter and eleven-year-old nephew and the thing I will remember the most is how well they were treated by the other attendees. We work in an industry with fantastic people and social outings like the Brewers game are an invaluable opportunity to network with these great people. Thank you to Mark Van Weelden and Tom Mulcahy for organizing this annual tradition.

There are at least two ways that you can support a function that is organized by the WI Section. You can organize or attend one. Speaking from my personal experience, I always hope for good attendance when part of a committee organizing a seminar. Not all topics can attract the masses, but we generally look for relevant and important information. Ideas for topics or suggestions are always welcome. The seminars are generally designed to be financially self-sufficient. Any profits are invested back into the industry through promotion of the organization and Young Professionals. Upcoming events can be observed at the Wisconsin Section Tab of the CSWEA website or on upcoming email blasts – please don't let this information get lost in *other* or *junk* folders. A couple of upcoming seminars will include the Operations Seminar that will be held at the New Water facility in Green Bay on November 14. The annual webinar hosted by the WI Section Watershed and Stormwater Committee is planned for mid-November as well, in coordination with the Fall Business meeting; more details will be available by the time this article is published.

> "I find the awards that we give incredibly important and meaningful. There is far too little recognition to go around for all the great work that is done by those who work in our industry and are members of CSWEA."

The 2018 CSX meeting was held in late July in the Wisconsin Dells, CSX provides brainstorming opportunities including many CSWEA members with various involvement. Refinement of the Annual Conference schedule should continue to improve the experience for all attendees. One conclusion regarding discussions on growth and promotion of CSWEA was that word-of-mouth promotion is invaluable. Many in attendance recalled the support of someone within their organization promoting their involvement in CSWEA and how that led to professional development that benefited all. Please encourage your coworkers and peers to join WEF and CSWEA and, if already a member, have them consider maximizing the experience by participating in a committee.

Perhaps a Cubs or Gophers fan would not share my support for the Brewers or Badgers, but we all appreciate and benefit from nominating worthy award candidates, cheering for the Operations Teams, and attending the events that we offer. CS

Plenty of Room to Join the Planning

By Peter Daniels

In the heat of summer, the Minnesota Section is deep into the planning of two conferences that are still several months away. There are even early conversations about planning for the 2020 Annual Conference that will be hosted by Minnesota. I am proud that our organization puts on such high-quality events that bring value to the water community in our region. It certainly takes some hard work and dedication to make it happen year after year. Thankfully, there are so many amazing individuals in our organization with the passion to move these planning efforts forward because there is so much to do.

Before moving on to an overview of some of the ongoing planning activities, I'd like to make a point to invite anyone interested in participating in conference planning to reach out to me. There are many ways to support these events. And if conference planning isn't your cup of tea, there are also many committees you can get involved with to allow you to focus your support in a specific area of interest.

The 33rd Annual Conference on the Environment (COE) is right around the corner on November 7. Thank you to Tim Wedin, the Minnesota Section past chair, for leading the planning process for CSWEA. This event is back at the Minneapolis Convention Center again this year and is put on jointly with the Air and Waste Management Association (AWMA).

The COE provides a great opportunity for college students to receive recognition for the great work they do. There is the Student Environmental Challenge and an area for Grad Student Posters. A Student and Young Professional mentorship event is also being planned again for 2018. In addition to organizing these activities, the planning committee has been busy requesting abstracts for the technical content, evaluating options for sponsorships and vendor displays, and nailing down the rest of the details that help make this a well-attended event each year.

The 36th Annual Innovative Conference is a little further out, coming up in early February, held in St. Cloud. This event is put on jointly with the Minnesota Wastewater Operators Association (MWOA). Thank you to Kathy Crowson for getting the planning underway so early for this event. For many years, Carol Mordorski helped lead the Innovative. With Carol's recent retirement, these are certainly some large shoes to fill. Kathy jumped in early, got the ball rolling with Rick Ashling from MWOA, and is doing a great job working with the rest of the Innovative Planning team.

An exciting change coming for the Innovative Conference is a new venue. The 2019 Innovative Conference will be held at River's Edge Convention Center in downtown St. Cloud. This will be a familiar venue to those who have attended the Minnesota Rural Water Annual Conference in the past. In addition to the extensive work related to researching and securing a new venue, the planning committee has been working on keynote speaker options and evaluating modifications to the event's technical content. These efforts will continue to make the Innovative a popular one-day event for engineers and operators each winter.

Many of the initiatives being discussed as part of the planning for the COE and Innovative Conference were also discussed at this year's Minnesota Section Exchange (MNX), hosted in St. Cloud in late June. We had one of the largest turnouts yet for MNX, with about 20 attendees. In a half-day work session, we reviewed suggestions for improvements to our events, how we continue to bring value to members, and several committee initiatives. As with past MNX events, the day allowed for people to meet some new faces, and helped people get an understanding of the priorities of others in the Minnesota Section.

It takes a large group to pull these events off. Thank you to past conference planners who have helped develop the means and methods that we rely on for making current planning efforts as smooth as they are. And thank you to everyone involved in the current planning efforts. At a time of year when people are busy with summer vacations, kids' activities, and primary work responsibilities, your time spent with making these events happen is greatly appreciated. The community of water professionals in our region values these events, as indicated by the fact that they have each been occurring for over 30 years. And if you haven't helped with planning a conference or been involved with a committee before, there is plenty of room to join. CS

Following the Example

By Chris Marschinke

In our industry, we often talk of 'leading by example,' which is a principled idea in its own right. However, what I've recently learned is that at times there is merit in following the example. That's not to say we shouldn't strive to set the bar higher with each day, but sometimes learning from other's examples is just as valuable – and what better examples to follow than those around us in CSWEA. Sometimes I struggle to truly appreciate the breadth of talent and expertise surrounding me until I'm confronted with it, which happens frequently in our organization. Most recently, I sat in a room full of those talented experts, including Rich Hussey, at the Central States Exchange (CSX).

The first day was largely spent discussing the recently retooled Annual Conference layout and schedule. We made a significant number of changes to the 2018 Conference, and the brainstorming behind those ideas and efforts started at CSX 2017. It was immediately apparent the amount of heart and dedication put forth by a number of people to ensure the event was as effective, impactful, and enjoyable as possible. As a first time CSX-er, I was incredibly impressed with the ability of the group to decide a change needed to be made, and fully execute that goal within 10 months. As much as I wanted to share all of my opinions (of which I tend to have many), I realized that following the example of others in the room, I may learn significantly more.

The second day of CSX was very much an exchange of ideas – what has worked, what hasn't, and how we better our organization over the next year. Similar to the Illinois section, our counterparts to the north have reorganized committees, seminars, and goals over the years to optimize each section's impact on its members. One intriguing concept that I feel the Illinois section should follow is Minnesota's annual exchange, MNX. Styled after the association's annual event, MNX provides an opportunity for the section's executive leadership, chairs, committees, and members to download everything that has been learned over the past year and voice ideas for improvement. Committee breakout sessions allow each group to plan for upcoming events and set goals throughout the next 12 months. The 2018 event included a review of a section survey sent to members that sought to identify the value CSWEA brings to its members, what has gone well, what can be changed, and how to increase the involvement of its members. Within the Illinois section, integrating an annual exchange into one of our quarterly meetings would allow us to identify goals as a group rather than individuals, and brainstorm metrics to track our progress against those goals. Hopefully, by the time you're reading this we've followed that example and held our section's inaugural ILX.

One area our section has clearly excelled in over the past several years is YP engagement. Roughly half of the offices and committee chairs are Young Professionals (or individuals just stretching the YP age), which is excellent to see. However, as we move into leadership positions in the section, we cannot lose sight of the groundwork laid before us. In talking with some of the more seasoned professionals, there are a number of ideas and concepts that were once very successful, that may have faded away over the years. That's another driving reason for holding our own section exchange – to bring those more experienced mentors back into the room and ensure we're guiding the next generation in without losing the institutional knowledge that has made us so successful until this point.

And with that note, I'll close my message for this the season of reflection. With fall comes more exciting events and opportunities to engage in CSWEA and WEF. Hopefully many of you were able to make your way down to New Orleans for WEFTEC, the marquee event for anyone in our industry. Thank you to everyone who helped support the CSWEA/IWEA reception, as well as those who attended – it's a great way to kick off the conference. I look forward to seeing many of you at our section and association events over the next several months. I hope everyone has a fantastic holiday season; I'll see you on the other side! CS

"We often talk of 'leading by example,' which is a principled idea in its own right. However, what I've recently learned is that at times there is merit in following the example. That's not to say we shouldn't strive to set the bar higher with each day, but sometimes learning from other's examples is just as valuable – and what better examples to follow than those around us in CSWEA."

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Written by: Tricia Garrison, Public Affairs & Education Manager

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NEW WATER IN NUMBERS

- 2 facilities, in Green Bay and De Pere
  - Average flow, Green Bay: 30 million gallons per day
  - Average flow, De Pere: 8 million gallons per day
- 231,000 customers served
- 285-mile service area
- 110 miles of pipes in interceptor system
- 13 lift stations and 28 metering stations
- $465 million in capital assets
- 1931: year Green Bay Metropolitan Sewerage District was established
- 15,677 samples analyzed, and results generated for 114,452 analytes last year by the state-certified Laboratory & Research Department
- 34 sites in area waters monitored by the Aquatic Monitoring Program

Football season is upon us, and in Green Bay, the Packers are everything.

Temperatures drop 20 degrees when the Packers lose, and the town loses half its wardrobe after the season ends.

Lambeau Field phoned NEW Water, and asked: "isn't NEW Water's pump station the tallest building in town?" staff jumped at the connection. At the time, the Packers were building new additions at Lambeau Field, which competed for the title. Blueprints were pulled, engineers were consulted. The result? Lambeau Field is now several inches taller than the pump station.

NEW Water seized this educational opportunity, and created a congratulatory video for the Packers, posting it online. It made the evening news, created a bond between the two organizations, and is a great story told at each tour given of NEW Water. Watch the 'Tallest Building' video, and other videos on NEW Water's YouTube Channel – linked at *www.newwater.us*.

Serving as a powerful entrée into community, the Green Bay Packers connection has travelled through the grapevine in Green Bay, and is a fun piece of trivia that starts the conversation. Do you know what's now the tallest building in town? What is a pump station? What is NEW Water?

Over the past several years, NEW Water has been working to reverse the 'out of sight, out of mind' traditional approach to community interaction with wastewater treatment. This approach of going 'beyond compliance' includes a new attitude toward resource recovery, forging new partners and connections. Proactively going 'outside the fence' to tell the NEW Water story to convey the value the organization provides the community it serves.

A NEW ERA IN RESOURCE RECOVERY

The timing is ripe to emerge from the shadows. With aging infrastructure and a lack of dollars from Uncle Sam for upgrades, the local community is footing the bill now, and they want to know what they're paying for. After the *Clean Water Act* in the 1970s, federal funding was flush for wastewater plant upgrades, and indeed, covered the costs for 77% of the Green Bay Facility. These days, NEW Water has gotten creative, leaner, and more collaborative.

Solids is the Achilles' heel of wastewater treatment, so the saying goes.

So when NEW Water's solids handling facility was reaching the end of its useful life 10 years ago, NEW Water opted to take a different approach to keep nonstop service running.

The old solids facility was about 40 years old, and malfunctioning regularly. A panel in the control room was literally being held together with duct tape. Past NEW Water Commission President Dan Alesch likened the aging facility to a clunky old car. "How many Band-Aids should we keep slapping on this old '74 Pontiac?" he would ask. Furthermore, new, stricter air regulations were on the horizon, and the capacity of the facility was reaching its limits.

NEW Water staff.

Children learn how to televise a pipe with engineers and technicians from NEW Water during the STEM Superheroes Camp.

Thus launched the quest for a solution to managing solids, in order to provide continuous service the community had come to expect.

NEW Water convened stakeholders to investigate options. Given the international nature of the industry, NEW Water looked around the globe for ideas, best practices, and solutions. More than 100 options were considered; eventually, the concept of coupling fluidized bed incineration with anaerobic digestion, as well as nutrient harvesting was decided upon: R2E2, or Resource Recovery and Electrical Energy. (NB: Yes, the name is a nod to 'R2D2' – Star Wars is always in fashion, and NEW Water believes that resource recovery is, too.)

Ten years in the making, the $169 million R2E2 Project launched construction in 2015, and is currently going online.

"This approach represents a new era in resource recovery for this organization, and this community," said Tom Sigmund, Executive Director of NEW Water.

Using anaerobic digestion and other technologies, R2E2 will generate electricity from biogas, harvest and reuse heat and nutrients, resulting in an approximate 50% reduction in energy costs each year. Additionally, struvite – a combination of magnesium, nitrogen, and phosphorus naturally present in wastewater – will be harvested for commercial fertilizer, and will bring in additional non-ratepayer revenue.

Public tours will be available in the late fall of this year, and can be scheduled online at *www.newwater.us/education/tours*.

WHAT'S IN A NAME?

Given the new attitude of the organization, which includes a new philosophy of resource recovery as opposed to traditional wastewater treatment, it was time to think about the name.

Clocking in at 17 syllables, Green Bay Metropolitan Sewerage District is neither easy to say, nor particularly palatable. Turns out, people don't really like the word 'sewerage.'

"It was time to think about changing our name, to better reflect our values, and to better help tell our story," said Tom Sigmund.

So began a rebranding process. While well known to corporations, embracing branding as a principle tenet of doing business is a concept the water industry hasn't fully dived into yet.

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The hardest – but most important – stakeholders to bring on board were the internal staff at the organization. If the name were good enough for all these years, why change?

The rebranding process included market research, and surveys with staff, Commissioners, municipal and industrial customers, other stakeholders and community organizations. Research showed that 'water' is something people can rally around. 'NEW' is a Northeast Wisconsin moniker that refers to the region – and is used by many businesses and organizations including the NEW Zoo and the NEW North (an economic development organization). It's also a nod to the 'new' product sent back into the environment each day.

The new brand was rolled out in a tiered fashion: staff first, external audiences second. For staff, the new brand was unfurled at an all-employee briefing, with newly branded 'swag' for all – duffel bags and shirts. Next, a new sign at the front gate, media attention, and a brand launch during a community science expo, well attended by families on a Saturday. The new name has since been heralded by stakeholders as a refreshing change. Treatment Plant Operator magazine's editor Ted Rulseh penned an editorial, calling it a 'name change for the better.'

The name has helped open doors for another new initiative for the organization: Watershed work.

WATER KNOWS NO BOUNDARIES

With a *dead zone* plaguing the bay of Green Bay, new phosphorus regulations were imminent for NEW Water. Excess nutrients have created low oxygen, or hypoxic zones, which have led to fish kills and clumps of algae that pollute area waters and shorelines. In the bay of Green Bay, NEW Water is responsible for less than 3% of the phosphorus loading into the bay, with 97% coming from sources including urban runoff, agriculture, industries, and other wastewater facilities.

With fish kills, unpleasant odors, and health risks associated with these polluted waters, in came new regulations to curb phosphorus. NEW Water, as a point source, would be required to reduce its phosphorus loadings an additional 25% from its current discharge to the Fox River. A study commissioned by NEW Water determined that to meet these new regulations, additional facility upgrades would cost more than $100 million, yet reduce only a fraction of the total phosphorus heading out to pollute the bay.

"The traditional bricks and mortar approach to reducing phosphorus loadings would be extremely costly and yield little environmental good," said Bill Hafs, Environmental Programs Director.

Instead, NEW Water has capitalized on another option allowed by the Wisconsin Department of Natural Resources for point sources, called 'Adaptive Management,' to work out in the watershed to improve practices on the land to improve water quality before it reaches NEW Water.

To dip its toes into this new idea, NEW Water launched a new division called Environmental Programs. Bill Hafs and team sought a grant from the Environmental Protection Agency's Great Lakes Restoration Initiative, and succeeded, to the tune of $1.6 million, to launch a pilot project with partners in Silver Creek, a 4,800 acre-predominantly agricultural sub-watershed of the Lower Fox River Basin. NEW Water convened a plethora of partners from federal, state, local governments,

The Silver Creek Project has brought partners in Northeast Wisconsin together to improve practices on the land, to improve water quality. NEW Water's pilot project will wrap up soon, with further watershed plans in the works.

Erin Houghton, NEW Water's Watershed Specialist, helps educate stakeholders on efforts in Silver Creek.

and the Oneida Nation, as well as agronomists, nonprofit organizations, and academia. Partners include The Nature Conservancy, Ducks Unlimited, University of Wisconsin-Green Bay, U.S. Fish and Wildlife, and many more.

"The beauty of this project is in the many partners who have rallied together for the cause of improving water quality," said Erin Houghton, Watershed Specialist.

A water and biological monitoring program was set up to determine baseline levels of phosphorus, and to document the improvement in water quality throughout the life of the project. NEW Water is seeing, first hand, the water quality improvements that are possible as land use issues are addressed.

U.S. Congressman Reid Ribble praised the project in his Save the Bay initiative, as an example of a sensible approach toward environmental protection – working together locally to improve water quality more cost effectively. He narrated a NEW Water video about the project called 'Water Knows No Boundaries,' which is posted to *www.newwater.us/programs-initiatives/environmental-programs*.

As part of the Silver Creek Project, four wetlands restoration projects were included. Two whooping cranes have been observed in these wetlands by staff from the U.S. Fish and Wildlife Service, and the Oneida Nation.

"This is a sign of success in the wetlands. There aren't many of them left in the world – and we're honored by their visit!" said Hafs.

Next up in the watershed for NEW Water: Full-scale Adaptive Management.

"We believe Adaptive Management offers a sustainable approach to improving water quality. By working together with community partners, we can go further for the environment, improving the natural resources for our community to enjoy, at a lower cost to our ratepayers," said Hafs.

The next areas selected for watershed work are the Ashwaubenon and Dutchman Creek watersheds, which combined are nearly 10 times the size of Silver Creek. What's new and exciting about this initiative is that a portion of the watershed is urban which will bring storm water and urban runoff water into the discussion. NEW Water has already begun engaging municipalities in this watershed, and ideas have been met with a positive reception.

BEYOND COMPLIANCE: CUSTOMER ENGAGEMENT

NEW Water has found that stakeholder engagement is paramount to educating the community, moving projects along, and getting buy-in for efforts to protect water resources.

During the R2E2 Project planning process, NEW Water began connecting with and informing community stakeholders of the need for a new solids handling facility. What they found was that people may not always agree with what you have to say – but they will accept it if you include them in the conversation and the decision-making process. Quarterly update meetings for R2E2 were convened with stakeholders including municipal customers, significant industrial users, and the Greater Green Bay Chamber. The in-person interaction proved to be worthwhile, and greatly appreciated by customers. How did NEW Water know? Customers showed up at Commission meetings, and expressed gratitude for being included.

Given the success of the R2E2 stakeholder meetings, NEW Water decided to continue with quarterly meetings – and broaden the scope. Meetings are scheduled at the beginning of the year – and always have donuts. Representatives from municipalities and significant industrial users that NEW Water serves are invited, and staff experts present newsworthy topics happening in their purview. Many of these important community stakeholders stay afterwards to have a cup of coffee or bear claw, and most importantly, to chat with various NEW Water staff. Building these relationships has been key to keeping the community engaged, and informed.

Sara Georgel was recently hired as NEW Water's new Pretreatment Coordinator, and found that the in-person interaction has helped establish rapport with the industries in her program.

"I was able to meet significant industrial users face to face at the update meeting – it was really helpful to have a friendly introduction to them, prior to me heading over for an official visit to their company site," Georgel said.

KICK-STARTING THE CONVERSATION: EXTREME WEATHER, INFLOW & INFILTRATION

Heavy rains pummeling Northeast Wisconsin was a recent hot topic impacting NEW Water.

At the height of this weather event, NEW Water experienced peak flows at a rate of 167 million gallons per day, over four times its average of 38 million gallons per day. Shortly after midnight, NEW Water's De Pere Treatment Facility lost power. Given that the facility has limited storage, getting operations online and pumping water again was imperative to prevent homeowner backups out in the community. Flashlights in hand, and in partnership with the electric utility, staff rallied to get the plant up and running, and their teamwork succeeded.

"I want to commend our staff from many departments who jumped into action in the middle of the night to respond to this emergency," wrote Executive Director Tom Sigmund in a note to all staff. "True character is revealed during times of crisis. Thank you to all who helped prevent a significant public health emergency."

Fortuitously, an update meeting was scheduled for a week later. NEW Water leveraged the opportunity to bring its paying customers into the conversation. NEW Water shared the story that extreme weather events like this significantly increase the likelihood of backups. NEW Water – like so many other facilities around the US – simply was not designed to handle volumes of that magnitude.

Why is all that water getting into the NEW Water system? It's not like people are flushing their toilets repeatedly in the middle of the night.

Sigmund told customers: "We were at capacity with these rains. I can tell you, that's all clear water added to our system. And you are paying for that."

One of NEW Water's customers chimed in on the conversation. A backup had occurred at a home in an older home in his community. The culprit, most likely? The ghastly combo of heavy rains, saturated soils, and leaky pipes.

NEW Water has an ongoing Interceptor System Master Plan Project, where hydraulic modelling is finding

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the hot spots in the collections area where heavier flows are likely to cause problems. NEW Water is engaging its customers in the discussion, sharing data and explaining the connectivity of the entire system. As a wholesale provider of services, NEW Water has 15 municipal customers, spanning 285-square miles. What happens in one community impacts the next one – and that heads downhill to NEW Water, at the mouth of the bay of Green Bay.

With studies estimating that some 80% of the clear water enters the sanitary sewer system from the homeowner side, more extreme weather events will mean continued pressure on the collections system and treatment facility. Should plant upgrades be the solution, when the root cause of the excessive water coming in is outside the interceptor system?

"There are no easy answers to this," said Brian Vander Loop, Business Services Director. "This is truly a community-wide issue, and will require efforts and commitment from the community to address it. But first, they have to be aware that there is a problem."

EDUCATING, ENGAGING AND INSPIRING THE COMMUNITY

Raising awareness is a key component of NEW Water's educational and outreach efforts.

In addition to quarterly update meetings, NEW Water interfaces with the community at events to answer questions, and put a friendly face on the work of the utility. One big hit each year is the Einstein Science Expo, which draws some 5,000 attendees. NEW Water invited the Green Bay Water Utility to team up to host a joint educational booth, which features interactive activities for children. This year, children went fishing in mini-swimming pools with magnetic fish and poles – and meanwhile learned that all water is connected. While the children were busy playing, staffs from both utilities took the opportunity to talk about water with the captive audience – the parents.

"The opportunity to talk with the community about water in a fun setting is priceless," said Sharon Thieszen, Field Services Manager, who is part of NEW Water's Speakers Bureau. "They say things like 'I had no idea of the work you do.' And they often say 'thank you.'"

It's really gratifying to see that lightbulb go on in their heads when they realize what goes into cleaning water each day. It's like they stop for a moment, and don't take it for granted."

Getting the community to know NEW Water outside of rate increases, and/or a crisis situation is yet another reason for proactive outreach. One state legislator stopped by the joint water booth this year, and thanked staff for helping to educate the public about water.

An ongoing educational campaign for NEW Water is 'Love Your Pipes.' With each tour that comes through, each presentation, and each encounter, NEW Water uses the opportunity to talk about 'what not to flush,' in order to protect the system, and waterways. That ongoing campaign has received some attention, in particular for a holiday video in which staff sing 'O Love Your Pipes,' to the tune of 'O Christmas Tree.' See the video and campaign at *www.newwater.us/education/love-your-pipes*.

NEW Water leverages educational opportunities to address its greying workforce. In recent years, a significant

Aaron Eichhorst, NEW Water Treatment Lead, helms the role of "Commander Cleanwater" for the STEM Superheroes Camp.

portion of NEW Water's workforce has been retiring – with more on the near horizon. To address this loss of knowledge in its ranks, NEW Water has tried to stay ahead of the game, by teaming up on a Youth Apprenticeship Program with the State of Wisconsin and the Greater Green Bay Chamber. High school students work part-time at NEW Water, learning operations, while they take a course at Northeast Wisconsin Technical College. It's a program created in part by Bruce Bartel, Treatment Manager.

"Getting the younger generation excited about our industry is key to the continuation of a strong workforce," said Bartel.

Bartel also dreamed up the idea to create an educational program to reach a demographic not usually connected to wastewater. NEW Water reached out to the Boys & Girls Club, which began a partnership to address a community need for educational opportunities to learn STEM (science, technology, engineering, mathematics) skills. As STEM skillsets are used each day by NEW Water staff, Public Affairs & Education convened Speakers Bureau members from every division to help engage, educate, and inspire the children. The result? A STEM Superheroes Camp. The program includes fun, hands-on activities to learn all about water and STEM, skills that have been identified as a need for the jobs of the future. NEW Water Treatment Lead Aaron Eichhorst helms the role of 'Commander Clean Water,' who recruits the kids to defeat the villains, 'Sinister Sediment,' and 'Phosphorus Phury.' Staff love it too, and have reported feeling a greater sense of pride about working at NEW Water. (NEW Water is grateful to the Central States Water Environment Association's Wisconsin Section for a grant to help make this camp possible.)

In 2018, the camp celebrated its third year, with children earning 'Defenders of the Bay' certificates to learn about the value of water, and how to protect it. Children take their roles as defenders seriously, and many request to come back each year. Children learn the word 'watershed,' and many of them for the first time learn where their water comes from, and where it goes. And why it's important to protect it.

"How old do I have to be to work at NEW Water?" asked John, one of the participants, aged 11.

It's that kind of enthusiasm and inspiration NEW Water hopes for as it continues its journey, beyond compliance. CS

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Black River Falls, Wisconsin, USA

Optimizing Chemical Dosing Reduces Chemical Use While Meeting Effluent TP Limits

By Rick and Bill, Black River Falls WWTP Operators

Chemical, biological treatment, or a combination of both, is the common method for removing phosphorus in a wastewater treatment plant (WWTP). When using chemical treatment, metal salts are added which react with soluble reactive phosphate (for example, Orthophosphate) to form solid precipitates that are removed by physical processes, such as clarification and filtration. The required chemical dosing rate depends on factors such as the targeted effluent phosphorous concentration, the influent phosphorus load, and the amount of phosphorus that is being removed biologically.

YSI IQSN P700 Ortho-phosphate analyzer

The city of Black River Falls in Wisconsin used chemical treatment with ferric chloride ($FeCl_3$) to achieve their effluent total phosphorus (TP) permit of 1.0 mg/l. Historically, the chemical dosing rate was manually adjusted on a daily basis based on the measured effluent TP concentration. Besides the required manual labor, this method did not account for changes in influent loading, biological update or change in dosing requirement during weekends and holidays.

The plant was upgraded with an OSCAR process performance optimizer control system with phosphorus controller, which uses continuous measurement of orthophosphate using an YSI IQ SensorNet P700 analyzer to automatically adjust the chemical dosing rate to maintain a desired effluent TP concentration without overdosing.

PLANT DATA

The phosphorus removal at Black River Falls WWTP was monitored with influent TP concentration (measured weekly) and effluent TP concentrations (measured five days per week using laboratory wet-chemistry analysis). The chemical dosing rate was logged daily. Baseline data was gathered for one year prior to updating the plant. After upgrading with the OSCAR system, the phosphorus removal and chemical consumption was measured for an additional year.

PHOSPHORUS CONTROL SYSTEM

Using the OSCAR system with phosphorus controller, the chemical dosing rate was continuously adjusted based on the real-time effluent orthophosphate concentration. The target effluent TP concentration was set to 1.0 mg/l.

RESULTS

When the plant was upgraded to automatically adjust chemical dosing using a phosphorus analyzer, $FeCl_3$ dosing rate decreased over 45% despite the influent TP load increasing by 20% during the first year of operation. The plant dosed an average of 22.9 gallons $FeCl_3$/day before the control system and analyzer installation. Additionally, this plant dosed an average of 11.5 gallons/day caustic to recover pH. After the upgrade, chemical consumption was reduced to an average of 12.5 gallons per day $FeCl_3$ while still meeting the effluent phosphorus permit of 1 mg/l of TP.

In addition, the optimized dosing eliminated the need to add caustic. The reduction in ferric and caustic dosing resulted in a payback period for installing the analyzer and control system of less than 20 months.

CONCLUSIONS

This study showed that the use of an online orthophosphate analyzer, combined with automated controls, can reduce chemical consumption and costs while maintaining effluent quality. In addition, upgrading with automatic control provides greater visibility of the process and improved operational stability. The reduced cost of chemical at Black River Falls WWTP gave a payback for the investment of less than 20 months. CS

Test plant:	Black River Falls, Wisconsin
Design flow:	0.86 MGD
Test dates:	February 2014-January 2016

PROCESS CONTROL SYSTEM	
Before Upgrade	Manual control of FeCl3 dosing rate based on the daily effluent TP concentration.
After Upgrade	OSCAR system with phosphorus controller, automatically adjusting FeCl3 dosing rate based on the real time measured effluent orthophosphate concentration.

FeCl3 and caustic uses and costs

Before upgrade	
FeC_{l3} used	22.9 gal/day
Caustic used	11.45 gal/day
Annual costs	**$ 49,858**

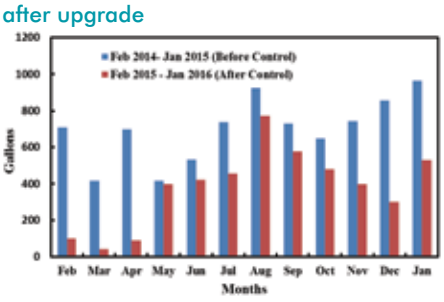
After upgrade	
Feb 2015-Jan 2016 FeC_{l3} used	12.5 gal/day
Feb 2015-Jan 2016 caustic used	0.0 gal/day
Annual costs	**$ 15,193**

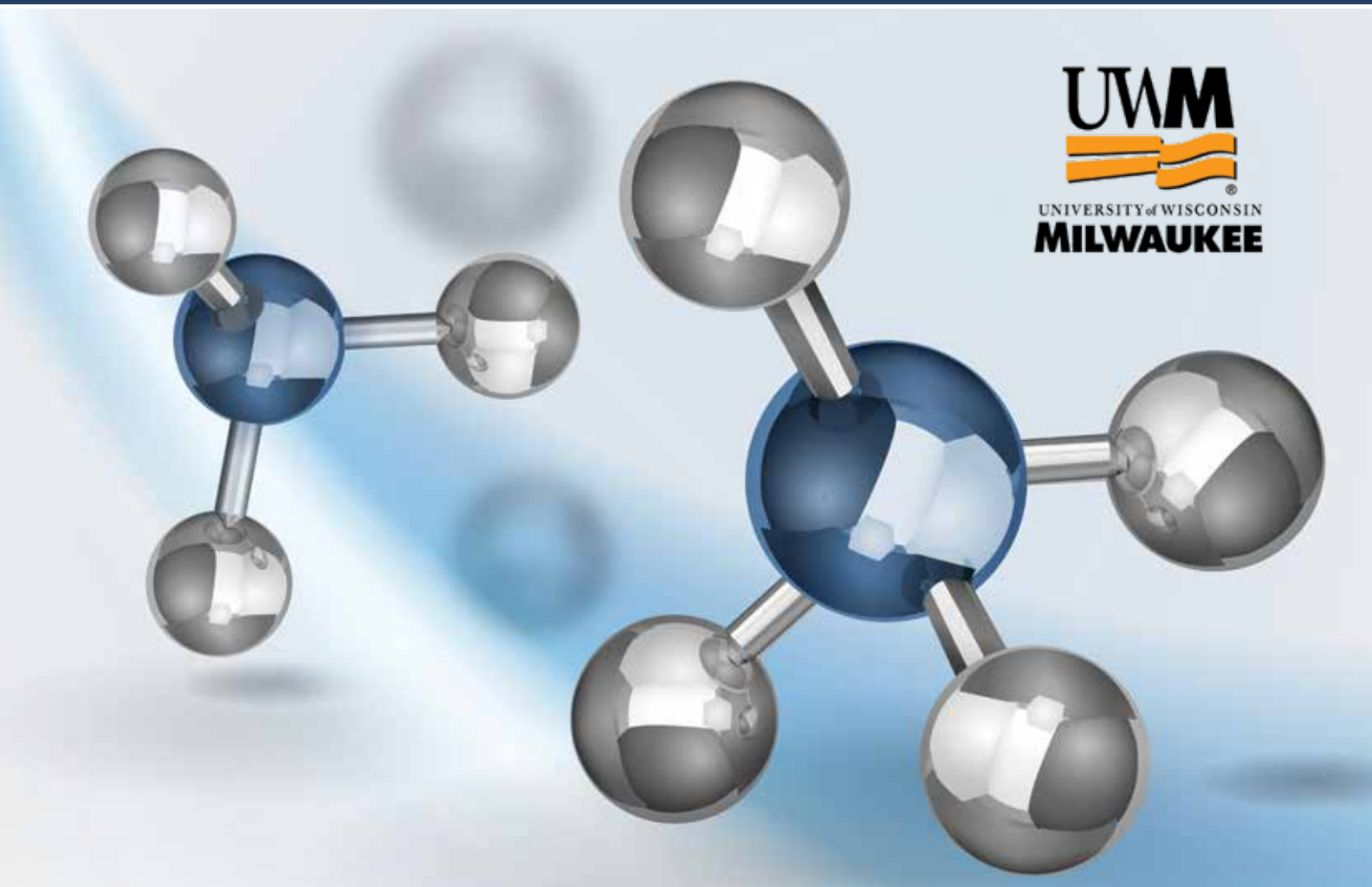
(Based on $FeCl_3$: $3.33/gal; Caustic: $5.27/gal)

Average effluent TP concentration

Before analyzer installation	0.50 mg/l
After analyzer installation	0.68 mg/l

Total FeCl3 used per month before and after upgrade





Methane Recovery from WWTP's Raw Biogas

Good for Energy Production and Even Better for Global Climate

By Md Abul Bashar, MSc, Civil and Environmental Engineering

Climate Change and Methane

While this article is being written another powerful hurricane is on the horizon. Hurricane Florence is beginning to bear down on the east coast of the United States. This category 4 hurricane has been predicted to cause enormous destruction and economic devastation through large portions of North Carolina, South Carolina, Virginia, and Georgia.

Hurricanes are no stranger to the region but the scientific consensus is the increased greenhouse gasses are making the hurricanes more potent by trapping more heat (energy) in the atmosphere and this, for example, is causing 500 or 1,000 year storms to occur more frequently (Bengtsson, Botzet, & Esch, 1996). Based on data provided by EPA, methane as a greenhouse gas (GHG) is 28-36 times more harmful to the environment based on its heat trapping capability than carbon dioxide (CO_2) and how long these gasses stay in atmosphere. As a result, it is imperative that we strive to prevent the release of uncontrolled methane from its sources into the atmosphere. Besides, as will be discussed here, methane is an excellent renewable energy source that can provide substantial amounts of energy.

Recovery of Methane from Raw Biogas

Methane has a high energy content of 55.5 MJ/kg as compared to 46.4 MJ/kg for gasoline. The beneficial use of biogas can be

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optimized by changing the energy content (low energy density) from a low-btu gas into a high-btu (high energy density) gas so that it can be utilized for various energy applications with more flexibility, the same as natural gas. This article outlines in some detail the beneficial energy use of methane produced from anaerobic digestion at wastewater treatment plants (WWTPs). Depending on the source raw biogas from anaerobic digestion, this gas will have a methane content of 50% to 60% and CO_2 of 40% to 50% on a molar basis (Bortoluzzi, Gatti, Sogni, & Consonni, 2014). If the methane content is upgraded to match its market competitor, these gases become essentially seamless in their energy use and applications. Comparing to other energy sources such as coal and gasoline, biogas is by far less prone to pollution. To make biogas interchangeable with natural gas, the CO_2 can be removed, then this upgraded biogas – otherwise referred to as renewable natural gas (RNG) – can be injected into the national gas grid or this RNG can be used for almost any industrial purpose.

Luckily, removing CO_2 is not extremely complex. Among many processes to upgrade biogas, based on simulation results from "Aspen Plus" computer software and analyzing the High Pressure Water Scrubbing (HPWS) process also known as 'water wash', the results indicate that this method could be a very attractive option for WWTP's to implement since they are already producing the biogas, WWTPs have the water supply, and the WWTPs can utilize this energy beneficially to be more energy self-sufficient and sustainable. This water wash process involves essentially running the impure biogas through pressurized water to absorb the CO_2 while the methane is insoluble by comparison. The process depends on the basics that CO_2 has a lower partial pressure than methane as described further in Henry's law of Solubility. One major advantage of water scrubbing is that, the entire process relies on readily available water supply and no other chemicals are really needed. It can also remove low levels of H_2S present in biogas. From the simulation results, the methane content can be improved as high as 98.7% at a pressure of 150 psi.

Challenges in Recovering Methane

There are more than five readily available technologies that are used in recovering methane. Physical absorption, chemical absorption, pressure swing adsorption (PSA), water wash, and membrane separation are the most common of them. While chemical absorption is amine-based, physical absorption is organic solvent-based like glycols (e.g. SELEXOL, Purisol, and Rectisol). Each method has their advantages and disadvantages, for example, purified gas from chemical absorption has high moisture content and the glycols in physical absorption form crystals in reaction with the ammonia present in raw biogas. On the other hand, PSA is a complex process and siloxanes present in raw biogas are damaging to the membranes.

Water wash has a number of advantages partially due to the simplicity using process and it is relatively inexpensive. To make the water wash work, pressure and temperature plays a vital role and Henry's law explains the relationship.

Henry's law is the relationship between the partial pressure and solubility in a gas-liquid phase. Introduced by English chemist William Henry, it states that, the solubility of gas into water is dependent on factors like pressure, temperature, liquid/gas ratio etc. According to Henry's law there is a linear relationship between the partial pressure of a gas and its concentration in dilute solution:

$$P_A = X_A * H_A \quad \text{..... (i)}$$

P_A = vapor pressure of component A above the liquid mixture
X_A = mole fraction of A in the liquid mixture
H_A = Henry's law constant

The relationship works best at lower pressure ranges. At higher pressures Henry's law is no longer valid in its simple form (Lekvam & Bishnoi, 1997), and temperature becomes a more crucial factor than pressure for gas solubility (Pierantozzi, 2003). Carbon dioxide solubility is the focus of this study, as it is the principal contaminant in raw biogas. Carbon dioxide solubility at high pressures under different temperatures is given in Figure (a)

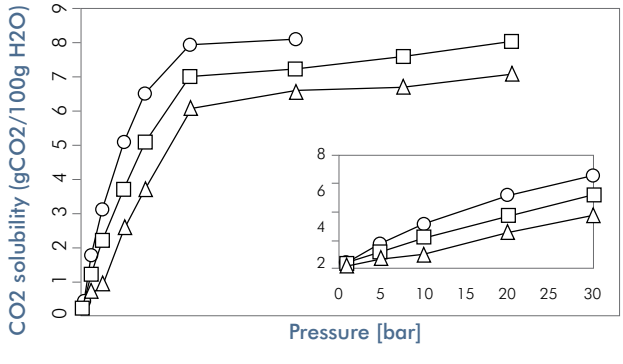


Figure (a): Solubility of carbon dioxide in high pressures under different temperatures (○ 0°C; □ 10 °C; △ 20°C) (Pierantozzi, 2003).

The other difficulty is Henry's constant for a specific gas is only valid at one specific temperature and plays a key role at higher pressure. After the temperature is increased, the solubility decreases and vice versa. The equation, introduced by Dutch Chemist van't Hoff, is one that can be used to get an approximation of how the solubility varies with the temperature (Sander, 2011).

$$K_H(T_2) = K_H(T_1) \exp\left[C\left(\frac{1}{T_2} - \frac{1}{T_2}\right)\right] \quad \text{..... (ii)}$$

In Eq. (ii), T_1 and T_2 are the absolute temperatures for the known and unknown constant respectively, and C is a specific coefficient which is defined as C=dln(kH))/d(1/T). For CO_2 in water, the value of C is 2,400. Figure (b) shows how the solubility of CO_2 changes between 10°C and 25°C according to Eq. (ii). As in the figure, the relative solubility is double at 10°C than at 25°C. A similar graph has also been published earlier (Petersson & Wellinger, 2009).

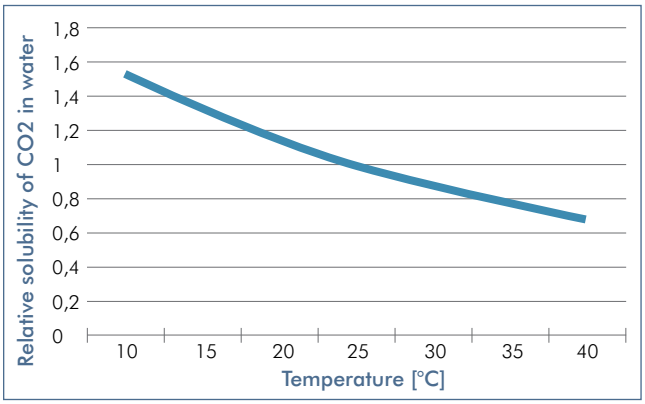


Figure (b): Relative solubility of CO_2 in water in the temperature interval between 10°C and 40°C. Solubility normalized to the value at 25°C.

Figure (b) shows that, the solubility falls sharply at lower temperature but in higher temperature it falls rather at a slower rate. As a result, to dissolve CO_2 a lower temperature is much favorable than a higher temperature.

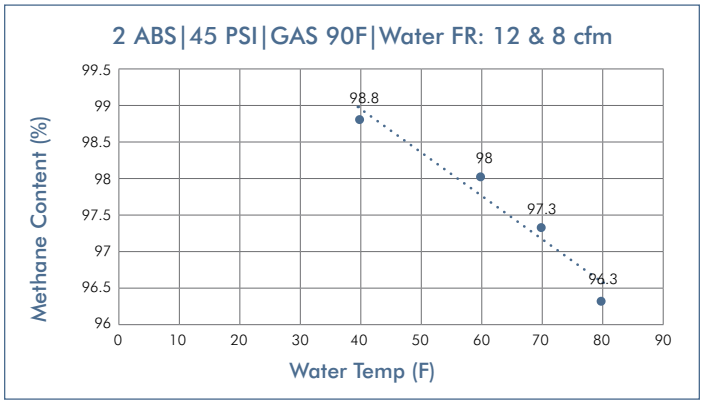
Modeling of Water Wash in Aspen Plus

Aspen Plus is simulation software used in oil and gas refinery engineering-process application as well as in pharmaceutical industry developed by Aspen Technologies. The physical property selection for modeling is a very important step in successful prediction of methane recovery. Among many models, the following thermodynamic models were tested: UNIQUAC, NRTL, NRTLRK (non-random two-liquid/ Redlich-Kwong equation of state with Henry's law), UNIQR (UNIQUAC/Redlich-Kwong equation of state with Henry's law); and ELECNRTL (Cozma at al.2014).

The success or predictability of a model depends on how well it can consider the variables like temperature and pressure as well as the mixture ratio and absorber internal setup. The selection of the models is supported by those parameters that are necessary to describe the gas solubility. The Electrolyte-NRTL activity coefficient model meaning ELECNRTL works best for simulations with electrolytes. ELECNRTL calculates liquid phase properties from the Electrolyte-NRTL activity coefficient model.

Based on the simulation for a system of two absorbers with 45 psi pressure following are the findings:

2 ABS|45 PSI|GAS 90F|Water FR: 12 & 8 cfm				
Water Flow Rate (cfm)	Biogas (cfm)	Water Temp (F)	Methane PDRTGAS(%)	Methane Loss (%)
12 and 8	20	40	98.8	0.55
12 and 8	20	60	98	0.55
12 and 8	20	70	97.3	0.55
12 and 8	20	80	96.3	0.55



The gas to water ratio for the mentioned scenario was 1 to 1 (1:1) meaning for two absorbers running at 12 and 8 cfm would purify 20 cfm of raw biogas. The raw biogas was considered to have 60% methane. The simulation result shows at a temperature of 40 deg F the purified gas can contain up to 98.8% methane with only 0.55% methane loss in the process (mostly slipped in water absorption process).

Phosphorus Recovery Integrated with Biogas Water Wash

Phosphorus recovery has been one of the biggest concerns in WWTPs. The primary concern is the environmental regulation and the secondary reason being phosphorus is a limited natural resource. The Wisconsin Department of Natural Resources (DNR) has approved the phosphorus effluent level of 1 mg/L for wastewater treatment plants under the *Clean Water Act*. However, the use of the biogas CO_2 by-product from this biogas water wash process to assist in facilitating phosphorous removal can be an added benefit of this process.

The common approach to recover phosphorous is by binding to the solid fraction of the digestate. It can be separated but because of the chemical environment it is in, it will form Struvite almost immediately. Struvite is a complex of magnesium with ammonium and phosphate ($MgNH_4PO_4.6H_2O$). And for a long time, it has been considered as a hindrance to the wastewater industry. It's only sparingly soluble in water, it precipitates both on pipework and as crystals in solution causing blockages which cannot be removed without significant and costly mechanical or chemical intervention. At present MMSD recovers phosphorus as Milorganite that has only 2.88% of P_2O_5 as compared to 28.92% in struvite.

Milwaukee Metropolitan Sewerage District (MMSD) treats 68.2 billion gallons of wastewater every year, which means about 180 million gallons every day. Jones Island treats a larger share of it (about 62-220 MGD depending on the season, based on data provided by MMSD).

Based on the data provided my MMSD (from May 2017 to April 2018) the average influent phosphorus concentration was 3.5 mg/L. Since lower pH can be facilitated by circulating the CO_2 by-product from this biogas water wash process to facilitate phosphorous precipitation as struvite, for an average 100 MGD wastewater and 2,000 cfm raw biogas at MMSD with the integrated process can recover approximately 1.5 tons of struvite per day which is estimated to be worth about $800 a day.

Conclusion

Overall, the study results have shown that biogas upgrading can be attractive to adopt at WWTPs where both the methane and CO_2 can be beneficially utilized so nothing goes to waste. The production

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cost of biogas varies but it has been estimated to be upwards of 25% of the value of product gas. The selection of upgrading technology depends on a number of factors when making a final process selection. The factors related to economics are the investment, operating and maintenance costs. There are also technical factors, which influence the placement of biogas upgrading plants such as the demand for heat and power generation, an existing facility that produces large amounts of heat that could be utilized by the biogas process.

After reviewing this water wash process in detail, it appears to be applicable to both large-scale plants and smaller plants based on the study. The pilot simulation offers a better understanding of the process. For small-scale plant process the lowest amount of biogas that was modeled was 20 cfm. A pilot is underway in Jones Island WWTP in Milwaukee this fall. The water wash pilot will be conducted by Energy Tech Innovations based on this study.

Acknowledgements:

First, I would like to thank my advisor Dr. Jin Li from University of Wisconsin Milwaukee for her effort with this work. I would also like to thank Mr. Bryan Johnson from Energy Tech Innovations, LLC (see www.energytechinnovationsllc.com) for his tireless energy and many recommendations that made this work possible. I would like to express my appreciation to CSWEA for their support and the WEF Student Design Competition for giving me a platform to showcase my work. My gratitude to Mr. Mike Holland, Mr. Mohammed Haque, and Mr. Pono Hanson for the whole process. Finally, I would like to thank Mr. Matt Magruder from MMSD for providing valuable data from the Milwaukee Metropolitan Sewerage District (MMSD) used in this study.

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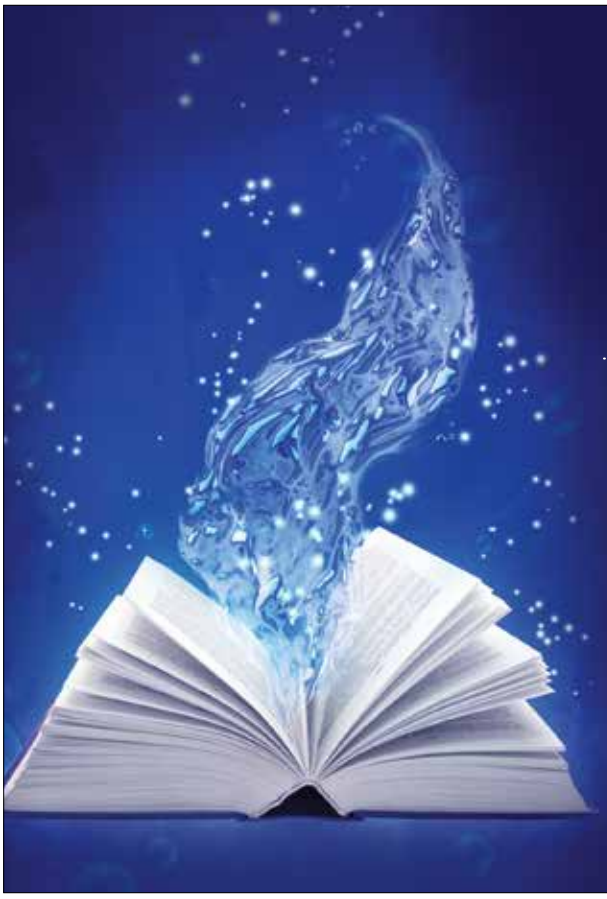

$1,000 SCHOLARSHIP

As the publisher of *Central States Water* magazine, we at Craig Kelman & Associates have a deep appreciation for our readers and members of CSWEA whose task it is to ensure that water taken from and put back into our precious Mother Earth is clean and safe for the people, animals and plants whose very existence depends upon it.

To demonstrate our admiration and respect for the association, its members and the water industry as a whole, we have established a yearly educational scholarship of $1,000 to be funded through a percentage of advertising sales generated in *Central States Water.*

On behalf of the publishing professionals who form part of our team, as well as our advertisers who use the pages of *Central States Water* to convey their important messages, we look forward to helping a worthy individual further their education in the water industry.

LIFT Spotlight:
Schreiber's *Fuzzy Filter*

The INNOVATION & TECHNOLOGY COMMITTEE will regularly solicit articles for publication in the *Central States Water* magazine regarding new water technologies and innovation in the water field and will help promote CSWEA Leaders Innovation Forum for Technology (LIFT) engagement. This first article focuses on an innovative activated sludge process, a granular sludge process, which allows for multiple process benefits to be realized. This is one of the innovative technologies in LIFT Link. LIFT Link was developed by the Water Research Foundation (WRF), then known as the Water Environment Research Foundation. LIFT Link is part of the WRF/WEF LIFT (*www.werf.org/lift*) program to accelerate innovation into practice. LIFT Link is an online platform which serves as a conduit of interaction among municipal and industrial water, wastewater, and stormwater agencies, technology providers, consultants, academics, investors, federal agencies, and others for advancing innovation. LIFT Link allows its users to discover new technologies and research needs; connect with others with similar needs, technology interests, and desired expertise; and collaborate on research and technology ideas, proposals, projects, demonstrations, and implementation. If interested in accessing LIFT and gaining a login please reach out to Mohammed Haque at *mhaque@cswea.org*.
Look for more innovative articles in the near future.

Schreiber's *Fuzzy Filter*® is an innovative and cost-effective filter that uses a media bed of individual compressible spheres made from high-grade polymer fiber. There are over 250 full-scale installations in North America. In the Central States Region, the Fuzzy Filter has been installed for tertiary treatment at wastewater plants in Illinois, and has been piloted in both Minnesota and Wisconsin.

High Rate Filtration

The Fuzzy Filter operates at a very high rate (30-45 gpm/ft2) as compared to other filtration systems (2-6 gpm/ft2). The design is compact and modular which offers significant cost savings on an installed basis. The filter is applicable to a wide variety of water and wastewater applications including:

- Tertiary
- Water reuse
- Combined sewer overflow/ stormwater treatment
- Primary effluent/carbon diversion
- Industrial process applications
- Pre-filtration to RO and membrane systems

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Effective Solids Capture

The media is retained between two perforated plates. The bottom plate is fixed while the top plate is moveable allowing the amount of media compression to be varied. The media closer to the moveable plate at the top is more compressed creating a porosity gradient. Larger particles are captured near the bottom of the bed and finer particles are captured near the top of the bed. The effect is a multi-media filter with a single media. The more compression, the smaller the pore size within the media and the smaller the particle that can be filtered (~4 micron).

Pilot Testing

We offer trailer mounted pilot plants to test actual process streams and demonstrate actual filtration rates and solids removal efficiencies. Pilots done in Pennsylvania and Wisconsin have demonstrated total phosphorus results as low as 0.05 mg/l. Startup of the full-scale Pennsylvania plant is scheduled in early 2019. Most recently pilot testing was conducted for mercury removal at the Western Lake Superior Sanitation District in Duluth, Minnesota.

Effective Backwash

During backwash the top plate is raised to create space for the media to move and effectively dislodge solids. Air scours in concert with wash water injection the filter media is cleaned easily using very little wash water (~2% of treated water). Influent water is used to wash the media, which eliminates the need for a backwash water storage tank.

After the washing cycle, the media is returned to its compressed state and filtration is resumed. The media has a life of 10 plus years, at some of our earliest installations of the media have been in service 15 years or more. Annual to semi-annual detergent cleaning can prolong its lifespan.

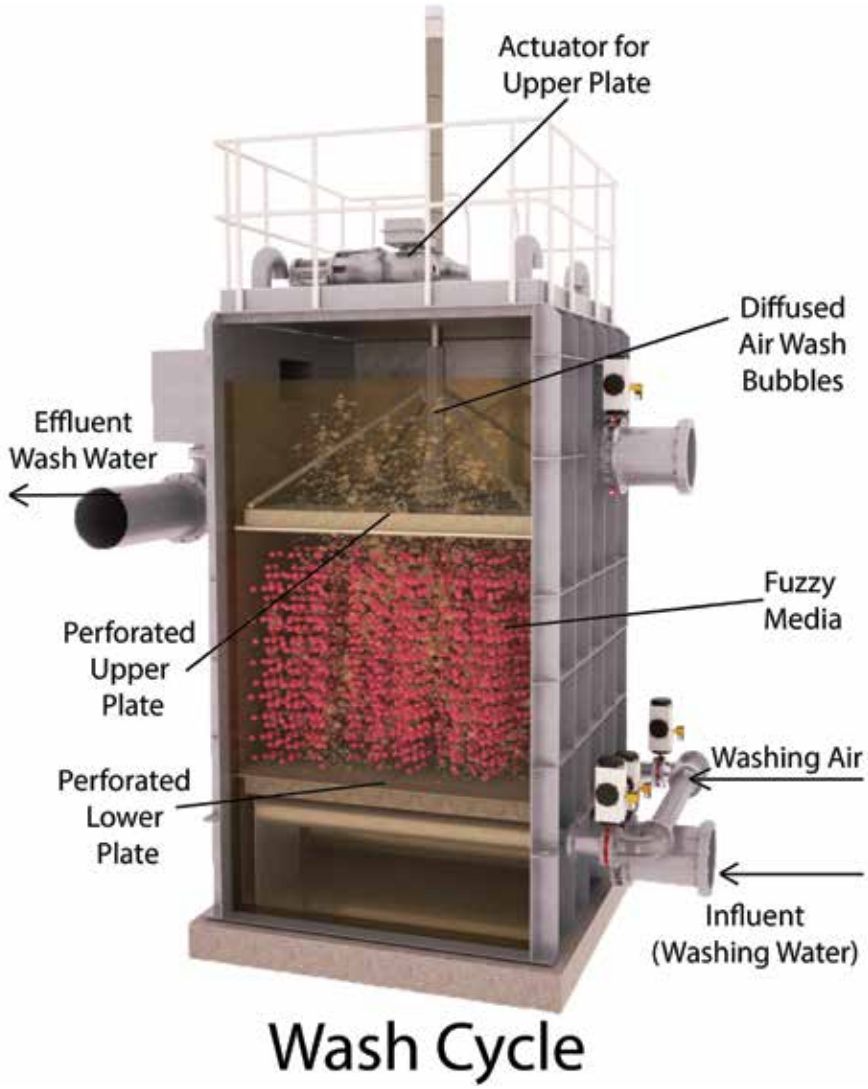
PLC based Control System

The system is completely automated. Backwashes occur based on pressure or time. Filter use is optimized based on the flow to the system. The operator can very the amount of media compression at the touch of a button. The simplicity of the Fuzzy Filter design makes the system very operator friendly. Benefits of the system are:

- High filtration rate (30-45 gpm/ft^2)
- Low effluent phosphorus
- Small footprint
- Effective solids capture down to four microns
- Adjustable media compression for optimum performance
- No backwash water storage tank required
- No media loss during backwash

These and more features are why the Fuzzy Filter has one of the lowest total ownership costs as compared to other filters currently on the market.

Schreiber LLC is a process company serving industrial & municipal markets since 1979 that offers wastewater treatment solutions through the application of energy-efficient and innovative equipment/process technology. This ranges from headworks to tertiary filtration. All products are made in the US at fabrication facilities located in Trussville, Alabama. The company's treatment processes such as the *Continuous Sequencing Reactor*, *Grit and Grease*, and *Fuzzy Filter* combine effectiveness and efficiency to produce the industry's highest quality products. For more information, visit *www.schreiberwater.com*. CS



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Thriving Despite Low Numbers

Women are underrepresented in water sector, data says

By Katherine Saltzman

The water sector employs significantly fewer women than the national average of all workers, according to the report, *Renewing the Water Workforce: Improving Water Infrastructure and Creating a Pipeline to Opportunity,* published in June 2018 by The Brookings Institute (Washington, D.C.).

According to the report, 46.8% of workers across the US are women, though women "only account for 14.9% of the water workforce." Furthermore, the occupational breakdown of women in water is skewed. "While women make up a majority of water workers in certain administrative positions – including 95% of secretaries – they only account for a fraction of employment in some of the largest water occupations overall, including plumbers (1.4%) and water treatment operators (5.2%)," the report says.

Successful women on the job

Joanna Healy, a Grade 4 certification Operator at the McDowell Creek Wastewater Treatment Plant, which is operated by Charlotte Water in North Carolina, began her career in the mailroom at the Hoover Dam in Nevada. Soon a position testing water and wastewater samples opened, and she took it. Later she moved into compliance reporting. Healy then transferred to a community college where she received an associate degree in Applied Science in Wastewater Treatment before moving to North Carolina.

"Usually there aren't a whole lot of us in the classes," Healy said. "In the maintenance tech class there were over 60 students and I was one of two females."

Healy attained her Grade 4 certification in 2.5 years by earning her associate degree. She also received a Pretreatment and Maintenance Tech 1 certification and plans to get a Pretreatment and Maintenance Tech 2 certification.

Despite few women in her classes, Healy said that she has received support and mentorship from trainers and colleagues throughout her training and career in the water sector.

"I think it's really neat that women can do anything men can do," Healy said. "That's what I tell my daughter. You can do all the things the guys can do, but you don't have to prove yourself to anyone."

Tara Romine started working at Charlotte Water in October 1990 as a laborer. An operator position later became available and she received on-the-job training to become qualified; more formal training was not readily available then, Romine said. By July 1998 she had received her Grade 4 certification and in 2000 took on the responsibility of first chief operator at Mallard Creek Water Reclamation Facility for Charlotte Water. When the facility became the first ISO certified plant in Charlotte Water, she assisted with the development and creation of the ISO program. In her role, Romine helps implement standard operating procedures and creates work instructions and procedures for new operators in addition to many other responsibilities.

Romine said her career in water has been filled with strong relationships and rewarding opportunities.

"I was always treated well," Romine said. "The gentleman that I train have given me the utmost respect. It has been a very good working environment for me. I feel like I have really been given a gift to serve the community."

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Barriers to entry

The Brookings report includes overall recommendations on improving gender and racial diversity in the water sector. These include increasing the visibility of the sector for younger students, creating more opportunities for workforce training, and expanding career paths for professionals in the water workforce.

However, the report stops short of forming conclusions on why so few women are in the water workforce.

Kalpna Solanki, CEO of the Environmental Operators Certification Program, suggests that Canada faces similar obstacles to the US in terms of recruitment, training, and retention, especially for female employees. Solanki's non-profit organization classifies water and wastewater facilities in British Columbia and Yukon and certifies the operators who work in those provinces.

"Very often people literally fall into the career. It wasn't necessarily a planned path. It would be better if it was proactive rather than reactive," Solanki said.

Often information on these water jobs are heard about at the Canadian equivalent of city or state departments of parks and recreation or departments of sanitation with majority male staff, she responded, "[Men] get into the [water/wastewater] workforce because they happen to be there," she said. "There are not many women [here], so the result is fewer women going into the field from that point."

Solanki echoed the Brooking Report's message that women's job descriptions within water sector are skewed. While things are changing and most female operators love their jobs, she said that she is aware of some situations of discrimination and harassment in the workforce.

"If 10% of the water workforce is female, their number is not spread evenly among the four major area specialties: water treatment, water distribution, wastewater collection and wastewater treatment," she said.

"I would be surprised if more than 1% is female in wastewater collection and 1% to 2% of women in water distribution," Solanki said. "Within that 10% of female operators, there are some specialties that have almost no women at all."

Overcoming entrenched attitudes

Even though Canada has workforce standards in place at public utilities, each employer at the utility must reinforce rules and guide employees on proper workplace behaviors. This is especially true if women have historically been underrepresented in the specialty area.

"Some of the feedback I have received from women especially in water distribution and wastewater collection, [is that] the problem often lies at the employer level," Solanki explained,

"The support mechanisms are not in place in where women are just parachuted into the workforce. The men are not prepared for this change [and] are not educated with regards to workplace harassment. The women are not properly trained in terms of what is acceptable and what is not acceptable behavior and what resources are available to them."

In June 2018, Solanki participated on a panel discussion during a workplace diversity workshop at the Canadian Water Summit. Topics included how to promote the field in general as well as to women; it also dealt with how to better recruit and integrate women in areas of the water sector where they are currently underrepresented.

"Most of the women that I meet like the work, are good at it, and like the variability of the job – there are no two days that are the same." Solanki said, "We do hear of a few women who face harassment but, in general, most women are happy and really enjoy being in the field."

Amanda Schuffels serves as an example of a happy newcomer to the water sector. In January 2018, she took on the role of full-time Grade 1 wastewater operator at the Kelowna Wastewater Treatment Facility in British Columbia, Canada. Previously she had worked in co-op training positions and part-time roles at the utility.

"A lot of men and women have taken me under their wing and have taught me what I needed to learn so that I can strive in my position, she said. "I love the job and industry."

Despite their lower numbers, female operators and utility leaders are at the forefront of the sector. These women prepare and train new employees, support innovations and technologies, manage the day-to-day operations of their facilities and support the environment and public health for communities across the world.

Katherine Saltzman *is a publications assistant at the Water Environment Federation (Alexandria, Va.) where she works on WEF's Operator Initiative programs.* CS

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CSX 2018 **RECAP**

BY DAVID ARNOTT

The Central States Exchange was held on July 26 and 27, 2018 at the Kalahari resort in Wisconsin Dells. The meeting started at noon on the 26 and ended at noon on the 27. The first day discussion ended at 5 pm. Then there was social time later this night and a chance for family members to enjoy the water park. We had a good mix of members from all three state sections and strong representation from municipalities, utilities, academia, manufacturers, and engineering consultants.

We discussed numerous topics. Three main issues were discussed in depth; further adjusting the Annual Meeting schedule, involvement of Young Professionals, and State Section Exchanges.

As for the Annual Meeting schedule, many changes were made to the 2018 meeting compared to the 2017 meeting. In summary, the main previous change was reducing the overall meeting duration from four days to three days. In general, people liked the reduced meeting with streamlined schedule. However, there is still opportunity to further improve the 2019 Annual Meeting.

Members agreed that there were too many activities on the afternoon of the first day. We were competing with ourselves for attendance at the many events. In the next years, the Executive Committee meeting will be moved from the morning of the first day to the afternoon before the first full day. As well, the workshops will not be on the first afternoon. The leadership workshop in particular, will be moved back the day before the education seminar in April. The afternoon events the first day will consist of a plant tour and a storm water tour. The tours will be designed to be high quality with a short classroom presentation, followed by a visit to a real-life application. Golf and the service project will start earlier in the morning the first day. The 7S, golden manhole, young professional, and global water stewardship meetings will take place late afternoon. The timing of the previous events of the day will be adjusted so there is plenty of time to attend these late afternoon meetings.

On top of all that, the Association luncheon will move from the second day to the third day. The change will allow a more even distribution of Association events throughout the meeting. On the third day, the exhibits will end just before lunch and will not extend into the afternoon.

We these small changes, the Annual Meeting will expand its potential and become even greater.

The agreed schedule for the 2019 Annual Meeting is summarized below.

Also at the Central States Exchange, Young Professionals and their involvement with the Association was an important topic. It was agreed that most YPs want to just be told what to do and they need clear direction from seasoned professionals. It is important for seasoned professionals to explain to them why it is important to see new things and meet new people. Seasoned professionals need to take initiative.

Members also discussed the 'go see it' concept. Ideas for things to see are a manufacturer, a representative or distributor, a WWTF, and storm water features with green infrastructure.

The idea of a webinar explaining the framework and organization of WEF, CSWEA and the State Sections was also discussed. Many YPs don't understand the interrelationship of the three entities, and get lost in the acronyms. Webinars are especially useful because many YPs don't have the ability to leave their place of work for an event like seasoned professionals do. Webinars can be a good way to overcome this obstacle.

The meeting also included a discussion of the concept of a State Section Exchange. The idea of this event is that state sections leaders come together and identify ways to enhance and improve state activities. Similar to the WEFMAX where Member Associations exchange ideas and Central States Exchange, where the states within our association exchange ideas, a State Section Exchange would be where best practices between state sections committees and leaders are shared. The event has been successful in Minnesota. Illinois and Wisconsin are seriously considering the idea as an add-on to an existing meeting.

Overall, Central States Exchange 2018 was successful. There are several key action items that came out of the meeting. I will be working on implementing the action items with key people in the next several months to make us an even stronger Association.

Thank you to all who took time out of their busy schedule to attend Central States Exchange 2018. CS

Day	AM	PM	EVENING
Pre-Conf		Ex Com Mtg	
1	Golf Outing (10 am) Service Project (10 am)	Plant Tour (1 pm)	Meet & Greet/Social (6:30 pm)
		SW Tour (1 pm)	
		7S/GM/YP/GWS Mtgs (4:30 pm)	
2	Tech Sessions	Tech Sessions	Awards Banquet
	Exhibits	Exhibitor Box Lunch	
		Exhibitor Reception	
3	State Section Mtgs	Exhibits (ends at 11:45 am)	
	Tech Sessions	Association Luncheon	
	Exhibits	Tech Sessions	

92nd Annual Call for Awards

Our role in protecting the public and the environment are often undervalued and invisible to the very public that we protect. Whether in design, academia, equipment manufacture and supply, management, or operations, we all know individuals who have successfully addressed unique and challenging issues. Our awards program offers the opportunity to receive recognition for these deserving professionals.

A top priority of CSWEA each year is to recognize the efforts of our members and water and wastewater professionals at all levels. We also seek to provide top-quality nominees to the Water Environment Federation (WEF) each year for national level recognition. Don't miss the opportunity to provide recognition to deserving water quality professionals. It's time to brag a little bit about the accomplishments of our members. To nominate someone is straightforward; fill out the nomination form at *www.cswea.org* with as much information as possible and submit it to CSWEA.

In order for you or a deserving colleague to be recognized, please submit a nomination to the Central States Water Environment Association and/or WEF for one of the many awards available.

Below is a listing of the award opportunities. Please carefully review the various awards available and nominate one of our many deserving members. Please note that award submittals need to be made by November 17, 2018 for awards presented by CSWEA to allow distribution to the respective CSWEA or WEF Awards Committees for consideration. CSWEA will present the winners with their awards at the 92nd Annual Meeting Awards Banquet.

2019 CSWEA & WEF Award nominations now being accepted

Nominations are now being accepted for the following WEF awards and should you be aware of a worthy nominee we ask that you please nominate them. Note that it is OK to self-nominate. Each award is briefly described below and complete information may be found on the *www.cswea.org* website.

WEF AWARDS presented at CSWEA Awards Banquet

Arthur Sidney Bedell Award:

The Bedell is a federation award that is given annually to one recipient in recognition of outstanding achievement in the sewerage and wastewater treatment works field, as related particularly to the problems and activities of the member association. The Bedell Award Subcommittee selects the nominations, and the award is presented at the CSWEA Annual Meeting.

William D. Hatfield Award:

The Hatfield Award is a federation award given annually to one recipient in recognition of outstanding operation of a wastewater treatment plant. Each State Section may nominate one person per year and submit it to the Hatfield subcommittee. This award is presented at the CSWEA Annual Meeting.

George W. Burke Safety Award:

The Burke Award is made annually by WEF to a municipal or industrial wastewater facility for promoting an active and effective safety program. Each State Section Committee can nominate a facility and the nominations are then sent to the general awards committee. The winner will be presented with the Burke Safety Award at the CSWEA Annual Meeting.

Lab Analyst Excellence Award:

This is a WEF award that is given annually to one recipient in recognition of outstanding achievement in the area of water quality analysis. Each State Section Laboratory Committee may nominate one person. This award is presented at the CSWEA Annual Meeting.

CSWEA AWARDS presented at CSWEA Awards Banquet

Radebaugh Award:

The Radebaugh Award is given to the author of a deserving paper presented at the previous year's annual meeting. The Radebaugh Award Subcommittee selects the winner from nominations received and the award is presented at the CSWEA Annual Meeting.

Operations Award:

The Operations Award is a Central States award that is given annually to one recipient in each state. The purpose of this award is to recognize operators of wastewater treatment facilities who are performing their duties in an outstanding manner and are demonstrating distinguished professionalism. The States Sections'

Committee makes the selection and each State Section winner will receive the award at the CSWEA Annual Meeting.

Industrial Environmental Achievement Award:
The award is given at the CSWEA Annual Meeting to one industry per year in recognition of outstanding contributions in waste minimization, pollution prevention, environmental compliance, and environmental stewardship. Each State Section Industrial Committee may nominate one facility per year.

Bill Boyle Educator of the Year Award:
This award is given to one teacher per year in recognition of outstanding education assistance to students of any level in the study of the water environment. The award is presented at the CSWEA Annual Meeting.

Collection System Award:
This award is given annually to one member from each section in recognition of outstanding contributions in advancing collection system knowledge and direct or indirect improvement in water quality. Each State Section Collection System Committee can nominate one individual per year with the selected candidate receiving the award at the CSWEA Annual Meeting. The recipient of the Association Award shall be nominated annually for the WEF Collection System Award.

CSWEA Outstanding Young Professional Award:
This award is given annually to one member from each state section in recognition of the contributions of young water environment professionals to CSWEA and to the wastewater collection and treatment industry. This award is presented at the CSWEA Annual Meeting.

Academic Excellence Award:
The Academic Excellence Award is given to one student per year from each eligible institution in the state section hosting the Annual Conference. (Wisconsin is hosting the next conference.) An eligible institution shall be a college or university having a recognized graduate or under- graduate program in engineering as accredited by the Accreditation Board for Engineering and Technology. The candidate shall be selected by the department chair or other designated person at the eligible institution. Selected candidates are able to attend the CSWEA Annual Meeting with expenses paid, to receive their award and scholarship.

Central State Section Safety Award:
The CSWEA Facility Safety Award is made annually by CSWEA to a municipal or industrial wastewater facility within each State Section in recognition of active and effective safety programs from Burke Award submissions and the awards are presented at the CSWEA Annual Meeting.

Water Stewardship Award: This award recognizes and honors the contributions of an individual for outstanding humanitarian service to improving and sustaining our global water environment.

Sustainability + Green Infrastructure Award:
Established in 2017, this award recognizes and honors the contributions of an individual for projects at their organization that support sustainability in the water environment or make use of green infrastructure in the design of water reclamation facilities or in water treatment processes.

WEF AWARDS presented at WEFTEC

Charles Alvin Emerson Medal:
This award is presented by WEF to an individual whose contributions to the wastewater collection and treatment industry most deserve recognition. Areas of involvement include membership growth, water resource protection, improved techniques of wastewater treatment and fundamental research.

Harry E. Schlenz Medal:
This award is presented by WEF and recognizes the achievements of an individual outside of the water environment profession, who takes up the banner of environmental public education. This person is typically in the journalism, film or video production field.

Richard S. Englebrecht International Activities Service Award:
This award is presented by WEF and recognizes sustained and significant contributions to the furtherance and improvement of the activities of the Water Environment Federation in the international field. CS

Operations Challenge 2018

By Chris Lefebvre

WEFTEC 2018 is home to the 31st Annual Operation Challenge Competition. This year's competition will once again consist of five events designed to test the mental and physical abilities of the competitors. There are 10 Division I teams and approximately 30 Division II teams that compete annually from around the world in the contest many refer to as the *Wastewater Olympics*.

The first day of the competition consists of the process control and laboratory events. The process control event is a written wastewater exam. The exam consists of multiple choice, short answer math, and scenario questions as well as process control adjustments on a computer simulation program. Each question is given a point value based on difficulty and teams are given 20 minutes to earn as many points as possible. The teams continue to the laboratory event, where teams are timed to see how fast they can properly analyze 12 samples for alkalinity and ammonia. Precision and proper lab procedures are very important in this event. WEFTEC judges watch each team to ensure that no mistakes are made. If a procedural error does occur, it results in penalty time being added to the team's final time.

Day two consists of the safety, maintenance, and collections events. The safety event is a simulated confined space rescue. In the maintenance event competitors will be troubleshooting a lift-station control panel and replacing an impeller on a submersible pump. Lastly, the Collections event, a crowd favorite. Teams simulate the repair of a broken 8" PVC sewer main and install a 4" sewer lateral connection to the repaired pipe with nothing but hand tools. These events are all timed, judged, and penalized similarly to the laboratory event. After all of the events are completed the scores are added up and the winners are announced. This year's teams will have big shoes to fill after the phenomenal showing by the CSWEA teams over the past two years. At WEFTEC 2016 the Shovelers earned second place in Division II in the process control event, third place for the laboratory event, and CSWEA also won the award for best fan support. WEFTEC 2017 saw the Pumpers destroy the competition for Division II first-place finishes in the laboratory and process control events. If you are going to be in New Orleans for WEFTEC 2018, please stop by and support your CSWEA Operations Challenge teams.

2018 TEAM MEMBERS

CSWEA Pumpers

- Luke Markko (Captain) – Northern Moraine WRD, IL
- Joe Watson – NEW Water, WI
- Brent Perz – Baxter and Woodman, IL
- Dan Hughes – Carol Stream WRC, IL
- Chris Lefebvre (Coach) – Stevens Point, WI

CSWEA Shovelers

- Wade Lagle (Captain) – Urbana & Champaign SD, IL
- Marc Zimmerman – Janesville Wastewater Utility, WI
- Matt Streicher – Glenbard Wastewater Authority, IL
- Jason Neighbors – Glenbard Wastewater Authority, IL
- Tom Dickson (Coach) – City of Oconomowoc, WI CS

YP Brewers Outing

CSWEA 2018 EVENTS CALENDAR

OCTOBER

WWOA Annual Conference
October 16
Grand Geneva Resort
Lake Geneva, WI

IL Operations Seminar
October 31
Wheaton Sanitary District
Wheaton, IL

NOVEMBER

MN Conference on the Environment
November 7
Minneapolis Convention Center
Minneapolis, MN

WI Resource Recovery Seminar
November 14
New Water
Green Bay, WI

WI Stormwater and Watershed Webinar
November 15
Marquette Global Water Center
Milwuakee, WI

WI Section Annual Business Meeting
November 15
Global Water Center
Milwuakee, WI

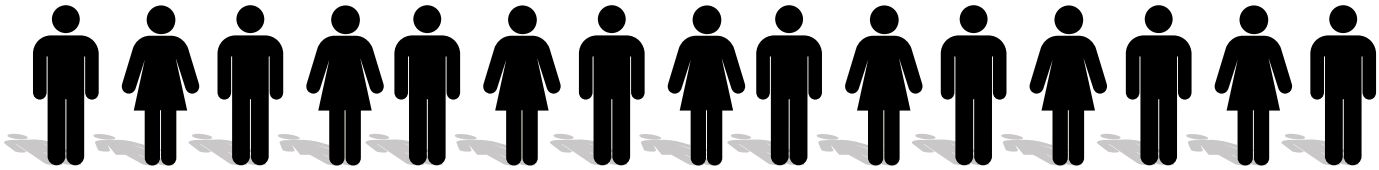
MAY

CSWEA 92nd Annual Meeting
May 14-16
Monona Terrace
Madison, WI

For up-to-date CSWEA events,
visit our website ***www.cswea.org***

CSWEA Welcomes Our New Members

Updated on October 14, 2018



July 2018

Ryan Stenjam, Montgomery Associates
Nicolas Nadelhoffer, Milwaukee MSD
Ellen Weigel, Wenck Associates
Nathan Dornfeld, Rempe Sharpe
Anne Hunter, Symbiont
Scott Johanning, Milwaukee MSD
Andy Kaminski, Milwaukee MSD
Javier Mulero, University of Illinois – Urbana & Champaign
Alana Rosenbaum, University of Illinois – Urbana & Champaign
Wessam Sadoun, University of Illinois – Urbana & Champaign
John Brockgreitens, University of Minnesota – Twin Cities
Tatiana Eliseeva, Badger Mining Corporation
Kim Breid, Badger Mining Corporation
Andrew Dennerlein, City of Racine
Daniel Mason, City of Racine
Maaria Firdaus
Kate Karaman
Ahana Narayanan
Oliwia Nazaruk
Maha Syed
Robert Szymczyk
Halli Heimbuch
Avni Jain
Haley Jostes
Stanley Kohls
Joshua McClaren
Manashree Padiyath
Levi Leonard
Abigail Warwick
Shivani Venkatraman
Elise Prange
Dawson Grohall
Hunter Bindas
Alyssa Rutzinski
Manasvi Thumu
Katelyn Holmberg, SEH, Inc.
Dylan Friss, Xylem

August 2018

Harry Domask, Walcomet
Evan Chambers, Town & Country Engineering
Will Lynn, Marquette University
Eileen Kennedy, Marquette University
Taylor Valencia
Joe Watson, NEW Water – Green Bay MSD
Sara E Georgel, NEW Water – Green Bay MSD
Natalia Taft, City of Racine
Eric Osterdyk, Wenk & Associates
Richard Olson, City of Owatonna
Joshua Johnson, Bollig Inc
Elizabeth M. Ebert
Jessica Zemen
Sheri Scott, MSA Professional Services
Paul M Hudalla, City of Minneapolis
Huy T Le, City of Minneapolis
Kevin Danen, City of Minneapolis
Lillian A Rouillard, City of Minneapolis
Sean E O'Berg, City of Minneapolis
Jason Ruffatti, Baxter & Woodman
Emma Flanagan, Envirocleen

CALL FOR ABSTRACTS

92nd ANNUAL MEETING

2019 CSWEA ANNUAL MEETING

MONONA TERRACE – MADISON, WISCONSIN

MAY 14 TO 16, 2019

This is a request for abstracts of papers to be considered for presentation at the 92nd Annual Meeting of the Central States Water Environment Association, Inc., held May 14 to16, 2019 at Monona Terrace in Madison, Wisconsin. To receive consideration, abstracts must be submitted online **before Thursday November 1, 2018.**

The theme for 2019 is **Transitioning to a New Generation**.

Papers on troubleshooting, efficiency, optimization studies, case studies, and completed projects are of high interest. We are seeking speakers and abstracts covering new and innovative methods and strategies to enhance our industry.

Two hours of ethics training, as required by WI and MN Professional Engineer Certification Requirements, will be on the program as well, for those engineers that require this to maintain their license.

Papers on other subjects which may be of interest to members are, of course, also welcome. All written papers submitted are eligible for the Radebaugh Award. Papers may also include the following topics:

OPERATIONS and MAINTENANCE:

- Efficiency (pumps, motors, lights, UV disinfection, HVAC, etc.)
- 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

ENHANCED RESOURCE and ENERGY RECOVERY:

- Resource recovery – Raw materials, nutrients, energy
- Digester gas production technologies
- Co-digestion
- Heat recovery technologies
- Alternative energy use

COLLECTION SYSTEMS:

- Collection system rehabilitation technologies/methods
- CMOM Program development and implementation
- Collection system design and operation
- Green infrastructure – Examples in practice
- Infiltration/inflow management
- Stormwater and combined sewer overflow management

RESEARCH and DESIGN:

- Nutrient removal technologies
- New/Innovative technology research and application
- Sustainability in design and construction
- Toxics/Emerging pollutants monitoring and control
- Treatment design
- Wastewater reuse, applications, technology and regulatory issues

RESIDUALS, SOLIDS and BIOSOLIDS:

- Environmental management systems
- National biosolids partnership
- Standard or advanced treatment and stabilization

WATERSHEDS and STORMWATER MANAGEMENT:

- Anti-degradation and other regulatory issues
- Habitat or groundwater protection or restoration
- Non-point pollution source modeling
- Water quality trading and watershed management issues and initiatives, including adaptive management
- Green infrastructure solutions and best management practices
- Total maximum daily loads involving point and non-point sources
- Education and outreach

GENERAL:

- Laboratory issues/bench-scale studies
- Pretreatment, industrial treatment, and pollution prevention
- Regulatory issues
- Security issues
- Engineering ethics training

SOFT SKILLS/LEADERSHIP:

- Leadership skills
- Managing an ill or injured employee
- Anti-harassment and discrimination training for managers
- Getting the most out of employee performance evaluations
- We negotiated the agreement – now what?
- Handling the grievance and arbitration process
- Managing in a union environment
- The basics of labor law
- 10 things every manager should know about labor law
- Top 10 employment law issues
- Stumbling into violations: Do handbooks and policies violate labor law?
- Management rights for managers
- Social media and the workplace

To receive consideration, please submit your abstract via the online submittal process that can be accessed from the CSWEA website. To submit your abstract, please go to *www.cswea.org* and then to the 92nd Annual Meeting Abstract submittal area. Once you start the abstract submittal process using the online form, you cannot come back to it later. It is important to have all materials ready to submit before starting.

Please contact me with any questions or problems that you encounter.

Thank you.

Matt Seib
Chair, Technical Program Committee
Madison Metropolitan Sewerage District
Phone: 608-222-1201

INSTRUCTIONS FOR THE SUBMISSION OF ABSTRACTS AND CRITERIA FOR PAPER SELECTION

The Central States Water Environment Association (CSWEA) Technical Program Committee has the responsibility for the technical sessions at the Annual Meeting. Participants in any sector of the water environment field are cordially invited to submit abstracts for evaluation. The basis for selection will be the excellence of the abstracts, as judged by the committee.

The abstract should be submitted online at *www.cswea.org*.Through the online submittal process you will enter the title and abstract, import your credentials, choose your topic area, and select your presentation format. Abstracts must contain a *summary* of about 250-500 words, with the full abstract (including all tables, figures, and references) to not exceed six pages.

The presenting author of each abstract will be notified in January of the acceptance or rejection of the abstract.

The following should serve as a guide in the preparation of the abstract and will serve as a guide for the reviewers of the abstracts.

1. Originality and status of subject:

The paper should deal with new concepts or with new and novel applications of established concepts. It also may describe substantial improvements of existing theories or present significant data in support or extension of those theories. Studies of incomplete or ill-defined problem situations should be avoided. Previously published data should be introduced only in summary form and for comparative or supportive purposes.

2. Technical content:

A summary of the conditions under which data was obtained should be presented along with the methodology used. The conclusions should be presented in the abstract and should follow directly from the investigation or evaluation that was conducted. The abstract should substantiate that the project has been fully developed, that the theory or experimental procedure has been firmly established, and that data have been collected and subjected to analysis. It should be evident that the abstract clearly describes the entire content of the conclusions of the paper to be presented.

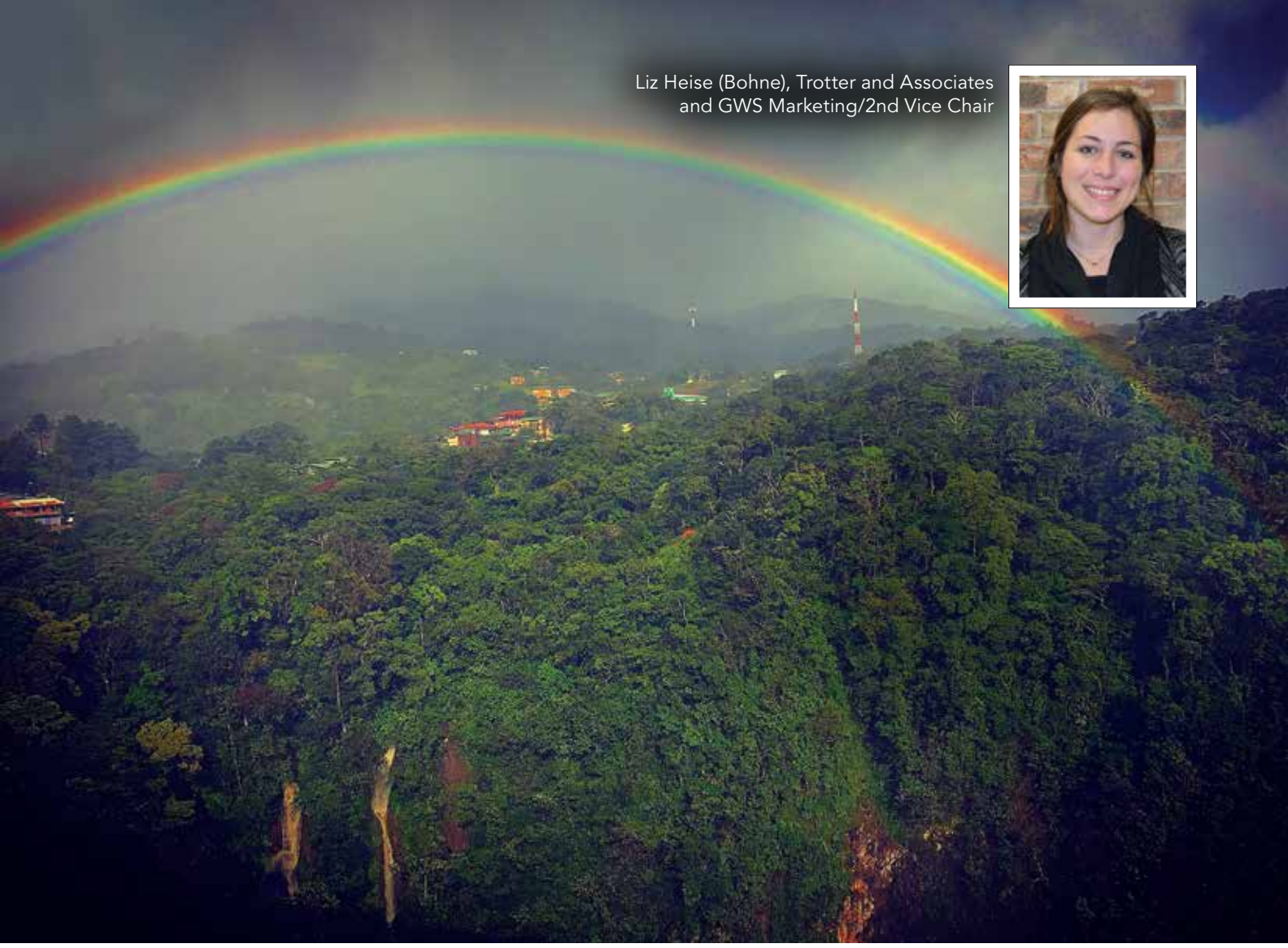
3. Water environment significance:

The paper should relate clearly and significantly to the water environment field. Papers of a truly fundamental scientific nature are desired, but the author should make evident the relationships of the work to a practical problem area or situation in water quality and wastewater control.

4. Adequacy of abstract preparation:

The committee has noted that historically the adequacy of an abstract is often indicative of the quality of the final paper. As a result, authors are urged to prepare their abstracts with care, following the instructions noted above. As a reminder, an abstract is meant to summarize the presentation. The summary should include objectives, scope, and general procedures, insofar as the limited length of the abstract permits. An indication of results or conclusions is required.

Abstracts are due by November 1, 2018



Liz Heise (Bohne), Trotter and Associates and GWS Marketing/2nd Vice Chair

Photo: Jorge Marín

GLOBAL WATER STEWARDSHIP

AUGUST SERVICE TRIP *Report*

By Elizabeth Bohne

Wow – just like that summer is over, but with the end of summer comes the end of another Global Water Stewardship (GWS) August Service Trip. Each year our trips have continued to grow in both attendance and success (or as we like to call them 'small wins'). This year's trip was full of small wins for the group, making it a GREAT WIN (in a competition against only ourselves and our own goals) for GWS overall. We kept very busy this week with the group split up across the country in San Jose, Palmar Sur, and Monteverde.

This year marked many firsts for the GWS group, as well as some continued programs and growth. Our student design competition winners presented their design to the local community for the first time, which allowed them to get feedback directly from the end beneficiaries. This is also the first project that has *more* land available than what we had anticipated, which helps us over the major hurdle of land acquisition that we have seen from previous years.

This was also the first year that we worked with the local officials to present two day-long training seminar in wastewater treatment, plant maintenance, and operations. This exchange of knowledge was an invaluable experience for all involved.

We finally continued our efforts in data collection and community outreach for the 2019 Student Design Competition project location. Next years project will be in Monteverde, a small community that was noted by AyA, the national water and wastewater governmental agency in Costa Rica as top of their priority list for wastewater treatment implementation. The group worked in the schools there to teach children ranging from eight to eighteen about wastewater treatment. They also built our second bio-garden, which will serve as a means to treat greywater, as well as an educational opportunity for the people who live and work in the area. They also collected data that will be used to develop the problem statement for the 2019 Student Design Competition.

Read on for updates from our trip participants about the trip highlights.

STUDENT PRESENTATION TO ASADA, PALMAR SUR

by Joe Lapastora, Northern Moraine WRF

During this year's annual trip to Costa Rica, three of the four GWS team members from the winning CSWEA student design competition traveled to Palmar Sur to present their proposed design to community officials. The team consisted of Liz Ebert, Joe Lapastora, Jessica Zemen and Erik Papenfus (who could not attend trip), all of whom are 2018 Environmental Engineering graduates from the University of Wisconsin-Platteville (UWP). The students' academic advisor, Dr. Mike Penn accompanied the team down south.

During the Spring 2018 semester at UWP, the students participated in the annual CSWEA student design competition in which they were tasked with the challenge of designing a wastewater collection and treatment system for a rural community in Costa Rica. Their team, self-identified as Beyond Water Solutions, competed and won the competition that took place in April at the CSWEA Education Seminar in Madison, Wisconsin. The team will also be competing at the WEFTEC Student Design Competition in Louisiana in late September of this year. In addition to presenting their solution for WEFTEC, the student group had the opportunity to present their design to the local community officials in Palmar Sur.

The team members were eager to visit the community for which they spent over 1,000 combined hours designing a new wastewater collection and treatment system. Upon arriving to the small ASADA building where the meeting was held, the group enjoyed seeing not only the beautiful scenery, but also the small community that they had spent so much time staring at pictures and google map images of. They presented a condensed version of their design including the collection system, two treatment systems, cost estimates, and future recommendations. Manuel de Los Santos, the GWS International Programs Chair, aided the group by translating the presentation to Spanish for the Palmar Sur ASADA officials.

Though the design is still in its preliminary stages, the design team received some valuable feedback and a few concerns were discussed. After the presentation, the group visited the site of their proposed treatment system. During the site visit, Liz, Joe, and Jess were able to speak to the ASADA members and discuss their design. Once they arrived at the proposed site, known as San Marcos, they noted that the available space was much larger than anticipated. The ASADA members informed the group of the acreage of the land and it was nearly twice as large as the acreage that was estimated for the problem statement. This was significant because the design that was presented consists of two separate treatment systems. Two systems were used to split the community into two sections because of land constraints in building a system large enough in the small amount of land that was thought to be available. After meeting with the ASADA, the group was confident that one treatment system could instead be designed to treat the entire community of Palmar Sur. In a local project, site visits are much more accessible. They play an important role in design, which is what makes our biannual trips invaluable to our success.

As the day neared its end, the GWS group received countless *thank yous* from the ASADA members over some local food. One ASADA member had specifically asked Manuel to translate a heartfelt thank you to the students for all their help. She stated "We [ASADA] cannot thank you guys enough. The people around Palmar Sur have struggled in recent years and every little bit helps out the community."

Joe Lapastora reflected on the opportunity saying: "It was a great experience in so many ways. Not only did we get to see our senior design project extend into the summer and progress further than most projects that come out

Figure 1. Beyond Water Solutions Team.

Figure 2. Palmar Sur Group

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of UWP, we were able to combine all of our environmental engineering knowledge and help those in need."

This day was a huge success for GWS in many ways. The partnership that we have developed with the local community is growing. They are depending on the success of our project for their local economy, public, and environmental health. We also love seeing our student members apply their knowledge and get real world experience as they start out in the work force. These students are the future of CSWEA and GWS.

AYA WORKSHOPS

by Eider Alvarez-Puras, Baxter and Woodman

An important aspect of our service trips is the education initiative. While some of the group traveled to Monteverde to build the bio-garden, a group of our volunteers stayed in San Jose, the capital city of Costa Rica.

In San Jose, AyA owns and operates the *Tres Rios* Water Purification Plant and the *Los Tajos* sewage treatment plant. This is one of the only wastewater treatment plants in the country, which has primary treatment for the City's sewage. Our group organized the first wastewater workshop oriented to AyA professionals, which took places at the *Tres Rios* Water Purification Plant. With the government ramping up their efforts to extend sanitation throughout the country, AyA invited GWS to present in-depth wastewater topics. Manuel de los Santos (Aqua-Aerobic Systems), Marco Vinicio (Downers Grove Sanitary District) and Eider Alvarez-Puras (Baxter & Woodman) presented a two-day workshop focusing on sanitary collection, maintenance basics, wastewater treatment fundamentals, and activated sludge.

The workshops were very well attended with over 30 AyA water and wastewater professionals representing the different administrative regions in

the country (Brunca, Central Pacific, Central West, Caribbean regions) and including several departments (Project Management Unit, R&D Unit, ASADAs Unit, Environmental Unit). It was a great opportunity to discuss the differences and similarities in our wastewater treatment needs and techniques. As we started speaking about wastewater peak flows and inflow and infiltration, a loud and intense rain started pouring. What a funny coincidence. Both presenters and attendees agreed that a typical midwestern peak factor of 1.5 would definitely not suffice in Costa Rica rainy season.

It was a great educational initiative and exchange of knowledge that benefited both AyA engineers and officials, as well as the GWS group. We plan to continue and grow this endeavor in future trips. It fulfills not only academic goals but also facilitates good camaraderie between both groups. The education and expertise of the operators in the future will help ensure the continued success and sustainability of our projects after implementation.

MONTEVERDE COMMUNITY INITIATIVES

by Mike Penn, UW Platteville

In addition to presenting their collection and treatment system design for the community of Palmar Sur, the University of Wisconsin-Platteville Senior Design team also travelled to Santa Elena in the mountainous Monteverde region of Costa Rica. With assistance from their project advisor Professor Mike Penn, Mike Holland (Kishwaukee Water Reclamation District) and Mike Pepin (former Director of Public Works, Seymour, WI) a bio-garden was constructed and installed to treat kitchen gray-water at the Cloud Forest School. Prior to installation, the gray-water was surface discharged on-site to open canals. With the assistance of a local backhoe operator, the project was completed in a single day – a significant improvement from last year when the group spent multiple days with a shovel. Though this may

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have built some character (especially in the tropical summer heat), all agreed that the $30 per hour (US dollars) for the local excavator was a very wise investment. This allowed the group to use their short week more efficiently.

The GWS team and student design winners also presented to elementary-age children at the school about the importance of sanitation and how wastewater treatment works. Mike Holland and Kate Holmberg (SEH, Inc. in the Twin Cities) gave a presentation to high school students about the importance of wastewater improvements in the community, and why we have a goal to replace the existing failing septic systems. Mike Penn then demonstrated how the newly constructed bio-garden utilized basic wastewater treatment processes (sedimentation and attached biological treatment) to treat gray-water.

Additionally, the GWS contingent met with local planners and water managers to discuss the scope of a prospective collection and treatment system for the Monteverde region. This project will prove to be particularly challenging because of the extreme terrain of the region.

Overall, this year's annual Service Trip was a great success, and especially rewarding for the recent UW-P graduates who were able to experience first-hand construction and field-engineering (e.g. duct tape!) on the bio-garden, assist in the scoping of the next Student Design Project, and help to educate the children of the Monteverde region.

Though the group was busy, of course they saved a little bit of time to relax and enjoy beautiful Costa Rica. They even got the chance to 'hang ten' and try out (and even succeed) at surfing. CS

GLOBAL WATER STEWARDSHIP

LAKESIDE EQUIPMENT CORPORATION
Water Purification Since 1928

GWS CORPORATE DONOR SPOTLIGHT

Lakeside Equipment

Interview by Elizabeth Bohne

Lakeside Equipment is one of GWS's newest corporate donors. After learning about GWS from an employee, they decided that ours was a mission worth supporting. I had the opportunity to talk to Warren Kersten, the Vice President of Lakeside Equipment, about his background, Lakeside Equipment, and why he supports Global Water Stewardship. Read on to learn more…

Liz: Tell me how you first got involved in with wastewater work?

Warren: My father was an environmental engineer, so from the time I was three years old he was dragging me around to wastewater plants. I was always interested in nature and protecting the environment. I wanted to follow in my father's footsteps. We used to fish the Mississippi River together and I would see all the floating debris and the poor water quality and wanted to be involved in fixing it.

Growing up and going through high school I always liked science so it was natural for me to continue on to study Biology for my undergraduate degree. I received a scholarship to play football at Augustana University. They did not have an engineering program but I then went on to South Dakota State to complete a second Bachelor of Science in Civil Engineering and a Master of Science in Environmental Engineering. The biology background definitely helped in my masters and has helped me further my career, as a large portion of the work Lakeside does is in biological process improvements.

I graduated in 1979. After graduate school I took a job with a consulting firm in Twin Cities, Minnesota where I mostly did wastewater treatment process design. Throughout school I had interned with Lakeside Equipment and then in 1990 they reached out to me and offered me a position with the company. I have been with them now for 28 years.

RAPTOR Fine Screens in Apra Harbor, Guam.

E.A. Aerotor Plant in Norfolk, New York.

Liz: Wow! So you've really grown with Lakeside. What do you find most challenging about wastewater treatment?

W: I think it's most challenging, but also most interesting, that each plant and project is different. Not only that, but I've watched the industry develop. I graduated high school in 1972, the year the clean water act was passed, so I've watched the industry develop and seen the effluent limits change to become more and more stringent. I've worked with Lakeside to help adapt our processes to the changing effluent limits. I remember the first earth day! It's amazing to think back on how much things have changed since then.

Liz: Where does Lakeside mostly work?

W: Most of our product is in the US, but we also have some in Canada, the Caribbean, Mexico, Guam, and the Philippines. We even work at some military bases in Korea.

Liz: What kind of process would you have at a Military base?

W: Typically we use our closed loop reactor process, or more commonly known as the oxidation ditch… But Lakeside provides pretty much everything on the liquid side of wastewater treatment. We have a number of screens, grit removal options, we even still have trickling filters and in the right conditions they are still the best option. We have clarifiers, oxidation ditches, and we are the only manufacturer that has all three types of screw pump. We also have SBRs.

Liz: I'm looking at your brochure online right now. It looks like you cover pretty much everything! What do you wish other people knew about Lakeside and wastewater?

> I think it's very important that we recognize this and help other nations who are not as fortunate as we are in this regard. The planet is our responsibility to protect. Lakeside is very committed to the environment. We want to be good stewards and help other people.

W: Lakeside is a company that is 90 years old, as of this year. It has always been employee-owned, meaning we have no investors outside the company. Something that I think is really amazing is that the average employee has been here 15 years, which is unheard of these days. We all know each other very well, everyone knows everything about everyone and we are all very comfortable. It's like a family atmosphere here. I think that it's real testimony of the environment and company culture we try to keep. It's been a great place to work for the last 28 years. I am proud that I can look back on my career and feel good about it, and like I have hopefully done something to help preserve the environment and make it a better place.

Liz: What's your personal philosophy on what should be done about availability of wastewater treatment in the developing world?

W: I have taken a number of trips to the Philippines. It was shocking to see the lack of wastewater treatment and solid waste disposal. I was there 28 years ago and at that point only about 5% had clean drinking water, now I believe it's up to 95%, however, wastewater treatment is severely lacking. I'm kind of an amateur photographer so I have lots of photos of what is getting dumped into the lakes and streams. I have a photo of a river where you can't even see water surface because of all the debris and another of a littered beach with people swimming in the water. Something that really blows my mind is the distribution of wealth in the world. Even the poorest people in the United States have more than half the planet. I think it's very important that we recognize this and help other nations who are not as fortunate as we are in this regard. The planet is our responsibility to protect. Lakeside is very committed to the environment. We want to be good stewards and help other people.

Liz: Is there anything else you would like to tell me about Lakeside or your choice to support GWS?

W: We realize the importance of wastewater treatment worldwide. Even though we don't do a ton of international work, we believe that supporting the effort is very important. We want to show that we believe in it through helping out wherever we can. This is why we always support WEF and exhibit at every conference. We also try to exhibit at all of the state organization conferences because we know that the exhibit money goes back to the organization and helps support programs like yours [GWS]. I have learned from going overseas shows how blessed we are and I want to help others realize that. My kids are grown now but when they were growing up if they complained about something I would show them a photo of Manila [Philippines] to get them to realize how lucky we are and we take it for granted. I hope that I can continue to instill that idea in others through my work with Lakeside and organizations such as GWS.

Liz: That's great to hear. I agree with you, we are very lucky and sometimes forget to realize that. It's great to talk to someone who really believes in what we are doing, not just as GWS but the wastewater industry as a whole. Sometimes it seems like people get bogged down with permit limits and regulations and forget the big picture, that we are trying to protect our waterways and reduced water pollution. Thank you so much for sharing your story with us and thank you so much for supporting GWS! CS

114-inch Open Screw Pumps in Roanoke, V.

Manila Bay Beach Garbage.

River of Garbage.

2018 CSWEA BUYERS' GUIDE

Welcome to the annual *Central States Water* Buyers' Guide. When making purchasing decisions about products and services in the wastewater industry throughout the Central States region, please support the companies whose advertising makes *Central States Water* possible.

OUR CSWEA BUYERS' GUIDE CONSISTS OF TWO SECTIONS

1. A categorical listing of products and services, including a list of companies which provide them.
2. An alphabetical listing of the companies appearing in the first section. This listing includes name, contact info, website, and more.

LISTINGS BY CATEGORY

Acoustic Pipe Inspection
InfoSense, Inc.

Activated Carbon
CEI Carbon Enterprises Inc.

Advanced Metering Infrastructure
Sensus, a Xylem brand

Aerators
Environmental Dynamics International

AMI Communications
Badger Meter

AMR
Badger Meter

Anthracite
CEI Carbon Enterprises Inc.

Architecture
McMahon

Biogas Upgrading
Unison Solutions, Inc.

Centrifuges – Dewatering & Thickening
Centrisys/CNP

Clarifiers
Kusters Water

Coatings, Lining & Corrosion Control
Bolton & Menk, Inc.
KLM Engineering, Inc.
LMK Technologies
Process Equipment Repair Services, Inc.
Sekisui SPR Americas, LLC

Communications/Public Information
AE2S

Construction Castings
Starnet Technologies

Contractors
Process Equipment Repair Services, Inc.

CSO/SSO Controls, Water Resources, Distribution & Collection
ADS Environmental Services
AE2S
AECOM
Brown and Caldwell
Burns & McDonnell
Donohue & Associates, Inc.
Greeley and Hansen
InfoSense, Inc.
LW Allen, LLC
Ruekert & Mielke, Inc.
Strand Associates, Inc.
Walter E. Deuchler Associates, Inc.

Cured-in-Place-Pipe (CIPP)
LMK Technologies

Disinfection/Equipment
ChlorTainer

Electrical, Instrumentation/ Controls/Generators
ADS Environmental Services
AE2S
Baxter & Woodman, Inc.
Donohue & Associates, Inc.
Environmental Dynamics International
Force Flow/Halogen
Gasvoda & Associates
Integrated Process Solutions, Inc.
LW Allen, LLC
Smith & Loveless Inc.
Starnet Technologies

Engineers/Consultants
ADS Environmental Services
AE2S
AECOM
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Bolton & Menk, Inc.
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Burns & McDonnell
Clark Dietz, Inc.
Crawford, Murphy & Tilly, Inc.
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Greeley and Hansen
HR Green, Inc.
Integrated Process Solutions, Inc.
KLM Engineering, Inc.
McMahon
RHMG Engineers, Inc.
Ruekert & Mielke, Inc.
Starnet Technologies
Strand Associates, Inc.
Trotter and Associates, Inc.
Walter E. Deuchler Associates, Inc.
Wenck

Equipment Service/Installation
Kusters Water

Filter Media/Filter Media Remove/ Installation
CEI Carbon Enterprises Inc.

Filtration
AECOM
CEI Carbon Enterprises Inc.
Environmental Dynamics International
Gasvoda & Associates
Kusters Water
Smith & Loveless Inc.

Geographic Information Systems
Baxter & Woodman, Inc.
Bolton & Menk, Inc.
Burns & McDonnell
McMahon
RHMG Engineers, Inc.
Ruekert & Mielke, Inc.
Walter E. Deuchler Associates, Inc.

Greensand Plus
CEI Carbon Enterprises Inc.

Grit Removal
Lakeside Equipment Corporation
Smith & Loveless Inc.

Hydrants
American Flow Control

Infrastructure Rehabilitation
Sekisui SPR Americas, LLC

Inspector/Locators
InfoSense, Inc
KLM Engineering, Inc.

Intake Screens
Lakeside Equipment Corporation

Leak Detection
Sensus, a Xylem brand

Manhole Rehab
InfoSense, Inc
LMK Technologies

Meter Reading Systems
Badger Meter
Sensus, a Xylem brand

Meters/Meter Testing
ADS Environmental Services
Badger Meter
Sensus, a Xylem brand

Mixing Systems
JDV Equipment Corporation

Nutrient Recovery
Centrisys/CNP

Odor Control Solutions
Brown and Caldwell
Kusters Water

Operation Services
ADS Environmental Services
Baxter & Woodman, Inc.

Packaged Treatment Plants
Lakeside Equipment Corporation

Pipe & Pipe Appurtenances
InfoSense, Inc.

Pipeline Products
Sekisui SPR Americas, LLC

Pneumatic Valve Actuators
Kinetrol USA Inc.

Process Mechanical
Donohue & Associates, Inc.
JDV Equipment Corporation
Process Equipment Repair Services, Inc.

Pumps/Pump Systems
AECOM
Brown and Caldwell
Burns & McDonnell
Donohue & Associates, Inc.
Gasvoda & Associates
Hawkins Inc.
JDV Equipment Corporation
LW Allen, LLC
Smith & Loveless Inc.
Strand Associates, Inc.

Rehab, Repair, Fabricate Equipment
Process Equipment Repair Services, Inc.

Residuals/Waste Management
Centrisys/CNP
Greeley and Hansen

Safety Products
ChlorTainer
Force Flow/Halogen

Samplers/Sampling Systems
Markland Specialty Engineering Ltd.
Scales & Emergency Shut Off Systems
Force Flow/Halogen

Secondary Containment
ChlorTainer

Septage Receiving Facility/Systems
JDV Equipment Corporation
Lakeside Equipment Corporation

Sewer Flow Monitoring (Sanitary, Storm, and CSO)
Sensus, a Xylem brand

Sludge Density Meters
Markland Specialty Engineering Ltd.

Sludge Level Detectors
Markland Specialty Engineering Ltd.

Storage Tanks/Reservoir Systems
AECOM
Bolton & Menk, Inc.
Centrisys/CNP
DN Tanks
Greeley and Hansen
KLM Engineering, Inc.
Pittsburg Tank & Tower Maintenance Co.
Strand Associates, Inc.

Stop Screens/Headworks
Kusters Water

Survey
McMahon
RHMG Engineers, Inc.
Ruekert & Mielke, Inc.
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Tank Maintenance and Inspections
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ChlorTainer
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American Flow Control
Gasvoda & Associates
Hawkins Inc.
Kinetrol USA Inc.
LW Allen, LLC

Water Quality Monitors
Integrated Process Solutions, Inc.
Starnet Technologies

Water/Wastewater Treatment Systems
Advanced Aquacultural Technologies, Inc.
AE2S
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Baxter & Woodman, Inc.
Bolton & Menk, Inc.
Brown and Caldwell
Burns & McDonnell
CEI Carbon Enterprises Inc.
ChlorTainer
CLEARAS Water Recovery
Donohue & Associates, Inc.
Environmental Dynamics International
Force Flow/Halogen
Gasvoda & Associates
Greeley and Hansen
Hawkins Inc.
Integrated Process Solutions, Inc.
JDV Equipment Corporation
KLM Engineering, Inc.
Kusters Water
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Process Equipment Repair Services, Inc.
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LISTINGS BY COMPANY

ADS Environmental Services
11535 W. 183rd Place, Suite 113
Orland Park, IL 60467
708-341-9701
cskehan@idexcorp.com
www.adsenv.com

Advanced Aquacultural Technologies, Inc.
PO Box 426
Syracuse, IN 46567
574-457-5802
advaquatechinc@gmail.com
www.advancedaquacultural technologies.com

AE2S
901 E Fish Lake Road, Suite 184
Maple Grove, MN 55369
763-463-5036
grant.meyer@ae2s.com
www.AE2S.com

Think Big. Go Beyond.

AECOM
303 East Wacker Drive, Suite 1400
Chicago, IL 60601
312-373-7700
askamericas@aecom.com
www.aecom.com

American Flow Control
PO Box 2727
Birmingham, AL 35202
800-326-8051
bmyl@american-usa.com
www.american-usa.com

Badger Meter
4545 W. Brown Deer Road
Milwaukee, WI 53224
800-616-3837
infocentral@badgermeter.com
www.badgermeter.com

Baxter & Woodman, Inc.
8678 Ridgefield Road
Crystal Lake, IL 60012
815-459-1260
dwold@baxterwoodman.com
www.baxterwoodman.com

Bolton & Menk, Inc.
1960 Premier Drive
Mankato, MN 56001
507-625-4171
tricia.stenberg@bolton-menk.com
www.bolton-menk.com

Brown and Caldwell
30 East 7th Street, Suite 2500
St. Paul, MN 55101
651-298-0710
dhenrichsen@brwncald.com
www.brownandcaldwell.com

Burns & McDonnell
1431 Opus Place, Suite 400
Downers Grove, IL 60515
630-724-3276
rpatchett@burnsmcd.com
www.burnsmcd.com

CEI Carbon Enterprises Inc.
28205 Scippo Creek Road
Circleville, OH 43113
800-344-5770
sales@ceifiltration.com
www.ceifiltration.com

ChlorTainer
3471-B Regional Parkway
Santa Rosa, CA 95403
800-543-6603
sales@chlortainer.com
www.chlortainer.com

Clark Dietz, Inc.
625 57th Street, 6th Floor
Kenosha, WI 53140
262-657-1550
info@clarkdietz.com
www.clarkdietz.com

CLEARAS Water Recovery
1500 Clark Fork Lane
Missoula, MT 59808
406-363-4139
brichichi@clearaswater.com
www.clearaswater.com

Centrisys/CNP
9586 58th Place
Kenosha, WI 53144
262-654-6006
info@centrisys.us
www.centrisys.com

Crawford, Murphy & Tilly, Inc.
2750 West Washington Street
Springfield, IL 62702
217-787-8050
rarmouti@cmtengr.com
www.cmtengr.com

DN Tanks
100 W. Court Ave, Suite 110
Jeffersonville, IN 47130
317-517-5771
steve.applegate@dntanks.com

7300 Yukon, Unit 1
Bismarck, ND 58503
701-425-1384
chris.saxton@dntanks.com
www.dntanks.com

Donohue & Associates, Inc.
3311 Weeden Creek Road
Sheboygan, WI 53081
920-208-0296
info@donohue-associates.com
www.donohue-associates.com

Environmental Dynamics International
5601 Paris Road
Columbia, MO 65202
573-474-9456
patrick.ely@wastewater.com
www.wastewater.com

Force Flow / Halogen
2430 Stanwell Drive
Concord, CA 94520
925-686-6700
info@forceflow.com
www.forceflowscales.com

Gasvoda & Associates
1530 Huntington Drive
Calumet City, IL 60409
708-891-4400
wytovicz@gasvoda.com
www.gasvoda.com

Greeley and Hansen
100 S. Wacker Drive, Suite 1400
Chicago, IL 60606
800-837-9779
jsullivan@greeley-hansen.com
www.greeley-hansen.com

Hawkins Inc.
2381 Rosegate
Roseville, MN 55113
800-328-5460
laura.eilek@hawkinsinc.com
www.hawkinsinc.com

HR Green, Inc.
2550 University Avenue West
Suite 400N
St Paul, MN 55114
651-644-4389
asumption@hrgreen.com
www.hrgreen.com

InfoSense, Inc
8116 S. Tryon Street, STE B3-203
Charlotte, NC 28273
704-644-1164
achurchill@infosense.com
www.infosense.com

Integrated Process Solutions, Inc.
PO Box 26, 34696 412th Street SE
Fosston, MN 56542
218-435-1703
ips@ipsamerica.biz
www.ipsamerica.biz

JDV Equipment Corporation
1 Princeton Avenue
Dover, NJ 07801
973-366-6556
sales@jdvequipment.com
www.jdvequipment.com

Kinetrol USA Inc.
1085 Ohio Drive
Plano, Texas 75093
972-447-9443
scott.richardson@kinetrolusa.com
www.kinetrolusa.com

KLM Engineering, Inc.
1976 Wooddale Drive, Suite 4
Woodbury, MN 55125
651-773-5111
oharrington@klmengineering.com
www.klmengineering.com

Kusters Water
101 Zima Park Drive
Spartanburg, SC 29301
864-576-0660
jim.weidler@kusterszima.com
www.kusterswater.com

Lakeside Equipment Corporation
1022 E. Devon Avenue
Bartlett, IL 60103
630-837-5640
sales@lakeside-equipment.com
www.lakeside-equipment.com

LMK Technologies
1779 Chessie Lane
Ottawa, IL 61350
815-640-9302
info@lmktechnologies.com
www.lmktechnologies.com

LW Allen, LLC
4633 Tompkins Drive
Madison, WI 53716
608-222-8622
sales@lwallen.com
www.lwallen.com

Markland Specialty Engineering Ltd.
305 Armstrong Avenue, Unit 9
Georgetown, ON Canada L7G 4X6
855-873-7791
markland@sludgecontrols.com
www.sludgecontrols.com

McMahon
PO Box 1025
Neenah, WI 54957-1025
skundinger@mcmgrp.com
www.mcmgrp.com

Pittsburg Tank & Tower Maintenance Co.
PO Box 913
Henderson, KY 42419
270-826-9000
sales@watertank.com
www.watertank.com

Process Equipment Repair Services, Inc.
5991 Division Road
West Bend, WI 53095
262-629-1059
perslamont@aol.com

RHMG Engineers, Inc.
975 Campus Drive
Mundelein, Il, 60060
847-362-5959
info@rhmg.com
www.rhmg.com

Ruekert & Mielke, Inc.
W233 N2080 Ridgeview Parkway
Waukesha, WI 53188
262-542-5733
ramtmann@ruekert-mielke.com
www.ruekertmielke.com

Sekisui SPR Americas, LLC
5000 Austell-Powder Springs Road
Austell, GA 30106
678-399-2611
sekisui.info@sekisui-spr.com
www.sekisui-spr.com

Sensus, a Xylem brand
8601 Six Forks Road, Suite 700
Raleigh, NC 27615
800-638-3748
contactna@xyleminc.com
www.sensus.com

Smith & Loveless Inc.
14040 Santa Fe Trail Drive
Lenexa, KS 66215
913-888-5201
answers@smithandloveless.com
www.smithandloveless.com

Starnet Technologies
8520 Hollander Drive
Franksville, WI 53126
262-886-0228
bgrindeland@starnet-wi.net
www.starnettech.com

Strand Associates, Inc.
910 West Wingra Drive
Madison, WI 53715
608-251-4843
marketing@strand.com
www.strand.com

Trotter and Associates, Inc.
40W201 Wasco Road, Suite D
St. Charles, IL 60175
630-587-0470
c.shulick@trotter-inc.com
www.trotter-inc.com

Unison Solutions, Inc.
5451 Chavenelle Road
Dubuque, IA 52002
563-585-0967
sales@unisonsolutions.com
www.unisonsolutions.com

Walter E. Deuchler Associates, Inc.
230 Woodlawn Avenue
Aurora, IL 60506
630-897-4651
mhalm@deuchler.com
www.deuchler.com

Wenck
7500 Olson Memorial Highway Suite 300
Golden Valley, MN 55347
763-252-6800
pdaniels@wenck.com
www.wenck.com

COMPANY	PAGE	TELEPHONE	WEBSITE
ADS Environmental Services	40	708-341-9701	www.adsenv.com
Advanced Aquaculteral Technologies, Inc.	39	574-457-6193	www.advancedaquaculturaltechnologies.com
Advanced Engineering and Environmental Services (AE2S)	6	763-463-5036	www.ae2s.com
AECOM	18	312-373-7700	www.aecom.com
AMERICAN Flow Control	65	205-325-7701	www.american-usa.com
B&M Technical Services, Inc.	63	715-228-7604	www.bmtechservice.com
Badger Meter, Inc.	31	800-876-3837	www.badgermeter.com
Baxter & Woodman, Inc	46	815-459-1260	www.baxterwoodman.com
Bolton & Menk, Inc.	53	507-625-4171	www.bolton-menk.com
Brown and Caldwell	31	651-298-0710	www.brownandcaldwell.com
Burns & McDonnell	50		www.burnsmcd.com
CDM Smith	18	651-772-1313	www.cdmsmith.com
CEI Carbon Enterprises, Inc.	46	800-344-5770	www.ceifiltration.com
Centrisys/CNP	58	262-654-6006	www.centrisys.com
Clark Dietz, Inc.	18	262-657-1550	www.clark-dietz.com
CLEARAS Water Recovery	14	541-930-3201	www.clearaswater.com
Crawford, Murphy & Tilly, Inc.	18	217-787-8050	www.cmtengr.com
DEUCHLER	23	630-897-4651	www.deuchler.com
DN Tanks	50	847-782-0357	www.dntanks.com
Donohue & Associates, Inc.	68	888-736-6648	www.donohue-associates.com
Energenecs, Inc.	46	262-377-6360	www.energenecs.com
Environmental Dynamics	4	573-474-9456	www.wastewater.com
Force Flow, Inc.	64	800-893-6723	www.forceflow.com
Gasvoda and Associates	67	708-891-4400	www.gasvoda.com
Greeley and Hansen	54	800-837-9779	www.greeley-hansen.com
Hawkins Water Treatment Group	12	800-328-5460	www.hawkinsinc.com
HR Green, Inc.	25	800-728-7805	www.hrgreen.com
InfoSense, Inc.	26	877-747-3245	www.infosense.com
Integrated Process Solutions (IPS), Inc.	65	218-435-1703	www.ipsamerica.biz
JDV Equipment Corporation	33	973-366-6556	www.jdvequipment.com
KINETROL USA, INC.	11	972-447-9443	www.kinetrolusa.com
KLM Engineering	26	888-959-5111	www.klmengineering.com
Kusters Water	3	800-264-7005	www.kusterswater.com
Lakeside Equipment Corp.	2	630-837-5670	www.lakeside-equipment.com
LMK Technologies, LLC	61	815-433-1275	www.lmktechnologies.com
L.W. Allen, Inc.	37	608-222-8622	www.lwallen.com
Markland Specialty Engineering Ltd.	47	855-873-7791	www.sludgecontrols.com
McMahon Associates, Inc.	25	920-751-4200	www.mcmgrp.com
Metropolitan Industries	62	815-886-9200	www.metropolitanind.com
Pittsburg Tank & Tower	26	270-826-9000	www.pttg.com
Process Equipment Repair Services, Inc.	12	262-629-1059	
RHMG Engineers, Inc.	50	847-362-5959	www.rhmg.com
Ruekert & Mielke, Inc.	26	262-542-5733	www.ruekertmielke.com
Sekisui SPR Americas, LLC	10	614-634-2291	www.sekisui-spr.com
Sensus. A Xylem brand.	3	800-638-3748	www.sensus.com
Short Elliott Hendrickson (SEH)	24	651-490-2030	www.sehinc.com
Smith & Loveless Inc.	8	704-844-1100	www.smithandloveless.com
Starnet Technologies	13	262-886-0228	www.starnettech.com
Strand Associates, Inc.	58	608-251-4843	www.strand.com
TGO Technologies, Inc.	16	800-543-6603	www.tgotech.com
TKDA	38	800-247-1714	www.tkda.com
Trotter & Associates Inc.	55	630-587-0470	www.taiengr.com
Unison Solutions, Inc.	46	563-585-0967	www.unisonsolutions.com
WENCK	63	763-252-6800	www.wenck.com
WSB & Associates, Inc.	50	763-541-4800	www.wsbeng.com
WTR Solutions, LLC	43	515-758-3833	www.wtrsolutions.com
Xylem	33		www.xyleminc.com

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1530 Huntington Drive, Calumet City, IL 60409
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