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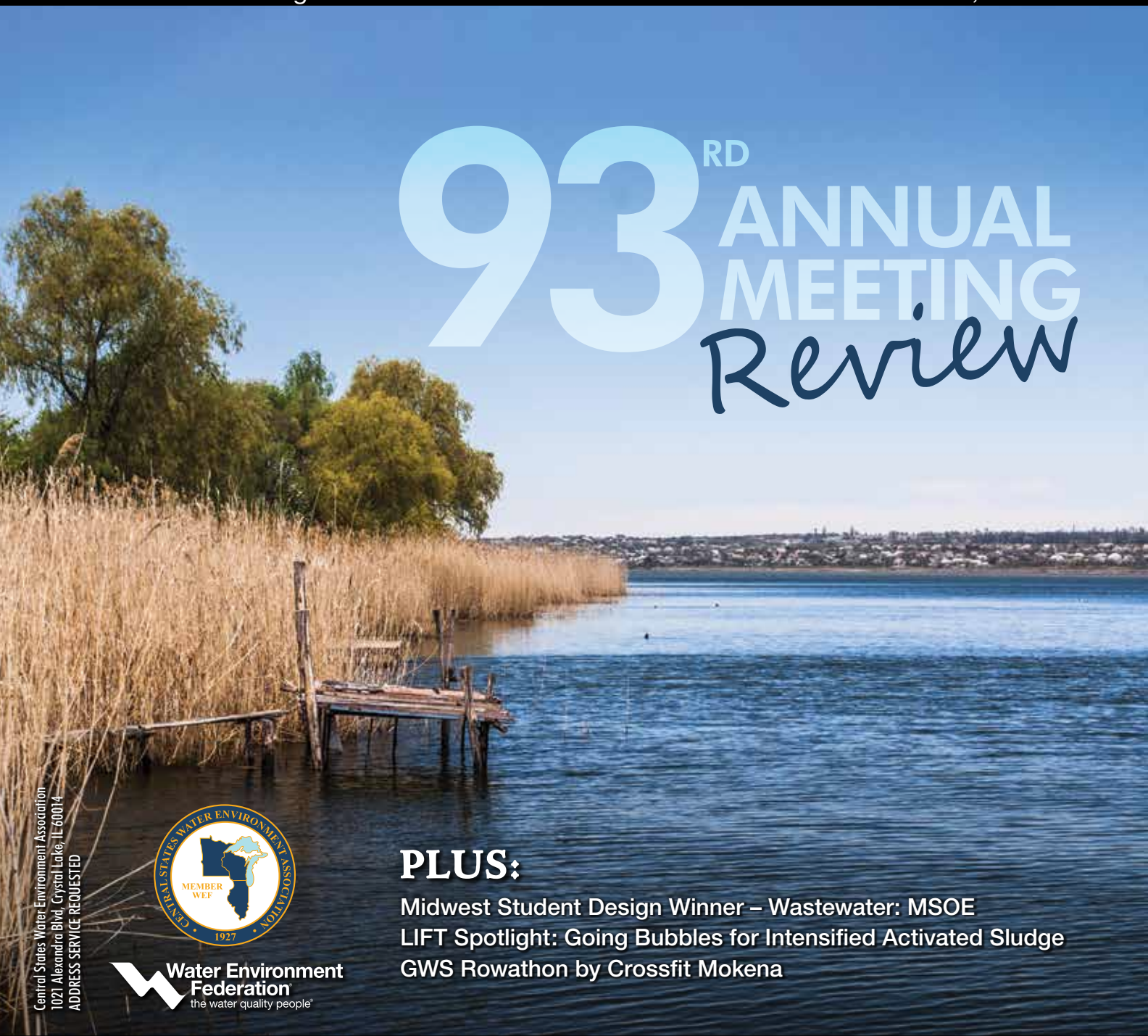

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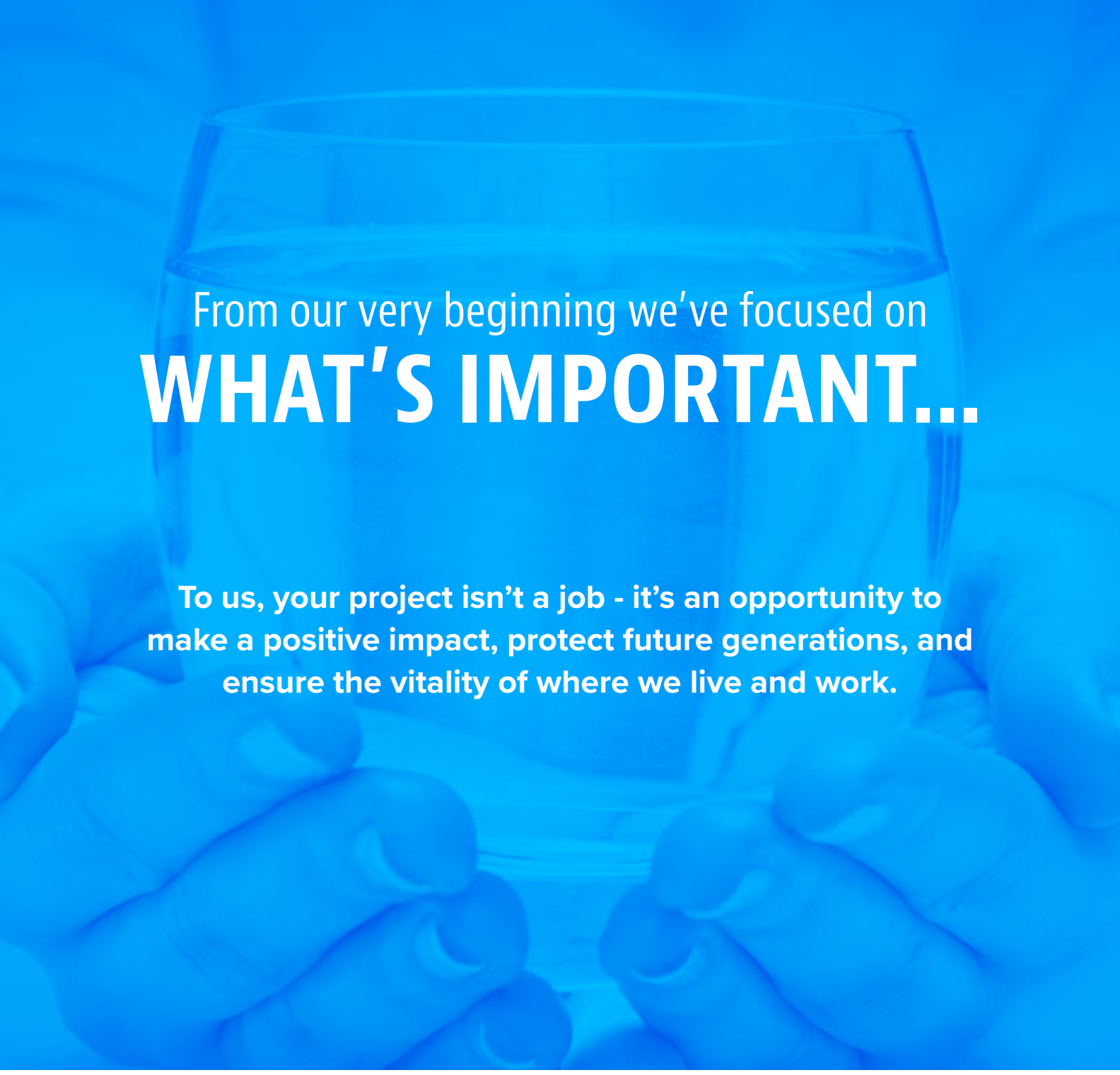

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Adapt or Die

By Mark Eddington

One of my favorite movies is *Moneyball*. No spoilers here, but in the movie, the general manager of the Oakland Athletics is faced with an existential crisis and must develop an innovative approach to stay relevant and compete. Trust me, nobody here is going to confuse CSWEA with the Oakland As and nobody (other than Amy) is going to mistake Mohammed Haque for Brad Pitt but I was struck by how smoothly the CSWEA's 93rd Annual Conference went off. Haque and Associates, the Technical Committee, and the Minnesota LAC converted from an in-person to a virtual Annual Conference in a matter of six weeks. Quick action, open-mindedness, and hard work helped ensure CSWEA remains relevant and solvent. Sure, there were technical glitches and lessons learned along the way but from the technical sessions to the WEF update from our "visiting" representative Lynn Broaddus (WEF President Elect and CSWEA's very own), the show went on.

I want to congratulate all the incoming CSWEA executive committee officers, nothing like coming onboard during a pandemic! Thank you to Doug Henrichsen, Jane Carlson, and the rest of the executive committee for their efforts this year. I also want to extend a special thank-you to Amy, Mohammed, and their team, who have worked tirelessly to change gears, learn new systems, and take risks to make lemonade out of a year full of lemons. To say that 2020 has been a challenging year would be a gross understatement. Regardless, once again, Central States led the way by producing a virtual annual conference that included a robust line-up of technical sessions. Making this "show go on" was an enormous undertaking. Special thanks go out to Emma Larson and the members of the Technical Committee for their hard work reviewing abstracts and arranging over 50 remote technical presentations. Innovative efforts like these will keep CSWEA solvent, relevant, and essential in our ever-changing world.

> "I am incredibly encouraged by the good work our members are performing under this dark cloud. I am inspired by the acts of growth, innovation, and leadership from our members."

I want to congratulate Doug for navigating CSWEA through this most interesting year. I also express my deep gratitude for his willingness to go into overtime and serve an additional three months as President. Doug, this officially makes you the longest serving Central States president in history! In turn, this will likely make me the shortest serving Central States president in history – and for this I am certain you will all be grateful. I look at it as a positive, it is hard to impeach somebody in only nine months!

This organization is filled with people to whom I owe a great deal of thanks. There is not enough time to mention them all, but I would be remiss if I did not acknowledge a few of the special ones that helped me along the way. Scott Trotter introduced me to Central States and pushed me to get involved when I had no idea what the difference between CSWEA/IWEA/WEF/IAWA even was. Eric Lecuyer, for growing and championing Central States for decades. Eric, we are taller because we stand on your shoulders. Amy and Mohammed Haque who picked up the baton and gave Central States leadership and vision when it needed it most. Beth Vogt and Randy Wirtz, who been great role models and the very backbone of this organization. Mike Holland, my favorite millennial, who has been along for this ride every step of the way. And of course, Tim Tack, who lowered the bar just enough to where an individual like me could ascend to a leadership role. Just kidding, Tim, you have supported Central States as much as anyone while making it fun and rewarding.

The COVID-19 pandemic and our national response is nothing short of a human and economic calamity. It is safe to say, its full effect will not be known for years. The ills, inequities, and misplaced priorities of our society have been laid bare for all to see. If you are unaware of this, I challenge you to go to your school district's FB page and see if you can get through the first five comments without someone referring to someone else

as Hitler! I believe we are witnessing a societal reset. I also believe this reset will provide us with a once-in-a-career opportunity to truly 'reassess' and 'revalue' our roles as wastewater professionals. Sanitation is essential, it is the "blocking and tackling" of a functioning society. Operators, engineers, regulators, equipment manufacturers and representatives (all members of Central States) are front and center, and now more than ever essential. I hope you all take pride in that, and let it shape your work toward enhancing our environment and society.

I am incredibly encouraged by the good work our members are performing under this dark cloud. I am inspired by the acts of growth, innovation, and leadership from our members. Our members are in virtual classrooms educating students and researching and testing wastewater to determine where the next COVID-19 outbreak is festering. Our members are volunteering their time to bring sanitation to people they do not even know living in underdeveloped countries. We are certainly not perfect. We have a long way to go and there is of course room for improvement. We can and should aspire to fully embrace diversity, with goals to better reflect the communities we serve. Our work to engage and educate, at home and around the world, reflect our collective values. These efforts and inclinations provide hope in a world, that at times, seems hopeless.

I am unbelievably proud to be a member of this organization and am completely humbled to be its president.

Once, 28 years ago, almost to the day, I sat across the desk from my freshman advisor at Marquette University, Dr. Al Zanoni. Dr. Zanoni (who I later learned was Central States' President in 1983) quietly set me on this course and so began my story in the wastewater industry. None of us thought we would end up in this business but let me assure you there is no place I would rather be. CS

Mark Eddington has been a member of CSWEA and WEF since 2002. He is an engaged member and has chaired the Illinois Collection System's Committee, Illinois Trustee, and Illinois Section. He has also chaired the CSWEA Technical Committee, served as WEF Delegate, and is the current CSWEA President. Mark is a member of several other organizations and served as President of the Illinois Association of Wastewater Agencies in 2015 and was acknowledged as its "Outstanding Member" in 2019. Mark is a licensed engineer in Illinois and Wisconsin graduated from Marquette University with a BS in Civil Engineering in 1996. Mark has been the District Manager of the Kishwaukee Water Reclamation District since 2010 and worked as a consulting engineer the previous 14 years. Mark lives in Downers Grove, Illinois with his wife Lisa and their three children, Ryan (14), Lily (12), and Brendan (9).

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Water Brings Us Together

By Mohammed Haque

Between the pandemic and the altered reality we are living our lives in these days, water seems like a precious commodity more than ever… at least, it has for me. I can't imagine washing my hands without water. The solitude of the pandemic has pushed more of us to enjoy the great outdoors… and thank goodness for that. If even for a day, we can enjoy the great trails, parks, lakes, rivers, and amazing beauty of our region. I've had the joy of doing some fishing in the last few months and most days out on a lake with my youngest son Zaid, has allowed me to reflect on how nature binds many of us together and also provides such a wholesome outlet for us.

I think we take our wonderful lakes and rivers for granted, but the health of those bodies of water has a lot to do with our profession. So readers, thank you for what you do and for providing all of us the wonderful waters in Illinois, Minnesota, and Wisconsin. Zaid and I have been able to enjoy several lakes in Illinois and Wisconsin and it's been amazing to see how well each body of water is doing in overall health.

Water also bring us together as a profession. Recently, with WEFTEC going online as WEFTEC Connect, our Ops Challenge competition has also moved online. CSWEA was able to put together a local team in Illinois consisting of Mike Holland, Matt Streicher, Jason Neighbors, and Luke Markko. These four gentlemen represented the Kishwaukee Water Reclamation District, Glenbard Wastewater Authority, and Northern Moraine WRD. It has been a tremendous joy watching them practice for the upcoming Ops Challenge Virtual event at WEFTEC Connect. The intensity with which they have prepared for the event should make us really proud. There were significantly less teams in this year's virtual competition, but we were able to get a really stellar team of die-hards together. Next time you run into any of our Operations Challenge competitors from this year or year's past, these guys and gals are the real deal. They ooze passion for what our industry stands for. CS

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Staying Connected

By Veronica Loete

You've probably heard this a lot over the last several months, but these are unprecedented times – at least when it comes to what is precedented for most of us in our lifetimes so far. The thing is, these times are not impacting us all in the same way. Some people are experiencing only minor changes to their daily routine. Their jobs may be functioning almost the same as they always have. Others have had their daily lives turned upside down by losing their job or working at home and/or taking care of children with changes in school and day care arrangements. Not to mention people who are dealing with serious illness in themselves or a loved one. Many of us fall somewhere in the middle. We are months into this pandemic (and we'll be even further into it by the time you read this message). Hopefully you have been able to find a version of a "new normal" or maybe you've even had multiple versions of your "new normal" as conditions continue to change.

Essential water and wastewater services do not stop for a pandemic. Despite the many difficulties during these times, I've been pleasantly surprised by the role CSWEA has played in my life and the lives of others. I already saw value in CSWEA or I wouldn't have gotten to the point where I am serving as Chair of the Wisconsin Section, but my experience in the past has been focused on conference attendance or a little bit of social fun at a Brewer game outing. Now my eyes have been opened to the next level of support and value that CSWEA can provide.

I got a report from outgoing Chair Rachel Lee about the COVID Roundtable Discussions that our Operations Committee has been hosting on a weekly or bi-weekly basis since March. The discussions have been well-received. An interesting topic discussed this summer is the state-wide COVID RNA sampling effort that the Wisconsin Department of Health Services and the State Lab of Hygiene are coordinating. They are targeting a one-year study at 100 facilities in over 70 counties. The roundtable discussions gave people a chance to hear about the study and discuss it with others outside their own organization. The study will be testing wastewater treatment plant influent to monitor virus activity. They expect that the influent will show activity 7-10 days before it is observed through patient testing. Kudos to the Operations Committee for giving people a place to connect and get information and thanks to Rachel for the update!

The Ops Committee isn't the only committee finding a way to fulfill CSWEA's mission during the pandemic. In early August, a version of the CSWEA/WIAWWA Management Seminar was held in the form of three webinars. In late July, our Section YP/Students Committee held a virtual YP Happy Hour on Zoom. Even though I may not really be putting the "Y" in YP anymore, I had the pleasure of participating as part of my section officer role. It was great to see both new and familiar faces via Zoom and nice to connect with fellow water professionals! Working from home has reduced that connection for many of us. I was happy to see the YP Committee do its part to foster connection virtually. The committee is planning to host another similar event in the fall so, YPs, I recommend you keep an eye on your inbox for the invitation.

Lastly, I'm excited about the virtual Annual Meeting that is happening as I write this message. I'm sure I'm not alone in wishing we could meet in person, but I think the virtual option being offered is a great alternative given the circumstances. I know the meeting will be long over by the time this hits your mailbox, but my message to you is this: Even if we can't be together now in the ways we are used to, the CSWEA Wisconsin Section can still provide the same benefits you are used to and maybe even one or two new ones.

I'm wishing you a happy and healthy fall season! CS

"Even if we can't be together now in the ways we are used to, the CSWEA Wisconsin Section can still provide the same benefits you are used to and maybe even one or two new ones."

Wastewater Operations Virtual Roundtable Discussions

By Rachel Lee, Troy Larson, and Jake Becken

The utilities that comprise an invaluable segment of the CSWEA membership are definitely essential and many of them have 'hands on' responsibilities that have required their attention through the COVID-19 pandemic. Utility managers have been busy strategizing on how to keep a viable workforce in place for months. This has been a tiring and sometimes lonely task considering that the situation in 2020 is (hopefully) a once in a lifetime situation. To help in this endeavor, the WI Section Operations Committee, the WI Section Board, and the CSWEA Executive Director teamed up to create a roundtable discussion intended to allow information sharing between interested participants. Each meeting we poll the audience about their desire to continue having the discussions. The meetings continue with 17 conversations having been completed at the time of writing.

The committee has not created rigid agendas but instead offered conversation starters with "whatever is on your mind" being the first bullet. The attendees have supplied most of the questions and subsequent answers to the topics that have been on people's minds. Many have attended to get peer input on ideas to allow them the confidence to return to their political entities with requests that they had never made before. Some have attended to ask specific questions, and others have joined to see familiar faces. There is not a one size fits all solution, so having many facilities share their plans provided numerous ideas and support to take back to their organizations. Some of the ideas discussed include:

- How to find personal protective equipment.
- Process changes related to changes in wastewater characteristics due to people working remotely.
- The nuisance of "flushable wipes."
- Changes in cleaning chemical use.
- Concerns about billing, collections, and budgets.
- Load changes and industry shutdowns.
- How to handle a positive COVID-19 test.

The roundtables discussed how the regulatory community was engaged; Amy Garbe of the Wisconsin DNR regularly reported on reporting tools developed for the pandemic, and actions taken to defer continuing education requirements along with other WDNR updates. WI Rural Water and the Wisconsin Wastewater Operators Association (WWOA) also participated in these discussions on occasion. Generous sharing of information was a hallmark of these roundtable discussions.

As the conversations continued the committee would identify people to present on specific aspects of their programs for the benefit of the attendees. Madison MSD's Kayce Board shared her knowledge of other programs that can provide benefit in these special conditions such as FEMA and Homeland Security. Mary Frances Klimek provided an overview of Racine's pandemic plan that was developed a decade earlier following the H1N1 outbreaks as well as some communication tools that Racine has used during this event. Much of the information shared in these presentations was included in a webinar hosted by CSWEA. As the pandemic progressed, Dr. Martin Shafer with the State Lab of Hygiene and Dr. Jon Meiman of the Wisconsin Department of Health Services provided a great introduction and update on the COVID-19 Wastewater Influent Study being coordinated throughout the state. Following some great roundtable discussion, CSWEA and WWOA organized a seminar that featured Dr. Shafer where he outlined the state program and detailed how the information would be collected, used, and reported to stakeholders.

The roundtable discussions were quite successful, and many attendees commented how they looked forward to seeing and connecting with other attendees in the meetings. Many benefited from the shared experiences that were discussed. This format could be a useful tool for our members to connect on other topics of interest in the future. The committee of Jake Becken (WI Operations Chair), Rachel Lee (WI Section Chair) and Troy Larson (WI Section Past Chair) would like to thank CSWEA and Mohammed Haque for his technical support and promotion. The committee would also like to thank all of the contributors, those who attended one and those who attended most of the discussions. It is evident that our wastewater professionals have been true rock stars during the COVID-19 pandemic. Our work tends to go unnoticed but the service we provide is undoubtedly essential, and we tip our hats to all that keep the water flowing, regardless of the situations in which we find ourselves. CS

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Supporting Our Members and Community Through Change

By Anna Munson

There is a fresh, cool breeze drifting through the door next to my kitchen table as I draft this article. It is a drastic change from the heat and humidity of the previous several days. I love hot, sticky summers but welcome the change to autumn when it arrives. Change is central to our lives right now.

Our Association and Sections have made many changes to continue to support our industry and our members through the COVID-19 pandemic. It seems that we have worked our way through the initial scramble to adapt and have moved into an operational phase with plenty of contingency plans.

When the decision was made in early spring to hold the 93rd CSWEA Annual Meeting fully virtual, everyone involved in planning the Annual Meeting scrambled to change their approach. The Technical Committee had to completely change their scheduled session times, adjust presentation tracks and coordinate obtaining recorded presentations from the speakers. Our Executive Director, Mohammed, led the effort to evaluate and select the virtual platform. His CSWEA responsibilities changed from CSWEA Executive Director to Virtual CSWEA Conference Developer. Our Conference Sponsorship group shifted from working to fill an Exhibit Hall to convincing vendors to give the Virtual Exhibit Hall a try. Changing to a virtual conference was a tremendous amount of work. On behalf of the Minnesota Section, I want to thank everyone who worked so many extra hours to make the Virtual Annual Meeting a success.

The Minnesota Section held its business meeting virtually on Tuesday during the CSWEA Annual Meeting. In general, most Section committees have continued their activities as initially planned or have modified them to be able to continue. For example, in July the Public Education and Outreach Committee hosted a virtual public showing of the movie *Brave Blue World*, followed by a virtual discussion panel. The Minnesota Exchange (MNX) planning meeting was held via GoToWebinar in July to plan the Section's priorities for the coming year. The Stormwater Committee planned a bike tour of various Minneapolis stormwater projects for September 17. The Resource Recovery and Energy Committee continued their monthly virtual learning sessions. Before the Section meeting concluded we welcomed new leaders into the following roles: Government Affairs Vice Chair, Collection Systems Committee Chair and Vice Chair, Public Education Committee, Awards Committee and the Section Chair and Vice Chair.

Minnesota Section activities planned for the next few months include the Minneapolis Stormwater Bike Tour in September, an outreach event for University of Minnesota students in October and a virtual Conference on the Environment slated for November. The Association will host a series of webinars on Effective Utility Management this fall in place of an in-person event. Each of these activities will be different than they would have been in a normal year but will still provide our members with a chance to learn and engage with our professional community.

None of us know whether our next CSWEA Annual Meeting will be in-person, virtual, or some combination of both. It's impossible to know if I'll still be working at my kitchen table or back at the office. However, we can be confident that our Minnesota Section and CSWEA will make the changes we need to continue to support our members and serve our community. CS

"It's impossible to know if I'll still be working at my kitchen table or back at the office. However, we can be confident that our Minnesota Section and CSWEA will make the changes we need to continue to support our members and serve our community."

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Bring It On, 2020

By Amanda Streicher

A Wisconsin girl as the Illinois Section Chair! Could 2020 get any weirder? While I've been a part of the IL Section for four years now, it still seems like just yesterday I was the WI Section YP Chair. Time flies when you are having fun, and I am looking forward to my year as IL Section Chair with this great group of people.

To not dwell on the obvious, I won't write about the pandemic… too much. Clearly, this virus has taken everyone for a surprise and sent the world on a new tangent from the direction we thought we would be heading. It goes to show no matter how much of a planner you may be, there are always challenges where you have to think on your feet – such is 2020.

While working to protect others and striving to keep the COVID cases low in Illinois, large gatherings are not permitted. This is the best opportunity to keep everyone safe, but it influences interactions within our highly social industry and the CSWEA community a great deal. Typically, by this time of the year, the IL section has put on several meetings and seminars. With all of these events being postponed, canceled, or moving to a virtual event, we have had a light conference year. However, our Operations Committee has done an outstanding job on keeping those trainings moving in a virtual sense with hardly missing a beat! Kudos to Jason Neighbors and all of his committee members!

As some things seem to be slowing down, such as hosting in-person events, other things are really starting to pick up. I have noticed an increase in communication across our industry and within our section. We are coming together more now on how we can continue to educate and inform our members of the amazing and interesting advances in our industry. Everyone is making an effort to reach out to one another and connect over topics of similar interests, and I think this is bringing our section closer together, while we stay six feet apart.

Virtual may be the new reality, but absence makes the heart grow fonder. Thankfully, we are able to communicate with everyone and share our ideas in a virtual way; unfortunately, we are missing that personal interaction. The IL Section has always done a good job of putting on all of the seminars, meetings, and fun S&YP outings. The shift to virtual events has allowed our section to have opportunities to continue educating our industry, however reinforces the joy that is being missed by not being with everyone in person. The virtual events do a fantastic job of relaying information, but general comradery is missed. I challenge the IL section to come together during our virtual events and not only educate and be taught, but to remember to keep things lively and personable. We are living in a world of separation and seclusion; let us work to bring our fun-loving personalities that we would share at our in-person events to the virtual meetings.

This year's annual meeting's virtual display allowed the entire organization to attend the same wide variety of educational sessions that would have been given at the in-person event. It presented opportunities to initiate discussions with speakers during their sessions, virtually meet with vendors, and interact with all of the industry professionals on the 'exhibit hall floor'. There was a big push during the conference to provide education, as well as to maintain those industry relationships between everyone at the conference. I think this platform was a great start and a great way to bring those two necessities of our organization together. I am grateful for the efforts this organization takes to maintain those standards, and I feel the IL Section can do the same with our shift to virtual events.

I am looking forward to seeing how our section adapts and takes on the challenges that have presented themselves in 2020. I believe we have the desire to provide education and the means to virtually do so. I believe we have the relationships within our section to keep in close contact while we stay socially distant. I believe we have the strength to come together over these strange and ever-changing times to continue to provide safe water for all of Illinois. I am looking forward to my year as Section Chair and say "Bring it on, 2020!" CS

"It goes to show no matter how much of a planner you may be, there are always challenges where you have to think on your feet – such is 2020."

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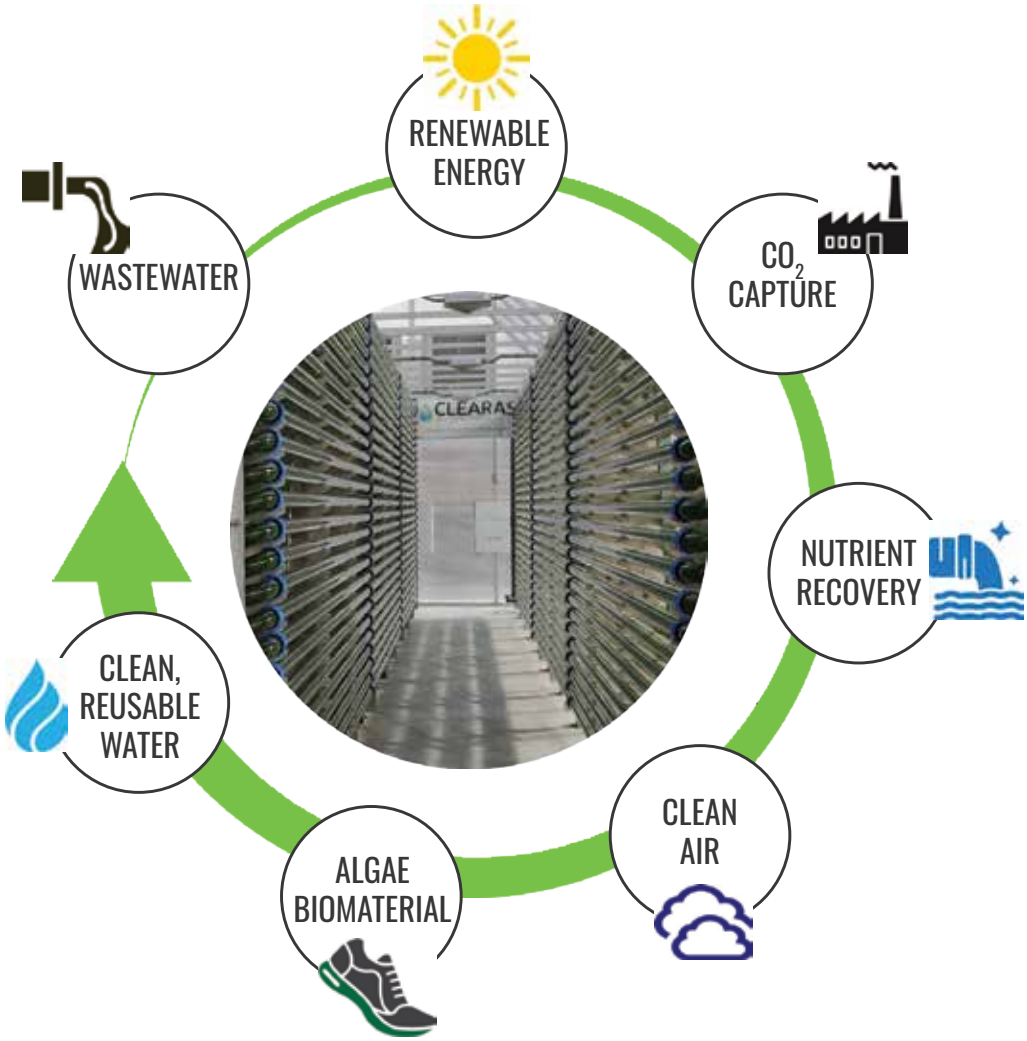

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AUGUST 18-20, 2020 | VIRTUAL

93RD ANNUAL MEETING

Review

Doug Henrichsen,
2019-2020 President

I wanted to take this time to thank all of the people who worked relentlessly on the CSWEA's 93rd Annual Meeting. The 2020 Local Arrangements Committee (LAC) chaired by Tim Wedin, MCES, did an outstanding job.

Special thanks to:

- Tim Wedin (Chair)
- Patti Craddock (Social and Catering)
- Kyle Fritz (Exhibitors)
- Lana Tullis (Conference Advisor)
- Ashley Hammerbeck (Conference Advisor)
- Dan Popehn (Financial)
- Evelun Slaiter (Conference Advisor)
- Fassil Yitbarek (Poster session)
- Patrick Haney (Conference Advisor)
- Tim Korby (Conference Advisor)
- Mark Doneux (Stormwater Tour)
- Scott Mulinix (Conference Advisor)
- Anna Munson (Conference Advisor)
- Peter Daniels (Conference Advisor)
- Rachel Lee (Conference Advisor)
- Chuck Lewis (Conference Advisor)
- Tracy Hodel (Conference Advisor)
- Christopher Harrington (Ethics Presentations)

The Technical Program Committee, chaired by Emma Larson (City of St. Cloud) also did a fantastic job organizing this year's technical program. Approximately 160 abstracts were submitted, which allowed us to hold several concurrent sessions. Members of the Technical Program Committee who reviewed all of the abstracts, and developed the technical program this year included:

- Emma Larson (Chair)
- Mandy Sheposh
- Matt Seib
- Collin Fitzgerald
- Ryan Giefer
- Mark Eddington

While we were not able to hold an in-person awards ceremony, we still were able to acknowledge the award winners this year. A summary of the awards and the 2020 winners is below.

ACADEMIC EXCELLENCE

This award is presented to an annual meeting host, state college, or university student selected by their professor for having exhibited an outstanding academic career. This year's winners have been judged to be outstanding students in the water environment field. In addition to this plaque, CSWEA awards a $250.00 cash Scholarship award, one year paid student membership and complimentary registration to the annual meeting.

Recipient: **Anndee Huff, University of Minnesota**

ARTHUR SIDNEY BEDELL AWARD

Acknowledges extraordinary personal service to a Member Association. The award is named for **Arthur Sidney Bedell**, WEF's second president, for his long devotion and service to the New York Sewage and Industrial Wastes Association, now the New York Water Environment Association.

The recipient is selected for extraordinary service to the Association from our most active members across all three states. To receive the Bedell Award, the recipient needs to have been very active in CSWEA for an extended period of time. This year's Bedell Award recipient has served our Association through sound leadership and significant contributions, which have benefited our organization and the advancement of the water quality profession.

Recipient: **TBA in 2021**

BILL BOYLE EDUCATOR OF THE YEAR AWARD

Established in 2007, this award recognizes accomplishments in the education and development of future water environment professionals by educators at all levels, from primary grades through graduate students. This award honors **Professor William C. Boyle**, a Professor Emeritus of Environment Engineering at the University of Wisconsin, Madison where he served as mentor to many CSWEA members. Beyond his role as educator, researcher, and mentor, Bill Boyle has served the CSWEA throughout his career as a tireless promoter of ongoing education and training and a facilitator of many successful technical programs and events.

Recipient: **Dr. John Katers, University of Wisconsin – Green Bay**

Dr. John Katers is the founding Dean of the College of Science, Engineering, and Technology (CSET) at the University of Wisconsin – Green Bay. Katers has been at UWGB since 1995, initially working for the University of Wisconsin Extension Solid and Hazardous Waste Education Center as a Recycling Specialist before joining the Natural and Applied Sciences faculty in 1999. Katers previously served as Chair of Natural and Applied Sciences and taught courses on pollution control, pollution prevention, waste management, renewable energy, and resource management. His research focused on anaerobic digestion and solids separation systems for dairy farms, where Wisconsin is a national leader, and on solid waste and recycling issues in Wisconsin, with Katers serving as the current Chair of the Brown County Solid Waste Board. He has secured more than $2 million in external funding for research projects and supervised nearly 40 graduate students. He holds a BS in Environmental Science and Business Administration and an MS in Environmental Science and Policy from UWGB and a PhD in Civil and Environmental Engineering from Marquette University.

GEORGE W. BURKE, JR. FACILITY SAFETY AWARD

This award recognizes an active and effective safety program in a municipal or industrial wastewater facility. This award was established in 1982 in honor of **George W. Burke, Jr.**, for his many years of service to both the water environment field and WEF as staff manager of technical services. Mr. Burke was instrumental in developing WEF's annual safety survey and assisting in the production of several safety training aids and promotional packets

Recipient: **Madison Metropolitan Sewerage District**

Madison Metropolitan Sewerage District

COLLECTION SYSTEM AWARD – ILLINOIS

The Collection System award is presented to an Association member from the State of Illinois in recognition of outstanding contributions in advancing collection system knowledge and direct or indirect improvement in water quality.

Recipient: **Chris Dufort, City of Elmhurst**

Chris Dufort has been employed by the City of Elmhurst for 31 years and has been the Superintendent of the Utility Division since 2010. Chris has overseen many capital projects throughout his career such as sanitary sewer lining, sanitary t-lining, and manhole rehabilitation. As well, Chris oversaw the revision of the City of Elmhurst's CMOM Program, which will prevent discharges from its sanitary sewer system and protect local receiving waters; the implementation of CMMS/GIS; the 2018 implementation of a sump pump remediation program to remove (I&I) from collection system; the 2019 implementation of new technology "SL Rat" for sanitary sewer monitoring; and the set up of preventative maintenance programs to reduce sanitary and storm water collection system blockages. Chris was also part of the Elmhurst team that created the City's first 20-year capital plan for sanitary collections and treatment.

COLLECTION SYSTEM AWARD – MINNESOTA

The Collection System award is presented to an Association member from the State of Minnesota in recognition of outstanding contributions in advancing collection system knowledge and direct or indirect improvement in water quality.

Recipient: **Christopher Harrington, HR Green**

Chris Harrington is an Associate and Project Manager at HR Green, Inc. He serves as a Group Leader and Regional Marketing Leader for Water in the St. Paul office. His 16 years of experience in civil engineering consist of working in engineering consulting (HR Green, Inc. and Retec), international development of drinking water systems (US Peace Corps), wastewater treatment research (University of Minnesota), and municipal drinking water services (Saint Paul Regional Water Services). Chris holds Bachelor's and Master's degrees in Civil Engineering from the University of Minnesota. Chris enjoys the challenges of designing systems to move water safely and efficiently from one place to another. He has served numerous roles within the Minnesota section of CSWEA including state section chair and collection systems chair. He is currently serving the Minnesota Section as Trustee to the CSWEA Executive Committee.

COLLECTION SYSTEM AWARD – WISCONSIN

The Collection System award is presented to an Association member from the State of Wisconsin in recognition of outstanding contributions in advancing collection system knowledge and direct or indirect improvement in water quality.

Recipient: **Joan Hawley, Superior Engineering**

Past Wisconsin Chair from 1995-1996, Joanie Hawley has been a member of WEF since 1986 and a member of CSWEA since 1990. She was a WEF Trustee 2015-2019. She has been an active member of CSWEA WI Section serving on the Collection Systems Committee and Government Affairs as well as CSWEA Local Arrangements. Joanie is a licensed professional engineer in the state of Wisconsin, Michigan and Washington and is a certified wastewater operator in Wisconsin and a Professional Collections Operator/ABC. She graduated from Marquette University with a BS in Civil Engineering and a MS in Environmental Engineering from University of Texas. She started her own consulting WBE firm in 2002 specializing in asset management and operations and maintenance. She is a strong advocate for operators and has a leadership role on the WEF Operator Advisory Panel focusing on operator initiatives including workforce development.

WILLIAM D. HATFIELD AWARD

The William D. Hatfield Award is presented to operators of wastewater treatment plants for outstanding performance and professionalism. The award was established in honor of **Dr. William D. Hatfield**, Superintendent of the Decatur, IL, Sanitary District, who was President of the Central States Sewage Works Association in 1944-1946 and served as President of the Federation of Sewage & Industrial Wastes Associations in 1958-1959. From 1946 to 1954 this was a Central States award presented to recognize the best annual treatment plant operating report and now is awarded in recognition of outstanding professional service in both facility operations and public education.

Recipient: **Stephan Brand, City of Oshkosh**

Steve Brand has been a member of WEF and CSWEA since 1988. He has held positions as a Wastewater Operations Specialist with a consulting firm in northwestern Wisconsin, Utility Manager for a northern Wisconsin community, an environmental coordinator in the paper industry at facilities in both Wisconsin and Minnesota, and has held his current position as Water and Wastewater Utility Manager for the City of Oshkosh for the last 17 years. Steve is a member of the WI section operations committee and was also active with the operations committee of the Minnesota section while working in Minnesota. Steve Graduated from Northland College in Ashland WI with a BA in Environmental Studies and has completed Masters level studies in Organizational Management at Concordia University St. Paul MN. He is a WI state certified operator in Water and Wastewater and also holds a Class A Minnesota Wastewater operator's certification.

INDUSTRIAL ENVIRONMENTAL ACHIEVEMENT AWARD

This award is presented to an industry in recognition of outstanding contributions in waste minimization, pollution prevention, environmental compliance and environmental stewardship.

Not awarded this year

CSWEA KELMAN SCHOLARSHIP AWARD

Beginning in 2010, our Publisher of the *Central States Water Magazine*, **Craig Kelman and Associates**, has provided a Scholarship Award. This year the amount of the scholarship is $1,000.00. The scholarship is awarded annually to a student or team at any level whose work as published in *Central States Water Magazine* is judged to be the best published paper during the year leading up to the Annual Meeting.

TBA

LABORATORY ANALYST EXCELLENCE AWARD

This award recognizes individuals for outstanding performance, professionalism, and contributions to the water quality analysis profession.

Recipient: **Derek Budsberg, City of Wisconsin Rapids**

Derek Budsberg has been a member of CSWEA since 2016. Derek's first involvement was with the Operations Committee for the Wisconsin Section in 2017, is a licensed operator in Wisconsin, and has been the Chief Operator/Laboratory Manager for the City of Wisconsin Rapids for three years. Prior to that Derek was an Operator for the City of Stevens Point for three years. Derek graduated from the University of Wisconsin – Stevens Point with a bachelor's degree in Waste Resource Management. Derek is a bright newcomer to the environment protection field, and continues to commit his involvement with CSWEA.

OPERATIONS AWARD – ILLINOIS

The Operations Award is given in recognition of outstanding wastewater treatment plant operation in the State of Illinois.

Recipient: **Jason Neighbors, Glenbard WW Authority**

Jason Neighbors got his start in Wastewater back in 1993 when he started as a part time employee at The Village of Plainfield. In 1996, he took a full time position and worked his way up to lead operator by 2001. In pursuit of new opportunities at a larger facility, he made the switch to The Wheaton Sanitary District in 2014. There, his role was as lead operator. This is when he became involved with CSWEA by joining the Operations Committee, where he now serves as Chair. In 2014, Jason took a position at Glenbard Wastewater Authority, where he is currently employed.

OPERATIONS AWARD – MINNESOTA

The Operations Award is given in recognition of outstanding wastewater treatment plant operation in the State of Minnesota.

Recipient: **Corey Bjornberg, City of Rochester**

Corey Bjornberg has been a CSWEA member since 2013 and a WEF member since 2006. He has presented at the CSWEA Annual Conference, Effective Utility Management Conference, and WEFTEC.

As well, he currently sits on the CSWEA Education Seminar and the MN Resource Recovery and Energy Committee. Corey has worked for the City of Rochester for seven years as the Process Control Supervisor overseeing the compliance and day-to-day operation of the 13 MGD Water Reclamation Plant. Prior to working for the Rochester, Corey worked as a consulting engineer serving municipal clients as a wastewater process engineer. Corey received a Bachelors in Civil Engineering and Masters in Environmental Engineering, both from North Dakota State University. Corey has a Minnesota Class A Wastewater Operator License.

OPERATIONS AWARD – WISCONSIN

The Operations Award is given in recognition of outstanding wastewater treatment plant operation in the State of Wisconsin.

Recipient: **Cody Schoepke, City of Fond du Lac WTRRF**

The Fond du Lac Regional Wastewater Treatment & Resource Recovery Facility treats an average daily flow of 8 MGD. In 2008, the treatment plant was upgraded to address capacity constraints and in response to new ammonia limits. An activated sludge process was installed to complete nitrification/denitrification to achieve those limits. In 2012, a HSW Receiving Facility, Biogas Cleaning, and a 450kW CHP System were installed to accommodate local industry and to utilize biogas to produce approximately 40% of plant power. In 2019, the staff implemented a deammonification process following their centrifuge dewatering that consistently removes over 90% of the sidestream ammonia. The system known as AnammoPAQ® was the first PAQUES system in the US. Fond du Lac WTRRF continues to meet permit compliance and often is well below discharge requirements.

Fond du Lac WTRRF is comprised of 21 staff members including seven wastewater operators, four maintenance mechanics, an electrician, three lab techs, a sampling technician, and five administrative personnel working a single shift with on-call duties as necessary. They are fortunate to have achieved being a Wisconsin state-certified lab. The staff in Fond du Lac is a talented group of individuals. They are on the forefront of new ideas, technology, and innovation mainly due to their creative solutions to process obstacles. Each and every one of them deserves recognition for this accomplishment.

GUS H. RADEBAUGH AWARD

Given to the author(s) of a deserving technical paper presented at an annual meeting of the Central States WEA. Established as the "Best Paper Award" in 1933, and changed to the "Gus Radebaugh Award" in 1941. This year we honor the paper selected at the 92nd Annual Meeting

Recipient(s): **"Doubling Down on Phosphorus"**

Rachel Lee, LAI, Ltd (formerly Ostara)

Mikaela Verigin, Ostara

Dr. Matt Seib, Madison MSD

Aaron Dose, Madison MSD

This work was a collaboration between the Madison Metropolitan Sewerage District (MMSD) and Ostara Nutrient Recovery Technologies. The team consisted of Rachel Lee and Mikaela Verigin from Ostara as well as Matt Seib and Aaron Dose from MMSD. Ostara and MMSD tested several strategies with the goal of improving recovery and reducing fines loss in the Pearl system. These efforts yielded twice as much phosphorus recovery, increasing the average monthly Crystal Green production from 1 ton/day to 2 tons/day, with fines loss going from 60% to less than 30%.

SUSTAINABILITY & GREEN INFRASTRUCTURE AWARD

Established in 2017, this award honors the contributions of an individual for programs and projects at their organization that support sustainability in the water environment or make use of green infrastructure in the design of water reclamation facilities or in wastewater treatment processes.

Recipient: **Michael Mucha, Madison MSD**

WATER STEWARDSHIP AWARD

Established in 2015, this award was developed as part of our effort with the Global Water Stewardship. This award recognizes and honors the contributions of an individual through outstanding humanitarian service to improving and sustaining our global water environment.

Recipient: **Mathew Streicher, Glenbard WW Authority**

Matt Streicher has been a member of CSWEA and WEF since 2009. He has been an active member, serving on many committees, as well as Chair of the Illinois Section. Matt also played an active role in Global Water Stewardship since it's inception, has participated on several service trips, and continues to be active in the organization as its Treasurer. Matt is a licensed engineer in the state of Illinois, a Board Certified Environmental Engineer, a Professional Operator, and a Class 1 Wastewater Operator in the State of Illinois. Matt graduated from the University of Iowa with a BS in Civil and Environmental Engineering, and currently serves as the Executive Director of the Glenbard Wastewater Authority, where he has been since 2016. Prior to that, Matt served as the District Engineer for the Wheaton Sanitary District.

YOUNG PROFESSIONAL AWARD – ILLINOIS

Established in 2007, this award recognizes the contributions of young water environment professionals for significant contributions to CSWEA and to the wastewater collection and treatment industry. Central States gives out this award to one recipient in each state (Illinois, Minnesota, and Wisconsin).

Recipient: **Stephanie Cioni, Wheaton Sanitary District**

Stephanie has been a member of CSWEA and WEF since 2017. She has been an active member of the CSWEA IL Section, serving as the Public Education Committee chair since 2018. Stephanie developed and spearheaded the CSWEA Water's Worth It Essay Contest and Don't Flush That! Video Challenge.

She has volunteered to represent CSWEA, at WEFTEC's WaterPalooza and has been a YP moderator at the CSWEA Annual Meeting. Stephanie began her career in wastewater interning at Downers Grove Sanitary District before becoming a laboratory analyst at Wheaton Sanitary District. She recently rejoined the Downers Grove Sanitary District lab. Stephanie earned a Bachelor of Science Degree in Biology from North Central College. She also holds a Class 4 Wastewater Operator certificate in Illinois.

YOUNG PROFESSIONAL AWARD – MINNESOTA

Recipient: **Sam Lobby, Western Lake Superior District**

Sam has been a member of CSWEA since 2016. He has served on multiple committees including the Resource Recovery and Energy Committee, the Industrial Waste Committee, and the Public Education Committee where he is currently Vice-Chair. He has presented at multiple CSWEA conferences on topics related to resiliency and sustainability. Sam has had the distinct honor of contributing to the protection of two of the world's greatest bodies of water – the Mississippi River and Lake Superior. His water career began at the City of St. Cloud and he is now working for the Western Lake Superior Sanitary District as an Environmental Program Coordinator. He has a bachelor's degree in Environmental Studies from UMD and dual masters in Sustainability Planning and Geography from the University of Kansas.

YOUNG PROFESSIONAL AWARD – WISCONSIN

Recipient: **Paige Peters, Marquette University**

Paige Peters has been a member of CSWEA since 2010, joining during her undergraduate years at Marquette University and since presenting at three annual summits as well as participating in Global Water Stewardship. Paige is a PhD student in Civil Engineering at Marquette University focused on water and wastewater treatment. Paige graduated with a BS and MS in Civil Engineering from Marquette University in 2011 and 2019, respectively. In 2016,

Paige founded Rapid Radicals Technology to commercialize her graduate research on the development of a high-rate advanced wastewater treatment process to eliminate combined and sanitary sewer overflows and basement backups during high-intensity rain events.

WATER TECHNOLOGY INNOVATOR AWARD

Established in 2019, this award recognizes individuals or groups that look beyond the traditional water and wastewater operational models and incorporate or advance sustainable principles and cutting-edge practices, with a focus on resource recovery, efficiency and sustainability.

The **St. Cloud Nutrient, Energy & Water Recovery Facility** has several active members within the CSWEA organization. The NEW Recovery staff has a passion for clean water and the facility has been a leader in resource recovery within the CSWEA organization and the nation. The NEW Recovery staff are

continuously looking for ways to do things better, often thinking outside the box, and looking at innovative technologies and methods to meet resource recovery and energy goals. This drive for excellence has resulted in the St. Cloud facility having one of the most successful and diversified resource recovery facilities around. CS

Congratulations, award winners!

Midwest Student Design Winner – Wastewater: MSOE

Joyabaj, Guatemala Wastewater Treatment Design

(Left to Right) Christine Boland-Prom, Jamie Sykora, Jamie Nguyen, Rebekah Janquart, Blake Bostwick, and Julian Sonn.

Prepared by the Milwaukee School of Engineering Student Design Team

In Spring of 2020, a team from Milwaukee School of Engineering competed in the CSWEA's Midwest Student Design Competition. After winning the competition, they will be representing CSWEA at the International Student Design Competition at WEFTEC. With this year's virtual conference, you can watch their recorded presentation online. The following report is their proposed design.

PROJECT BACKGROUND

The people of Joyabaj, Guatemala have identified a problem within their infrastructure: a severe lack of wastewater treatment. To combat this, the community selected five sites to house decentralized wastewater treatment facilities (*Figure 1*). A Chilean engineering firm designed anerobic upflow reactors for the Democracia, Central, and Libertad sites. In February 2019, Mayor Florencio Carrascoza met with students from Milwaukee School of Engineering's Engineers Without Borders (EWB) chapter to discuss student involvement with designing one of the two remaining wastewater treatment facilities. This project focuses on providing an analysis of alternatives and a 30% proposed design for site 5. Flow data from the existing sites were used to determine flow at site 5.

OBJECTIVES

The municipality of Joyabaj has a population of around 20,000 people, and a growth rate of greater than 2% per year. With an expanding population, the community has a long-term goal of prioritizing their need for wastewater treatment facilities to prevent adverse effects on both the people of the community as well as the environment.

The overall goal of this project is to improve the health of the citizens of Joyabaj by sanitizing wastewater. Untreated wastewater can spread pathogens and pollute drinking water, which puts the community at risk of contracting life-threatening illnesses.

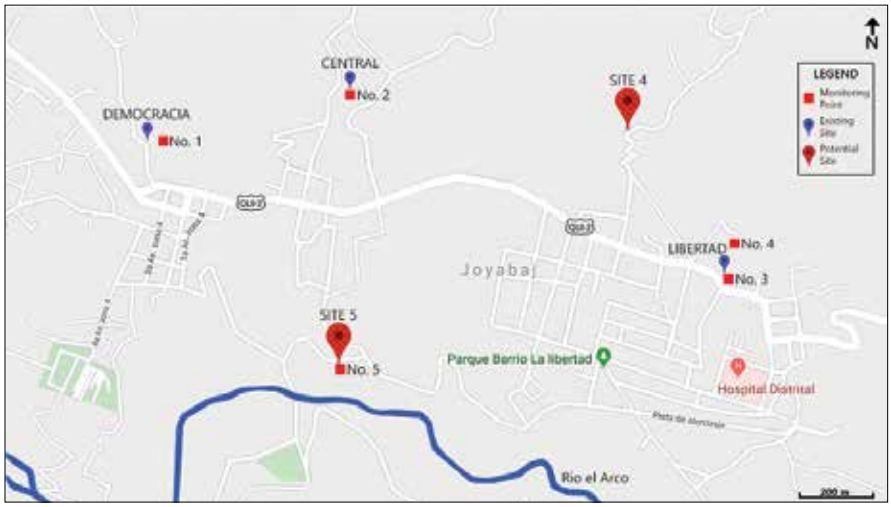

Figure 1: Site locations.

Parameter	Unit	Acuerdo 236	Wisconsin DNR
Temperature	°Celsius	TCR +/-7	49
Fats and Oils	mg/liter	10	+
Floating Materials	mg/liter	Absent	+
Biological Oxygen Demand (BOD5)	mg/liter	100	30
Suspended Solids	mg/liter	100	30
Total Nitrogen	mg/liter	200	+
Total Phosporus	mg/liter	70	+
pH	-	6 - 9	6 - 9
Fecal Coliforms	100 milliliters	<1 x 104	400
Arsenic	mg/liter	0.1	+
Cadmium	mg/liter	0.1	4.4x103
Total Cyanide	mg/liter	1	0.13
Copper	mg/liter	3	1
Chromium Hexava-lent	mg/liter	0.1	0.08
Mercury	mg/liter	0.02	1.5x106
Nickel	mg/liter	2	0.1
Lead	mg/liter	0.4	0.01
Zinc	mg/liter	10	5
Color	Units of platinum cobalt	750	+

TCR: Temperature of receiving body. Adjacent River, T=21.2°C.
+ indicates parameter limit is based on specific conditions.

Table 1: Comparison of Guatemalan and Wisconsin discharge limits.

Furthermore, the untreated wastewater is currently being discharged into a nearby river, harming aquatic life and negatively impacting the environment downstream. The project will help address these issues by proposing a design for a wastewater treatment system within the community. This will intercept the current collection system, treat the wastewater, and discharge sanitized wastewater to Rio El Arco.

ASSESSMENT ACTIVITIES

The Chilean engineering firm collected data and compiled the findings in a report called Estudio Técnico (Quiñonez, 2016). The report sampled the wastewater at each site every two hours for a total of eight samples and averaged the results. Other collection methods include in-situ observations and research. There are summaries and samples of data collected evaluating the current water quality from five different monitoring points.

Guatemalan wastewater standards *Acuerdo 236-2006* and *Acuerdo 105-2008* are used as the primary design guidelines for the water and environmental portions of this project (Ministro de Ambiente y Recursos Naturales, 2008). These two agreements establish criteria and requirements that must be met for the discharge and reuse of wastewater, the disposal of sludge, and the methods of technical data collection. Parameters from these criteria include target effluent standards, such as BOD and TSS limits of 100 mg/L. For practicality, this project will primarily follow the standards set forth by *Acuerdo 236-2006*, with reference to international and US regulations, such as the *Ten State Standards* set by Great Lakes – Upper Mississippi River Board.

SITE CONDITIONS

There is minimal information available on the project site. The land is currently a sugar cane field, owned by the local government. The approximate slope of the site is 20%. Topography, collection system, discharge, and approximate site boundaries are shown in Figure 2. The site is accessible from a road to the north. The auxiliary site is private property and will need to be acquired prior to construction.

The current site is used to farm sugar cane, which can grow in a variety of soil types. The crop requires fertile, well-drained soil ranging from sandy soils to clay loams and heavy clays (Netafim, n.d.). Soil classification is currently unavailable for this area. Volcanic rock is the current assumption; however, accurate soil data will need to be collected.

ALTERNATIVE RESEARCH

The alternative analysis focuses on the secondary treatment process. After selecting a secondary treatment process, any necessary additional systems will be designed based on the selected treatment process. All selected treatment processes will utilize a preliminary treatment screen and a primary clarifier, to settle out large solids in the influent. Additional treatment, such as a secondary clarifier, or tertiary treatment, will be included in the treatment process design if needed. The need for additional treatments is dependent on the concentration of the effluent leaving the secondary system.

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For the community of Joyabaj, seven secondary treatment processes were considered:

1. Aerated lagoons
2. Aerated activated sludge
3. Algae
4. Anaerobic digestion
5. Rotating biological contactor (RBC)
6. Trickling filter
7. Constructed wetlands

To narrow down the alternative options, five criteria were identified as the main concerns of the client: reliability, land requirement and feasibility, energy consumption, maintenance simplicity, and safety and security. After preliminary research, the rotating biological contactor, trickling filter, and constructed wetland were further researched for their feasibility with the design criteria.

Rotating Biological Contactor

Rotating biological contactors were considered for this project because of their low energy requirements. This process can be designed to efficiently utilize space, which is ideal for this site with limited land. The main concern with an RBC is the susceptibility for shaft failure from lack of maintenance (EPA, 1984). After discussing with a vendor representative at Evoqua Water Technologies LLC about the design of the RBC, an equipment and cost estimation was supplied. From Joyabaj's wastewater qualities and the target effluent standards of 50 mg/L BOD and 50 mg/L TSS, the calculated total surface area of the RBC should be 10,033 m^2.

Trickling Filter

Trickling filters are fairly reliable and only require energy to distribute water over its medium. This process also only requires daily observation to ensure that the system has proper ventilation and is not clogged. Even if the system is clogged, it can still treat wastewater and can easily be cleaned.

Subsurface Constructed Wetland

Constructed wetlands operate completely off-grid and do not require any mechanical components. The wetlands only need to be maintained if plants become overgrown or when pipes backup. Although this treatment process requires a large area of land, its minimal energy

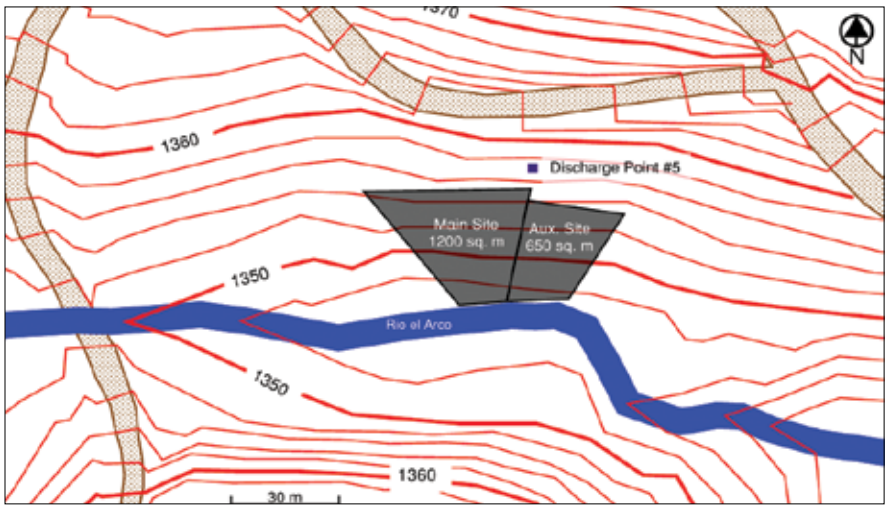

Figure 2: Site area.

Criteria	Reliability	Land Requirement and Feasibility	Energy Consumption	Maintenance Simplicity	Safety and Security	Score
Weight	30%	25%	20%	15%	10%	100%
RBC	2	10	6	4	5	5.40
Trickling Filter	7	7	8	8	6	7.25
Wetland	10	0	10	10	5	7.00

Table 2: Decision matrix.

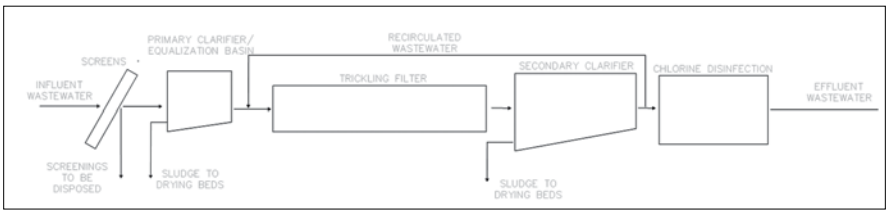

Figure 3: Process flow diagram of proposed design.

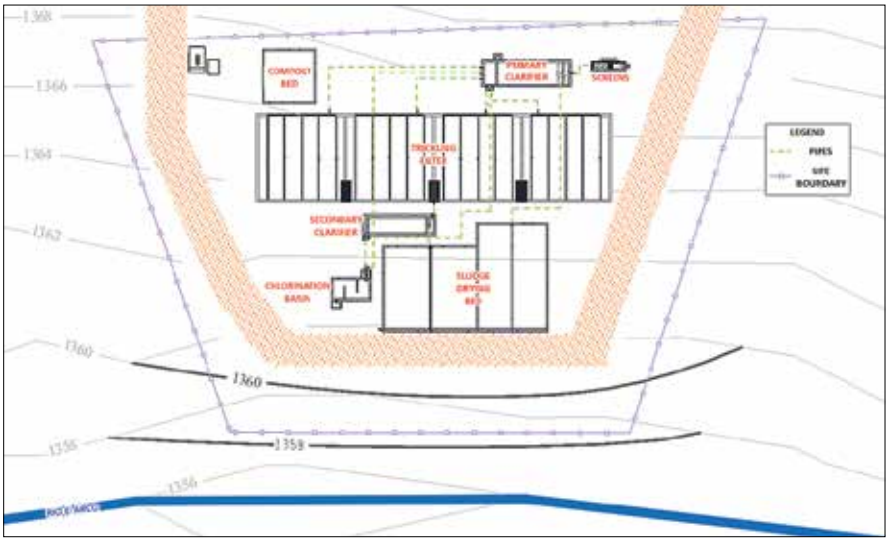

Figure 4: Site plan.

consumption and need for maintenance were optimal features to consider for further analysis (EPA). To treat the wastewater in Joyabaj, a wetland of 82,784 m^2, or approximately 20.5 acres, should be constructed. This size is notably larger than the available site size of 1,200 m^2 (approximately 0.30 acres) and would require extensive labor, especially due to the sloping terrain.

ALTERNATIVE SELECTION

Through consultation with the client and research about Guatemala and Joyabaj community, five criteria were determined to address the needs of the community:

- Reliability
- Land requirement
- Maintenance simplicity
- Energy consumption
- Safety and security

With the client's needs in mind, five criteria were selected, and each given a weight to represent their importance toward the project. As reliability was considered to have the largest impact on the project, it was given the highest weight of 30%. The client saw this criterion as the most important, because if a treatment process were to fail, the project would be unsuccessful.

Land requirement and feasibility was considered the second most important factor, as the selected site is limited in size. With limited area, only a select number of processes have the capability to fit on this site and accommodate for future population growth. As this is a limiting factor, land requirement and feasibility received a weight of 25%. For a combined weight of 55%, reliability and land requirement and feasibility truly drive the alternative analysis.

Energy consumption was seen as the third largest limiting factor and given a weight of 20%. As the power grid in Joyabaj can be unreliable at times, a treatment process that uses less energy, or that can be powered by alternative energy sources were considered much more desirable to the client.

The next criterion, maintenance simplicity was given a weight of 15%. With limited knowledge of wastewater treatment in this area, the proposed treatment system must require simple maintenance.

The final criterion, safety and security, does not directly dictate the project. However, it does impact the surrounding community. To ensure safety of the community and protection the treatment process, this criterion must be accounted for. For these reasons, this criterion received a weight of 10%.

Grading

For each criterion, the processes were ranked on a scale from 0-10, with 0 being the least feasible option and 10 being the most feasible. The total scores for each process were then combined and compared to find the most feasible process. The summary of scores can be seen in Table 2.

It was found that the trickling filter was most feasible treatment process to choose for Joyabaj. The system scored six or higher for all criteria and had the highest average.

Preferred Alternative

After analyzing the advantages and disadvantages of the three alternatives, it was determined that the rotating biological contactor was the least ideal treatment process for the community of Joyabaj. This process has a high risk of failure and overall does not score well with the criteria to fit the needs of the community. While the wetland scored high with most of the criteria, its land requirement was too unfeasible in comparison to the available site size. Ultimately, the trickling filter was considered the best treatment process for the community of Joyabaj. It was the most feasible alternative and not only does it have low energy consumption, it also has simple maintenance tasks, and is fairly reliable even when not properly maintained.

PROPOSED DESIGN

The proposed wastewater treatment facility will have a 20-year service population of 7,600 people. It will utilize the steep slope to hydraulically power the system, eliminating need for added energy to power it. Untreated water will enter the system through a series of screens to remove large debris. The water will then flow to a combined primary clarifier and equalization basin before being treated in the trickling filter. Following the TF, water will flow into a secondary

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clarifier followed by chlorination before being discharged. Solids accumulated in the clarifiers will be dried on sludge drying beds before being disposed. This process is illustrated Figure 3. Figure 4 shows the proposed site plan.

Screening

Similar to treatment facilities in the area, a preliminary screening process was designed as a manually raked bar screen to separate out any large solids. The screening channel was designed per *Wastewater Engineering: Treatment, Disposal, and Reuse* by Metcalf and Eddy, using a design average flow of 9.7 L/s, and a recommended channel slope of 1%.

The estimated approach velocity for the channel was much lower than average velocities suggested to use for calculations. For this reason, the approach velocities for the surrounding sites were calculated, allowing proper interpolation of the approach velocity for this designed channel. From this, it was found that using a bar thickness of 1/4" and a spacing of 1", 15 bars would be needed in the screening channel. The bars will be placed at a 60-degree angle and will be welded to a horizontal bar at the top to secure them in place.

Any solids will be manually raked off the screens by an operator, which are to be disposed of in an adjacent trash bin. These solids are to be brought to a landfill or follow local disposal guidelines. During times of high flow, a 10-inch bypass channel was added to route water around the bar screens to avoid clogging.

Primary Clarifier and Equalization Basin

A combined primary clarifier and equalization tank will be used to minimize energy consumption and reduce mechanical equipment. Tank sizing was determined based on typical overflow rates for primary sedimentation followed by secondary treatment (Metcalf & Eddy, 1991). For peak flow, the required area was determined to be 26 m^2. A height of 3 m was calculated, using a hydraulic retention time of two hours. Two meters were added for sludge storage and equalization.

A 2.5 m, steel inlet baffle will distribute the flow of incoming wastewater to the system. Solids collected at the bottom of the tank will flow via gravity to a sludge drying bed. The flow of solids will be controlled by the operator using a valve. An outlet baffle will be used to skim scum from the surface of the water. The scum will be removed by the operator using a skimmer and stored to await disposal.

The primary clarifier will also serve as a distribution box for the tricking filter. Four 4" diameter pipes will convey water to different cells of the trickling filter. There is also an inlet to recirculate water from the secondary clarifier. This will dilute the wastewater in the trickling filter. Lastly, there is an 8" diameter overflow pipe that will direct the water to the chlorination tank in the event of excess flow.

Trickling Filter

The trickling filter was designed in accordance to the parameter outlined in *Wastewater Engineering: Treatment, Disposal, and Reuse*, which accounts for both organic loading rate and hydraulic loading rate. It will have a natural ventilation, rock trickling filter that is locally sourced with specifications matching those discussed earlier. Utilizing locally sourced rocks will cut down construction costs by minimizing the shipping routes. Plastic media will be considered for a smaller footprint and more efficient treatment after communication with the client.

There are four individual sections, or boxes, of the trickling filter. This allows for easy maintenance of each box as well as modular treatment. Since Joyabaj has a 2% growth increase it is critical to design a system that can treat the current population. The initial start-up will utilize one box and roughly every six to seven years another box should be put in service. Each additional box accounts for the acceptable organic and hydraulic loading rates.

Need for maintenance is discerned by observing the conditions of the treatment process, thus no sensors or monitors are required. The trickling filter has two PVC observation pipes at different depths. By looking down the observation pipes, the operator can check if there are any clogging issues deeper in the filter media. This is a preventative maintenance technique to alert the operator of any issues before surface ponding occurs.

Secondary Clarifier

A secondary clarifier will follow the trickling filter for further treatment of the wastewater. Its primary purpose is to settle solids produced from the trickling filter. Generated biomass sloughed off from the trickling filter settles in the clarifier tank to be sent to its respective sludge drying bed cells, separating it from the treated water that either flows to disinfection or recirculates back to the primary clarifier.

The secondary clarifier was designed similarly to the primary clarifier, where it would have a hydraulic retention time of at least two hours and its size was based on the larger value between the average flow and peak hourly flow using typical surface overflow rates found in *Wastewater Engineering: Treatment, Disposal, and Reuse*.

Including an overflow weir near the discharge end of the clarifier would help control the level of water in the tank. The weir would also help with the removal of any floating contaminants in the clarifier, but this issue should not be much of a concern, as the trickling filter does not produce much scum.

Chlorination

For tertiary treatment, a chlorination process was designed per *Ten State Standards* to further remove pathogens and fecal coliforms from the wastewater. The process involves a chlorine tablet injector, followed by a contact basin. Similar to facilities in the area, no dechlorination system will be designed at this time.

The tablet injector will introduce calcium hypochlorite tablets at a 70% concentration. A flow weir inside the injector will control dosage based upon the rate of flow through the device, meaning no electrical parts are needed. Although the local recommended dose of 2.5 mg/L is suggested to remove any remaining fecal coliforms, the system is designed to operate under a dosage of 10 mg/L, as suggested for treatment of trickling filter effluent.

Chlorinated water will then flow through a contact basin, designed for a two-meter water depth and a 15-minute contact time. Baffle walls put in place to route water throughout the basin extend out approximately two-thirds of the width of the tank, similar to common applications in the area. Following the contact basin, water will be discharged into the receiving body of water.

Item	Cost
Site Excavation	$6,781
Clearing and Grubbing	$218
Slab on Grade	$4,168
Walls	$4,916
Estimated Total Cost	$16,083

Table 3: Cost estimate.

Sludge Handling

Sludge produced from both the primary clarifier and secondary clarifier will flow via gravity to their respective cells in the sludge drying bed. The sludge drying bed has a dynamic cell and a static cell for each clarifier for a total of four cells. This design allows sludge to continue to flow into the dynamic cells while the sludge in the static cells dries. Sludge is applied in a 250 mm layer then dried for at least ten days. Once dried, the solids are manually removed and disposed.

Due to the limited space available, the sludge drying beds will have to be undersized as the site does not have enough space to accommodate a drying bed designed for the total sludge production. This situation also occurred at one of the already constructed sites with the community's intention of finding a suitable area for future expansion of the sludge drying beds.

To reduce the amount of sludge disposed, composting sludge was considered to create a useful product to apply over land. Using the windrow method, partially dewatered sludge is mixed with dry bulking materials and turned periodically over four to seven months in a windrow. This process creates an aerobic environment for microbes to decompose the sludge to create an organic product that is free of harmful pathogens and can safely be applied over land or disposed. While sludge from both clarifiers can be composted, the site does not have enough space to accommodate the total volume of sludge produced. Because of this issue, the community can consider composting only one cell of sludge at a time while disposing the remaining dewatered sludge.

COST

A cost estimation was done for development of the wastewater treatment facility, as seen in Table 3. Altogether, with materials and labor, the project is estimated to cost the community of Joyabaj just over $16,000. This dollar amount was calculated using the local labor rate, and material costs in Guatemalan Quetzals – which was then converted to USD for a better understanding.

Labor costs in Joyabaj are much lower than typical in the United States. Typical labor rates are equivalent to under one USD. Overall labor costs for the project are estimated to be much lower than expected in the US, primarily due to the much lower wages that any workers may receive.

CONCLUSION

Moving forward with this design, it is imperative we keep a relationship with the community. When this project began, we were not supplied with any site data soil samples. Thankfully, members of our team and an advisor had traveled to this region before, so we were able to make assumptions regarding soil type. This information assisted us greatly when researching any structural considerations. Although we were not able to obtain any data during this initial 30% design, the next steps include working with the community to obtain soil samples. This will help immensely with structural design, which we assume to include pilings to ensure stability.

It is also important to note that components such as the composting beds do not fit on the allotted area we were given. In order to combat this issue, we realize some steps of the processes are oversized. We realize that our processes are designed to meet *Ten State Standard* effluent requirements, although the Guatemalan effluent limits are much higher. With this in mind, we realize that some steps in the process could be resized to meet the higher effluent standards, which would ideally decrease the area needed.

Moving forward with this design, it is imperative we keep a relationship with the community. When this project began, we were not supplied with any site data soil samples.

REFERENCES

Congress of the Republic of Guatemala. (1997). Health Code of Guatemala. Guatemala City: Congress of the Republic of Guatemala.

DNR. (1995, September). Advanced Trickling Filtration and RBC's Study Guide. Wastewater Operator Certification. Madison, Wisconsin: Wisconsin Department of Natural Resources.

EPA. (n.d.). Retrieved from A Handbook of Constructed Wetlands.

EPA. (1984). Summary of Design Information on Rotating Biological Contactors. Washington DC: United States Environmental Protection Agency.

EPA. (1998). How Wastewater Treatment Works... The Basics. Washington, DC: United States Environmental Protection Agency.

EPA. (2000). Wastewater Technology Fact Sheet: Trickling Filters.

EPA. (2000). Wastewater Technology Fact Sheet: Wetlands: Subsurface Flow.

Food and Agricultural Organization of the United Nations. (n.d.). Guatemala - Map. Retrieved from Food and Agricultural Organization of the United Nations: *www.fao.org/countryprofiles/maps/map/en/?iso3=GTM&mapID=604*

Global Facility for Disaster Reduction and Recovery. (n.d.). Joyabaj. Retrieved from ThinkHazard: *http://thinkhazard.org/en/report/65078-guatemala-quiche-joyabaj*

Henry H. Benjes, J. (1990). Capital and O&M Cost Estimates for Attached Biological Wastewater Treatment Processes. Cincinnati, OH: Unites States Environmental Protection Agency.

Iowa Department of Natural Resources. (2007). Constructed Wetlands Technology and Design Guidance. Retrieved from Iowa DNR Water Quality: https://www.iowadnr.gov/environmental-protection/water-quality/wastewater-construction/design-guidance-documents

Metcalf & Eddy. (1991). Wastewater Engineering: Treatment, Disposal, and Reuse 3 ed. New York: The McGraw-Hill Company.

Ministro de Ambiente y Recursos Naturales. (2008, January 9). Acuerdo Gubernativo No. 105-2008. Guatemala.

NESC. (2004, Winter). The Attached Growth Process. Pipeling, pp. Vol. 15, No. 1.

Netafim. (n.d.). Sugar Cane Crops. Retrieved from *www.sugarcanecrops.com/soil_requirement*Pa. DEP. (2016). Rotating Biological Contactors. Wastewater Treatment Plant Operator Certification Training.

Pa. DEP. (2016). Trickling Filters. Wastewater Treatment Plant Operator Certification Training.

Quiñonez, A. M. (2016, November). Estudio Técnico. Joyabaj, Quiché, Guatemala.

Rhyne Designs. (2013). Constructed Wetland. Retrieved from Rhyne Designs Landscape.

Stahl, D., & Trier, M. (2015). Document 525 Pre-Implementation Report. Milwaukee: Engineers Without Borders USA.

Wastewater Committee of the Great Lakes - Upper Mississippi River. (2014). Recommended Standards for Wastewater Facilities. Albany: Health Research Inc., Health Education Services Division.

Wisconsin Legislative Reference Bureau. (n.d.). Department of Natural Resources. Wisconsin Administrative Code, NR 102, NR 104, NR 105, NR 217 CS

NOVEMBER

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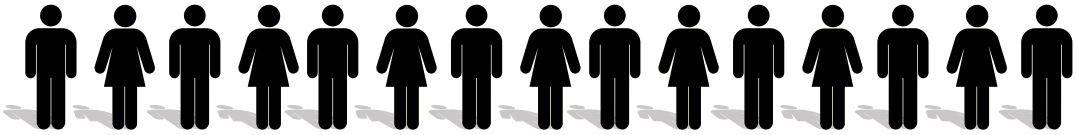

April

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John Grant
Mitchell Schutte

May

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Daniel S Devine, Milwaukee Metropolitan Sewerage District
Danielle Luke
Debra Oakes, Berntsen International, Inc.
Dione M Garson, Milwaukee Metropolitan Sewerage District
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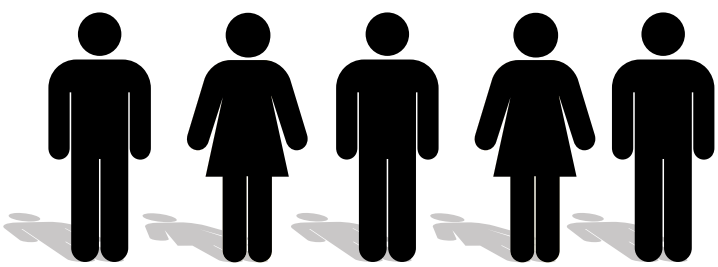

July

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Teamwork Enables

Homeowner's Association to Protect Delicate Waterway

By Chris French

Managing two adjacent wastewater treatment plants both nearing the end of their days can be a tall order at the best of times. Yet, when they discharge into one of the most diverse and sensitive waterways in the world, home to more species of fish than many rivers in North America, some might be deterred by the sizeable challenge.

The need to meet increasingly tight restrictions, particularly on phosphorus levels, is daunting enough. Add to that, a site so awkward that it looked like helicopters might be needed to deliver new equipment and the task seems downright impossible. Undeterred, the Lockerbie Homeowner's Association in Mountain Brook, Birmingham, Alabama (AL), decided to invest in and take responsibility for a brand-new treatment plant.

The Association consulted Living Water Services (Living Water). One option put forward by the state-wide wastewater company was to create a new lift station where effluent could be pumped to the Jefferson County Sewer. Thanks to the connections it has made through owning, managing, or serving 58 wastewater facilities through AL, Living Water was able to consult key contacts, such as Krebs Engineering (Krebs), for the best solution.

"The old plants just weren't designed for today's needs," said Tyler McKeller, Co-owner of Living Water. "Discharge levels were being met, but only by adding large volumes of chemicals, which all came with significant cost and labor. The first plant, which is around 30 years old, couldn't cope much longer, and the adjacent plant, some 22 years old, was basic at best. With discharge into a tributary of such a delicate waterway as the Cahaba River, the pressure was on to find a dependable, long-term, cost-effective solution."

There was no government funding or grants. The Lockerbie Homeowner's Association expected its new wastewater treatment plant to meet all requirements.

"People paying for such an important service out of their own pockets understandably want it to be right," Gary Huffman, President of Krebs, explained. "They don't want to have to constantly worry about the day-to-day operation or not meeting their permit. They want complete peace of mind."

He added: "We were all concerned about the existing systems, how we could bring about a smooth-running, long-lasting treatment plant, and how we could get round the severe constraints of such a small and awkward location. The old systems did not have the capability to remove phosphorus without additives, so Tyler and Krebs realized the more the treatment plant could achieve biologically, the less chemically dependent it would be. We both knew restrictions on discharge would become increasingly tighter in the future."

Eshelman's Ed Moore came in to assess the requirements and the

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logistics of a new package plant for Lockerbie. "Ed is a good listener and knowledgeable," said McKeller. "He knows how to meet needs and pull things together." Uniting the expertise of Krebs Engineering (founded in 1926), The Eshelman Company (founded in 1927), and Lakeside (founded in 1928), meant there was no shortage of company experience to find the best possible solution.

"Considering the age of the plants," said Moore, "Living Water Services was doing a tremendous job in meeting permit requirements, especially in AL's hot summers. We knew well to safeguard the environment and bring about the upgrade at the complicated location, we'd all have to work closely together. As Gary Huffman rightly said, expectation from the Homeowner's Association was high. Naturally, they had their concerns and wanted to ensure the investment in the new plant would provide the right protection for the Cahaba River, an important asset to the states of Birmingham and AL. So, at an early stage we spoke to Lakeside to see what they could offer and how the new equipment could be installed."

A compact design that would work for the treatment plant's small footprint was essential, so Lakeside, through Jim Aitkenhead, Regional Sales Manager, proposed a continuous-feed sequencing batch reactor (CSBR). Designed as a cost-effective solution for biological treatment processes, the fully automated CSBR treats raw wastewater flow in a single basin, using timed based phases to fill, mix, aerate, settle, and decant waste sludge. Compared to a conventional Sequencing Batch Reactor, the CSBR system allows raw wastewater to continuously flow into

the reactor basin during the treatment cycles, including during the settling and decanting phase. A baffle wall prevents short-circuiting as the flow travels from the reactor's pre-react zone. It also equally distributes the flow into the main react zone, where aeration, settling, and decanting occur. The process produces clear effluent without foam or floating scum.

"I knew of Lakeside's solid reputation from other treatment plants, but to be honest, I wasn't sure how the system could handle the phosphorous biologically, especially without us having to continue to use lots of chemicals." McKeller added, " On top of the man-hours to go to site, the cost from April through to October had risen to around $1500 per month."

With Living Water, Krebs, and Eshelman all based within 10 to 15 minutes of the Lockerbie plant, logistics would be much simpler than for many upgrades. Nevertheless, the close-knit team had to keep one plant online during the upgrade and work out how best to get the new CSBR to the site.

"First, the older of the plants was shut down," said Huffman."Working with Livingston-based Goldman Contracting, we extended the existing slab so we could repurpose an existing tank to store sludge. We didn't have any other choice."

Bringing in a crane truck would have been easy but there was no access to the eight-lane highway less than 100 yards to the east of the treatment plant, leaving a small, winding gravel road.

"The best way to describe the location of the plant is it is 50-feet down a hole!" Moore explained, "Setting down an air conditioner is one thing, but a 20,000 lb. steel fabrication is something else. For the first time in my career I even inquired about using a helicopter, but the quote I received would have taken us over budget."

Thad Goldman (Goldman Contracting) and Lakeside worked together to have the CSBR designed and manufactured in two parts. It was delivered by an 18-wheeler, which reversed down a small winding gravel road, performing a 180-degree switchback, swinging the equipment out over the existing embankment and lowering it precisely in to place – twice.

"The local company CraneWorks of Birmingham did a fantastic job," added McKeller, "I'm still amazed at how they got the plant in!"

To assemble the CSBR, a navy-certified welder arrived from Austal, a Mobile, AL-based shipbuilding company. "We're a close community of companies," Huffman stated. "We needed to show the Lockerbie

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Homeowners Association their investment in equipment designed for 25-plus years of reliable, low-maintenance operation was money well spent."

The new plant has now been operating since January 2020. Early discrepancies with the site's power supply were resolved quickly. McKeller commented: "As with all new equipment it can take a little while to get used to. We needed to find the best way of understanding the control system, but since, from an operator's point of view, we haven't had a single issue"

The plant now produces immaculate water. "We're now getting Total Suspended Solids between just 1 or 2. As for our 0.3 mg per litre limit on phosphorus, we're typically getting 0.1." Mckeller adds, "You just wouldn't expect to see those results out of a non-filtered plant. This is phenomenal compared to before."

With the Cahaba River regarded as a natural preserve, the new largely unmanned Lockerbie plant is under the jurisdiction of the Alabama Department of Environmental Management and has already been visited by the Environmental Protection Agency.

"They were impressed with the outstanding water quality," McKeller said. "The discharge point here is not forgiving so we have to be right on top of the operation. But now we have the new treatment system and our great monitoring system, we have every confidence in it."

Permit requirements are now comfortably met and the customer is saving around $7,000 pa in chemical savings. The unofficial partnership of like-minded AL companies is confident about the future wellbeing of the Lockerbie wastewater facility.

"The Lakeside team takes huge pride in the longevity and quality of their equipment," said Ed Moore from Eshelman. "We know in the future, regardless of the age of a system, they keep exceptional records and documentation, and we can get parts. I know for sure they will always help us find a way to keep everything shipshape."

McKeller concluded: "When Jim Aitkenhead at Lakeside said their CSBR could make such an impact on the phosphorous biologically, I thought I'd need to see it to believe it. Well, he was right." CS

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LIFT Spotlight:
Going Bubbles for Intensified Activated Sludge

Wastewater treatment and resource recovery has been driven by the activated sludge process for more than 100 years. From the research in 1882 that began to investigate blowing air into sewage, to the research by Arden and Lockett that developed the concept of activated sludge, through our most innovative wastewater treatment technologies, the majority of advancements in the field have focused on supplying oxygen to microorganisms for wastewater treatment (Alleman and T. B. S. Prakasam, 1983). Activated sludge has thus relied historically on forcing oxygen into water through various mechanisms (large bubbles of air, small bubbles of air, mechanical mixing of pure oxygen to name a few). The membrane aerated biofilm reactor (MABR) is a truly transformational technology, as it breaks this reliance on oxygen transfer from gas to liquid. Instead, the MABR transfers oxygen via a gas permeable membrane into a biofilm, potentially achieving 100% oxygen transfer efficiency while enabling simultaneous nitrification and denitrification (SND). This bubble-free oxygen transfer achieves higher rate biological nutrient removal in a smaller footprint.

What is the MABR?

The MABR has no relationship to the MBR. The membrane bioreactor (MBR) was also a transformational technology, but it was focused on changing the way we think of solids removal in activated sludge by filtering mixed liquor suspended solids (MLSS) with membrane rather than settling the solids in a clarifier. While the MABR also uses membranes, they are a completely different material and the membranes are used to transfer a gas **into** liquid, rather than **removing** solids from liquid. As shown in Figure 1, a membrane is provided with air, pressurized to a relatively low pressure (two to seven pounds per square inch (psi), and oxygen permeates through the membrane material to the wastewater. There are no bubbles associated with this gas transfer. The bubble-free gas transfer provides a surface for bacteria to colonize and form a biofilm. This biofilm has an aerobic base that supports nitrification. An anoxic exterior of the biofilm, as well as an anoxic bulk liquid, provides nitrification and denitrification in a single tank. This simplifies the process flow diagram for biological nitrogen removal by combining anoxic and aerobic volume into a single tank, and also minimizes the need for internal mixed liquor recycle (IMLR) pumping.

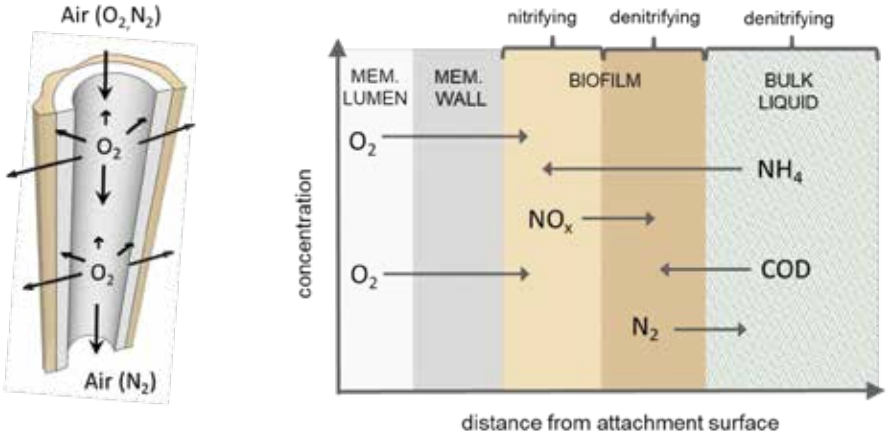


Figure 1: The membrane aerated biofilm reactor (MABR) transfers oxygen (either from pure oxygen or more commonly from air) to a biofilm where nitrification and denitrification can occur.

How Long has the MABR Been in Development?

For any new technology, there is often a large leap that is required to move from pilot scale testing to full-scale application. The development of new technologies has typically followed an "S-Curve" in the wastewater industry, as discussed by Parker (2011). As discussed in the recent *Water Resources Utility of the Future Annual Report* (2015), this acceleration of the S-Curve has led to the emergence of an Innovation Ecosystem. Within this ecosystem, technology developers, consulting engineers, utilities, and universities are collaborating to better define risks associated with innovative technology. This collaboration results in a deeper understanding of technology risks and benefits, and increased implementation of innovative technologies that provide clear resource reduction and recovery benefit for a utility.

The MABR technology development has actually had an extended bench scale and pilot scale period. Initial attempts to incorporate membrane aeration into biological processes focused on using the membranes solely for gas transfer and not as a support structure for biofilms. However, gas transfer efficiency decreased rapidly due to biofouling of the membranes (Weiss et al. 1998). Timberlake et al. (1988) were the first

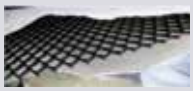
		FLUENCE SUBRE and ASPIRAL	OXYMEM OXYFILM/OXYFAS	SUEZ ZEELUNG
Membrane	Material	A polyolefin dense non-woven fabric coated with a thin film of poly acryl acrylate.	Extruded polydlmethylsilicone membranes	Polymethylpentene
	Type	Flat sheet seperated by spacer.	Curly hollow fiber membranes.	Small diameter hollow-fiber membrances (60 um) wrapped around a support cord.
	OD, ID, thickness, length	1 x 254 m of membrane	OD = 500 um	Individual membranes OD = 60 um Membrane assemblies OD = 1 mm
				
Module	Configuration	Cylindrical reactors contain the spiral wound membrane reactors. Spirals are stacked into modules.	Membranes potted in header and footer manifolds, assembled into cassette.	Membrane bundles are grouped into modues, which are packaged in MABR cassette.
	Footprint	Diameter 2.2 m x 1.18 m per spiral.	2.1m x 1.05 m x 2.1 m.	2.1 m x 1.7 x 3.1 m.
				
Operational Strategies	Mixing System	Mixing via diffused air.	Mixing via waste air sparging.	Mixing waste air sparging through cassette.
	Membrane Pressure	50-100 mbar.	150-200 millibar, maximum internal pressure 0.45 bar.	500-850 millibar, maximum process air pressure 83 kPa.
	Biomass Control	Mixing via diffused air.	Patented online automated biofilm thickness measurement and scour system.	Mixing via waste air sparging through the cassette.
	OTR	Up to 15 O2/m2-d.	8-14 g O2/m2-d.	8 to 14 g O2/m2-d.
	Rate of Nitrification	Up to 3 g NH4/m2-d.	1.0-2.0 gNH4/m2-d.	1.5-3.0 g NH4-N/m2-d.
	Energy	7.5-10.5 kg O2/kwh.	8 kg O2/kwh.	6 kg O2/kwh.

Table 1. MABR industry comparison

to design a system to take advantage of the aeration membranes as a support for bacteria. By pressurizing hollow fiber membranes with air, Timberlake et al. found that a significant amount of total nitrogetn (TN) removal was achievable with a biofilm grown directly on the membrane surface. Additional studies focused on achieving nitrification and denitrification in a stratified biofilm for TN removal (summarized by Syron and Casey, 2008). The thickness and density of the biofilm led to mass transfer and biofilm management concerns. Research began to examine a hybrid system, where a nitrifying biofilm was supported by the MABR, but suspended growth was maintained under anoxic conditions (Downing and Nerenberg, 2008). Pilot scale studies indicated that this hybrid system could achieve a high TN removal while maintaining a thinner biofilm (Downing et al, 2010). This essentially resulted in a 'supercharged' integrated fixed film activated sludge (IFAS) process, where an aerobic biofilm was present in an anoxic tank. Even with all of the research investment, it has only been in the past five years that commercially available MABR technologies have come to the market from multiple manufacturers. Beginning in 2015, the installations of the MABR technology as a stand-alone processes, as well as for retrofits of the activated sludge process, have been growing exponentially.

What are the Key Design Metrics for the MABR technology?

The fundamental understanding of the competition of nitrifying bacteria, denitrifying bacteria, and oxygen transfer in an MABR biofilm has been studied for nearly 30 years. This provides a solid fundamental understanding of how the MABR works from a physical, chemical, and biological perspective. The challenge has been the development of a commercially viable technology. There have been two main paths for commercial technology development: package MABR systems that rely on the MABR to achieve the majority of nitrification in the system and activated sludge retrofit applications where a portion of the overall nitrification (30% to 50%) is achieved in the MABR while the activated sludge process is relied on for the remaining treatment. For both of these technology packages, there are several key design metrics that have to be considered:

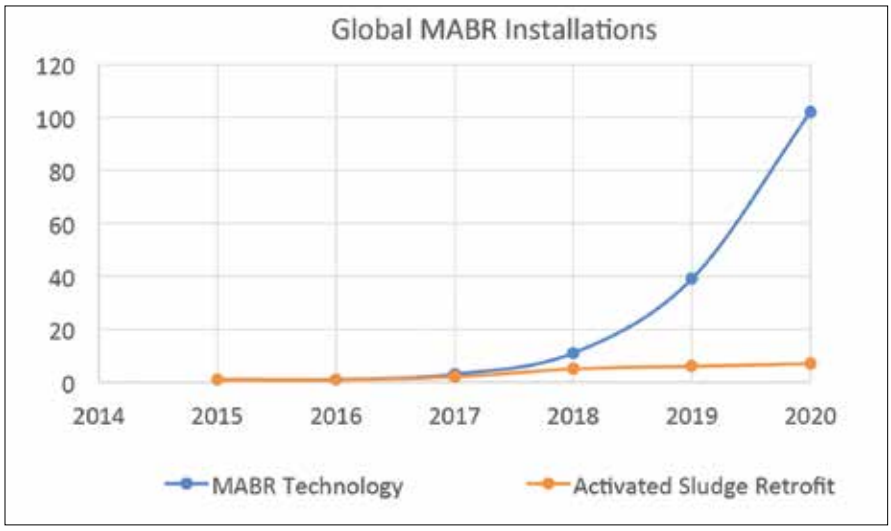


Table 2. MABR industry comparison

- **Influent screening** – given the high potential for clogging, manufacturers are currently recommending influent screening of 1 to 3 mm.
- **Effluent ammonium concentration** – low effluent ammonium concentrations (less than 2 mg/L) will require some polishing from activated sludge suspended growth or more membrane surface area.
- **Mixing and biofilm management** – as with any biofilm process, mixing and scour are critical for mass transfer into the biofilm and managing the overall thickness of the biofilm.
- **Influent BOD loading** – high influent BOD to nitrogen ratios can create a large amount of aerobic BOD oxidation, impacting the nitrification efficiency of the MABR.
- **Process airflow rate** – replenishment of the oxygen inside the MABR membrane requires a constant airflow. Given the high oxygen transfer efficiency, this airflow is typically less than 30% of the equivalent airflow for suspended growth, but still must be considered when evaluating the blower configuration for the MABR.

Who Manufactures the MABR Technology?

Currently, three major manufacturers provide the MABR technology commercially in North America: Suez, OxyMem/DuPont, and Fluence. The Suez MABR application has focused on retrofit into the activated sludge process with the ZeeLung technology. Physically, the ZeeLung MABR looks very similar to the ZeeWeed MBR, but the membrane materials are significantly different. The ZeeLung Cassettes are inserted into anoxic reactors in an activated sludge processes, with a focus on retrofitting the activated sludge tanks. The ZeeLung cassettes provide energy efficient nitrification in a biofilm, while the suspended growth in the activated sludge process provides ammonium polishing, denitrification, and biological phosphorus removal. Mixing of the ZeeLung cassettes is provided with offgas from the MABR modules and delivered via large bubble mixing.

The OxyMem technology, which is now a DuPont product, is similar in structure to the Suez technology, but relies on very different membrane materials and mixing technologies. The membrane material utilized by OxyMem results in a lower backpressure inside the membrane, and potentially a lower specific surface area. Mixing is achieved via offgas from the MABR module, which is utilized as part of an integrated airlift pumping system. OxyMem has developed similar retrofit configurations as Suez, and additionally offers modular package systems for small systems and expansion options.

A third MABR manufacturer, Fluence, relies on a very different MABR configuration. The Suez and Oxygem MABRs are cord-like membranes grouped in bundles. The Fluence MABR relies on a flat sheet membrane that is spirally wound with spacers to provide volume for water flow and biofilm growth. Fluence offers a packaged MABR system for small systems (commercially available as ASPIRAL™) as well as activated sludge retrofits (commercially available as SUBRE™). Mixing is accomplished in the Fluence MABR systems with cyclic application of airflow into the MABR zone.

A brief summary of each manufacturer's MABR is provided in Table 1. All three options provide energy efficiency intensification of the activated sludge processes. More information can be found at each manufacturer's website.

Has the MABR Been Implemented in North America?

There are several MABR facilities in design and construction in North America. However, the majority of global installations have been in China. The largest single MABR is located in the CSWEA area, at the Yorkville-Bristol Sanitary District in Illinois. This is the Suez technology, and has been featured at several CSWEA conferences and in previous issues of the *Central States Water* magazine.

What are the Benefits of the MABR Technology?

The MABR is a disruptive technology that brings together two important aspects of resource recovery focused wastewater treatment: process intensification and low energy consumption. Given the benefits of the MABR, it is fair to ask why it is not applied with every activated sludge process expansion. There are two key factors for the success of the MABR, and facilities typically have to be faced with both factors for a successful MABR project:

1. Process intensification required.
2. Reduction in energy consumption.

Process intensification can take the form of a capacity expansion requirement, new nutrient removal requirements (nitrogen and/or phosphorus), or drivers related to wet weather flows. The intensification aspect is related to achieving these drivers without the addition of new tanks, but rather through the addition of MABR units. Reduction in energy consumption can either be driven by high energy costs, or simply a goal for more sustainable energy use. When both of these drivers are present, the MABR can be a valuable technology for consideration.

References

Alleman and Praksam (1983) Reflections on Seven Decades of Activated Sludge History. *Journal Water Pollution Control Federation* **55**(5): 436-443

Downing and Nerenberg (2008) Sustainable nitrogen removal from wastewater with the hybrid membrane biofilm process (HMBP): bench-scale studies *Water Science and Technology* **58**(9): 1715-1720.

Downing, Bibby, Esposito, Fascianella, Tsuchihashi, and Nerenberg (2010). Nitrogen Removal from Wastewater using the Hybrid Membrane-Biofilm Process (HMBP): Pilot Scale Studies. *Water Environment Research* **82**(3):195-201.

Timberlake D, Strand S, Williamson K. 1988. Combined aerobic heterotrophic oxidatoin, nitrification and denitrification in a permeable-support biofilm. *Water research* **22**(12):1513-1517.

Weiss PT, Gulliver JS, Semmens MJ. 1998. In-Stream Hollow-Fiber Membrane Aeration. *Journal of Hydraulic Engineering-ASCE* **124**(6):579-588.

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

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3. Engineering Sciences
4. Liberal Arts
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AWIA COMPLIANCE

Risk and Resilience: What You Need to Know and Where to Find Resources

Passed in 2018, *America's Water Infrastructure Act* (AWIA) requires community water systems to file a 'risk and resilience' assessment with the EPA. Within six months of the assessment, water systems must develop an emergency response plan. Links to the process, certification requirements, and resources can be found at *www.epa.gov/waterresilience/americas-water-infrastructure-act-risk-assessments-and-emergency-response-plans.*

Who Must File a Risk and Resilience Assessment?

Any community water system that serves more than 3,300 persons is required to file an assessment and emergency response plan. While a community water system is defined as any drinking water utility that consistently serves at least 25 people or has 15 service connections year-round, only those serving 3,300 people are impacted by this requirement.

When Do I Need to File?

The due dates for both the assessments and the plan are dependent upon the size of your service population.

Service Population	Risk and Resilience Assessment	Emergency Response Plan
≥ 100,000 people	March 31, 2020	September 30, 2020
Serving ≥ 50,000 and ≤ 99,999	December 31, 2020	June 30, 2021
Serving ≥ 3,301 and ≤ 49,999	June 30, 2021	December 30, 2021

Continuing Requirements

Every five years, your utility must review your risk and resilience assessment and adjust if needed. You then must recertify your assessment with the EPA. Within six months of recertification of your risk and resilience assessment, you must review your emergency response plan and revise if necessary.

Is There a Form or a Standard I Must Follow?

The short answer is no. Your utility's assessment and plan must meet all the criteria in AWIA Section 2013(a) and (b), but the AWIA does not require that you use any particular standard, tool or method for conducting your assessment or developing your plan. Please be aware that your risk assessment and emergency response plan need to include assessments accidental emergencies (chemical leaks, equipment malfunctions), natural disasters, and changing conditions (flooding or drought from climate change, for example), as well as malevolent acts of sabotage, both on your physical assets and your cyber-control systems.

The lack of a hard and fast standard recognizes the need for these assessments and plans to be flexible and tailored to each utility's needs. However, there are some guidance documents that can act as a road map to the development of these documents. The AWWA has developed *J100-10 Risk and Resilience Management of Water and Wastewater Systems* to guide utilities in their assessments, available for purchase here: *www.awwa.org/store/product-details/productid/21625.*

Establishing Priorities, Determining Strategies, and Finding Funding Sources

The EPA's *Resilient Strategies Guide* will help you identify possible priorities to evaluate and strategies to fortify your assets based on your utility type (it includes wastewater/stormwater as options, in addition to drinking water), your utility size, and state. The Launch Guide button is at *www.epa.gov/crwu/resilient-strategies-guide-water-utilities#*, which will take you to the guide launch page at *www.epa.gov/crwu/resilient-strategies-guide-water-utilities#/utility-information?utilityname=&region=101&utilitytype=4&utilitysize=1315.*

Malevolent Acts: A New Concern

The risk for terrorism and potential sabotage must be taken seriously. The EPA has designed a guide to assist in this aspect of risk assessment and plan development, entitled *Baseline Information on Malevolent Acts for Community Water Systems.* This guide provides step-by-step assessments for different utility types and threats. The link to the EPA's site is *www.epa.gov/waterriskassessment/baseline-information-malevolent-acts-community-water-systems,* which includes the link to the document PDF at *www.epa.gov/sites/production/files/2019-07/documents/baseline_information_malevolent_acts_508_072519.pdf.*

Risk Assessment for Extreme Weather

If extreme weather is a major risk for your utility, there is an assessment tool that will help you project current and long-term conditions. CREAT has interactive maps to help evaluate your area and integrates with the resilient strategies guide at *www.epa.gov/crwu/creat-risk-assessment-application-water-utilities.* This resource also helps identify strategies and, in some cases, funding sources for implementation.

Don't Forget Chemical Safety

One of the asset categories identified is 'the use, storage or handling of chemicals.' The example cites chlorine as a chemical of concern for uncontrolled release. Maintaining a chlorine residual is key to the safety of your water, and maintaining safe chlorine handling practices is also critical to the safety of your employees and surrounding populations.

Your Communities Depend on You

You know your water is literally the life-giver to your community. The economic and physical health of your communities are only as stable as the water source you provide. Thorough risk assessment and emergency planning is critical to maintaining your utility and the welfare of your community.

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GLOBAL WATER
STEWARDSHIP

By Mike Holland

The 2020 Costa Rica *Riptide Rowathon*

42,195… that's how many meters there are in a marathon, and believe me, Jason Neighbors, Matt Streicher, and I counted each one of them as we rowed our way through the Costa Rica Riptide Rowathon hosted by Crossfit Mokena on August 16. To raise money for Global Water Stewardship (GWS), CSWEA's own Jason Neighbors (Glenbard Wastewater Authority) along with his amazing wife, Christie, agreed to donate the use of their crossfit gym for the day to raise money for GWS through a *Rowathon*, where innocent suckers, like myself, actually paid money to sit on an exercise machine and row the distance of a half or full marathon.

In total, nearly 50 questionably sane people participated in the event. Teams consisted of two to three rowers, with six teams in the half-marathon and 11 teams in the full-marathon category. Each team decided on their own how they wanted to split up the rowing. Jason, Matt and Mike's team, "the Clean Water Warriors," elected to go with three rotating shifts of five minutes on and 10 minutes off. This decision was made after it was unanimously agreed upon that it would be unfair to the other teams if Mike just rowed the entire thing and blew the competition away… this was for charity, after all.

After an hour and a half, it became **very** clear that the half-marathoners (who were now finishing up) were by far the smarter ones as they relaxed in their folding chairs while the full-marathoners rowed on. Team Clean Water Warriors ended up finishing the marathon two hours and 51 minutes, good enough for a 4th or 5th place finish (this is a hotly contested issue in the international rowing circuit with the difference only being nine seconds) but a ways back from the winner at two hours, 11 minutes. However, many people in attendance said that the team from CSWEA would have won if only Matt Streicher had taken off his shirt to row topless earlier in the competition.

The Clean Water Warriors team of Jason Neighbors, Matt Streicher, and Mike Holland.

All joking aside, this was a great event that ended up raising over $2,000 for GWS while pushing everyone involved to not only better themselves physically but also to actively think about our impact on the water environment. Special thanks go out to CSWEA and Baxter & Woodman for sponsoring, along with numerous local sponsors such as Excel Real Estate, Integrated Physical Medicine of New Lenox, EssentialsCare, and Livesore Chicago. Most of all, thank go out to Christie and Jason Neighbors for hosting, organizing, pushing and cheerleading through this amazing event. I've had five days now to recover from this event and am just now able to raise my arms above my head; just enough to be able to punch myself for thinking that rowing a marathon was a good idea. CS

Jason and Christie Neighbors graciously hosted the event at their crossfit gym.

By Liz Heise

GLOBAL WATER STEWARDSHIP

GWS Update

2020 has thrown us

all some curve balls, leading us into uncharted territories in these "unprecedented" times (as they say). From transitioning to working from home, virtual meetings, and closed borders, GWS has had our fair share of challenges over the last six months. Working internationally presents some challenges when flying is dangerous and international borders are closed, but GWS quickly learned to adapt and overcome. We have been busier than ever, and though we have not been able to physically travel to Costa Rica, we have only strengthened our presence and impact.

In April, we held our first virtual student design competition. The judges consisted of both GWS volunteers, and Costa Rican water professionals. This competition included the winner of the Costa Rican Student Design Competition, who went on to take first place in international competition. This team also had the opportunity to compete with other international teams in the WEFTEC Virtual Student Design Competition. This was a huge moment for GWS and the TEC students. The judges also selected a US Competition Winner – Marquette University. Though this all-female team did not get the opportunity to travel to Costa Rica in August, they still were able to present their design for the La Fortuna community to ASADA leaders, AyA, and GiZ International Development leaders. We are very excited to announce that La Fortuna has received funding to move forward with the next steps in design and development of their wastewater treatment system! We will continue working with the community in the next steps of the project.

The chosen 2021 Student Design Competition community is Samara. This is a tourist town with three different water systems, and a portion of the town with a collection system that dumps untreated wastewater. Typically, we would meet with the ASADA and collect necessary data for the problem statement during our August Service Trip. This year, we have been meeting remotely with the ASADA, and working with the amazing TEC university students and faculty to collect the data needed for the problem statement. We are not letting travel bans slow us down.

During this time, GWS has also been working to improve our social media presence within Costa Rica. We have been using social media as an education platform to connect people with education opportunities. Additionally, we have been working with local water professionals to attend

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Quarantine Edition

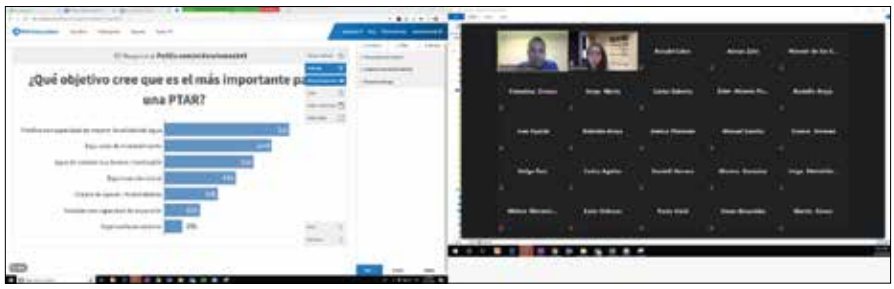
CSWEA educational webinars. One benefit of the virtual world we are living in, is that it has opened up many more opportunities for connection across the globe.

Additionally, thank you to Jason Neighbors who hosted the first ever GWS Riptide Rowathon at Crossfit Mokena! This awesome event brought people together (socially distanced, of course) to sweat and raise money for GWS. The event raised $2,000 and our very own Mike Holland, Jason Neighbors, and Matt Streicher placed fifth!

Not only have we been pushing forward with our student design, we also have continued our educational initiatives. TICOSAN 2020 was held (virtually) at the end of September. This was the first ever wastewater conference in Costa Rica. We even received national recognition from the news media! The event had over 200 registered, 10 exhibitors, complete with technical presentations, a virtual exhibit hall, and networking opportunities.

Finally, GWS was also selected by the WEF Programming Committee to be a part of a special Water, Sanitation, and Heath (WaSH) seminar that will be a part of WEFTEC connect. Be sure to tune in and watch our segment (available for a whole year after WEFTEC, so no excuses for missing it!) to learn more about all of our initiatives and successes.

Overall, GWS came into 2020 with more momentum than ever. We were able to adapt and overcome, and continue to grow and improve. I've said this ever year since I became involved with the group, but this really has been our best year yet and I cannot wait to see what 2021 has in store for us. We are ALWAYS looking for more passionate and dedicated volunteers so if you're interested in joining one of the best groups around, reach out to *chair@globalwaterstewardship.org*. CS



"GWS came into 2020 with more momentum than ever. We were able to adapt and overcome, and continue to grow and improve."

CALL FOR ABSTRACTS

94th ANNUAL MEETING

2021 CSWEA ANNUAL MEETING

DRURY LANE - OAKBROOK TERRACE, IL

MAY 17-20, 2021

This is a request for abstracts of papers to be considered for presentation at the 94th Annual Meeting of the Central States Water Environment Association, Inc., which will be held May 17 - 20, 2021. To receive consideration, abstracts must be submitted online by **November 1, 2020.**

Submittals that will be given highest credit will include:

- Submittals with a focus on day-to-day treatment, by people with hands-on experience at facilities.
- Topics in new emerging concerns (PFAS, Chlorides etc.).
- Case studies presented from an operations perspective, young professionals, and middle management.
- Research topics and case studies related to new and innovative technologies.

Two hours of ethics training will be on the program as well for engineers that require this to maintain their license.

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

OPERATIONS and MAINTENANCE by OPERATORS and MAINTENANCE:

- Time management or new process startup
- Efficiency (pumps, motors, lights, UV disinfection, HVAC, etc.)
- Technology/SCADA/Web-Based maintenance programs/GIS applications
- Troubleshooting – Traditional facilities (activated sludge, BNR), new processes (nutrient recovery) etc.
- Case studies of retrofitted facilities
- Case studies of completed projects
- Optimization
- Prioritization – wastewater treatment and new processes, operations perspective
- Nutrient removal
- Process control
- Start-up case studies

WATERSHEDS and STORMWATER MANAGEMENT:

- Implementing new MS4 permit requirements
- Adopt a storm drain, pond etc. program case studies
- Anti-degradation and other regulatory issues
- Using grants and other funding sources to implement stormwater management as part of CIP projects
- Habitat or groundwater protection or restoration
- Non-point pollution source modeling
- Water quality trading and watershed management issues and initiatives, including adaptive management
- Green infrastructure solutions and best management practices
- Total maximum daily loads involving point and non-point sources
- Education and outreach

UTILITY MANAGEMENT:

- Communications
- Employee retention and development
- Succession planning
- Project funding
- Utility rate development and reviews
- *America's Water Infrastructure Act* (AWIA) – Risk and Resilience
- Dental office category regulation (40 CFR Part 441) program implementation
- Hazardous waste pharmaceuticals program implementation

ENHANCED RESOURCE and ENERGY RECOVERY:

- Resource recovery – sourcing raw materials, nutrient recovery
- High strength waste and pretreatment programs
- Digester gas production and treatment technologies
- Lessons learnt from co-digestion
- Heat recovery case studies
- Alternative energy use
- Energy management and savings to utility management or enhanced RER

COLLECTION SYSTEMS:

- Collection system rehabilitation technologies/methods
- Collection system rehabilitation case studies
- Educating the public on how to protect the system
- CMOM program development and implementation
- Collection system design and operation
- Green infrastructure case studies
- Infiltration/inflow management case studies
- Stormwater and combined sewer overflow management

RESEARCH and DESIGN:

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

RESIDUALS, SOLIDS and BIOSOLIDS:

- Pollutants of Emerging Concern – PFAS
- Environmental management systems – National Biosolids Partnership
- Public education and awareness, case studies
- Fertilizer production – Class A case studies
- Standard or advanced treatment and stabilization

GENERAL:

- Laboratory issues and bench-scale studies
- Pretreatment, industrial treatment, and pollution prevention
- Pollutants of emerging concern – PFAS, chlorides etc.
- Public education to address emerging concerns – chlorides; water softener use, leachate, flushable wipes, etc.
- Regulatory issues
- Security issues
- Engineering ethics training

SOFT SKILLS/LEADERSHIP:

- Leadership skills
- Managing the ill or injured employee
- Generational integration
- Anti-harassment and discrimination training for managers
- Getting the most out of employee performance evaluations
- Union negotiations
- Handling the grievance and arbitration process
- Managing in a union environment
- Labor Law
- Management rights for Managers
- Social media and the workplace

To receive consideration, please submit your abstract via the online submittal process that can be accessed from the CSWEA website. To submit your abstract, please go to *www.cswea.org* and then to the 94th Annual Meeting Abstract Submittal area. Once you start the abstract submittal process using the online form, you cannot come back to it later. It is important to have all materials ready to submit before submitting. As a reminder, an abstract is meant to **summarize** the presentation. The summary should include objectives, scope, and general procedures, as the limited length of the abstract permits. An indication of results or conclusions is required. Submittal of presentations (slides) or a generic product brochure in place of an abstract, will not be considered. Thank you.

Mandy Sheposh
Chair, Technical Program Committee
Johnson Controls, Inc.
Phone: 708-549-5931
amanda.sheposh@jci.com

INSTRUCTIONS FOR THE SUBMISSION OF ABSTRACTS AND CRITERIA FOR PAPER SELECTION

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

The abstract should be submitted online at *www.cswea.org*. Through the online submittal process, you will enter the title and abstract, import your credentials, choose your topic area, and select your presentation format. Abstracts must contain a summary of no more than 500 words, with the full abstract (including all tables, figures, and references) not to exceed six (6) pages. Abstracts that are not in the required format will not be given equal credit.

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

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

1. Originality and status of subject:

The paper should deal with new concepts or with new and novel applications of established concepts (operations and maintenance, collection systems, stormwater, utility management and leadership, research and development etc.). It also may describe substantial improvements of existing theories or present significant data in support or extension of those theories. Studies of incomplete or ill-defined problem situations should be avoided. Previously published data should be introduced only in summary form and for comparative or supportive purpose.

2. Technical content:

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

3. Water environment significance:

The paper should relate clearly and significantly to the water environment field. The author should make evident the relationships of the work to a practical problem area or situation in water quality and wastewater control.

4. Adequacy of abstract preparation:

The committee has noted that historically the adequacy of an abstract is often indicative of the quality of the final presentation. As a result, authors are urged to prepare their abstracts with care, following the instructions noted above. As a reminder, an abstract is meant to **summarize** the presentation. The summary should include objectives, scope, and general procedures, as the limited length of the abstract permits. An indication of results or conclusions is required. Submittal of presentations (slides) or a generic product brochure in place of an abstract will not be considered.

Abstracts are due by November 1, 2020

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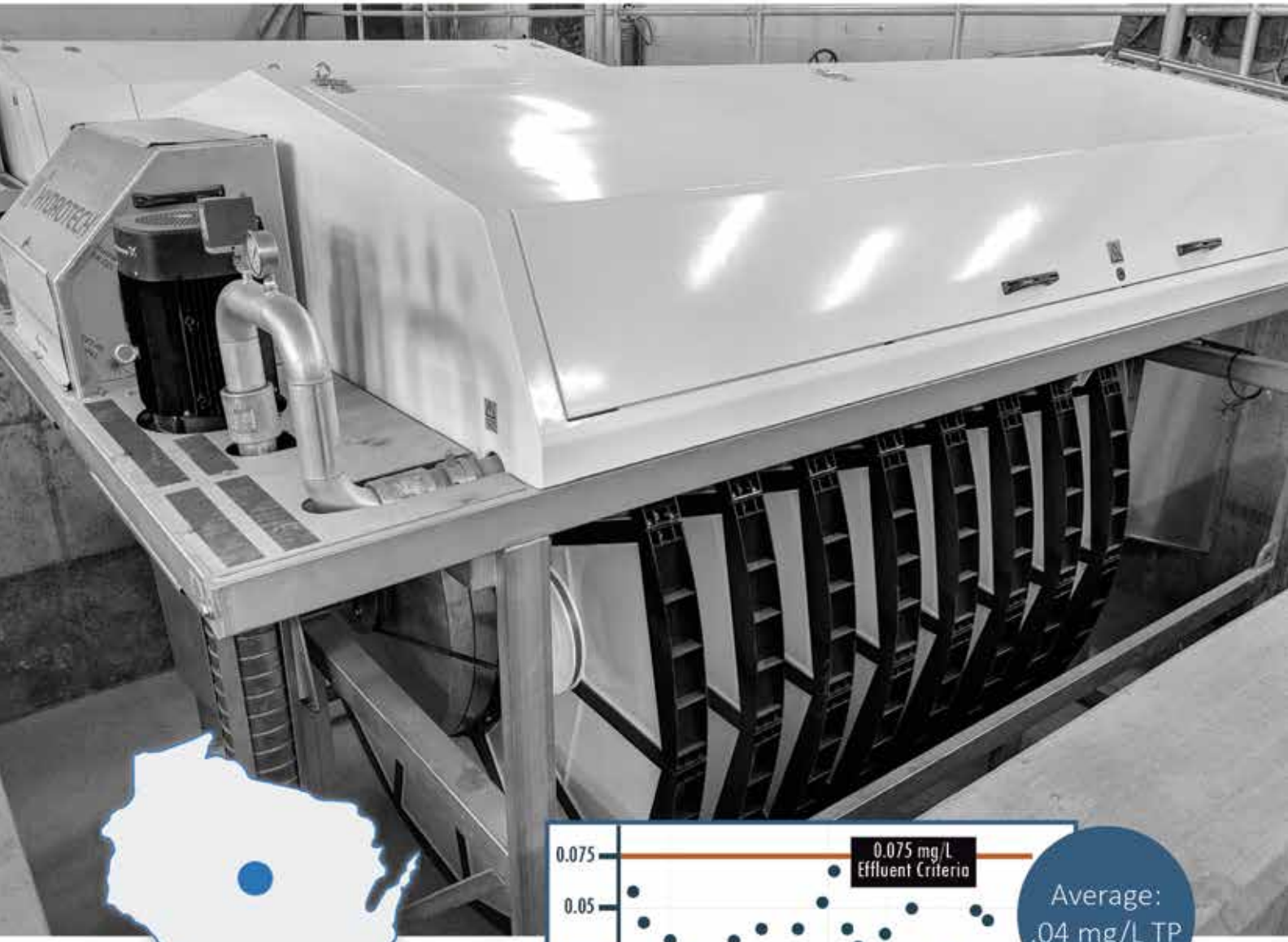

Average:
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2 months of data after commissioning

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