

CENTRAL STATES WATER

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

97th ANNUAL MEETING *Flowing into the Future*

MAY 13-15, 2024 | RENAISSANCE SCHAUMBURG, IL

PLANT PROFILE:

Stevens Point WWTF



PLUS:

- 2024 Officer Nominations
- 29th Annual Education Seminar Preview
- GWS Update: Annual Service Trip



Central States Water Environment Association
1021 Alexandra Blvd., Crystal Lake, IL 60014
ADDRESS SERVICE REQUESTED



NO LOWER BEARINGS, SPROCKETS, BUSHINGS OR GUIDES. NO PROBLEMS!

Capture more debris with no fouling or jamming. Lakeside's **Raptor® FalconRake® Bar Screen** features a trouble-free stainless steel chain link design and multiple rake heads to achieve continuous, highly efficient solids removal with low headloss. The energy saving drive system operates at variable speeds to ensure superior cleaning, and is easily accessible above the water surface. And, as with everything Lakeside manufactures, our heavy-duty design and all stainless steel construction is made to last even in the most severe conditions. Protect your downstream equipment with the **Raptor FalconRake Bar Screen**, Lakeside's proven, durable and cost-effective screen technology for rapid debris removal in municipal and industrial applications.

For more information on how you can achieve Lakeside quality and performance, contact one of our experts at **630.837.5640**, email us at sales@lakeside-equipment.com or visit our website www.lakeside-equipment.com.



Cleaner Water for a Brighter Future®



Raptor® Screening Products

- Fine Screen
- Micro Strainer
- Rotating Drum Screen
- Septage Acceptance Plant
- Septage Complete Plant
- Complete Plant
- Multi-Rake Bar Screen
- FalconRake® Bar Screen
- Rotary Strainer Screen
- Wash Press

NANOBUBBLE TECHNOLOGY HELPS MEISTER CHEESE SOLVE ANAEROBIC DIGESTION CHALLENGES

Meister Cheese Company is a family-owned business that has been crafting private-label cheese and dairy products since 1916. While dedicated to high quality and sustainability, Meister faced complex wastewater challenges that curtailed their goal to grow and meet the market demand.

Anaerobic Digestion Inefficiencies Halting Company Growth

The company uses an anaerobic digester to produce methane gas, or biogas, which fuels the cogeneration system that provides electricity for their wastewater plant.

However, from rigorous food safety standards and Clean-in-Place procedures, the high concentration of antimicrobial compounds in cheese production wastewater inhibits the microbes that convert waste into valuable biogas. Meister's inhibited anaerobic digestion led to an overloaded treatment plant that was difficult to manage along with high operation and maintenance costs.

With an overloaded wastewater treatment system, the dairy farm would need to reduce cheese production or bear the cost of hauling high-strength sludge away. Neither option was financially or environmentally appealing. Meister needed a solution that would remove antimicrobial compounds from its wastewater to enhance biogas production, reduce hauling costs, and avoid a severe impact on its bottom line.

Embracing Nanobubble Technology

In October 2022, Meister installed Moleaer's nanobubble generator (NBG) inline to recirculate NBs inside of its anaerobic digester to break down the antimicrobial surfactants upsetting the process. Two months later, after seeing already seeing results in the digester, Meister installed another inline unit upstream of the digester to recirculate NBs at the lift station. Nanobubble (NB) technology uses air and water to generate in-situ clean chemistry and selectively removes inhibitory compounds, like disinfection products, soaps, and surfactants.

Meister's results were transformative. The NBs reduced the wastewater's antimicrobial surfactant concentrations from as high as **19 mg/L to non-detectable**. The removal of surfactants from Meister's wastewater increased the conversion of chemical oxygen demand (COD) to biogas in the anaerobic digester and cogeneration uptime.

Benefits of Nanobubbles: Cost Savings, Increased Production & Sustainability

Before installing Moleaer's NB units, difficult-to-treat sludge forced the farm to haul as much as three million gallons of waste in 2022. Removing sludge from the process also lowered gas production, disrupting the cogeneration system's benefits. After installation, hauling almost stopped, with only 12,000 gallons of waste trucked offsite. Gas production increased by an average of 20% since installing NB technology. The volume of biogas produced per pound of COD destroyed increased by 30%, enhancing gas production and the overall treatment system's performance. Meister was able to return on the investment of Moleaer's NB technology within 30 days because of these improvements.

The financial impact was equally impressive. Larry Harris, Master Cheesemaker and operations manager at Meister stated, "We're planning to increase production by over 20 million pounds of cheese and whey products over the next three years since installing Moleaer equipment in our wastewater process. That includes avoiding \$10 million in CAPEX improvements we would have needed to make. We recommend Moleaer's system for other cheese manufacturers looking to increase their wastewater treatment capacity and production at the same time."

On top of avoided capital expenditures, operation costs fell as well. With the anaerobic digester predictably producing more biogas,

cogeneration uptime increased by 21%. Between the value of biogas and Meister's improved treatment, the dairy farm saw a payback period of less than one month after installing both NBGs.

A Future with Nanobubble Technology

Pretreatment with NBs enabled Meister to change the direction of their plant's capital and operational expenses to a degree that was unimaginable a year ago. The direct inhibitory compound removal intensified the treatment facility and balanced wastewater quality while reducing traditional chemical addition.



Moleaer's nanobubble generator was easily installed with little to no downtime for the wastewater plant.



Nanobubbles helped remove inhibitory compounds prior to Meister's anaerobic digestion resulting in increased biogas production and quality.



MOLEAER
ADVANCING NANOBUBBLE TECHNOLOGY

3232 W El Segundo Blvd | Hawthorne | CA 90250
info@moleaer.com

Visit Moleaer's website to learn more.

Your Trusted Source for Quality **VALVE** SOLUTIONS



Vessco, LAI and Dorner are known for providing outstanding solutions for water, wastewater and sewage treatment. Our long partnership with DeZURIK allows us to provide a broad range of quality valves under the DeZURIK, APCO, Hilton, Willamette, Red Valve, Tideflex and RKL Controls brands. Contact one of these partners today for valve solutions that provide superior performance and value.



847-392-0990 | lai-ltd.com
ILLINOIS



262-932-2100 | dornerco.com
WISCONSIN



952-941-2678 | vessco.com
MINNESOTA

FEATURES

2024 Officer Nominations	17
29th Annual Education Seminar Preview	21
97th Annual Meeting Preview	27
Plant Profile: Stevens Point WWTF	48
GWS Update: Annual Service Trip	51

DEPARTMENTS

Messages

President’s Message	7
WEF Delegates’ Report	9
Advertiser Information Center	61

CSWEA/WEF News

Member Profile: Matt Seib	18
Member Profile: Kyle Sandberg	19
2024 Events Calendar	59

Section News

Wisconsin Section Chair Message	11
Minnesota Section Chair Message	13
Illinois Section Chair Message	15

President
Amy Underwood
Downers Grove Sanitary District
P: 630-969-0664
aunderwood@dgsd.org

1st Vice President
Troy Larson
Strand Associates, Inc.
P: 608-251-4843
troy.larson@strand.com

2nd Vice President
Tim Wedin
Metropolitan Council
P: 651-602-4571
timothy.wedin@metc.state.mn.us

Treasurer
Alan Grooms
Madison Metropolitan SD
P: 608-222-1201
alang@madsewer.org

Immediate Past President
Tracy Hodel
City of St. Cloud
P: 320-650-2953
tracy.hodel@ci.stcloud.mn.us

WEF Delegate ‘22-’25
Rich Hussey
LAI, Ltd.
P: 847-392-0990
rhussey@lai-ltd.com

WEF Delegate ‘23-’26
Anna Munson
Hazen & Sawyer
P: 651-888-8804
amunson@hazenandsawyer.com

PWO Representative ‘23-’25
Jeremy Cramer
City of Sun Prairie
P: 608-825-0731
jrcramer@cityofsunprairie.com

YP Representative ‘22-’24
Andee Huff Chester
Brown and Caldwell
ahuffchester@brwncald.com

Minnesota State Section Trustee ‘24
Anna Munson
Hazen & Sawyer
P: 651-888-8804
amunson@hazenandsawyer.com

Illinois State Section Trustee ‘24
Amanda Streicher
Baxter & Woodman Inc.
P: 312-751-3250
astreicher@baxterwoodman.com

Wisconsin State Section Trustee ‘24
Matt Seib
Madison Metropolitan SD
P: 608-414-455-1609
matts@madsewer.org

Follow us on Twitter  @cswea Link up with CSWEA on

 **LinkedIn**

Published by:



Tel: (866)985-9780 Fax: (866) 985-9799
www.kelmanonline.com info@kelman.ca
Design/Layout: Tabitha Robin
Marketing Manager: Jeff Kutny, jeff@kelman.ca
Advertising Co-ordinator: Stefanie Hagdiakow
Federal tax# 23-7378788

©2024 Craig Kelman & Associates Ltd. All rights reserved. The contents of this publication, which does not necessarily reflect the opinion of the publisher or the association, may not be reproduced by any means, in whole or in part, without the prior written consent of the publisher.

Central States Water, the official magazine of the Central States Water Environment Association, Inc., is published four times per year. Send comments, news items, gloss photographs or digital images to Mohammed Haque, mbaque@cswea.org

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



Follow us on Twitter  @cswea
Link up with CSWEA on  **LinkedIn**



Seeing your facility from a 360° PERSPECTIVE

“Virtual design lets us help you be fully-integrated in the design process and get what truly works for your team!”

*Steve Seibert,
Lead BIM/Revit Specialist*



www.ae2s.com

Water Engineering and Beyond

Award-Winning Best Place to Work

Thank You All

By Amy Underwood



I was reminded recently of the meaning of the phrase “Water is Life” while listening to *Parched*, a podcast from Colorado Public Radio. The final episode focuses on the fate of the Colorado River in Mexico. For decades the riverbed has been dry and barren. This desert was a result of all the water being divided between upstream parties, leaving none for the former wetland. Restoration of a section of the wetland was started more than 12 years ago by bartering with local farmers for water for the environment. Once water was reintroduced to the former wetland, native species were replanted. The host takes the listener to the restored area where you can hear life through the breeze in the trees and through the calling birds, life that did not exist without the water.

How we address challenging water issues now impacts the sustainability of life for future generations. Over the last several months, the Local Arrangements Committee and the Technical Program Committee have been hard at work putting together the program for the CSWEA’s 97th Annual Meeting, which will allow attendees to collaborate on challenging water issues. The theme for the Annual Meeting is *Flowing into the Future*. The Technical Program contains many presentations on topics which are shaping the future of clean water. Highlights on the Annual Meeting may be found in the program preview in this issue. I look forward to seeing you all at the Annual Meeting on May 13-15, 2024, at the Renaissance in Schaumburg, IL.



Thank you to the members of the Executive Committee who made the trip to Schaumburg in January for our meeting and thank you also to those who attended virtually. In addition to addressing routine Association business, the Executive Committee adopted changes to the CSWEA Statements of Policy (SOPs). The changes included making the Resource, Recovery & Energy (R2E) Committee, which was previously an ad hoc committee, a permanent Association level committee. Thank you to Mohammed Haque, Troy Larson, and Tim Wedin for your assistance in drafting the SOP revisions. The updated SOPs may be found on the CSWEA website.

This past fall, six members of the Executive Committee formed the Ad Hoc Strategic Planning Committee, with Mohammed Haque in an advisory role. A member survey will be drafted in early February, so it will likely have already gone out to members

before this is published. Thank you in advance to all who participated. The committee’s intention is to present a draft Strategic Plan at Central States Exchange (CSX) in July, where we hope to get great feedback on the plan before it is finalized.

Thank you to our association immediate past president, Tracy Hodel, who will end her term on the Executive Committee in May. Throughout my time working with Tracy, I have appreciated her enthusiasm and her genuine approach to everything she does. Also thank you to Anndee Huff Chester for her dedicated service on the Executive Committee as she finishes her two-year term as the Young Professional Representative.

I have one last “thank you” (at least for this magazine – I’m sure I will give many more at the Annual Meeting in May). That “thank you” is to all of you for the honor and trust you have given me in being president of this association. I have been truly blessed in this opportunity to serve you and by the support I have received while in this role. You have made this an incredible experience. **CS**

“How we address challenging water issues now impacts the sustainability of life for future generations.”

Experience, Expand, Evolve with ZeeWeed* 500

The next generation of superior MBR technology for large municipal MBR applications

Not only is our reinforced membrane one of the **STRONGEST** in the market, but the ZeeWeed 500 series has now expanded with its innovative ZeeWeed 500EV configuration. Addressing the ever-changing needs of municipal customers looking to:



Reduce membrane tank footprint by up to 50%



Lower energy usage by 20% and reduce chemical consumption



Longer membrane life means fewer membrane replacements



Best available technology for water recycling



Learn more



Reducing the Total Cost of Ownership with Innovation



*Trademark of Veolia may be registered in one or more countries. © 2023 Veolia. All rights reserved.

Inside Drops for Manholes

Stop wasting resources on outside drops!

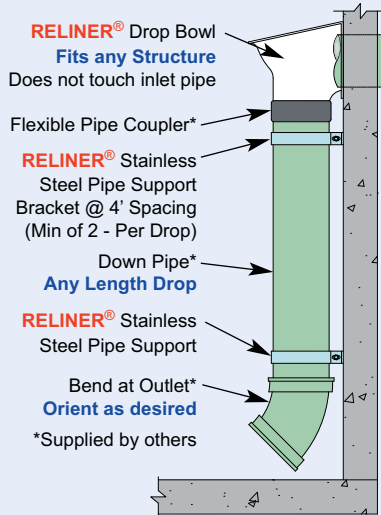
Find out why sewer districts throughout the USA are specifying RELINER® products



Photo by Central Industrial Contractors

Manhole Inside Drop

- Eliminate outside drops
- Reduce maintenance
- Simplify cleaning
- Stop Corrosion
- Install Quickly



Outlet sizes to service
4" lateral drops through
24" wet well drops



Now available
in 304 & 316
Stainless

AIS Compliant

Stainless Pipe Supports

- Adjustable, non-corrosive
- 11 gauge 304 or 316 SS
- Supports the pipe fully
- 1.5"-30" dia. in stock
- Easy to install

RELINER®/Duran Inc.

www.reliner.com

1-800-508-6001



Strong Start for WEF

Written by Anna Munson and Rich Hussey



Rich Hussey



Anna Munson

We hope everyone is having a great start to the year. There was a fair amount of activity in the beginning of the new year within WEF that we would like to share. In addition, there are many opportunities within our membership to shine either individually or collectively as CSWEA. WEF Awards program offers more than 30 professional recognition awards to members and water sector professionals. This year, WEF will also award a \$25,000 scholarship to support post-baccalaureate students in the water environment field as well as multiple scholarships to individuals who are seeking water sector operator education, training, or certification. Please consider the following opportunities:

- **The Member Association Excellence Awards** recognize a WEF Member Association that demonstrates good performance in all areas listed below and exceptional performance in multiple areas.
- **The Water Quality Improvement Award** is presented annually to the water quality improvement program that best demonstrates significant, lasting, and measurable excellence in water quality improvement or in prevention of water quality degradation in a region, basin, or water body.
- **The Operator Scholarship** provides funding for individuals who are seeking water sector operator education, training, or certification to enter the industry or to advance their knowledge, skills, abilities or license.

Also note if you know of an individual, fellow MA, program, etc. that deserves to be recognized for a WEF Award, you are welcome to sponsor an applicant or submit a nomination:

The WEF Awards application deadlines are as follows:

- The Canham Graduate Studies Scholarship | Open now through March 31 | www.wef.org/wef-canham-graduate-studies-scholarship
- The Operator Scholarship | Open now through March 31 | www.wef.org/opscholarship
- The WEF Awards | Open now through March 31 | www.wef.org/award-applications

Please note that all of these award opportunities can be located on WEF's website under the Membership and Community tab.

The various workgroups within the House of Delegates are hosting monthly meetings and developing various action items towards the workgroup assigned goals. One new item that is being developed within WEF is the Workforce Development Work Group. This group

will be getting underway in April, and prior to that, WEF is gathering some data from all their MAs to kickstart their efforts. The purpose is to seek out MAs who have successful programs in workforce development and ultimately provide details of those programs as a resource to the other MAs. The workgroup will deliberate after the results have been returned and select a few MA programs to highlight in a toolkit.

Please consider attending some upcoming WEF events. WEFMAX Registration is now open. Join WEF, the WEFMAX Committee and the 2024 Host MAs (Virginia WEA, WEA of Utah, and Florida WEA) in celebrating 50 years of WEFMAX in 2024. To register please go onto the WEFMAX website. Listed below are the dates and the locations:

- **WEFMAX in Alexandria, VA** | April 10-12, 2024
- **WEFMAX in Park City, UT** | May 15-17, 2024
- **WEFMAX in St. Petersburg, FL** | May 29-31, 2024

WEF is also offering YP scholarships to cover the registration cost to attend the National Water. The Policy Fly-In during Water Week 2024 in Washington, DC and, a \$800 stipend for each scholarship recipient to help cover transportation, lodging, and food expenses. The *scholarship application* is open and will close on March 1, 2024.

On a different note, to help communicate the successes within the various MAs, WEF has implemented a MA spotlight presentation at each WEF Delegate Meeting. This past January, CSWEA was highlighted by Elizabeth Heise. She represented CSWEA well and discussed the unique successes CSWEA holds with the operator training programs and the Midwest Student Design Competition. Other MAs applauded these efforts and were fairly impressed with the Design Competition and encouraged WEF to financially support this effort further. There are many who should be applauded for these efforts, especially the current chair Joe Lapastora.

There are many great opportunities both within WEF and CSWEA to become more active. We, as the WEF Delegates, are here to help address any questions or concerns within our membership. CSWEA is filled with so many outstanding members that we hope that you take part in the opportunities highlighted above and further demonstrate to WEF and other MAs the true value of being a CSWEA member. Please feel free to email Anna or I with questions of concerns (amunson@hazenandsawyer.com or rhussey@lai-ltd.com). **CS**

TAP INTO SOUND SCIENCE

Looking for a safer and easier way to know which sewer lines need cleaning?



SAVE TIME

Get a reading in 3 minutes or less with no flow contact.



SAVE MONEY

Screen 2+ miles per day at a fraction of CCTV costs.



SAVE WATER

Clean the pipes that truly need it.

Take the RAT Anywhere

Easy to use. Light to carry. EPA evaluated.

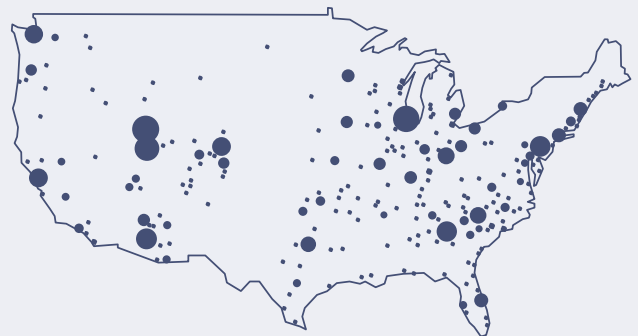
Find the RAT Everywhere

Trusted by 1,500+ utility companies for condition-based maintenance.



See and Hear the Difference

Scan code for testimonial video



InfoSense, Inc



SL-RAT

Request a Demo Today

877-747-3245 • sales@infosense.com • infosense.com

We Have Come a Long Way



By Chris Lefebvre

The Wisconsin River has been dubbed “the Hardest Working River in America” because of its 26 hydroelectric dams and 21 reservoirs. Today these reservoirs make the Wisconsin River a recreation destination for people from all over the Midwest.

Each spring the stretch of river near Nekoosa provides some of the best trophy walleye fishing in the state and on weekends during the summer months almost every sandbar is filled with people enjoying the water. Like many other bodies of water, this wasn’t always the case.

Last week one of our retired wastewater operators stopped by to visit. The conversation led to a discussion of how much the river has changed since he was a young boy living in Stevens Point. He talked about how bad the river smelled and how people to avoid the riverside parks because of the odor. The only activity he did along the river was fishing for bullheads, and he added that you would never consider eating a fish out of the river during those days. Prior to the early 1980s, many of the reservoirs on the Wisconsin River more closely resembled an upset activated sludge facility than the tourist destination they are today. In those days, floating sludge would build up behind the dams and the DO in some areas would drop to levels that would regularly cause fish kills. Stories like these make me proud to be in an industry that is working to ensure a healthy environment for future generations.

We have made huge gains in water quality over the 52 years since the *Clean Water Act* but there is still work to be done. Some of these same reservoirs still turn green in the summer from high nutrient loading and we continue to find other pollutants like PFAS and pharmaceuticals




that have detrimental effects on wildlife and human health. With all these challenges, it is comforting to know that our industry will continue to do its part to leave the lakes and rivers of Wisconsin better than we found them.

Supporting organizations like CSWEA is a great way to ensure that an environmentally friendly mindset is continued well into the future. Our organization is at the forefront of making changes for the betterment of the environment. As an organization we promote new technologies and ideas on how to be more effective

and efficient at removing pollutants from our most important resource, water. CSWEA even does a great job promoting this mentality outside of our country through the Global Water Stewardship program. None of this would be possible without people like you stepping up and donating a few minutes of your busy schedules to help. If you aren’t currently on a committee, I strongly encourage you to join one. It is normally just a few meetings a year and you get to meet some great people while you help guide our industry into the future. If you aren’t sure how to get involved, feel free to track me down at the CSWEA Annual Meeting in May and I will gladly help you out.

By the time this is published I will be almost done with my tenure as the Wisconsin State Section Chair. While this role was outside of my comfort zone, it has been a great experience. My time as Chair wouldn’t have been successful without the great people I have had the pleasure of working with. Thank you all for your continued dedication to doing the things that make our organization great. **CS**

“We have made huge gains in water quality over the 52 years since the *Clean Water Act* but there is still work to be done.”




SOLAR ENERGY AND STORAGE SYSTEMS

RENEWABLE ENERGY

Ziegler Power Systems offers a variety of renewable energy and microgrid solutions:

Solar panels • Battery energy storage

888.320.4292
www.zieglercat.com/solar



EQUIPMENT AVAILABLE NOW!

TEMPORARY PFAS TREATMENT



BY WATER SURPLUS®



SOLUTIONS THAT MEET YOUR NEEDS

- ✓ REVERSE OSMOSIS TO CONCENTRATE
- ✓ ION EXCHANGE
- ✓ GRANULAR ACTIVATED CARBON

800.919.0888
WaterSurplus.com



All Things Water

If you're trusted to protect public health or the environment, we can help.

Offices in
 Saint Paul, MN
 and Nationwide

Hazen

hazenandsawyer.com

Wastewater

possibilities abound




Engineers | Scientists | Consultants | Constructors
 St. Paul | Milwaukee | Chicago | BrownandCaldwell.com

©2024 Brown and Caldwell

Gone Too Soon. We Will Miss You, Samidha Junghare



We are very saddened to pass on the tragic news of Samidha's passing. Samidha Junghare passed away unexpectedly in the early hours of February 2, 2024, at St. Luke's Hospital.

She was born in Austin, TX, daughter to Indira and Yashwant Junghare, then grew up in Lauderdale, MN. While growing up in Minnesota, Samidha excelled in figure skating competitions and later in her college years enjoyed professional team figure skating entertaining fans attending Minnesota North Star men's hockey games. Not only did she figure skate, but she was active in many other sports including gymnastics, downhill skiing, roller skating, and was a swimmer and lifeguard.

Samidha was CSWEA's MN Section Chair and Vice Chair. She was heavily involved with planning the Innovative Conference for many years. She was a big factor in getting engaging and compelling speakers for the conference which made it a much more interesting event. Samidha could always be

counted on for a friendly smile and warm presence. She was active in CSWEA for many years in many different roles and we all mourn her loss. Some of her other highlights at CSWEA were:

- Treatment Facility Operations Award Recipient in 2022
- Member of 2023 Local Arrangements Committee for the 96th Annual Conference
- Member and former Chair of Operations/Safety/Laboratory Committee
- Regular participant in Resource Recovery and Energy (R2E) Committee
- Member of General Awards Committee
- Helped prepare the information for WLSSD's R2E award in 2020 and was a big part of why WLSSD received that award
- Inducted into 7S in 2023

She is survived by her husband Mike; their children Meera and Nayan; her mother, Indira Junghare; her brother, Milind Junghare; Auntie, Nalini Kokate; and a large family of aunts, uncles, cousins, and friends.

Education is very important to Samidha and her family. In lieu of flowers, those who wish



to remember Samidha can make donations to her children's education. Meera is a Junior at the University of Minnesota, and Nayan is graduating high school this spring with plans to attend college in the fall. Gifts can be made via the link below.

A celebration of life was held on Saturday, February 10 at Pier B Resort Ballroom in Duluth, MN. Full obituary, online condolences and donations may be found at www.everloved.com/life-of/samidha-junghare/obituary. CS

“Samidha could always be counted on for a friendly smile and warm presence.”

Intelligent Pumping Solutions, Optimized for Excellence - Discover the Future with Grundfos Connect

Revolutionize Water Management with Whole Life
Cost Savings and Advanced Remote Surveillance

Unlock the full potential of your water utility systems with Grundfos SE/SL pumps, now enhanced with the power of Grundfos Connect. Experience the seamless integration of advanced pump technology and smart monitoring that ensures peak performance and reliability.

This solution delivers unparalleled insight into your pump's performance and condition, providing a solid foundation for informed, knowledge-based preventive maintenance. With Grundfos Connect, you're not just investing in a pump; you're investing in a future of cost-effective operations and sustainability.



- ✓ Real-time monitoring of Pump Status, Run Time, Flow, Volume, and Energy Consumption
- ✓ Immediate alerts with Alarms for proactive issue resolution
- ✓ Standard equipped with robust thermal, moisture, and leakage switches for enhanced safety and durability
- ✓ Significantly reduce the frequency of on-site visits and maintenance, optimizing your team's efficiency and reducing operational costs



[grundfos.com](https://www.grundfos.com)

*Transform your operations with Grundfos Connect.
Save money, reduce downtime, and elevate your water
management system to new heights. Visit our website
or contact a Grundfos specialist today to learn how our
integrated solutions can empower your business.*

GRUNDFOS 

Possibility in every drop



New Beginnings

By Jason Neighbors

With spring approaching and winter starting to retreat in the rearview mirror, it is a time for new beginnings! All the planning from last year is coming full circle and is ready for implementation. This is an extremely exciting time of year. For many of us, this can be in the form of capital projects, professional events, or new personnel. New beginnings provide new opportunities to succeed, learn, and mentor. For me, personally, the new year marks the beginning of all three.




“New beginnings provide new opportunities to succeed, learn, and mentor.”

it is to get out there and create your network. This spring brings us a plethora of opportunities to build that network from the Government Affairs Seminar in March to the Education Seminar in April, as well as the Annual Meeting in May. Join a committee that

interests you. Don't know how? Just reach out, we are here to help.

New personnel bring new perspectives, resources, and problem-solving skills. It also allows us to pass our knowledge on as we train. Mentoring those around you keeps your skills sharp as well as providing an opportunity to learn from their past experiences, both successes and failures. Whether it is in-house training or one of the excellent monthly Operator Training events CSWEA provides, we can learn alongside the new personnel, making the whole team stronger. It is these “Ah-Ha!” moments that I love.

It has been my immense pleasure to have served for the last year as the Chair of the Illinois Section of CSWEA. I have learned a great deal in the process! Good luck to the incoming Chair Chris Buckley.

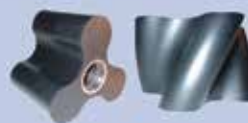
Remember, the challenges we face create opportunities to showcase our abilities and what we are made of. Bring on the challenges! 

Capital improvement projects challenge us to think of the future as well as reflecting on the past. This year provides our treatment plant the opportunity to install a new non-potable water system. Our current system became undersized with a previous plant expansion. This project provides us the ability to size this system for our current needs as well as the future. Projects like these can be monumental accomplishments! Take pride in all the victories no matter how small. Simple things such as moving a door to a more opportune location can be a huge win. Replacing an obsolete process with a more efficient and modern one can change the performance of the facility drastically. These projects allow us to learn and grow in our positions and give us knowledge and insight we take with us into the future.

It is in these moments that the network we build within our professional lives comes into play. In being a part of CSWEA, I have had the great pleasure to meet some amazing people. In conversations at professional events throughout the year, such as the Annual Meeting, I have had the opportunity to brainstorm and learn from other's experiences. This has helped to guide my decisions when facing my own work challenges. Last year, while in the midst of an aeration project, a new technology was brought to my attention that I was not previously aware of. This changed the direction of our aeration project and ended up reducing the overall cost and timeframe of the project. I cannot stress enough how important

“Mentoring those around you keeps your skills sharp as well as providing an opportunity to learn from their past experiences, both successes and failures.”

REPLACEMENT • REPAIR • RECOVERING



- Aftermarket pump parts for most models of Börger®, Vogelsang®, Lobeline®, Lobeflo®, and Muniflo® Pumps
- Repair of Rotary Lobe Pumps
- Manufacturer of the Muniflo Rotary Lobe Pump (originally manufactured by Wemco since 1985)



Are you looking for obsolete Lobeflo® Pump Parts? We are the answer!

www.equipump.com | info@equipump.com
tel 800-783-5623 | fax 800-693-5623



**EFFICIENCY
SAVES MONEY.**

**CONVENIENCE
SAVES TIME.**

WE OFFER BOTH.

It's the synergy that comes from supplying both pump equipment and electrical controls to operate those pumps. It's the one stop shop for selection and sizing as well as after-market service to the end user.

We sell solutions that provide the highest operational efficiency. We have premium-efficient pumps and motors along with advanced control strategies to reduce energy costs.

We understand your needs and the dynamics of your situation. We'll develop customized solutions and enhanced services that you can't find anywhere else. With one call, find out why L.W. Allen pumps and Altronex control systems have become the leading provider of pumps, controls, technical assistance and superior customer service.

**Reduce your energy costs and save time.
Call (800) 362-7266.**

517 N Westhill Blvd • Appleton, WI 54914
1802 Brackett Ave • Eau Claire, WI 54701
4633 Tompkins Drive • Madison, WI 53716
(608) 222-8622 • FAX (608) 222-9414 • www.lwallen.com



L.W. ALLEN
PUMP SYSTEMS®



ALTRONEX®
Control Solutions by SJE

2024

OFFICER NOMINATIONS



2ND VICE PRESIDENT **RICHARD HUSSEY**

Richard Hussey has been part of the wastewater industry since 2000 and has been an active member of CSWEA and WEF since joining the industry. He is a member of the 7S Society, a current WEF Delegate, and has served in many different roles within CSWEA. These roles include IL Section Chair, IL Section Trustee, CSWEA YP Chair, Education Seminar Chair, along with many different committees throughout his involvement within CSWEA. He has also been part of four Local Arrangement Committees for various Annual Conferences. Rich has a BS and MS from the University of Illinois Urbana Champaign in Engineering and is a current licensed professional engineer. Currently, Rich has worked for LAI Ltd, a water/wastewater equipment manufacturer representative firm, for the past 20 years. Prior to joining LAI Ltd, Rich worked as a consulting engineer serving municipal clients.



TREASURER **ALAN GROOMS**

Alan Grooms has been a member of CSWEA and WEF since 2009. He has presented at the CSWEA Annual Conference, WEFTEC, the WEF Biosolids and Residuals Conference, and the WEF Nutrient Conference. Alan has served on several committees and organizing bodies, including service as the 2013 CSWEA Annual Conference Local Arrangements Committee Chair, Wisconsin Section CSWEA Chair, as well as working on local arrangements committees and the Wisconsin Section Operations Committee, the Wisconsin Section Management Seminar Committee, and is a member of the CSWEA 7S. Alan is a licensed professional engineer and a certified operator in the state of Wisconsin. He graduated from Iowa State University with BS and MS degrees in Civil and Environmental Engineering, and currently works as the Operations Manager at Madison Metropolitan Sewerage District, where he has been employed for more than 14 years. Prior to coming to the District, Alan worked as a consulting engineer serving municipal clients.



YOUNG PROFESSIONALS REPRESENTATIVE '24-26 **ELIZABETH KRAMER**

Elizabeth Kramer has been active in CSWEA and the wastewater industry for more than five years. She has served in several committees during her time as part of CSWEA. Her first role was as part of the MN Section Operations, Lab, and Safety Committee. She has since served as the co-chair and now chair of this committee, which organizes the annual Innovative Approaches to Wastewater Operations Conference. Elizabeth was involved in the Local Arrangements Committee for the 2022 CSWEA Annual Meeting and was the Local Arrangements Committee Chair for the 2023 Annual Meeting in St. Paul.

Elizabeth graduated from Gustavus Adolphus College in 2015. Her current role is Sustainability Coordinator for the City of St. Cloud. Many parts of her work focus on the St. Cloud Nutrient, Energy and Water Recovery Facility, where she has worked for nearly six years. **CS**



Matt Seib

Process and Research Engineer,
Madison Metropolitan Sewerage District

Matt Seib grew up in Waukesha, WI before attending University of Wisconsin-Platteville to get a bachelor's degree in civil engineering. During his undergraduate education, Matt had opportunities to explore different career paths through summer internships with a large regional construction firm and civil engineering design firm, and also spent five weeks in Bangladesh shadowing aid workers to get a first-hand look at development work in areas of extreme poverty. Matt was initially interested in specializing as a structural engineer but became fascinated with environmental engineering and wastewater treatment in particular. Specifically, Matt was drawn to anaerobic digestion as a means to convert waste into valuable products for beneficial reuse.

When searching for career opportunities in anaerobic digestion, it became clear to Matt that he needed to pursue a graduate degree. During his graduate school search, Matt discovered the Peace Corps Master's International Program at Michigan Technological University. At the time, this unique graduate school program combined on-campus course work with a 27-month

service period as a Peace Corps Volunteer to fulfill the requirements for a master's degree. Since visiting Bangladesh, Matt had an interest in additional foreign aid volunteer opportunities, and this program combined two things at once. Through this program, Matt completed his Peace Corps service in Mali (western Africa) as a water and sanitation engineer and used the time to study community drinking water use and sanitation practices for his master's degree.

While Matt was finishing up his master's work, one of his advisors suggested a doctoral research assistant position at Marquette University focusing on anaerobic digestion. Matt decided this was an opportunity he could not pass up. He ultimately graduated with a PhD in civil engineering with a focus in anaerobic biotechnology. His doctoral research was on developing low energy demand anaerobic membrane bioreactor systems to replace activated sludge for municipal wastewater treatment. While at Marquette, Matt was recognized for his academic achievements by receiving the WEF Canham Graduate Studies Scholarship and an EPA STAR Fellowship.

Following graduate school, Matt took a position as the Process and Research

Engineer at the Madison Metropolitan Sewerage District (MMSD) and has been in that role for the past eight years. In this role, Matt helps oversee and troubleshoot daily operations at one of the largest treatment plants in WI. He is also involved in various aspects of capital planning and leads research efforts for treatment upgrades. While working at MMSD, Matt has continued to advance his career by becoming a Professional Engineer, an Advanced Wastewater Treatment Operator in WI, and an Envision Sustainability Professional. He has also been active within CSWEA having served on the Technical Committee and Education Seminar Committee as well as at the WI Section level with the Government Affairs Committee, Energy and Resource Recovery Committee, and Operations Committee. He currently serves as the WI Section Trustee. Matt has been recognized for his work by receiving the CSWEA Young Professional Award, Radebaugh Award, and 7S Award, along with the WI Section Service Award and the Wisconsin Wastewater Operators' Association (WWOA) Newcomer of the Year Award. [CS](#)

“He has also been active within CSWEA having served on the Technical Committee and Education Seminar Committee as well as at the WI Section level with the Government Affairs Committee, Energy and Resource Recovery Committee, and Operations Committee.”



Kyle Sandberg

Project Engineer, HR Green, Saint Paul, MN

Kyle Sandberg is from Allentown, PA and currently resides in Minneapolis, MN. He received a bachelor's degree in civil engineering from the University of Notre Dame. While at Notre Dame, he was an undergraduate researcher in a lab that focused on biofilms and membrane-biofilm reactors where he was first exposed to the field of wastewater treatment. After he graduated from Notre Dame, he enrolled at the University of Minnesota, where he earned his master's degree and PhD in civil engineering. His research focused on the occurrence of antibiotic resistance genes in wastewater in various environments. He visited wastewater treatment plants throughout Minnesota to collect influent samples and determine how the quantity of resistance genes varies between treatment plants. He also sampled freshwater sediments along the Minnesota and Mississippi Rivers to determine the impact

“Kyle is excited to attend more CSWEA events to meet other members and become more involved in the organization.”

of wastewater treatment plant effluent and heavy agricultural activity on the quantity of resistance genes.

After finishing his PhD, Kyle moved to Indianapolis, IN to work for Commonwealth Engineers, Inc., where he worked on water and wastewater treatment projects. He worked closely with SRF and USDA Rural Development to prepare preliminary engineering reports to secure funding for various wastewater treatment plant and collection system improvements projects. He also gained experience hydraulic analysis of collection systems and treatment plants. Kyle currently works in Saint Paul, MN at HR Green, Inc. working on all phases of water and wastewater treatment projects starting

with feasibility studies through design and construction. He is particularly passionate about modeling wastewater treatment plant processes.

Kyle is part of the Local Arrangements Committee, which helps organize the Annual Meeting (This year, held in downtown Saint Paul, MN in May 2024). He worked with the registration subcommittee, helping attendees and exhibitors get checked in and set up. Kyle is also part of the R2E committee and has enjoyed learning about technologies and methods to reduce energy use in wastewater treatment.

Kyle is excited to attend more CSWEA events to meet other members and become more involved in the organization. [CS](#)

COMMITTED TO CONSTRUCTING EXCEPTIONAL WATER PROJECTS

- ☑ Water and Wastewater Facilities
- ☑ Preconstruction, CMAR, and Design-Build Services
- ☑ Municipal, Federal, and Private Sector Clients



☎ 218.546.5519

🌐 ricelake.org

Don't Gamble with Water



Viva

TRI-STATE

2024

39th ANNUAL
TRI-STATE SEMINAR
August 5 – 8, 2024

South Point Hotel & Casino | Las Vegas

ALL UNDER ONE ROOF

- ◆ More Than 300 Exhibitors
- ♣ 200+ Technical Sessions
- ♥ Expanded Tour Offerings and Workshops for New and Experienced Operators
- ♠ Up to 24 Contact Hours Available Over 3 Days

HOTEL RESERVATIONS

GROUP NAME:
Tri-State Seminar 2024

ROOM RATE: \$88/night
(not including taxes & fees)

DATES: August 4 - 8, 2024

GROUP CODE: TRI2024
(first 3 are letters, last 4 are numbers)

CUT-OFF DATE: 07/19/2024

REGISTRATION RATES (Per Person)

- ◆ \$99 Early Bird
- ♣ \$199 After July 19, 2024
- ♥ \$249 After August 4, 2024





29TH ANNUAL CSWEA EDUCATION SEMINAR



The Future of Nutrient Removal:
Decarbonization, intensification and emerging technologies

APRIL 9TH 2024

Mark your calendars for the CSWEA 29th Annual Education Seminar to be held in person on April 9th, 2024 at the Monona Terrace in Madison, WI. We have an exciting program to discuss trends in biological nutrient removal. Presentations will include discussions on decarbonization, activated granular sludge, low dissolved oxygen operation, membrane bioreactors, primary filtration, annamox, intensification, fermentation, and more.

MIDWEST STUDENT DESIGN COMPETITION (MSDC)

We encourage attendees to arrive April 8th to support University students from CSWEA and surrounding states that will be presenting their environmental and wastewater design projects at the Monona Terrace. Please consider attending to learn about their contributions to the industry and support these budding professionals. Competition starts at 10:00 am.

I&T DINNER

There will be an Innovation and Technology (I&T) dinner after the meet and greet at Cooper's Tavern (20 West Mifflin Street). If interested in attending, please sign up when registering.

29th ANNUAL CSWEA EDUCATION SEMINAR **SPEAKERS**



Julian Sandino, PhD,
PE, BCEE



Mari Winkler, PhD



Daniel Noguera, PhD



Kendra Sveum, PE



Matt Magruder



Jim McQuarrie, PE.



Cyrus McMains, PE



Kam Law, PE



Scot Strassburg, PE



Susan Danzl, PE

Meet and Greet Reception – April 8th

A meet and greet will be held April 8, 2024 after the Midwest Student Design Competition where both university students and seminar presenters will be available for networking. This event will be from 5:00 pm until 6:30 pm at the Monona Terrace.



29TH ANNUAL CSWEA EDUCATION SEMINAR

The Future of Nutrient Removal: Decarbonization, intensification and emerging technologies

8:00 - 8:10: WELCOME AND INTRODUCTIONS

8:10 - 8:55: NUTRIENT REMOVAL:

WHERE HAVE WE COME FROM AND WHERE ARE WE GOING

SPEAKER: JULIAN SANDINO, PHD, PE, BCEE
VICE PRESIDENT,
TECHNOLOGY SENIOR FELLOW, GLOBAL
WASTEWATER SOLUTIONS DIRECTOR
EMERITUS AT JACOBS

The past 30 years of our industry has seen an increasing influx of new ideas, technologies, and solutions related to nutrient removal. This presentation will take us through that history, discussing key advancements (and, in some cases, failures). It will touch on the early upgrade ideas to BNR within conventional activated sludge facilities, early biofilm technologies, the advent of membrane bioreactor (MBR) technology, and more recent advancements and trends, including the trend towards decarbonization and its impact on nutrient removal. Finally, it will include some advice on designing nutrient removal facilities knowing that the future is uncertain with respect to technologies developments and regulations.

DETAILED BIO:

Dr. Julian Sandino is a Vice President, Technology Senior Fellow, and Global Wastewater Solutions Director Emeritus in Jacobs, ENR -ranked No. 1 firm in Wastewater Treatment. He also serves as an advisor and special consultant to the World Bank in the areas of Water and Sanitation. Julian is named in Global Water Intelligence's Top 40 Global Water Influencers list and is a Fellow of the Internationally Water Association (IWA) and of the Water Environment Federation (WEF).

8:55 - 9:30: THE IMPORTANCE OF BIOFILMS AND GRANULES FOR NUTRIENT REMOVAL

SPEAKER: MARI WINKLER, PhD
ASSOCIATE PROFESSOR AT CIVIL &
ENVIRONMENTAL ENGINEERING DEPARTMENT
AT THE UNIVERSITY OF WASHINGTON

This talk highlights the integration of the activated granular sludge (AGS) technology

in existing wastewater infrastructure. We reported for the first time that granules are commonly present at full-scale continuous flow systems with low SVI, and granule growth may be associated with operational factors favoring PAO/GAO growth. AGS consists of variable granule sizes and this talk will show that granule sizes strongly impact nitrification, nitrogen removal as well as N_2O production rates at different operational DO. Moreover, a proof-of-concept for phosphorus recovery was tested by utilizing the high thickening properties of AGS. Furthermore, the talk will highlight the intensification of nitrogen removal with hydrogel immobilized mixed communities of AOB/anammox and pure culture of comammox.

DETAILED BIO:

Dr. Winkler (Mari) is a John R. Kiely Endowed Associate Professor at Civil & Environmental Engineering Department at the University of Washington (US). She received her PhD from the Environmental Biotechnology Department at Delft University of Technology (NL) and did a Marie-Curie Postdoc at Ghent University (BE). She also worked as a sales manager (DE, AT) and as a consultant (NL) shaping her application driven research. Dr Winkler received several prizes for her work (AEESP outstanding PhD dissertation award, Paul L. Busch Award, Huber Technology prize, Jaap van de Graaf award, B-IWA industry award, ISME-IWA Biocluster award, and Rhurverband water award). Her academic interests include microbial ecology of mixed culture communities, mathematical modeling of microbial interactions, and innovative wastewater and sludge treatment processes including Anammox, nDAMO, aerobic granular sludge, resource recovery, biosolids technology, SARS-CoV2 surveillance in the sewer.

9:30 - 9:50: POSTER SESSION & BREAK

9:50 - 10:30: YES, IT WORKS! BIOLOGICAL NUTRIENT REMOVAL (BNR) WITH MINIMAL AERATION

SPEAKER: DANIEL NOGUERA, PhD
DISTINGUISHED PROFESSOR OF CIVIL AND
ENVIRONMENTAL ENGINEERING AT THE
UNIVERSITY OF WISCONSIN – MADISON

In biological nutrient removal (BNR) treatment plants, removal of nitrogen and phosphorus is achieved by cycling the mixed liquor through aerated and not aerated zones. Aerated zones are required for ammonia oxidation and as part of the cycle that enriches polyphosphate-accumulating organisms (PAO). However, aeration is also an energy intensive operation, and thus, minimizing the amount of oxygen delivered to the process can help reduce energy requirements during treatment. This presentation will describe bench-scale, pilot-scale, and full-scale experiments demonstrating that the adaptation of key microbes to low dissolved oxygen conditions leads to the establishment of efficient BNR with minimal aeration. Lessons learned from 20 years of conducting these experiments will be discussed.

DETAILED BIO:

Professor Daniel R. Noguera is the Wisconsin Distinguished Professor of Civil and Environmental Engineering at the University of Wisconsin – Madison. He earned MS and PhD degrees in environmental engineering from the University of Illinois at Urbana-Champaign and was a postdoctoral researcher at Northwestern University before moving to Wisconsin in 1997. He specializes in sustainable biotechnology and bioenergy research. His lab currently studies bacterial transformation of lignocellulosic biomass, aromatic degradation pathways, conversion of agro-industrial residues into specialty biofuels and bioproducts, anaerobic digestion, and operation of biological nutrient removal processes under minimal aeration. He has received multiple awards, including the National Science Foundation CAREER award, the Paul L. Busch award from the Water Environment Research Foundation, and research or education awards from

the Water Environment Federation and the American Water Works Association.

10:30 - 11:10: ULTRA-LOW NUTRIENT REMOVAL AT THE BROAD RUN WATER RECLAMATION FACILITY: PAST, PRESENT, FUTURE

SPEAKER: **KENDRA SVEUM, PE**
DIRECTOR OF WATER RECLAMATION AT LOUDOUN WATER

The Broad Run Water Reclamation Facility (BRWRF) is a relatively new WRF located in Loudoun County, VA. The BRWRF went online in 2008 and was the largest MBR facility in the world at that time. The unique treatment train at the facility was driven by the stringent effluent limits that were put in place by the Virginia Department of Environmental Quality due to the effluent discharge location within close proximity of the Fairfax Water Drinking Water intake. This facility also faces stringent effluent challenges from the Chesapeake Bay Nutrient Program which assigned Nitrogen and Phosphorus waste load allocations (WLA) to all WWTPs in the state of Virginia based on their design capacity in the year 2011. The current regulations have no pathway to acquire additional WLA to accommodate new WWTPs since that date or expansion of existing WWTPs due to economic growth. This presentation will cover BRWRF nutrient removal performance to date as well as current work and challenges to meet future effluent discharge requirements that could be as low as 1.46 mg/L Total Nitrogen and 0.036 mg/L Total Phosphorus.

DETAILED BIO:

Kendra Sveum is the Director of Water Reclamation at Loudoun Water, in Ashburn, VA, where she oversees the operation of wastewater treatment, wastewater conveyance, remote small community systems, and the production/distribution of reclaimed water for Industrial non-potable reuse. Kendra is a licensed Professional Engineer and has a Bachelors of Science in Chemical Engineering and a Masters of Environmental Engineering from the Illinois Institute of Technology.

11:10 - 11:30: MORNING PANEL Q&A

11:30 - 12:45: LUNCH WITH POSTER SESSION

12:45 - 1:15: PRIMARY FILTRATION AS A REPLACEMENT FOR CONVENTIONAL STATE-OF-THE-ART PRIMARY CLARIFICATION FOR IMPROVED CARBON DIVERSION AND BIOGAS PRODUCTION, DOWNSTREAM ENERGY EFFICIENCY, AND PLANT GHG EMISSIONS REDUCTIONS

SPEAKER: **MATT MAGRUDER**
RESEARCH MANAGER AT THE MILWAUKEE METROPOLITAN SEWERAGE DISTRICT

Conventional primary clarification is the state-of-practice to remove readily settleable solids and scum. The downside of conventional treatment is that it requires a lot of space and time to achieve desired removals. To address these limitations, filter technologies have been engineered to improve removals in a fraction of the space, time, and with more consistency over wider ranges of flows and loadings without chemicals. Preliminary analysis by MMSD shows potential for decrease in WAS production, aeration costs, chemical consumption reduction, increase in biogas production and significant wet weather management risk reduction. MMSD is receiving Department of Energy grant funding to support demonstrating two alternative primary filter systems side-by-side against the conventional state-of-the-art primary clarifiers. This presentation will provide an overview of the research and updates on the project.

DETAILED BIO:

Matt Magruder has been with the Milwaukee Metropolitan Sewerage District for more than 14 years, and he is currently serving as the Environmental Research Manager. In addition to managing and coordinating the District's research efforts, Matt is leading MMSD's Digital Transformation Framework Project. Matt represents the District on various planning, advisory, and industry working groups. He received his BS in Biology from UW – Whitewater, his MBA from Cardinal Stritch University, and is an

American Society for Quality Certified Six Sigma Black Belt.

1:15 - 1:50: SCALING THE BENEFITS OF PARTIAL DENITRIFICATION/ANAMMOX (PDNA) TO FULL-SCALE FACILITIES

SPEAKER: **JIM MCQUARRIE, PE**
NATIONAL WASTEWATER MARKET SECTOR LEAD AT AECOM

Current best practice for removing nitrogen from municipal wastewater relies on complete oxidation of ammonia coupled with heterotrophic respiration to complete the conversion to nitrogen gas. This widely adopted approach for nitrogen removal is effective and reliable. However, in some cases, space limitations, operating costs, or constraints of the current biological process motivate the need for an alternative to convention. New process engineering concepts are being scaled from research that leverage the redox benefits of anammox bacteria to mainstream biological nitrogen removal configurations. This presentation seeks to share with the audience important background information, plus status of full scale anammox-based mainstream treatment processes.

DETAILED BIO:

Jim McQuarrie's professional career is evenly split between engineering consulting and public utility roles. His career in wastewater began as an entry-level operator working at a small wastewater treatment plant. As an operator, the exposure to wastewater treatment and the service it brings to society fueled his passion to learn more. After graduate school he moved to engineering consulting and specialized in wastewater process design and in particular application of biofilm processes to achieve intensification of processes to reduce footprint. He returned to the public sector for 10 years, serving multiple roles at Metro Water Recovery in Denver, CO where he was tasked with helping to develop and support a culture of innovation and formalizing establishment of a successful Technology



29TH ANNUAL CSWEA EDUCATION SEMINAR

The Future of Nutrient Removal: Decarbonization, intensification and emerging technologies

and Innovation Department. Today, Jim serves as the National Wastewater Market Sector Lead at AECOM and now calls Philadelphia, PA his home city.

1:50 - 2:05: EARLY AFTERNOON Q&A

2:05 - 2:20: AFTERNOON BREAK

2:20 - 2:55: BIOFILMS, DENSIFICATION AND THE ALPHABET SOUP OF YBSD: DEMONSTRATION OF MABR AND ZEEDEENSE FOR PROCESS INTENSIFICATION

SPEAKERS: **CYRUS MCMAINS, PE**
EXECUTIVE DIRECTOR AT YORKVILLE BRISTOL
SANITARY DISTRICT
KAM LAW, PE
WASTEWATER INNOVATIONS PRACTICE
LEADER AT DONOHUE ASSOCIATES

Prior to 2017, the Yorkville Bristol Sanitary District (YBSD) facility faced two challenges – increased organic load from population growth and industrial contribution, and a new regulatory target for phosphorous removal. Rather than adopting the conventional solution of building new bioreactor tanks, YBSD implemented an MABR upgrade to increase treatment capacity and implement biological phosphorous removal in the existing infrastructure. This solution was 75% lower in capital cost than a conventional upgrade and was implemented in less than 18 months. The MABR solution has been delivering efficient, high-quality effluent for more than five years. The next bottleneck in the secondary treatment process is clarification and YBSD anticipates the need to build new secondary clarifier capacity in the coming years. An alternative approach is to couple densified activated sludge with the MABR (a process called zeeDENSE) to intensify the capacity of the existing secondary clarifiers and eliminate or postpone the construction of new infrastructure. YBSD embarked on a zeeDENSE demonstration program in February 2023. While the two-year program is still on-going, a

midpoint milestone has been achieved. This presentation will provide an overview of the process intensification journey at YBSD, including drivers, zeeDENSE demonstration program setup, latest test results, and day-to-day impacts on operations, maintenance, sampling and data analyses.

DETAILED BIOS:

Cyrus McMains has a BS in Civil/Environmental Engineering from Bradley University and is a registered Professional Engineer in Illinois. He has worked in the wastewater industry for 25 years, first as an engineering consultant and, since 2017, as Executive Director of the Yorkville-Bristol Sanitary District (YBSD).

Kam Law is the Wastewater Innovation Practice Leader at Donohue & Associates. She has been in the wastewater industry for 28 years focusing on biological treatment and nutrient removal. She served as the Illinois WEA president from 2018 to 2019 and she is currently a Delegate-at-Large for WEF.

**2:55 - 3:15: EMBRACING INNOVATION
ONE PROJECT AT A TIME**

SPEAKER: **SCOT STRASSBURG, PE**
ENGINEER DIVISION MANAGER AT
FOUR RIVERS SANITATION AUTHORITY

With expected permit updates, Four Rivers Sanitation Authority (FRSA) began planning to transition their 40 MGD conventional activated sludge treatment plant for nutrient removal. Other goals of the planning and implementation efforts include reducing existing plant bottlenecks, replacing equipment past its useful life, incorporating innovative technologies where appropriate, and phasing the work to minimize disruptions to service while optimizing performance. Currently FRSA has various projects that are completed, in construction, or in design. When using innovative technology, applied research testing is being performed to reduce design assumptions and predict impacts on the

rest of plant. As projects are implemented, the planning level projects are being adapted to avoid unnecessary expense and, in some cases, delaying aspects of a project that may benefit from synergistic effects of other upgrades. Although some of the following will be considered 10+ years into the future, the main projects of our facility upgrades include reducing effluent diffuser headlosses, addition of primary filtration, addition of aerobic granular sludge for a portion of plant flow, conversion to modified University of Cape Town BNR, sidestream RAS fermentation, WAS hydrolysis, deammonification, tertiary filtration, selective wasting, nutrient harvesting, and biosolids drying.

DETAILED BIO:

Scot Strassburg is a professional engineer with a Bachelor of Science degree in Civil & Environmental Engineering from the University of Wisconsin – Madison. He started his career in the water/wastewater consulting world for 24 years and then transitioned into the public sector for the past 13 years. As Plant Engineer Division Manager with Four Rivers Sanitation Authority, Scot is involved with all aspects of planning, design, construction, and commissioning of plant capital projects.

**3:15 - 3:35: NEW ADVANCES IN MBR APPLICATION:
THE DETROIT LAKES STORY**

SPEAKER: **SUSAN DANZL, PE**
WASTEWATER MARKET LEADER AND
PROJECT MANAGER AT SEH

The adoption of Membrane Bioreactors (MBRs) is increasing for nutrient removal facilities, particularly where low-level phosphorus treatment is required. Detroit Lakes, MN began the journey of meeting an effluent phosphorus (P) limit of 0.066 milligrams/liter (mg/L) in 2013. After planning, design, and construction, a new MBR treatment process went online in 2019. The facility has demonstrated its ability to meet the low-level effluent phosphorus target. However, a number of challenges have emerged including membrane fouling, biology sensitivity

to membrane cleans, and influent contaminants. This presentation will discuss the ways Detroit Lakes has worked through these challenges, including results of a full-scale pilot test of a continuous biomass densification. Through before and after testing, the pilot has shown improved performance, lower operating costs, and better sludge quality.

DETAILED BIO:

Susan Danzl is a wastewater market leader and Project Manager at Short Elliott Hendrickson, Inc., specializing in wastewater treatment projects from planning through construction. She earned her Bachelors and Masters degrees from Michigan Technological University and the University of Notre Dame. She has

been a consulting engineer for more than 17 years. Working with the City of Detroit Lakes since 2013, Susan has helped the City plan for and implement upgrades to their water reclamation facility to meet challenging nutrient targets.

3:35 - 4:00: PANEL SESSION Q&A

REGISTRATION CHARGES

1 Registration fee to attend live event (includes continental breakfast, lunch, and refreshments)

Fee per Person	by March 15	after March 15
Education Seminar (ES)	\$200	\$225
Additional Utility Attendee*	\$50	\$55
Student**	\$25	\$30

*After one person from a utility registers at standard price, up to five additional people can register for \$50 per person.

**Students – please indicate if you will present a poster and name of poster:

Yes Tentative title of poster: _____

Please indicate dietary restrictions: vegetarian vegan gluten free other

2 Attending I&T Dinner after Meet and Greet at Coopers Tavern (\$50):

Yes No Any dietary restrictions? _____

3 No refunds given after March 23

Lodging: A limited number of rooms are available at The Hilton Madison Monona Terrace, 9 East Wilson St, Madison. The rooms have been reserved at a conference rate of \$169 per night and will be held until March 9. For reservations, please call the hotel at 608-255-5100 and reference group code "CSW." Parking is available for a fee at the Hilton or next door at the Monona Terrace Community and Convention Center. Other lodging is available nearby at the Best Western Premier Park Hotel (608-285-8000) at \$149 to \$209 per night. Reference CSWEA for the group block. This hotel is about 0.7 miles walking distance from the Monona Terrace Community and Convention Center. Alternatively, rooms for each hotel can be booked online at the conference rates using the unique booking links below:

Hilton: www.hilton.com/en/book/reservation/deeplink/?ctyhocn=msnmhhf&groupcode=csw&arrivaldate=2024-04-08&departuredate=2024-04-09&cid=om,ww,hiltonlink,en,directlink&fromid=hiltonlinkdirect

Best Western: www.bestwestern.com/en_US/book/hotel-rooms.50061.html?groupId=2E6JZ9D3



Systems are shipped to jobsites pre-piped, pre-wired, pre-tested, and ready for immediate field connection. Houses come in a variety of exterior finishes to fit into any surroundings.



Built for variety of applications:

Water Boosters Chemical Rooms
Lift Stations Generator Houses
Control Rooms Valves & Meters
and More!

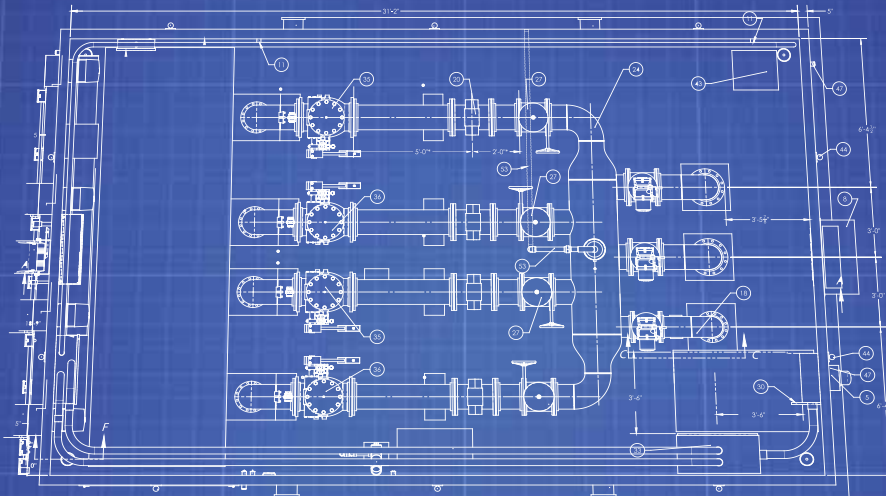


Our in-house teams of engineers and fabricators work together to build a custom system for your project. Systems are constructed entirely in-house from start to finish.

CUSTOM HOUSED SYSTEMS

BUILT TO YOUR SPECIFICATIONS

Metropolitan Industries has been at the forefront of the industry's shift to prefabricated housed systems by being involved in thousands of successful installations for a variety of municipal, commercial, and industrial applications. Metropolitan can manufacture housed systems as part of retrofit upgrades to existing sites or as part of entirely new installations.



(815) 886-9200
Romeoville, IL 60446

METROPOLITANIND.COM
EMMONSPUMP.COM

(518) 694-0404
Albany, NY 12204



PROGRAM AND REGISTRATION INFORMATION



97th ANNUAL MEETING *Flowing into the Future*

MAY 13-15, 2024 | RENAISSANCE SCHAUMBURG, IL

CENTRAL STATES WATER ENVIRONMENT ASSOCIATION (CSWEA)
1021 ALEXANDRA BLVD, CRYSTAL LAKE, IL 60014 USA
WWW.CSWEA.ORG • 855-692-7932

R
RENAISSANCE®

97th Welcome to the ANNUAL MEETING



Amy Underwood,
CSWEA President
2023-2024

The Local Arrangements Committee (LAC) is pleased to welcome you to the CSWEA's 97th Annual Meeting at the Renaissance in Schaumburg, IL. Our theme this year is Flowing into the Future. Whether it's dealing with too much or too little rain, addressing emerging contaminants, or becoming more sustainable, working in the water industry at this time provides us a unique opportunity to be the ones who drive the future of clean water. The Local Arrangements and Technical Program Committees have put together a great program that will help you learn from and collaborate with others who are making a difference in our industry.

The Annual Meeting starts on Monday with the golf outing, a service project assisting the Forest Preserve of Cook County in removing invasive species, and concurrent tours of stormwater improvements in downtown Arlington Heights and the Fox River Water Reclamation District Albin D. Pagorski Water Reclamation Facility in Elgin. The day concludes with the social event which will be held at Enterrium in the Woodfield Mall. This will provide opportunities to network and socialize while also having competitive fun bowling and playing other games.

Tuesday starts bright and early with the Jim Shaw Memorial 5k Run/Walk before the opening keynote session. The keynote address will be by Dr. Ann Perry Whitmer, who is an engineering professor at the University of Illinois at Urbana-Champaign's Carle College of Medicine, the world's first Engineering-Based Medical School. Dr. Whitmer will be discussing the emerging discipline of Contextual Engineering, which applies the social sciences to improve technical engineering design processes and explores the context of engineering for power system design, environmental infrastructure, and ecosystems affected by climate change. We will then transition into technical sessions and the Exhibit Hall. Lunch will be provided in the Exhibit Hall. The Exhibitor's Reception will be held in the late afternoon concurrent with meetings for 7S, Golden Manhole Society, Young Professionals and new members, and Global Water Stewardship (GWS). In the evening, the CSWEA Annual Awards Event will be held off site at Maggiano's Little Italy. Join us at the event as we recognize outstanding members who have made great contributions to CSWEA and the water industry.

Wednesday starts with the State Section breakfasts followed by the Association's annual business meeting before once again transitioning into technical sessions and the Exhibit Hall. The Annual Association Meeting and Luncheon will be held at noon. WEF Immediate Past President Ifetayo Venner will provide an update on WEF. 7S and Golden Manhole Society inductees and the Operations Challenge teams will be recognized.

The Exhibit Hall will be open all day on Tuesday and in the morning on Wednesday. Many of the exhibitors also sponsor the meeting, for which we are extremely grateful. Please visit them in the Exhibit Hall and thank them for their support while learning about what services or products they offer. Also, please be sure to stop by the Exhibit Hall to place a bid in the Silent Auction which will raise funds for GWS and to visit the CSWEA booth to learn how you can become more active in the Association.

The technical sessions will run concurrently with the Exhibit Hall on Tuesday and Wednesday morning and then continue after lunch on Wednesday afternoon to close out the Annual Meeting. The Technical Program will include five parallel tracks on Tuesday and four parallel tracks on Wednesday. There will be tracks focusing on nutrients, wastewater treatment intensification, resource recovery, energy, collection systems, wet weather management, PFAS, odor control, and management, among other things. An operations track will be held on Wednesday, focusing on wastewater treatment optimization in the morning and math for wastewater operator certification in the afternoon. An ethics track will also be held on Wednesday afternoon. Thanks to the Technical Program Committee and Chair Chris Buckley for putting together an outstanding program.

Thank you to all who have worked tirelessly for this Annual Meeting, and a special thank you to LAC Chair Liz Heise and the rest of the LAC for your dedicated work in putting this meeting together. We look forward to seeing everyone in May for a successful event!

Conference at a Glance

MONDAY, MAY 13		LOCATION	ROOM
8:00 am-11:00 am	Ex Comm Meeting	Richard Walkers Pancake House (Breakfast)	-
11:00 am-4:00 pm	Golf Outing	Highland Woods Golf Club	-
1:00 pm-3:00 pm	Plant Tour	Albin D. Pagorski Water Reclamation Facility	100 Purify Drive (Raymond Street), Elgin, 60120
1:00 pm-4:00 pm	YP Service Project	Arthur L. Janura Preserve	Carl R. Hansen Woods
1:00 pm-4:00 pm	Stormwater Tour	Arlington Heights Village Hall	33 South Arlington Heights Road
5:30 pm-9:30 pm	Bus to/from Social	Front Circle of Marriott/Enterrium	
6:00 pm-9:00 pm	Social/Meet and Greet	Enterrium	-
TUESDAY, MAY 14		LOCATION	ROOM
6:30 am	Jim Shaw Memorial 5k Run/Walk	Front Circle of Convention Center	
8:00 am	Opening Keynote	Schaumburg Convention Center	Nirvana BC
9:00 am-10:00 am	Technical Sessions	Schaumburg Convention Center	Schaumburg E-H/Nirvana ABC/Euphoria
9:00 am-6:00 pm	Exhibit Hall	Schaumburg Convention Center	Exploration Hall
10:00 am-11:00 am	Poster Session/Ops Challenge	Schaumburg Convention Center	Back of Exploration Hall
11:00 am-12:00 am	Technical Sessions	Schaumburg Convention Center	Schaumburg E-H/Nirvana ABC/Euphoria
12:00 pm-1:00 pm	Exhibitor Lunch	Schaumburg Convention Center	Exploration Hall
1:00 pm-2:00 pm	Technical Sessions	Schaumburg Convention Center	Schaumburg E-H/Nirvana ABC/Euphoria
2:00 pm-2:30 pm	Poster Session	Schaumburg Convention Center	Back of Exploration Hall
2:30 pm-3:30 pm	Technical Sessions	Schaumburg Convention Center	Schaumburg E-H/Nirvana ABC/Euphoria
3:30 pm-3:45 pm	7S Meeting	Schaumburg Convention Center	Schaumburg EF
3:45 pm-4:00 pm	Golden Manhole Society	Schaumburg Convention Center	Schaumburg GH
4:00 pm-4:30 pm	YP/New Member Meeting	Schaumburg Convention Center	Back of Exploration Hall
4:00 pm-6:00 pm	Exhibitor Reception	Schaumburg Convention Center	Exploration Hall
4:30 pm-5:00 pm	GWS Meeting	Schaumburg Convention Center	Back of Exploration Hall
5:30 pm-10:00 pm	Buses to/from Awards Banquet	Front Circle of Marriott/Maggianos	
6:00 pm-7:00 pm	Pre-awards Reception	Maggianos	-
7:00 pm-9:00 pm	Annual Awards Event	Maggianos	-
WEDNESDAY, MAY 15		LOCATION	ROOM
7:00 am-8:00 am	State Section Breakfasts	Schaumburg Convention Center	Nirvana ABC
8:00 am-9:00 am	Annual Business Meeting	Schaumburg Convention Center	Nirvana ABC
9:00 am-10:00 am	Technical Sessions	Schaumburg Convention Center	Schaumburg E-H/Euphoria
9:00 am-12:00 pm	Exhibit Hall	Schaumburg Convention Center	Exploration Hall
9:00 am-12:00 pm	Operations Track	Schaumburg Convention Center	Euphoria
10:00 am-11:00 am	Exhibitor Hour/Poster Session/Ops Challenge	Schaumburg Convention Center	Exploration Hall
11:00 am-12:00 pm	Technical Sessions	Schaumburg Convention Center	Schaumburg E-H/Euphoria
12:00 pm-1:30 pm	Annual Association Meeting	Schaumburg Convention Center	Nirvana ABC
1:30 pm-3:30 pm	Ethics Session	Schaumburg Convention Center	Schaumburg EF
1:30 pm-3:30 pm	Operations Track	Schaumburg Convention Center	Euphoria
1:30 pm-3:30 pm	Technical Sessions	Schaumburg Convention Center	Schaumburg GH

JDV LEVEL LODOR™

Safe Even Distribution

Represented by:



mnxinc.net

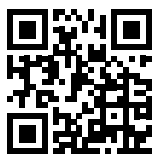
*Plus
Odor control*

www.jdvequipment.com



Address water challenges through
strategy, innovation and sustainability.

BURNS & MCDONNELL



LEARN MORE

Local Arrangements Committee

Name	Organization	LAC Role	Email
Liz Heise	Trotter and Associates	LAC Chair	e.heise@trotter-inc.com
Amanda Streicher	Baxter & Woodman	5k Walk/Run Chair	astreicher@baxterwoodman.com
Brad Bennett	U-C Sanitary District	Audio/Visual Chair	bbennett@u-csd.com
Natalie Cook	Donohue & Associates	Catering Chair	ncook@donohue-associates.com
Jonah Arter	CSWEA	Registration and CEUs	jarter@cswea.org
Dean Wiebenga	Peterson and Matz	Exhibit Chair	dean.wiebenga@petersonandmatz.com
Tim Tack	LAI, Ltd.	Golf Outing Chair	ttack@lai-ltd.com
Matt Streicher	Glenbard Wastewater Authority	Social Chair	mstreicher@gbww.org
Franklin Jakubow	Fox River WRD	Plant Tour	fjakubow@frwr.com
Marissa Villafuerte	Brown and Caldwell	Poster Sessions Chair	mvillafu2@gmail.com
Nick Domalewski	Baxter & Woodman	Service Project Chair	ndomalewski@baxterwoodman.com
Rich Hussey	LAI, Ltd.	Silent Auction Chair	rhussey@lai-ltd.com
Tim Juskiewicz	Burns and McDonnell	Stormwater Facilities Tour Chair	tjuskiewicz@burnsmcd.com
Chris Buckley	EEL	Technical Program Chair	cbuckley@eeiweb.com
Derek Wold	Baxter & Woodman	Soft Skills Track	dwold@baxterwoodman.com
Jason Neighbors	Village of Lockport	Operations Track	jneighbors@lockport.org
Jillian Kiss	Trotter and Associates	2018 LAC Chair, Advisor	j.kiss@trotter-inc.com
Joe Lapastora	Northern Moraine WRD	Flyers/Social Media Chair	lapastora@nmwr.com
Amy Underwood	Downers Grove Sanitary District	2023-2024 CSWEA President	aunderwood@dgsd.org
Mohammed and Amy Haque	CSWEA	Executive Management	mhaque@cswea.org ; ahaque@cswea.org

Technical Program Committee

Name	Organization	Role	Email
Chris Buckley	EEL	Chair	cbuckley@eeiweb.com
Mandy Sheposh	Johnson Controls	Committee Member	amanda.sheposh@jci.com
McKala Kiessling	City of Oconomowoc	Committee Member	mkiessling@oconomowoc-wi.gov
Shanna Czeck	City of St. Cloud	Committee Member	shanna.czeck@ci.stcloud.mn.us
Steve Graziano	Jacobs	Committee Member	steven.graziano@jacobs.com
Colin Fitzgerald	Jacobs	Committee Member	colin.fitzgerald@jacobs.com

Executive Committee

- President, Amy Underwood
- 1st Vice President, Troy Larson
- 2nd Vice President, Tim Wedin
- Treasurer, Alan Grooms
- Immediate Past President, Tracy Hodel
- WEF Delegate '22-'25, Rich Hussey
- WEF Delegate '23-'26, Anna Munson
- PWO Representative '23-'25, Jeremy Cramer
- YP Representative '22-'24, Andee Huff Chester
- Minnesota Section Trustee '22-'24, Anna Munson
- Illinois Section Trustee '23-'25, Amanda Streicher
- Wisconsin Section Trustee '23-'25, Matt Seib
- Executive Management, Amy Haque and Mohammed Haque

You don't hire engineers who are "good enough."
You hire the very best.

Incidentally, so do we.



There is no B-Team.

ApexEngGroup.com

Connecting communities
with real solutions for
75 years.



City of Long Prairie, Wastewater Treatment Improvements

Bolton-Menk.com

Conference Highlights

Monday, May 13

GOLF OUTING



Highland Woods Golf Club | 11:00 am-4:00 pm

This year's golf event will be held on Monday, May 13th at the Highland Woods Golf Club (2775 Ela Road, Hoffman Estates, IL 60192) at 11:00 am.

Highland Woods is a Forest Preserve northwest suburban championship course. It has generous fairways and 52 strategically placed sand traps throughout its rolling hills and tree-lined fairways

The registration fee includes a round of golf, golf cart, lunch voucher, and sleeve of balls as well as a chance at the many skill prizes. Rest assured, it will all end in plenty of time to get to the Meet and Greet Social event. Proceeds from the outing will support water quality issues through the Central States Water Environment Association (CSWEA).



YP SERVICE PROJECT

The Carl R. Hansen Woods (The Arthur L. Janura Preserve) | 1:00 pm-4:00 pm

Volunteer to help remove invasive species at an oak-hickory woodland at Carl R. Hansen Woods. Work alongside other CSWEA volunteers with the Poplar Creek Prairie Stewards to help improve the environment and make some new connections in the process! Materials and tools will be provided. Bring a reusable water bottle to fill.

For more information about this year's project, contact Nick Domalewski at ndomalewski@baxterwoodman.com.



STORMWATER TOUR

Downtown Storm Sewer Improvements – Arlington Heights, IL | 1:00 pm-4:00 pm

In 2019, the Village of Arlington Heights completed improvements to their combined sewer system in response to a 7-inch rainfall event in July of 2011 that flooded or caused sewer backups in hundreds of homes. To protect homes, improve conveyance and reduce the occurrence of flooding, the Village had completed the installation of approximately 5,100 LF of 8" to 42" combined sewers in the downtown area primarily on West Campbell and West Sigwalt Streets between North Ridge Avenue and Vail Street. The cost for the project was \$3.7 million. The tour will include a site walk of the project limits and a short presentation of the project.

PLANT TOUR

Albin D. Pagorski Water Reclamation Facility | 1:00 pm-3:00 pm

The Fox River Water Reclamation District (FRWRD) owns and operates three water reclamation facilities (WRFs): the Albin D. Pagorski WRF (ADP WRF), the North WRF, and the West WRF; and 12 remote pump stations that provide wastewater treatment services to over 200,000 people in the metropolitan area of Elgin, IL.



The ADP WRF is a design average 25 MGD facility, originally constructed in 1924 and significantly expanded upon and upgraded since. Wastewater tributary to the ADP WRF is collected in both separate and combined sanitary sewers and includes flow from the Poplar Creek drainage basin of the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC). The ADP WRF serves as a regional biosolids facility, receiving the solids generated at all FRWRD facilities via the Sludge Transfer Force Main located underneath the Fox River. Biosolids are anaerobically digested, dewatered, stored, and applied on farmland for beneficial reuse.

In 2022, biological phosphorus removal upgrades were completed at the ADP WRF to ensure compliance with lower effluent phosphorus limits set by the Illinois Environmental Protection Agency (IEPA). This included the construction of new fermentors, mixing basins, and struvite reactor among many substantial upgrades to the facility.

CSWEA'S 97th ANNUAL MEETING

SOCIAL MEET AND GREET

Enterrium | 6:00 pm-9:00 pm

Come kick off the Annual Meeting at Enterrium, located in the Woodfield Mall. Join your fellow water professionals for an outing of games, bowling, food and drinks, and fun! Transportation will be available from 5:30 pm-9:30 pm to and from the convention center, leaving from the circle drive at the front. If you would like to drive yourself, it is about a seven-minute drive from the Renaissance. Registration will be set up at the entrance to the event. Remember to get your drink tickets that are included with your registration badge and come ready to play, network, and have some fun!



Tuesday, May 14

THE JIM SHAW MEMORIAL 5K RUN/WALK

Front Circle of the Renaissance Schaumburg | 6:30 am

Meet at the Front Circle of the Renaissance Schaumburg to take part in our annual 5k Run/Walk. Course details will be provided at registration. Run or walk along with your friends and fellow water professionals, enjoying the early-morning camaraderie before the conference day begins.

OPENING SESSION AND KEYNOTE ADDRESS

Nirvana BC | 8:00 am



This year's Keynote is Dr. Ann-Perry Witmer, a teaching assistant professor in the Carle Illinois College of Medicine, as well as a lecturer in several College of Engineering and College of ACES departments at the University of Illinois Champaign-Urbana.

Dr. Witmer will be discussing her experiences working with water and wastewater both locally and internationally through the lens of contextual engineering. She will be highlighting the importance of place-based knowledge, and dealing with change in the face of shifting conditions. She will be drawing from her experiences around the world to show that the knowledge is out there to help us keep safe and reliable water flowing and keep wastewater treated. She will discuss the importance of embracing the change that also allows us to appreciate new perspectives and acknowledge that things are not the way they used to be.

She will also be discussing her experiences as an engineering professor working at the world's first Engineering Based Medical School and the intersection between engineering, public health, and medicine.

TECHNICAL SESSIONS

Schaumburg E-H/Nirvana ABC | 9:00 am-3:30 pm

For more information, please see the Technical Program

EXHIBIT HALL

Exploration Hall | 9:00 am-6:00 pm

Exhibits showcasing the latest technology in wastewater, collection systems, treatment and many related items will be on display. Be sure to visit our fine exhibitors and thank them for their support of our Association.

EXHIBITOR LUNCH

Exploration Hall | 12:00 pm-1:00 pm

The Exhibitor Lunch offers exhibitors and conference attendees to meet in a relaxing and social environment. Please visit the Exploration Hall, where the Exhibitor Lunch will be held.

POSTER SESSION

**Back of Exploration Hall |
10:00 am-11:00 am/2:00 pm-2:30 pm**

Posters will be on display at the back of Exploration Hall. Presenters will be available at their posters at this time to discuss their posters and answer questions. Please stop and visit.

EXHIBITOR RECEPTION

Exploration Hall | 4:00 pm-6:00 pm

Light snacks and refreshments (remember to bring your drink tickets included in your registration packet) will be provided in the Exploration Hall. Share some refreshments, visit with our exhibitors, and thank them for attending this year's Annual Meeting.

CSWEA ANNUAL AWARDS EVENT

Maggianno's Little Italy | 6:00 pm-9:30 pm

This year's awards banquet will be held offsite at Maggianno's Little Italy in Streets of Woodfield. A pre-awards reception will be held from 6:00 pm-7:00 pm with drinks and passed hors d'oeuvres prior to the dinner.

At 7:00 pm, we will all sit down for a delicious family-style Italian meal while we listen to updates about CSWEA activities from the outgoing president, as well as vision for the year ahead from our incoming president. We will also honor this year's award winners for the many WEF and CSWEA Awards presented to the best of the best water professionals in the industry.

Transportation to/from the Renaissance Schaumburg will be provided between 5:30 pm and 10:00 pm.



Wednesday, May 15

STATE SECTION BREAKFASTS

Nirvana ABC | 7:00 am

Please attend your respective State Section's business meeting to be updated on the activities of the Section and its committees. Don't miss this opportunity to get involved and find out where you can help your Section. This is a ticketed event and includes a meal. Please remember to purchase and bring your ticket with you.

CSWEA ANNUAL BUSINESS MEETING

Nirvana ABC | 8:00 am-8:45 am

The Association Business Meeting will include reports from the Association Committees and Sections and the annual election of officers. We encourage everyone to attend and learn about our Association's activities. Everyone is welcome!

EXHIBIT HALL

Exploration Hall | 9:00 am-12:00 pm

Exhibits showcasing the latest technology in wastewater, collection systems, treatment and many related items will be on display. Be sure to visit our fine exhibitors and thank them for their support of our Association.

TECHNICAL SESSIONS

Schaumburg E-H/Euphoria | 9:00 am-3:30 pm

For more information, please see the Technical Program

POSTER SESSION

Back of Exploration Hall | 10:00 am-11:00 am

Posters will be on display at the back of Exploration Hall. Presenters will be available at their posters at this time to discuss their posters and answer questions. Please stop and visit.

CSWEA ANNUAL ASSOCIATION MEETING

Nirvana ABC | 12:00 pm-1:30 pm

Everyone is invited to the annual CSWEA Luncheon and Association Meeting! Enjoy a meal with colleagues, network, and meet some new people. Join us to learn about what CSWEA is up to, hear an update about WEF from our WEF Visitor, Past President Ifetayo Venner, and help us honor our newest inductees to the highly respected 7S and Golden Manhole Societies!

This is a ticketed event and includes a meal. Please remember to purchase and bring your ticket with you.

Technical Program

Tuesday, May 14					
Session	A	B	C	D	E
	NUTRIENTS	RESIDUALS AND SIDESTREAM NUTRIENT MANAGEMENT	IMPLEMENTATION	WET WEATHER MANAGEMENT	CONVEYANCE
8:00-9:00	Opening Session and Keynote Address				
9:00-9:30	Implementation of Primary Sludge and Biomass Fermentation for Improved Biological Phosphorus Removal at the Delafield-Hartland Wastewater Treatment Facility Nick Bartolero, Strand Associates	Sidestream Phosphorus Sequestration and Recovery: A Step Beyond Phosphorus Removal Bryan Coday, Carollo Engineers	Harnessing the Power of Collaborative Project Delivery Methods Tracy Ekola, Brown and Caldwell	Enhancing Wastewater Infrastructure Resilience: A Case Study of Smart Sewer Technology Implementation in Northern Moraine Water Reclamation District Joe Lapastora, Northern Moraine WRD	Building Sanitary Service Repair Assistance Program DGSD 20-Year Update Derek Wold, Baxter and Woodman Amy Underwood, Downers Grove Sanitary District
9:30-10:00	From High to Low: Case Study on the Transition to Suboxic DO Levels for Efficient Aeration and Nitrogen Removal Natalie Beach, Carollo Engineers	Anaerobic Digestion with Nutrient Control: What if your Digesters were the Sidestream? Matthew Williams, Thermal Process Systems	Less is More! Bartlett's Wastewater Improvements Simplify Operation While Providing Flexibility and Improved Effluent Quality Troy Stinson, Strand Associates	Expand Capacity of the WWTP without Additional Biological Tankage and Handle Wet Weather Peak Flows John Dyson and Vendash Gupta, Aqua-Aerobics Systems	Rain or Shine, Illuminating Flow Monitoring Performance for Decision-Making Tony Romza, RJN Group
10:00-11:00	Break and Poster Session				
11:00-11:30	Why Are My Paos Misbehaving? Variability of Carbon Efficiency, PAO: GAO Competition, and Biomass Fermentation Jennifer Loconsole, Black & Veatch	Piloting a Strain Press at the Madison Metropolitan Sewerage District Carly Amstadt, Madison Metropolitan Sewerage District	Benefits of Hydrocyclones for WRRF Performance: Better Settling, Improved Nitrification and Reduced E.coli? Arun Mande, CDM Smith	Case Study: Innovative Decentralized Wastewater Treatment System for Remote Sewer Overflow Treatment in Milwaukee, WI Will Schanen, Rapid Radicals	Highbanks Ravine, St. Cloud, MN; An Outfall with a History and the Long Journey to Funding a Necessary Project to Protect River And Bats Emma Larson, City of St Cloud
11:30-12:00	Commissioning of Biological Phosphorus Facilities Troy Larson, Strand Associates	A Measured Approach to Biosolids Management: Setting a Trend for Large Utilities Sudhan Paranjape, Carollo Engineers	Riding the Wave: Upgrading Outdated UV Systems in the Midwest George Kontos, Carollo Engineers	Federal, State, Regional, and City Resources Combine with a Common Goal: Create a Better Environment Brendan Ward, HDR Engineering	Trench Wet Well and Physical Model Improve New Lift Station Operation Matthew Eberhardt, Foth Infrastructure and Environment
12:00-1:00	Exhibitor Lunch				
Session	F	G	H	I	J
	WWTP INTENSIFICATION	BIOGAS/ENERGY	CHEMICAL DOSE OPTIMIZATION	PRELIMINARY/PRIMARY TREATMENT	STORMWATER/WATERSHED
1:00-1:30	Decarbonization of Biological Nutrient Removal Ethan Yen, Black and Veatch	Microaerating Anaerobic Digesters Provides Benefits for Biogas Quality Matt Seib, Madison Metropolitan Sewerage District	Let's Stir Things Up: Jar Testing as an Essential Tool for Chemical Treatment Ryan Holzem, Donahue and Associates	A Study on the Performance of Locally Available Coagulants on Chemical-Enhanced Primary Treatment (CEPT) at Milwaukee Metropolitan Sewage District Fuad Bin Nasir, University of Wisconsin – Madison	Fullersburg Woods Dam Removal: Issues, Considerations, and Controversies Deanna Doohaluk, DuPage River Salt Creek Workgroup
1:30-2:00	The Case for Process Intensification with Aerobic Granular Sludge Brent Quimby, Aqua-Aerobics Systems	Thinking Big on Energy: MMSD's Roadmap to 100% Renewable Energy Katie Richardson, Greeley and Hansen	Innovative Use of Zeta Potential to Optimize Coagulation in Tertiary Filtration at Valparaiso, IN Emily Saban, Stantec	Design Considerations for the First Primary Filtration Facility in Illinois Kam Law, Donohue & Associates	Model Redo: How Public Feedback Impacted the Flood Reduction Solutions Caroline Burger, Carollo Engineers
2:00-2:30	Break and Poster Session				
	WWTP INTENSIFICATION	BIOGAS/ENERGY	MANAGEMENT	PRELIMINARY/PRIMARY TREATMENT	STORMWATER/WATERSHED
2:30-3:00	Aerobic Granular Sludge (AGS) Technology: Lessons Learned Patrick Young, HDR Engineering	Unlocking the Potential of Your POTW: Generating Renewable Energy and Maximizing Its Value Tom Bachman, Mead and Hunt	Cultivating the Next Wave of Leadership: A Case Study in Professional Development Guy Carpenter, Consor Engineers	Everything You Never Knew About Enhanced Primary Treatment Christine Hengel-Prom, Black and Veatch	Development of a Citywide Green Stormwater Infrastructure Plan to Aid in Water Quality and Flood Risk Reduction Carrie Bristol-Groll, Aqualis
3:00-3:30	Total Nitrogen Treatment: What is Required vs. What is Realistic Ben Burroughs, Arcadis	RNG Strategic Planning James Kerrigan, Fox Metro Water Reclamation District	Circularity as a Path to Sustainability and Resilience for the Water Industry Melissa Darr, Arcadis	Implementation of Cloth Media Disk Filtration for Wet Weather Flow Management in Elkhart, IN Katherine Merkle, Donahue & Associates	A Case Study on Watershed-Based Approaches and Modeling Strategies for Nutrient Permit Compliance Brent Brown, Jacobs Engineering

Flowing into the Future

Wednesday, May 15				
Session	K	L	M	N
	PFAS/CEC	R&D/NOVEL APPROACHES	ODOR CONTROL	OPERATIONS OPTIMIZATION
8:00-9:00	Annual Association Business Meeting			
9:00-9:30	The Next Contaminant of Emerging Concern Kaitlyn Hague, HDR Engineering	Chemical Oxidation as a Secondary Treatment Alternative to Activated Sludge Payton Loftis, Marquette University	Odor Control For an Interceptor: A Layered Approach David Arnott, Ruekert & Mielke	Cutting Maintenance, Saving Energy, Improving Mixing, and Adding Condition Monitoring by Replacing Old Mixers with Innovative Mixing Technology in BNR Mike Grinnell, Lake County Public Works
9:30-10:00	Solutions for PFAS Recovery: Strengthen Public Trust, Restore Environmental and Financial Resources Steve Schneider, SL Environmental Law Group	Coupled Biological Sulfate Reduction: Sulfide Immobilization System for Removing Sulfate from Industrial and Municipal Wastewater Nathan Johnson, University of Minnesota Duluth	Cold Weather Considerations for Your Vapor Phase Odor Control System Sean Trainer, Evoqua	Process Changes and Energy Reduction Nick Newman and Ben Meier, Kishwaukee Water Reclamation District
10:00-11:00	Break/Exhibit Hall			
11:00-11:30	Can Drying Actually Transform PFAS Too? Elucidating the Impacts of Drying, Pyrolysis, and Gasification on PFAS through Water Research Foundation Research Patrick McNamara, Black & Veatch/ Marquette University	Use of Wastewater Grit and Milorganite Chaff in Concrete Baolin Wan, Marquette University	Odor Control Implementation at City of Wichita Plant 2: Sampling, Dispersion Modeling, Alternatives, Evaluation, and System Selection Eric Compton, CDM Smith	Screw Press Dewatering: Lessons Learned and Performance Optimization Andy Warmus, Village of Carol Stream, IL Amanda Striecher, Baxter and Woodman
11:30-12:00	Results from WRF 5111: The Fate of PFAS through Sewage Sludge Incinerators Llyod Winchell, Brown and Caldwell	Sewage Sludge Incinerator Ash as a Phosphorus Fertilizer for Corn and Soybeans Persephone Ma, Brown and Caldwell	Stop Suffocating Sulfate Reducing Bacteria (SRBs) Garrett Schleis, ECO Oxygen Technologies	Most-Open-Valve Automation Automated Solutions for Optimizing Aeration Blowers Using VFDs and Advanced Controls Robert Kisler, Hoffman & Lamson
12:00-1:30	Annual Association Meeting and Luncheon			
Session	O	P	Q	R
	R2E2	ETHICS/ MANAGEMENT	WWTP PLANNING	OPERATIONS TRACK
1:30-2:00	St. Cloud's Green Hydrogen Project: Integration of Green Hydrogen Production into the Resource Recovery Process Tracy Hodel, City of St Cloud	Professional Ethics in Engineering Dr. Michael C. Loui, University of Illinois at Urbana-Champaign	Navigating the Flow: A Guide to Pumping Equipment Selection in Wastewater Treatment Applications Kyle Malin, HDR Engineering	Math 1 Training for Operators
2:00-2:30	One Way to Self-Sufficient Energy and Carbon-Neutral Water Sector by 2030 Urik Folkmann, WTA Consulate of Denmark		Planning and Designing a New Facility with Room for Growth Natalie Cook, Donahue and Associates	
	R2E2	ETHICS/TRAINING	WWTP PLANNING	OPERATIONS TRACK
2:30-3:00	The Water Council Guy Carpenter, Consor Engineers	Professional Ethics in Engineering Dr. Michael C. Loui, University of Illinois at Urbana-Champaign	WEF's Integrated Planning Roadmap Brandon Koltz, Brandon Koltz Water and Environmental Consulting LLC	Math 1 Training for Operators
3:00-3:30	Improved Carbon Diversion to AD using Primary Filters Matt MacGruder, MMSD		Small Plant, Tight Site: A Journey from Antiquated Package Plant to Innovative SBR Dan Schaefer, SHE	Math I Training for Operators Exam Certification

Presenters

Keynote Presenter

Tuesday, May 14 | 8:00 am

DR. ANN PERRY WITMER



Dr. Ann-Perry Witmer is a teaching assistant professor in the Carle Illinois College of Medicine, as well as a lecturer in several College of Engineering and College of ACES departments at the University of Illinois Champaign-Urbana. She is the originator of the emerging discipline of Contextual Engineering, which applies the social sciences to improve technical engineering design processes, and she leads the sizeable Contextual Engineering Research Group, which explores the context of engineering for power system design, environmental infrastructure, and ecosystems affected by climate change. Dr. Witmer's work has brought her into close association with communities on five continents, exploring place-based knowledge and applying it to engineering solutions that best address user needs.

Before joining the University of Illinois, Dr. Witmer worked for more than a decade as a consulting engineer for public water supplies in Wisconsin, Illinois, Minnesota, and Iowa. In addition to her civil and agricultural engineering degrees from the University of Illinois, Dr. Witmer holds degrees in journalism and art history from Boston University and was a working journalist for daily newspapers in Illinois and Pennsylvania before becoming an engineer.

PFAS and Emerging Contaminants Track

Wednesday, May 15 | 9:00 am to 12:00 pm

KAITLYN HAGUE, HDR ENGINEERING



Kaitlyn Hague has been working for HDR as a water/wastewater EIT for two years. Her work is primarily focused on process design for digester complexes. Before Kaitlyn joined HDR, she attended South Dakota State University where she earned undergraduate and graduate degrees in Civil and Environmental Engineering. Her graduate thesis addressed microplastics behavior in wastewater treatment plants.

STEVE SCHNEIDER, SL ENVIRONMENTAL LAW GROUP PC



Steve Schneider has been working with SL Environmental Law Group to help educate water and wastewater utilities in Minnesota on cost recovery strategies for PFAS contamination. Mr. Schneider draws upon his 30 years of experience with St. Paul Regional Water Services, where he spent the majority of his career serving their 450,000 customers in all aspects of operations, including 17 years as General Manager of the utility. He understands the challenge associated with managing a utility while dealing with the unfunded mandates resulting from more stringent treatment regulations regarding emerging contaminants like PFAS. Steve holds bachelor's degrees in Civil and Geological Engineering from the University of Minnesota and has held several positions

with the AWWA and the Association of Metropolitan Water Agencies (AMWA), including AMWA President from 2019-2021.

DR. PATRICK MCNAMARA, PHD, PE, BLACK AND VEATCH



Pat is a Wastewater Process Engineer with Black & Veatch and an associate professor at Marquette University. His research group investigates pyrolysis of biosolids and the fate of micropollutants, including antimicrobial chemicals and antibiotic resistant bacteria. His research is currently funded by the National Science Foundation, the Milwaukee Metropolitan Sewerage District, and private foundations. He got his PhD at Minnesota and his MS from Texas where he worked on dewaterability at Hornsby Bend.

LLOYD WINCHELL, PE, BROWN AND CALDWELL



Since graduating in 2005 from the University of Minnesota, Lloyd has spent 17 years with Brown and Caldwell as an environmental engineer. Lloyd's work has focused solely on wastewater treatment projects involving both industrial and municipal utilities. His specialties include wastewater liquids and solids process engineering. Recent solids process engineering includes PFAS fate, incineration optimization, energy recovery in solids processing, and emissions compliance.

Operators Track

Operations Optimization and Operators Track

Wednesday, May 15 | 9:00 am to 3:30 pm

FUNDAMENTALS OF WASTEWATER MATH

The CSWEA Annual Conference will be offering a Full Day Operators Track developed for operators with an emphasis on Wastewater Optimization presentations in the morning with training certification for Math of Wastewater Operators in the afternoon.

Part of the Wastewater Optimization track will feature operators from the Kishwaukee Water Reclamation District discussing their hands-on approach to Operational Changes and Energy Savings at their WWTP.

The Math for Wastewater Operators Track will serve as an excellent review and preparation for all levels of Wastewater Operator Certification exams. Math is a basic skill that is necessary for the function of any wastewater plant. This course will cover much of the basic math and calculations used regularly in wastewater treatment.

This is a unique opportunity to take the class in a comfortable environment with plenty of time to absorb the material and



do well on the exit exam. Completing the course provides for 1.5 CEUs for Operators in Illinois, Wisconsin, and Minnesota.

- Basic Arithmetic
- Area and Volume Measurements
- Detention Time
- Pound Formula
- Chemical Dose
- Percent Removal Calculation
- Practice Problems
- Conversion Factors and Formulas
- Exam

JASON RUFFATTI, PE, WATER/WASTEWATER PROJECT MANAGER

Graduated with a B.S. in Civil Engineering at the University of Iowa. Five years of experience as a Water/Wastewater Engineer.

BRENT PERZ, PE, WASTEWATER DEPARTMENT MANAGER

Graduated with a B.S. in Civil Engineering at Iowa State University. 20 years of experience as a Wastewater Engineer and Project Manager.

Ethics Training

Wednesday, May 15 | 1:30 pm to 3:30 pm

PROFESSIONAL ETHICS IN ENGINEERING



In this interactive session, we will explore the professional responsibilities of engineers. We will watch and discuss the short video "Incident at Morales: An Engineering Ethics Story," which raises ethical questions in the everyday practice of engineering. For example, what issues are involved in hiring an engineer from a competitor? How does organizational culture affect engineering decisions? Do professional responsibilities for safety stop at state or national borders?

This session will be led by Michael C. Loui, who is Professor Emeritus of Electrical and Computer Engineering and

University Distinguished Teacher-Scholar at the University of Illinois Urbana-Champaign. He held the Dale and Suzi Gallagher Professorship in Engineering Education at Purdue University from 2014 to 2019. He has conducted research in computational complexity theory, in professional ethics, and in engineering education. He is a Carnegie Scholar, a Fellow of the IEEE, and a Fellow of the American Society for Engineering Education. Professor Loui was Editor of the Journal of Engineering Education from 2012 to 2017 and Executive Editor of College Teaching from 2006 to 2012. He was Associate Dean of the Graduate College at Illinois from 1996 to 2000. He directed the Theory of Computing Program at the National Science Foundation from 1990 to 1991. He earned the PhD at the Massachusetts Institute of Technology in 1980 and the BS at Yale University in 1975.

Special Guest

IFETAYO VENNER, PE, WEF IMMEDIATE PAST PRESIDENT



Ifetayo Venner, PE, is the immediate past president of, and a member of the 2023-24 Board of Trustees for, the Water Environment Federation (WEF), an international organization of water quality professionals headquartered in Alexandria, VA.

Ifetayo is a Professional Engineer and Envision Sustainability professional with Arcadis, a global design and consultancy firm

for natural and built assets. She is the North America Wastewater and Water Sustainability Leader.

Ifetayo has been an active member of WEF since joining after college, participating in committees and task forces related to water resource recovery facility design, sustainability and WEF governance. She is a member of the Florida Water Environment Association and the Water Environment Association of Texas.

Ifetayo is a licensed professional engineer in Florida and Texas. She has a bachelor's degree in civil engineering from McGill University, a master's degree in environmental engineering and science from Stanford University, and an MBA (with a concentration in management and sustainability) from the University of South Florida.



FLOW OPTIMIZATION SECOND TO NONE

BÖRGER
EXCELLENCE – MADE TO LAST

Boerger Rotary Lobe Pumps are low maintenance and high performance for your toughest wastewater applications.

- + Flows up to 7,500 gpm
- + Low Shear Handling
- + Reversible Operation
- + Dry Running Capability
- + Solids Handling
- + MIP (Maintenance In Place)

www.boerger.com

BLUeline
NOVA



Municipal Representatives:



We can provide a solution for any tank, even custom-builds.

Choose Assmann for your water and
wastewater management storage needs.

SCAN TO LEARN MORE



ASSMANN-USA.COM



Venue

THE RENAISSANCE SCHAUMBURG CONVENTION CENTER

1551 North Thoreau Drive, Schaumburg, IL 60173

The conference will be held at the Renaissance Schaumburg Convention Center in Schaumburg, IL. The Renaissance Schaumburg stands out in the Chicagoland area as a ground-breaking showpiece for conventions and trade shows. Offering 150,000 square feet of flexible event space and ideally located near upscale shopping and dining, the Renaissance Schaumburg offers a blend of modern elegance with expansive and fully integrated facilities.



Accommodations

THE RENAISSANCE SCHAUMBURG CONVENTION CENTER HOTEL

The Renaissance Schaumburg Convention Center Hotel is offering a special group rate for conference attendees this year. Just steps from Schaumburg, the hotel is located at 1551 Thoreau Drive North, Schaumburg, IL 60173.

With two restaurants and a coffeeshop also located within the hotel, you can network and catch up in between conference sessions and events. Free self-parking is available onsite.

Book a king standard room for \$163 per night while attending the conference by visiting <https://book.passkey.com/event/50655732/owner/27662/home>.

Reservations by attendees must be received on or before 5:00 pm on Monday, April 22, 2024, to qualify for the group rate. We expect that there will be great demand for these rooms, so please book early.



Exhibit Hall

The Exhibit Hall will be open two days: Wednesday and Thursday, May 14-15, 2024. This year, there will be an Exhibitor Lunch from 12:00 pm-1:00 pm on Tuesday in the Exploration Hall for those who wish to attend. As well, the conference provides longer breaks during the technical sessions with refreshments in the exhibit hall.

Exhibitor Lunch
12:00-1:00 pm
 Tuesday

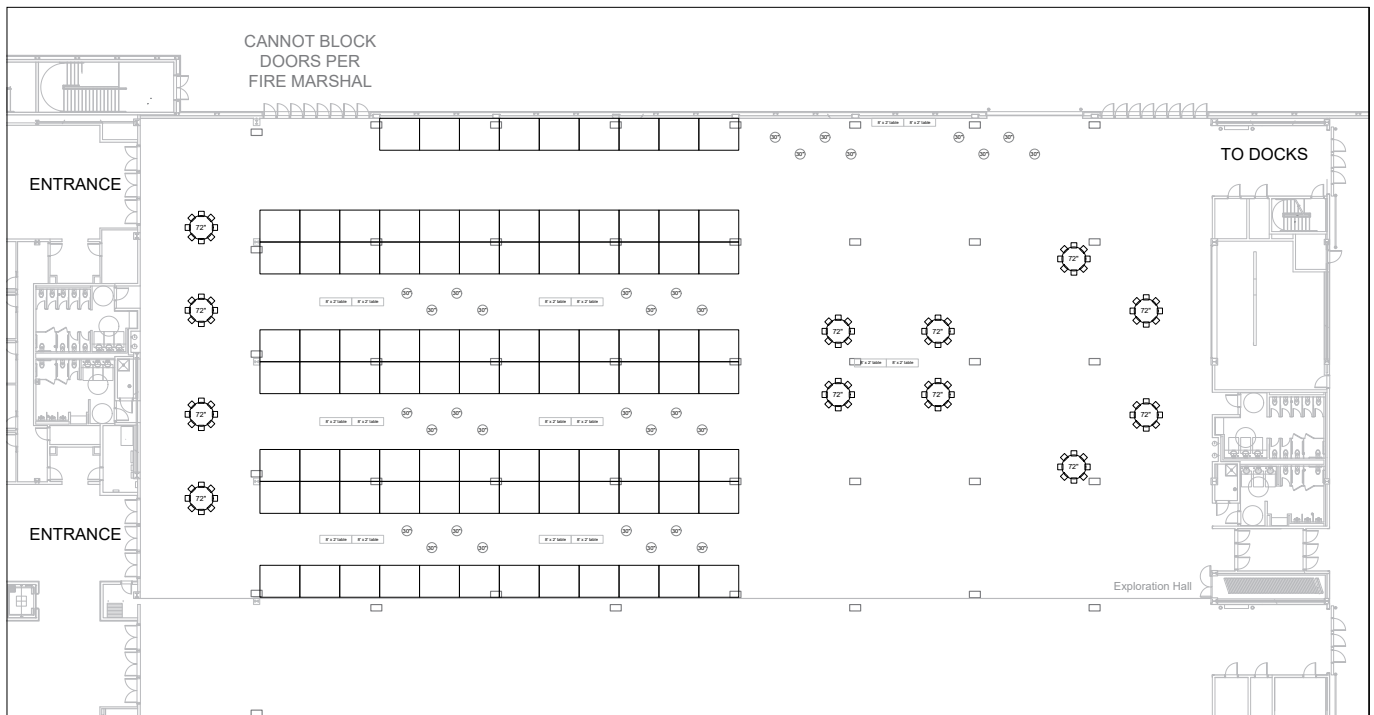
Exhibitors

American Concrete Products
Applied Technologies Inc.
Baxter & Woodman, Inc.
Blue-White Industries
Brierley Associates Corporation
ComEd Energy Efficiency Program
CORNCOB, Inc.
DN Tanks
Drydon Equipment
Dutchland Inc.
Electric Pump
ENECON Corporation
Energenecs
Flow-Technics, Inc.
Foth Infrastructure and Environment
Gasvoda & Associates

George E. Booth
Hach
Hach Software Group
Headworks International
HydroCorp – Cross-Connection Control Program Services
In-Pipe Technology
Interstate Power Systems
Kraft Power Corporation
L&J Technologies
LAI Ltd.
Lystek International
Peterson and Matz, Inc.
PPG/Raven
Pumps and Controls
Redzone Robotics

RJN Group, Inc.
Sherwin Williams
Stewart Spreading, Inc.
TKDA
Tnemec/Epoxytec
Trotter and Associates, Inc.
Tsurumi Pump
Unison Solutions
USALCO
VEGA Americas
Verde Solutions LLC
Visu-Sewer of Illinois, LLC
Warren Environmental
Wisconsin Surplus Online Auction
World Water Works
Xylem

EXHIBIT HALL LAYOUT



Attendee Registration Form

FULL CONFERENCE REGISTRATION

Includes Monday Night Social, Exhibits, Technical Sessions, Tuesday Exhibitors Lunch, Wednesday Exhibitors Reception and Annual Awards Event. Full Conference Registration also includes all meals on Wednesday, State Section Business Meeting, and Annual Association Meeting.

	Before April 19	After April 19	AMOUNT
Member	\$515	\$575	
Non-Member [1]	\$535	\$585	
Retiree	\$315	\$345	
Student	\$175	\$175	

BASIC CONFERENCE REGISTRATION

Includes Monday Night Social, Exhibits, Technical Sessions, Exhibitors Lunch, and Tuesday Exhibitors Reception. Sit-down meals on Tuesday and Wednesday must be purchased separately.

	Before April 19	After April 19	AMOUNT
Member	\$380	\$405	
Non-Member [1]	\$410	\$435	
Retiree	\$190	\$210	
Student	\$ 50	\$ 50	

ONE DAY REGISTRATION

Tuesday: Includes Monday Night Social, Exhibits, Technical Sessions, Exhibitors Lunch, and Exhibitors Reception. Sit-down meals must be purchased separately.

Wednesday: Includes Exhibits and Technical Sessions. Sit-down meals must be purchased separately.

	Before April 19	After April 19	AMOUNT
Tues - Member	\$230	\$255	
Tues - Non-Member [1]	\$260	\$285	
Wed - Member	\$230	\$255	
Wed - Non-Member [1]	\$260	\$285	

EVENTS AND MEALS (A LA CARTE)

Please circle event & meal selections for you and any guest/spouse who may be joining you for an event or meal.

ATTENDEE OR GUEST NAME	EVENTS						EVENTS W/MEALS				TOTAL
	GOLF OUTING	STORMWATER TOUR	5K RUN/WALK	SERVICE PROJECT	MONDAY SOCIAL (GUESTS)	PLANT TOUR	STATE SECTION BUSINESS MEETING	ANNUAL ASSOCIATION MEETING	ANNUAL AWARD EVENT	ALL MEALS	
	\$85	N/C	\$25	N/C	\$25	N/C	\$25	\$35	\$75	\$135	
	\$85	N/C	\$25	N/C	\$25	N/C	\$25	\$35	\$75	\$135	
	\$85	N/C	\$25	N/C	\$25	N/C	\$25	\$35	\$75	\$135	
	\$85	N/C	\$25	N/C	\$25	N/C	\$25	\$35	\$75	\$135	
	\$85	N/C	\$25	N/C	\$25	N/C	\$25	\$35	\$75	\$135	

[1] Includes one (1) year of membership to CSWEA.

[2] Guest/Spouse Registration includes Meet & Greet, Exhibitor Reception and Refreshments in Exhibit Hall.

Global Water Stewardship Donation \$ _____

GRAND TOTAL \$ _____

Name _____ Employer _____

Address _____ City _____ State _____ ZIP _____

Phone _____ Email _____

WEF Member Number _____ New Member (within last year) Yes No

Operator Number (if applicable) _____

Are you a Young Professional (less than 36 years old) Yes No Do you want to become more active in CSWEA? Yes

Dietary Restrictions/Special Accommodations _____

Golf Partners _____

Would you like to donate an item to the CSWEA Global Water Stewardship Silent Auction Yes

Make Checks Payable to CENTRAL STATES WATER ENVIRONMENT ASSOCIATION | 1021 Alexandra Blvd, Crystal Lake, IL 60014

Questions?

Registration: Amy Haque - 855-692-7932 x102 | ahaque@cswea.org

Utility Registration Form

Contact Person _____

Utility _____

Address _____

City _____ State _____ ZIP _____

Phone _____

Email _____

UTILITY REGISTRATION [1]

Registration includes Monday Night Social, Exhibits, Technical Sessions, Box Lunch, and Exhibitors' Reception. (Registration does not include the State Section Business Meeting, Annual Association Meeting, Annual Awards Event, or other Events. Register for them below).

	Before April 19	After April 19	AMOUNT
Collection System Only or 0-1 MGD	\$300	\$350	
1 - 5 MGD	\$500	\$600	
5 - 20 MGD	\$900	\$1,000	
20 - 50 MGD	\$2,000	\$2,500	
> 50 MGD	\$3,000	\$3,500	

UTILITY ATTENDEE REGISTRATION INFO & A LA CARTE SELECTIONS

Please mark the days of attendance, circle events and meals for each utility attendee and indicate the total for each attendee to the right.

ATTENDEE NAME	ATTENDING			EVENTS						EVENTS w/ MEALS [2]				TOTAL
	TUES	WED	BOTH	GOLF OUTING	STORMWATER TOUR	SERVICE PROJECT	5K RUN/WALK	MONDAY SOCIAL (GUESTS)	PLANT TOUR	STATE SECTION BUSINESS MEETING	ANNUAL ASSOCIATION MEETING	ANNUAL AWARDS EVENT	ALL MEALS	
				\$85	N/C	N/C	\$25	\$25	N/C	\$15	\$25	\$35	\$75	
				\$85	N/C	N/C	\$25	\$25	N/C	\$15	\$25	\$35	\$75	
				\$85	N/C	N/C	\$25	\$25	N/C	\$15	\$25	\$35	\$75	
				\$85	N/C	N/C	\$25	\$25	N/C	\$15	\$25	\$35	\$75	
				\$85	N/C	N/C	\$25	\$25	N/C	\$15	\$25	\$35	\$75	
				\$85	N/C	N/C	\$25	\$25	N/C	\$15	\$25	\$35	\$75	
				\$85	N/C	N/C	\$25	\$25	N/C	\$15	\$25	\$35	\$75	

[1] Registration based on NPDES permitted flow.

[2] Rates reflect maximum rates allowable on per diem or GSA rates. Only Available to members registered as utilities.

Global Water Stewardship Donation \$ _____

GRAND TOTAL \$ _____

GUEST & SPOUSE REGISTRATIONS

Please use the Attendee Form on previous page to purchase all Guest/Spouse event and meal tickets.

List any new WEF/CSWEA Members from the last year: _____

List all Young Professionals (35 years old or younger): _____

List attendees that would like to be more active in CSWEA: _____

Dietary Restrictions/Special Accommodations _____

Please list name with request

Golf Partners _____

Would you like to donate an item to the CSWEA Global Water Stewardship Silent Auction Yes

Make Checks Payable to CENTRAL STATES WATER ENVIRONMENT ASSOCIATION | 1021 Alexandra Blvd, Crystal Lake, IL 60014

Questions?

Registration: Amy Haque – 855-692-7932 x102 | ahaque@cswea.org

ClarkDietz

Engineering Quality of Life®



integrated
WATER QUALITY SOLUTIONS

WATER | WASTEWATER | STORMWATER

Illinois • Indiana • Kentucky • Wisconsin • clarkdietz.com

STRUCTURE. & INTEGRITY.

PITTSBURGH TANK & TOWER GROUP

An ESOP Company

Since 1919

"100 years and still climbing"



WWW.PTTG.COM

INSPECTIONS REPAIR TANKS

NEW TANKS

(270) 826-9000 ext. 2601

EXISTING TANKS

(270) 826-9000 ext. 4601



HRGreen®

- ▶ MINNESOTA
St. Paul
- ▶ ILLINOIS
Aurora | McHenry
New Lenox | Peoria



Providing engineering and technical management solutions that **build communities** and **improve lives.**



HRGREEN.COM

BROADBAND + CONSTRUCTION + ENVIRONMENTAL
GEOSPATIAL + GOVERNMENT + LAND DEVELOPMENT
PLANNING + TRANSPORTATION + WATER



Engineers and Consultants



**LEVERAGING
INFRASTRUCTURE TO**
advance resiliency,
improve sustainability,
and enhance community.

cmtengr.com | [@cmtengrs](https://twitter.com/cmtengrs)

Conference Sponsors

Platinum Sponsors



Gold Sponsors



Silver Sponsors



Bronze Sponsors



Meet & Greet Sponsors



Association Luncheon



Golf Sponsors



5K Run/Walk



Excellence in EngineeringSM



Channahon | Illinois



Mt Horeb | Wisconsin



Joliet | Illinois



STRAND
ASSOCIATES®

www.strand.com
12 Locations Nationwide

Multidisciplinary firm serving public and private sectors

VALVE SELECTION 101

QUESTION: WHICH RESILIENT WEDGE GATE VALVE OFFERS THE FOLLOWING FEATURES:

- SINGLE-BOLT, LOW-TORQUE RESTRAINT
- PREASSEMBLED JOINT RESTRAINT
- PIPE MATERIAL FLEXIBILITY
- SIGNIFICANT INSTALLATION COST SAVINGS

ANSWER:
AMERICAN SERIES 2500 WITH

ALPHA™
RESTRAINED JOINT ENDS



ALPHA™ is a licensed trademark of Romac Industries Inc. (U.S. Patent 8,894,100)

Ben Franklin is credited with saying "Time is money." The AMERICAN Flow Control Series 2500 with ALPHA™ restrained joint ends comes with the restraint accessories attached, leaving only one bolt on each end to tighten. ALPHA can be used with a variety of materials including ductile iron, cast iron, HDPE and PVC.

Low-torque, single-bolt restraint and material flexibility means reduced installation times leading to significant labor savings and less inventory. That saves time and money.

The AMERICAN Series 2500 with ALPHA™ restrained joint ends – It's the only gate valve you'll ever need.

www.american-usa.com
PO Box 2727, Birmingham, AL 35202
800-326-8051
EOE/Vets/Disabilities



AMERICAN
FLOW CONTROL
THE RIGHT WAY

DUCTILE IRON PIPE | FLOW CONTROL INTERNATIONAL

SPIRALWELD PIPE

STEEL PIPE

Stevens Point WWTF

By Chris Lefebvre, Wastewater Superintendent, City of Steven's Point



The City of Stevens Point Wastewater Treatment Facility is located in Central Wisconsin and discharges to the main stem of the Wisconsin River. The facility serves a population of approximately 28,000 people, this includes the City of Stevens Point,

the Village of Park Ridge, a portion of the Town of Hull, and the UW-Stevens Point campus. The facility is designed to treat 4.55 MGD. Due to well-drained soils in the area and recent sewer lining projects the facility sees a consistent influent flow that averages 2.4 MGD and rarely exceeds 4.0 MGD.

The original treatment facility was commissioned in 1940, more than 30 years prior to the *Clean Water Act*. The city invested in an activated sludge facility even though the state only required primary treatment. This facility had two rectangular primary clarifiers, two aeration basins, two

“The original treatment facility was commissioned in 1940, more than 30 years prior to the *Clean Water Act*. The city invested in an activated sludge facility even though the state only required primary treatment.”



Stevens Point WWTF
(Courtesy of Donohue and Associates)

‘squirrel’ secondary clarifiers, two anaerobic digesters, a sludge lagoon and even a 40kW biogas-fired generator.

In 1972, the *Clean Water Act* made funds available for the first major facility upgrade. This upgrade included converting the existing primary clarifiers to DAFTs for WAS

thickening, new rectangular primary clarifiers, two additional aeration basins, a rim-feed secondary clarifier, chlorine disinfection, a third anaerobic digester, and a second sludge lagoon.

The next major upgrade was in 1992. This upgrade added two influent screw pumps, mechanical fine screens, grit removal, two center-feed secondary clarifiers to replace the original 1940 clarifiers, replaced chlorine disinfection with UV, and added a pair of sludge storage tanks. This upgrade also included an effluent reuse system that utilized an effluent heat pump to heat and cool the wastewater administration building.

The facility received its first effluent phosphorus limit in 1995. This led to one of the aeration basins being modified to accommodate enhanced biological phosphorus removal using an A/O process. This process is still being successfully utilized today.

In 2002 Wisconsin Focus on Energy conducted an energy audit of the wastewater facility. This audit led to the wastewater staff focusing on energy efficiency, which has been continuous through every decision that has been made since. Some of the suggestions from the audit were achievable without any major capital expenses; installing manual switches on outdoor lighting, installing LED light fixtures, adjusting operational setpoints such as target DO, and turning off non-essential equipment. Once the low hanging fruit had been removed, the staff focused on areas of the facility that required more of an investment. The first project was to replace the 50 hp plant air compressor with a more efficient 15 hp compressor. By 2010 these small changes had produced greater than a 20% reduction in energy consumption while removing 20% more BOD/day.

Then, in 2011, the facility added a Linear Motion mixer to the newest digester (1972), a 180kW biogas fueled CHP along with a biogas conditioning skid, and replaced one of the positive displacement aeration blowers with a new screw compressor that offered better efficiency and a wide range of SCFM output to handle the highly variable

BOD loading that the facility was seeing. This variability in loading was caused by the rapid expansion of the Stevens Point Brewery. By 2013 the loadings from the Stevens Point Brewery were consistently causing large filamentous outbreaks in the activated sludge. To solve this problem, the city and brewery partnered to install a high-strength waste lift station on brewery property, a 40,000-gallon, high-strength, waste-holding tank at the wastewater facility, and directionally bored a 3,500-ft forcemain between the two facilities in 2014. This project successfully eliminated slug loading to the wastewater facility, which in turn, avoided a large facility upgrade and gave the brewery a competitive advantage by avoiding additional sewer use surcharges. The added infrastructure also allows the wastewater facility to accept other high strength materials that can be mixed with the brewery waste and fed directly to the anaerobic digesters.

Also in 2014, a VFD controlled 44 hp submersible influent pump was added to handle the normal daily influent flow, the 30-year-old 100 hp screw pumps have since been used only during higher-than-normal flows and for a few hours each day during the winter to keep them from freezing.

The anaerobically digested biosolids have been used as a fertilizer for as far back as records were being kept. Initially, material was removed from the sludge lagoons each fall and land applied on farm fields. As the facility grew the need for better biosolids storage was answered by building two 1.6-million-gallon storage tanks in 1992. This material was land applied as a liquid at 2% solids. In 2002, a Rotary Drum Thickener was installed to process the digested sludge to help mitigate trucking costs. This equipment in conjunction with decanting was able to get the biosolids to 5% to 6% solids.

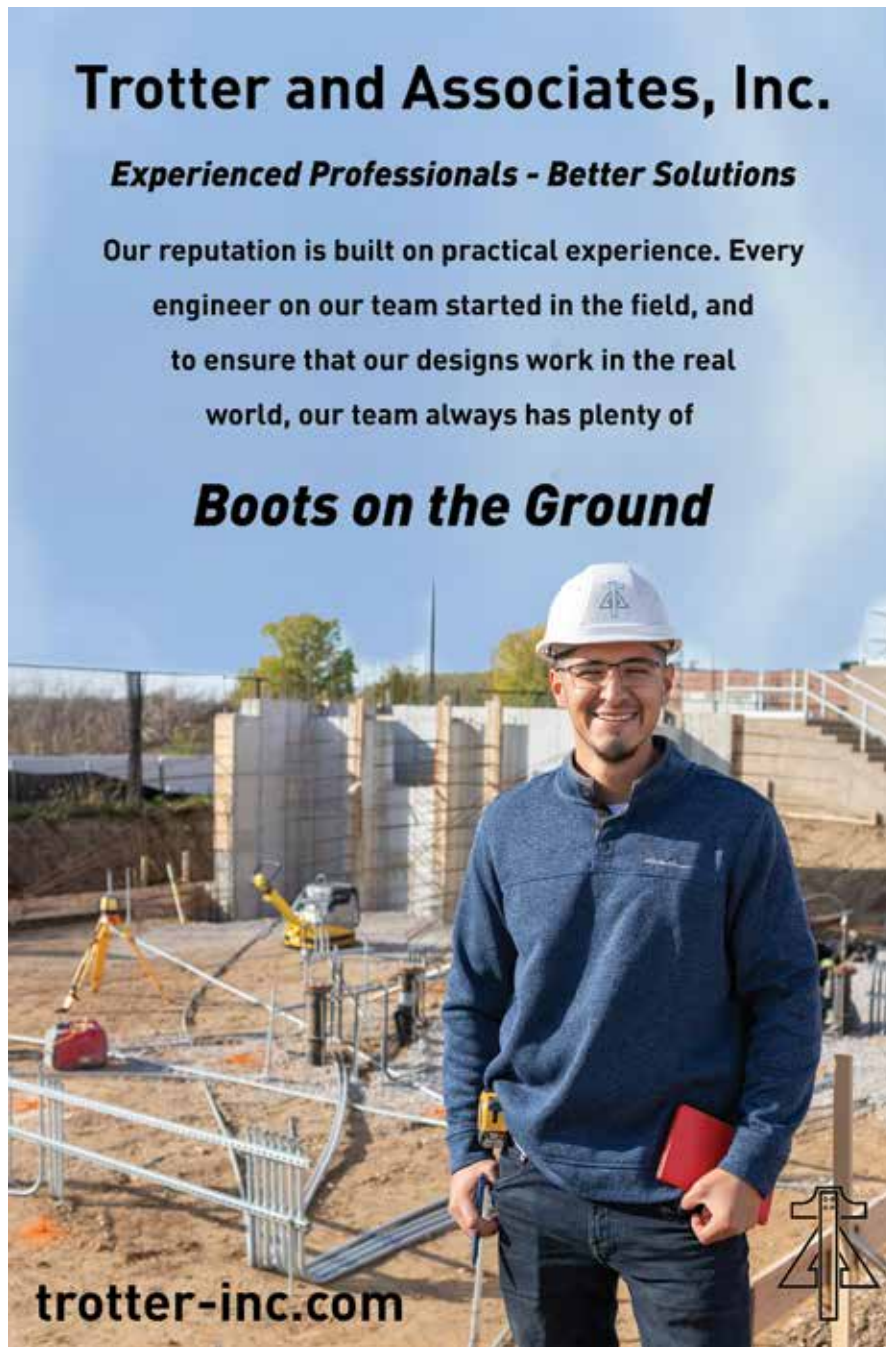
Throughout the 2010s, land application of class B biosolids became much more difficult. The area’s light soils and shallow depth to ground water had always made approvable fields difficult to locate. That issue, along with an increase in competition

for these fields from industrial, municipal, and manure applicators, forced the facility to look to the future. In 2019, the facility started producing BioPOINT a class A heat-dried biosolid fertilizer. This upgrade included a 1.5-meter belt filter press and a thermal oil heated paddle dryer. The class A process eliminated the need for two sludge storage tanks so one of the storage tanks was converted to a 1.6-million-gallon anaerobic

digester with a gas holding cover, giving the facility over 2.2 million gallons of anaerobic digestion capacity. This additional capacity is being utilized to take in high strength wastes and sludges from 15 different entities. The biogas that is produced is utilized to heat the digestion process and as much as 90% of heat for the biosolids dryer. Prior to 2021 biogas was also used to run the 180kW CHP unit, this equipment was decommissioned

due to excessive O&M costs. The final BioPOINT product is being utilized as an agricultural fertilizer with landfilling as an alternative when necessary.

Through these upgrades, existing infrastructure has been attempted to be reused whenever possible. To date, all the tankage and buildings except one of the original 1940s squirrel clarifiers is being utilized. In 2018, one of the original secondary clarifier tanks was converted to



Trotter and Associates, Inc.

Experienced Professionals - Better Solutions

Our reputation is built on practical experience. Every engineer on our team started in the field, and to ensure that our designs work in the real world, our team always has plenty of

Boots on the Ground

trotter-inc.com



A truck loaded with BioPOINT

an effluent holding tank to supply water for a heat pump to service a new 50,000-square-foot utility garage. This garage was built to house the Utility's Collection, Stormwater, and Water Department's Staff and their equipment. This building was built with resource recovery in mind, not only is the heat source renewable, but the roof was also used to install a 130kW solar array.

The wastewater facility is operated by a staff of six: a superintendent, a chief operator, and four operators. This staff is responsible for operating and maintaining 15 lift stations, the equipment and processes within the treatment facility, and a full wastewater laboratory. The facility has been able to keep staffing consistent even with significantly more processes by leveraging the available instrumentation and technology to their advantage.

While the facility is consistently meeting all its permit requirements, staff is still looking to the future with plans to add a selector basin to stabilize the biological nutrient removal process and a 200kW solar array. **CS**



GLOBAL WATER
STEWARDSHIP

GWS Update

Annual Service Trip

By Sarah Guzman, GWS Co-Chair

Last August, our amazing group of GWS volunteers, along with a group of students from Marquette University, went on our annual service trip to Costa Rica. We had a total of nine GWS volunteers and four students from Marquette University, who were the winners of the 2023 Midwest Student Design Competition. The group arrived in San Jose, Costa Rica on Sunday, August 20, 2024, and we drove to Horquetas de Sarapiquí that same day.

Horquetas is the 2024 GWS Community of Choice. Located in northern Costa Rica, Horquetas sits at the border between the provinces of Guanacaste and Alajuela. The local water authorities from the ASADA received us with an amazing dinner at a local restaurant, and we had time to introduce everyone while networking with them. After dinner the GWS volunteers went to the hotel and enjoyed a nice splash at the hotel pool. Horquetas was extremely hot and humid, and the pool was an amazing touch.

On Monday, the group toured the Horquetas community with the ASADA manager, who gracefully offered to take the group on a tour of the area and provided a chance to explore some of the region's beautiful hiking trails. This was one of the best ways to get everyone in the Pura Vida spirit, exploring the communities with the locals and learning about their culture. After that, we met





with the Horquetas ASADA leadership group to discuss their water system and vision for their future wastewater system. Horquetas is the site for the 2024 GWS Student Design Competition, which already happened on

January 29, 2024. On Monday, we also visited potential sites for the wastewater plant, as well as the schools that are options for the biogarden construction during our 2024 August service trip.

On Tuesday, the leadership team from the ASADA took us to a local dam, where most of the water for the community is collected and stored. They also took us to the springs, where the water is obtained from. After this amazing



- SCADA Systems
- Custom Controls
- System Integration
- Prefabricated Structures
- PLC & HMI Programming

For over 20 years, Starnet has been providing custom solutions to the water & wastewater industry, with a focus on operator safety. Visit us and discover an innovative answer for your application.

Call Us: (262) 886-0228

StarnetTech.com • ArrowStations.com • ArcSafe.com





trip and after having a farewell lunch with them, the GWS group continued their journey to Bijagua, which is approximately three-hours away from Horquetas. Bijagua is in the center of the country, surrounded by rainforests. Bijagua was the 2023 Community of Choice

for the Student Design Competition. On our way to Bijagua, we stopped at La Fortuna, which was the 2019 Community of Choice. GWS has a great relationship with the local water authorities from La Fortuna, who hosted a dinner for the group. After dinner, we

continued our journey. We arrived in Bijagua late at night and went straight to bed. Wednesday was a free day for the students and GWS volunteers, while the GWS leadership team worked and coordinated the activities for Thursday with the Bijagua ASADA,

ELECTRIC PUMP

You can count on us for all your fluid handling solutions!

952-758-6600 / 800-211-6432 www.electricpump.com



ensuring everything was set and ready for the biogarden construction. Part of the GWS group went to Rio Celeste waterfall and it was as amazing as ever. The dreamy, blue waters from the waterfall looked like they were straight out of movie. The group also did ziplining. On Wednesday evening, the group went to a local conservatory where they saw an amazing variety of local species, including tapirs, snakes, frogs, and birds. This night hike was one of the highlights of the trip. Following the hike, the group met with the ASADA leadership group and AyA members for dinner and discussed the logistics for Thursday.

The group rose very early on Thursday, and were excited to start on the biogarden construction at the school in Bijagua. The GWS volunteers also worked with the students at the school to teach them about the biogarden and why it is important. It is the school's responsibility to maintain the biogarden, so it is important for the teachers and students to be involved in the construction. When we arrived at the school, the GWS group – along with the ASADA members and AyA members – started the construction of the biogarden. We also were joined by members from one of our sponsors, Durman by Aliaxis. Some GWS volunteers and AyA members also did educational water activities with the students from the school, who were between first and fifth grade. This was a long, hot day, but one of the best days of the trip. It was so inspiring to see how all the volunteers from different backgrounds came together to work on this amazing and soul-filling project that is the biogarden construction. The biogarden was done by 4:00 pm and everyone was beaming with happiness about the results. The Marquette students were absolutely rockstars during the biogarden construction and put 110% into this project.

But just because the biogarden was complete, didn't mean we were at the end of Thursday. Following the construction of the biogarden, the volunteers rushed to the hotel to get ready for the presentation that the Marquette students were going to do for the Bijagua community and AyA members. The students also handed over their final reports, which the ASADA will review and use to move forward in the next step of implementation of



a centralized wastewater system. This was the first time that the Bijagua community saw the design of the wastewater plant and they were impressed with the amazing work that the Marquette students did.

On Friday, we did one last check on the biogarden to make sure everything was working properly. Following this check, the group returned to San Jose to ensure that we made our weekend flights home the next day. Everything went smoothly and everyone had a great time. For first timers and old timers, this trip is always a life changing experience, and it really showcases the amazing work that GWS does in Costa Rica.

It is amazing how months of planning go into making this a successful week. There is so much more that we want to do, and we are hoping to keep expanding GWS' footprint in order to keep educating and sharing with others the importance of sanitation and clean water. If you or someone you know might be interested in supporting GWS cause, do not hesitate in reaching out.

If you want to learn how it went or get involved in any of the GWS initiatives, please reach out to Sarah Guzman and Joe Lapastora at chair@globalwaterstewardship.org.
Pura Vida! **CS**

EMERGENCY CHLORINE SHUTOFF SYSTEM

Now With More Alarm Outputs -
"Low Battery" & "Not Armed and Ready"

- ◆ Closes valve within seconds
- ◆ Fire code approved as alternative for scrubber in most states
- ◆ Compatible with all direct mount vacuum regulators
- ◆ No tools or adapters required for installation on valve



www.halogenvalve.com



How SURE?

Sustainability and Resiliency for Conventional Filters

By Stuart F. Humphries, Director – Filtration Technologies, Orthos Liquid Systems, Inc. shumphries@orthosfilters.com



For well over a century, conventional granular media downflow filters have provided reliable, economic water and wastewater treatment. Even today, this type of filtration system provides proven treatment capabilities and long-term maintenance benefits. Though the process of granular media filtration is relatively well-understood, the long-term success of a filter may ultimately depend more on the filter underdrain design.

Conventional Filter “ABCs”

The filtration operation for conventional filters is comprised of two distinct phases: filtration and cleaning (backwashing). The filtration phase to remove particulate material is accomplished by passing the water downward through a filter bed comprised of one or more granular medias (e.g., sand, anthracite, GAC), with or without chemical addition. The solids removal process is accomplished by several removal mechanisms such as straining, sedimentation, impaction, interception, adhesion, and adsorption. The filtration phase must end once the suspended solids in the effluent increase to an unacceptable concentration or when a limiting headloss occurs across the filter bed. Backwashing cleans the filter media by reversing the flow through the media to send the solids-laden wash water for treatment elsewhere. Air is often used in addition to

water, either sequentially or simultaneously, to provide enhanced media scouring.

All granular downflow filters must contain media as well as an underdrain, which must:

- 1) Support the granular media;
- 2) Withstand maximum filtering headloss;
- 3) Uniformly allow percolation of the filtrate across the media bed;
- 4) Uniformly distribute backwash water across the entire bed at varying flowrates;
- 5) Uniformly distribute the scouring air either separately or simultaneously with the backwash water;
- 6) Withstand the upthrust created at the maximum rates of backwash and scouring air; and
- 7) Resist corrosion.

Underdrain Types

Filter underdrains are principally comprised by one of the following: (a) Suspended concrete slab or steel plate with integral filtration nozzles and plenum below; or (b) Set of round, triangular, or block-shaped parallel pipes (laterals) containing holes, slots or nozzles and that connect into a main header pipe or duct (flume).

Suspended underdrains utilize an elevated floor, supported on columns or between dwarf walls, creating a plenum underneath. The plenum space, with at least 6" to more than 30" of vertical height, advantageously provides for inspection and service through an access



hatch. Floors are constructed using steel plate (for small filters), from precast slabs, or by pouring a monolithic concrete slab on top of base form panels. Monolithic slabs minimize grouting (i.e., potential leakage points) and include reinforcement bars linked to the tank structure to create a robust design that withstands very high vertical forces. Nozzles sleeves are cast into the concrete floor, and once curing is finished, nozzles are quickly installed. Unlike nozzle-less lateral underdrains, suspended floors may be pressure-tested to ensure structural capability by inserting blanking plugs into the nozzle sleeves.

Lateral underdrains consist of a main header pipe or flume with several parallel laterals branched perpendicularly off one or

both sides of the header or flume. The headloss in each lateral includes entry, friction, and discharge losses, the sum of which vary water and air flowrates considerably under different operating conditions. Lateral underdrains are often fixed in place by grout or anchor bolts and buried in gravel to support and retain media and improve backwash performance.

Underdrain Design

Except in specific cases, filter underdrains must be level for uniform filtration across the bed and to evenly distribute the water and air fed during backwashing in a two-dimensional horizontal plane. Uneven, shallower parts of the media bed will create undesirable and increased filtering, backwash, and separate air scour flowrates. For simultaneous air-water cleaning, a zone of lower water flow may receive a higher proportion of air due to reduced water flow back pressure.

Filter underdrains must either have a fine straining method to hold back the media or have graded gravel to prevent media migration and loss. For underdrains requiring gravel, packing layers must remain stationary during backwash – if disrupted, the gravel must be re-laid. Backwashing, particularly at increased rates, will not regrade the material, and instead will likely cause spouting through the media. Air scour and simultaneous air/water washing make problems from gravel layer undulations much worse. Suspended underdrains with large slot opening nozzles and gravel permit horizontal short circuiting, convergence of flow from several nozzles, and formation of a spout through the packing layer. Fine slot nozzles to retain media directly above the suspended underdrain eliminate horizontal short circuiting and also provide the advantage of a lower hydraulic filter profile.

Lateral systems (triangular or block with slots, round pipes with nozzles) that have openings fine enough to retain the media can block up if backwash water is not entirely free of grit. In contrast, because suspended underdrain velocities are relatively low, nozzles with very fine slots may be used without concern as grit particles in backwash water may settle in the plenum.

Backwash Method

Critical to a filter is the ability for its media to be effectively cleaned. With proper backwashing, conventional filters have many significant advantages over other filter types, to include much longer filter runs with smaller overall backwash volumes. However, not all conventional filter backwash capabilities are “created equal.”

Velocities under a suspended underdrain are relatively low, which reliably leads to good backwash and air scour distribution. The large plenum area buffers changes and provides uniform water and air flowrates across the filter floor. Comparatively, underdrains with laterals produce higher velocities, friction loss, and the Bernoulli effect, resulting in limits of effective lateral length, additional filter design concerns, and increased maldistribution. The flow pattern down the length of a lateral forms an asymmetric “U” shape and changes significantly according to flowrate, leading to operational challenges and structural design concerns. When the air/water interface is created during air scour, without a sufficient lateral cross-section for the air to pass down the lateral length, waves are created that produce intermittent discharge and damage. As inferred previously, nozzle-less lateral systems cannot be pressure-tested following installation, introducing doubt of installed structural capability during these conditions.

Air is distributed through laterals using the orifices or slots located in the crown of a round pipe or triangular lateral, near the top of the primary duct of a block-shaped lateral, or through slotted nozzles mounted on a round pipe lateral. For triangular and nozzle-less round laterals, orifices must be engineered only for a specific set of flowrate conditions, which unquestionably change during backwash and air scour operation and lead to poor performance and orifice blockage.

Air is distributed through a suspended floor through precision-engineered nozzles/strainers. A nozzle has three main components, the strainer to retain media, a water control orifice, and a stem with air orifices. Nozzle stems include a top air bleed hole and lower air metering hole or slots. As scour air is supplied, air collects at the plenum top and depresses the plenum water to form a uniform air/water divide line across all filter stems. The air bleed hole triggers the flow of air and the resulting headloss causes depression of the plenum water interface. Once the air metering hole or slots are exposed, this larger orifice area stabilizes the water level. However, when air and water flow simultaneously, driving head increases, forcing air into the stem, which raises the plenum water level. By correct selection of the stem bore and of the size and location of the orifices, a range of air/water interface level may be beneficially maintained under both air-only and simultaneous conditions. After air scour has ended, the air bleed hole allows venting of air from the underdrain.

Market Analysis

Though nozzle-based underdrains predominate the international municipal market, block-shaped lateral systems are prevalent in the United States. The molded block contains a triangular or semi-circular primary manifold that distributes into an outer pair of secondary ducts, which in turn feed an upper face (or cap). Multiple lengths of blocks are laid side-by-side and grout is placed between these laterals. Originally (late 1970s), the cap contained large perforations requiring gravel; however, to avoid the packing layer, in the early 1990s, sintered polyethylene bead slabs were screwed onto the block top. Due to the numerous amounts of floor uplift events, resulting mostly from slab plugging, biological fouling, and grout leakage, most manufacturers have discontinued the beaded slabs, reverted to slotted caps, and now provide a significant amount of supplementary hardware to hold down the blocks.

In response to the prevalent floor failures, stainless steel triangular laterals have recently increased in usage. Though having a low hydraulic filtering profile, maldistribution of triangular lateral systems is significantly higher than that of block or nozzle-based monolithic floors. Undesired outcomes result: Poor media agitation and cleaning, shorter filter runs, increased backwash rates and volumes, and reduction in filter capacity. Adding the recent increased cost of stainless steel, the life cycle benefit of triangular lateral systems over that of block style is questionable.

To fully capture the treatment capabilities and long-term maintenance benefits of conventional filters, prudent municipal filter design must include consideration of suspended monolithic floors. This type of nozzle-based underdrain system eliminates gravel, has excellent filter and backwash distribution characteristics, and is structurally superior to lateral systems. At end-of-life cycle, in contrast to a complete lateral underdrain overhaul, nozzles are simply replaced as the monolithic floor remains part of the civil structure. One monolithic underdrain manufacturer, Orthos Liquid Systems, boasts 250 installed filters, some with more than 25 years of operation, without a filter underdrain failure. Lateral systems manufacturers with significant experience can make no such claim.

References

1. Stevenson, D. G. (1997). Water treatment unit processes. London: Imperial College Press.
2. Tchobanoglous, G., & Burton, F. L. (1991). Wastewater engineering: Treatment, Disposal, and Reuse. New York: McGraw-Hill. [CS](#)

Unlimited Remote Support Service

Unison Solutions is committed to keeping your biogas conditioning and upgrading systems working at their optimum. We are now offering annual support for **unlimited remote assistance** on all Unison manufactured equipment.



- Troubleshooting system errors
- Basic system information and operation
- Unison supplied programming parameter edits, alarm set point, control loop tuning, and firmware upgrades for sites that allow remote access
 - Engineering support if needed on original system design
 - Media and gas testing support

Call today for a quote!



UNISON



563.227.4149



service@unisonsolutions.com

BAXTER & WOODMAN
Consulting Engineers

Building community value through innovative engineering solutions



WASTEWATER



WATER



STORMWATER



baxterwoodman.com



THE **DIFFERENCE**
IS **CLEAR**

Drinking Water

Wastewater

Stormwater

Environmental Resources
and Compliance



Foth



Water Services

CENTRAL STATES
WATER

To reach water industry professionals in Minnesota, Illinois and Wisconsin through *Central States Water* magazine and its targeted readership, please contact Marketing Manager, Jeff Kutny.



866-985-9789 • jeff@kelman.ca

APRIL 9



EDUCATION SEMINAR

Monona Terrace Convention Center | Madison, WI

APRIL 16



OPERATOR TRAINING PROGRAM

CSWEA OPERATOR TRAINING WEBINAR – FUNDAMENTALS OF MAINTENANCE I

Online

APRIL 25



EPA AAA DECISION-MAKING TOOL WORKSHOP

Milwaukee Metropolitan SD

MAY 13-15



CSWEA 97TH ANNUAL MEETING

Renaissance Schaumburg Convention Center | Schaumburg, IL

MAY 14



OPERATOR TRAINING PROGRAM

CSWEA OPERATOR TRAINING – MATH I

In-Person at the Annual Meeting

JUNE 6

WI SECTION 2024 CLASSIC COLLECTION SYSTEM SEMINAR

Watertown, WI

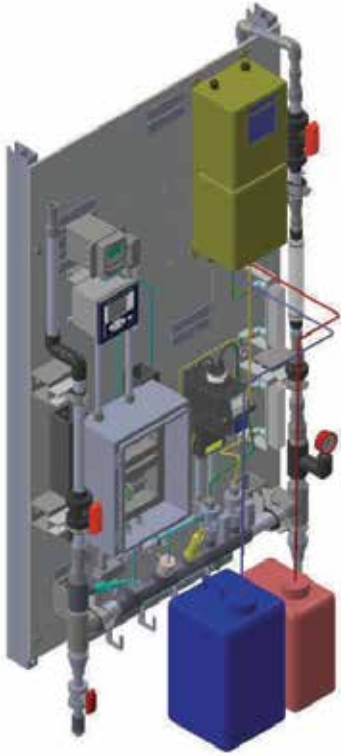
Cost Effective
Algae Control
Durable Stainless Steel Construction

- ▶ Full access when open between baffle and weir
- ▶ Exclusive hinge system locks covers open with no tethers, cables or struts
- ▶ Light weight, safe, reliable and effective
- ▶ Lower your labor costs with a cleaner solution

Continuously inhibit algae growth and reduce post clarifier treatment issues

Janssen
MACHINE COMPANY

Contact us to get your quote started today
23062 Hwy.34 • Barnesville, MN 56514
Phone 218-493-4470 • Fax 218-493-4441
janssenmachine@rrt.net • janssenmachine.com



Integrated Process Solutions, Inc.

www.ipsamerica.biz



DRINKING WATER. WASTEWATER TREATMENT. WATER RESOURCES.

SOLVING YOUR MOST PRESSING WATER CHALLENGES.

With SEH, you are a true partner and collaborator.

Building a Better World for All of Us[®]

Engineers | Architects | Planners | Scientists

800.325.2055 | sehinc.com/subscribe





Central States Water is made possible by the companies below who convey their important messages on our pages. We thank them for their support of CSWEA and its publication and encourage you to contact them when making your purchasing decisions. To make it easier to contact these companies, we have included the page number of their advertisement, their phone number, and, where applicable, their website.

COMPANY	PAGE	TELEPHONE	WEBSITE
Advanced Engineering and Environmental Services (AE2S)	6	763-463-5036	www.ae2s.com
AMERICAN Flow Control	47	205-325-7701	www.american-usa.com
Apex Engineering Group	32	701-373-7980	www.apexenggroup.com
Assman Corporation of America	40	888-357-3181	www.assmann-usa.com
Baxter & Woodman, Inc.	58	815-459-1260	www.baxterwoodman.com
Boerger, LLC	40	877-726-3743	www.boerger.com
Bolton & Menk, Inc.	32	507-625-4171	www.bolton-menk.com
Brown and Caldwell	12	651-298-0710	www.browncaldwell.com
Burns & McDonnell	30		www.burnsmcd.com
CDM Smith	62	651-772-1313	www.cdsmith.com
Clark Dietz, Inc.	45	262-657-1550	www.clark-dietz.com
Crawford, Murphy & Tilly, Inc.	45	217-787-8050	www.cmtengr.com
Donohue & Associates, Inc.	64	920-208-0296	www.donohue-associates.com
Electric Pump, Inc.	53	800-211-6432	www.electricpump.com
Energenecs	62	262-377-6360	www.energenecs.com
Engineering Enterprises, Inc.	62	630-466-6700	www.eeiweb.com
Equipump	15	800-783-5623	www.equipump.com
Force Flow/Halogen Valve Systems	55	925-686-6700	www.forceflowscales.com
Foth Infrastructure & Environment	58	920-497-2500	www.foth.com
Gasvoda and Associates	63	708-891-4400	www.gasvoda.com
Grundfos Americas Corporation	14	913-227-3400	www.grundfos.com
Hazen and Sawyer	12	651-256-9534	www.hazenandsawyer.com
HDR Engineering Inc.	62	763-591-5400	www.hdrinc.com
HR Green, Inc.	45	800-728-7805	www.hrgreen.com
InfoSense, Inc.	10	877-747-3245	www.infosense.com
Integrated Process Solutions (IPS)	60	218-435-1703	www.ipsamerica.biz
Janssen Machine Company	59	218-493-4470	www.janssenmachine.com
JDV Equipment Corporation	30	973-366-6556	www.jdvequipment.com
LAI, Ltd.	4	847-392-0990	www.lai-ltd.com
Lakeside Equipment	2	630-837-5640	www.lakeside-equipment.com
LW Allen/Altronex	16	800-362-7266	www.lwallen.com
Metropolitan Industries	26	815-886-9200	www.metropolitanind.com
Moleaer, Inc.	3	424-558-3567	www.moleaer.com
Pittsburg Tank & Tower	45	270-826-9000	www.pttg.com
RELINER/Duran Inc.	8	800-508-6001	www.reliner.com
Rice Lake Construction Group	19	218-546-5519	www.ricelake.org
SEH	60	651-490-2000	www.sehinc.com
Starnet Technologies	52	262-886-0228	www.starnettech.com
Strand Associates, Inc.	47	608-251-4843	www.strand.com
Tri-State Seminar	20		www.tristateseminar.com
Trotter & Associates Inc.	50	630-587-0470	www.trotter-inc.com
Unison Solutions, Inc.	58	563-585-0967	www.unisonsolutions.com
Veolia	8	952-262-1757	www.watertechnologies.com
WaterSurplus	12	800-919-0888	www.watersurplus.com
Ziegler Cat	12	952-887-4520	www.zieglercat.com



50
YEARS

**Engineering
Enterprises,
Inc.**

WATER WORKS | WASTEWATER | FLOODPLAIN & STORMWATER MANAGEMENT
TRANSPORTATION | MUNICIPAL CONSULTING | LAND SURVEYING

Sugar Grove/Main Office | 52 Wheeler Road, Sugar Grove, IL 60554
Rockford/Branch Office | 124 North Water Street, Suite 306, Rockford, IL 61107
Itasca/Branch Office | 555 Pierce Road, Suite 105, Itasca, IL 60143
www.eeiweb.com • (630) 466-6700



One Water Solutions Start Here

Through holistic planning, we help communities map out a sustainable water future. Our One Water approaches focus on affordable, equitable and implementable design.

hdrinc.com/one-water-solutions



listen. think. deliver.

A water partnership with CDM Smith is about much more than engineering. It's about thoughtful experts, powerful insights and smart decisions. It's an alliance to help you manage precious resources and get the most value from your infrastructure investments.

Illinois ■ Minnesota ■ Wisconsin



Process. Control. Service.

Energenecs

WWW.ENERGENECS.COM
800-343-6337



**WE STIR UP
EVERYTHING
BUT TROUBLE.**



Rotamix

For hydraulic mixing without headaches, choose the reliable Vaughan Rotamix System. Blend lower operating and maintenance costs with a more efficient breakdown of solids. Your digesters, sludge storage tanks, and equalization basins won't know what hit them.

*Choose the unmatched reliability of Vaughan.
Free sample CFD's upon request.*



888-249-CHOP | ChopperPumps.com

GUARANTEED PERFORMANCE | NO MOVING PARTS IN THE TANK | FOCUSED MIXING

LOCAL REP

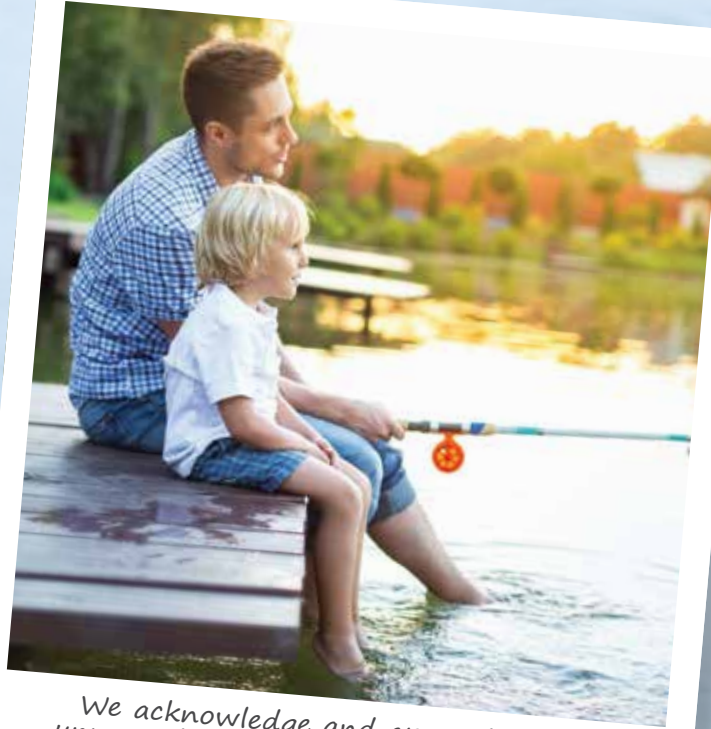
GASVODA & ASSOCIATES, INC.

1530 Huntington Drive,
Calumet City, IL 60409

Phone: 708-891-4400

Fax: 708-891-5786

info@gasvoda.com



We acknowledge and appreciate the unwavering dedication of water quality professionals who tirelessly protect public health, preserve the environment, and enhance our quality of life.



ILLINOIS CHAMPAIGN, CHICAGO, NAPERVILLE
INDIANA FORT WAYNE, INDIANAPOLIS, SOUTH BEND
MICHIGAN GRAND RAPIDS
MINNESOTA MINNEAPOLIS
MISSOURI ST. LOUIS
WISCONSIN MILWAUKEE, SHEBOYGAN