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Diane Taniguchi-Dennis  
Chief Executive Officer  
Hillsboro, Ore.

# All About Relationships

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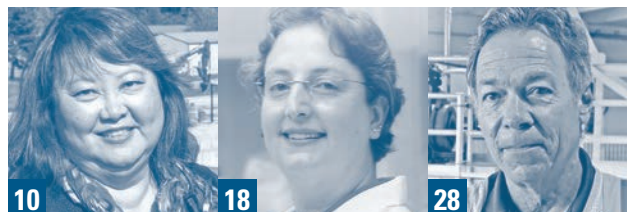
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ON THE COVER: Real power and energy in organizations come from relationships. Those words describe the work of Diane Taniguchi-Dennis, chief executive officer of Clean Water Services. She encourages productive relationships among her management team, with everyone at every level in the utility, and with key stakeholders in the community around Hillsboro, Oregon. (Photography by Michael Schmitt)

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let's be clear

## Building Superstars

SO YOU'VE JUST HIRED A NEW OPERATOR WHO SHOWS GREAT PROMISE. THE WAY YOU LEAD WILL DETERMINE TO WHAT EXTENT THAT PERSON EXCELS.

By Ted J. Rulseh, Editor



It's tough finding young, high-quality operators to replace those retiring. It's harder to keep them in the face of competing offers from other utilities. It's harder still to make sure they live up to the potential you saw when you hired them.

Fortunately, as a supervisor or manager, you have the power to help set new people on a course for successful careers and for a long stay at your facility. Here are some tried and true ways to keep new team mem-

bers engaged with your operation and help them make career progress.

**Help them set goals.** Early in their tenure, sit down with them and discuss what areas of the profession they find the most interesting. Some may aspire to leadership roles. Others may want to specialize in one area of operations. Some might not be sure at such an early stage what direction to take. Whatever the case, to the extent possible, work with each person on a plan that moves them in the direction they desire.

**Devise ways to measure progress.** This might entail setting a target timetable for mastering a process — being able to operate it. It might include a schedule for achieving the different levels of licensing. Given goals to work toward, people tend to see work life from a bigger perspective than merely showing up and completing daily tasks.

**Cross-train.** Even those who prefer to specialize can benefit from knowing many or all aspects of treatment plant operation. After all, a plant is not a collection of disconnected processes but an integrated, functioning whole. It's the same with an operations team. Well-rounded people will be more

Don't wait for an annual review to give critiques, suggestions, or praise. Make it a habit to speak to team members regularly.

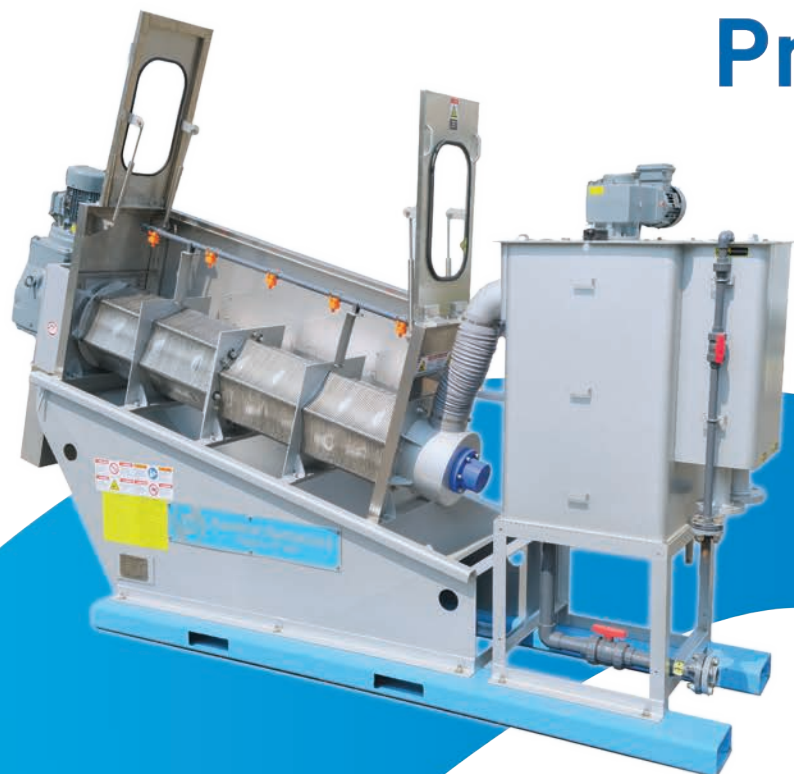
valuable to your facility and better prepared for new opportunities, whether in your facility or at their next job.

**Give feedback continuously.** Don't wait for an annual review to give critiques, suggestions or praise. Make it a habit to speak to team members regularly. Give guidance. Show that you notice when they're performing well, or when they go above and beyond to meet a challenge. Let them know how they're progressing in line with the goals they set and the performance measurement you mutually agreed to. Ideally, in annual reviews, there should be no surprises.

**Help them build a network.** Take new team members on visits to neighboring facilities. Get them involved in local and statewide operator associations, and encourage them to take part actively, by serving on committees



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and boards of directors. Such connections can help them grow both personally and professionally.

**Invest in their success.** Allocate funds to pay for their attendance at state and national conferences, short schools, seminars and other educational events. Also budget money to help them defray the cost of attaining higher levels of licensure. Provide salary incentives for taking steps up the certification ladder.

**Give them free rein.** Provide room for new team members to take initiative, to think for themselves, to offer suggestions. Let them know that they are integral parts of the team and that their expertise and ideas are valued.

**Walk the talk.** Show your new team members that you practice what you preach by following your own professional development plan and building and sustaining a professional network.

If you follow these steps, you'll help your entire team perform better and set your new team members on a solid course. You might even improve the odds of their staying even if lured by higher pay from a larger organization.

If they feel they are gaining more than a paycheck — if they value being appreciated, being on a defined development path, learning constantly, having their voice heard — they may find it in their interests to stay with a good thing, instead of seeking greener pastures.

Even if they do leave, you'll have the satisfaction of knowing you helped them progress toward their career objectives. They might even become recruiters for you — telling aspiring young professionals that yours is a great place to start. **tpo**

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## RECYCLED WATER INVESTIGATION

### Improving Response to Reuse

University of Delaware researchers are investigating consumers' willingness to purchase food products grown with recycled water. In a research paper published in the *American Journal of Agricultural Economics*, researchers went up and down the grocery aisle asking where consumers draw the line.

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## AWARD WINNER

### Inspection Robot Keeps Pipes Healthy

A robot that autonomously moves through the drinking water network to ascertain its condition and that knows exactly what to do in problematic situations — that's the prospect of the Autonomous Inspection Robot, which received the annual innovation award during the opening ceremony of Aquatech Amsterdam 2021.

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## OVERHEARD ONLINE

"We estimate that 25 watersheds contribute approximately 46% of global nitrogen inputs from wastewater into the ocean."

**Researchers Examine Wastewater Discharge Effects on Coastal Ecosystems**  
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# All About Relationships

FROM TEAM MEMBERS TO LOCAL GROUPS TO PASSIONATE MEMBERS OF THE PUBLIC, DIANE TANIGUCHI-DENNIS HELPS CLEAN WATER SERVICES FORGE TIES THAT HELP PROTECT THE WATERS

STORY: **Jim Force** | PHOTOGRAPHY: **Michael Schmitt**

“In organizations, real power and energy is generated through relationships,” wrote author and management consultant Meg Wheatley.

The words aptly describe the work of Diane Taniguchi-Dennis, chief executive officer of Clean Water Services in Hillsboro, Oregon. She encourages productive relationships among her management team and with everyone at every level in the utility.

“The team is everybody doing the work, delivering service 24/7,” she says. “It’s the operators, the mechanics, the electricians, the laboratory, the engineering and capital projects team, the business services team and all our staff working in the field to address the needs of our customers and restoring the watershed.”

She might add it’s also the community organizations and interest groups her organization collaborates with to protect the public health and the environment in the Tualatin River Watershed. For her leadership, she recently received the 2021 President’s Award from the WaterReuse Association.

“Under her leadership, Clean Water Services has been a leader in water recycling for environmental restoration,” the association said. And while the award may have put her at the top of the list, she sees herself at the bottom of a pyramid that includes nearly team 400 members employees and serves more than 620,000 customers.

## FOSTERING CREATIVITY

Taniguchi-Dennis says her role is fostering and supporting creativity and innovation among the utility’s employees. “Being CEO is all about people — incubat-



Diane Taniguchi-Dennis, CEO, and Dennis Evans, electrician, at the motor control center cabinets (Eaton) at the Durham treatment plant.

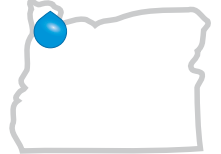
ing their talents and gifts and unleashing them. We really have a lean organization for all the customers we serve. And we have talented, well-trained senior team members who are great at their jobs. We have terrific people here.”

But it’s really the future she’s focusing on. “We’re doing a lot of work in performance excellence,” she notes, referencing the Baldrige Excellence Framework for achieving great results. The key, she says, is to get everyone to buy in and embrace “a blueprint for innovation.”



## Diane Taniguchi-Dennis, Clean Water Services

Hillsboro, Oregon



**TITLE:**  
**Chief Executive Officer**

**RESPONSIBILITIES:**  
**Lead a team of 397 employees serving more than 620,000 people**

**EDUCATION:**  
**Bachelor's degree, civil and environmental engineering, Cornell University; MBA, Willamette University**

**CERTIFICATION:**  
**Professional Engineer, Board Certified Environmental Engineer**

**EXPERIENCE:**  
**16 years in public works and waterworks management**

**AWARDS:**  
**2021 Presidents Award 2021, WateReuse Association; 2019 Water Finance & Management Award (from magazine of the same name)**

**GOALS:**  
**Create a blueprint for innovation; build a dream team for future success**

Taniguchi-Dennis firmly believes that "Everyone has the gift of something to contribute." (SSI clarifier drive from Ovivo.)

She adds, "It's all about where you want to be in 10-20 years, but to get there you have to backcast your steps. If you don't know what future you want, you're destined to stay where you are."

Taniguchi-Dennis relies on something she learned as a young parent. Small children, she says, have an ability to think and tell you what they think: "They know how to add and subtract ideas between two people,

how to combine. As adults we seem to have lost that joyful ability.

"Everyone has the gift of something to contribute. Our organization should be the place we come to learn and play with our ideas. The potential is unlimited. That's the secret sauce I bring. It's the hope and vision for the future of water and getting the team to understand it and make things happen."

“The team is everybody doing the work, delivering service 24/7.”

**DIANE TANIGUCHI-DENNIS**





From left, Diane Taniguchi-Dennis; Randy Robbins, plant maintenance technician; and Dave Clements, principal engineer. The Clean Water Services team sees the necessity of attracting a new generation of operators.

She calls it “I to Us to All”: developing creative and resilient people, who can create and solve problems on integrated teams, and who deliver as an organization what customers expect and need.

## MEANINGFUL ALLIANCES

Beyond the office, Taniguchi-Dennis believes it is critical to cultivate alliances with stakeholders: “We want to get our customers involved in our programs. We reach out to the public, to people who are passionate about our region. It’s the best way for them to learn about the importance of the Tualatin River and a healthy watershed.

We consult with our board-appointed Clean Water Services Advisory Committee. We work directly with our county and our 12 cities and integrate with their community development plans. We have worked to build relationships with our agricultural partners and with our soil and water conservation district. We need to know what farmers need to do well and how our work for the river can support their success.”

Because the Tualatin River is a salmon stream, state regulations call for a temperature of no more than 77 degrees F for effluent from resource recovery facilities. Through a partnership known as Tree for All, CWS works closely with landowners to bring shade to the riverbanks and cool the water. The program has seen some 14,000 trees and shrubs planted so far, and it is widely supported by the public.

Taniguchi-Dennis says trees along the riverbanks are a better solution than expensive water chillers for the effluent: “Plus, what do chillers do to improve habitat and water quality, and help stabilize soil and prevent runoff and erosion?”

Another collaboration led to the cleanup of a several thousand acres of farmland contaminated by nutrient pollution after pumps failed and dikes were over-topped by impounded water. The site is now part of Wapato Lake National Wildlife Refuge.

A unique public-private partnership was involved, including the U.S. Fish & Wildlife Service, local and regional industry, public utilities and environmental organizations. The area is being restored as a wetland and contains a peat bog that Taniguchi-Dennis suggests might be restored to sequester carbon emissions in the future.

“It’s going to take all of us working on behalf of our watershed,” she says. “But we can do a lot when we work together. It’s the way we think.”

Cooperation like this goes back to the beginnings of CWS. The utility was formed in 1970, before the Clean Water Act, because pollution in the area was so significant. The state put a moratorium on development.

“We want to get our customers involved in our programs. We reach out to the public, to people who are passionate about our region.”

**DIANE TANIGUCHI-DENNIS**

“There were 26 small treatment plants in the area, but they were not effective at controlling pollution,” Taniguchi-Dennis says. “By a 2-1 margin, the public voted to form a unified sewerage agency. The people created us. We were already working as a watershed protection agency when the federal regs arrived.”

## THE TEAM, THE FUTURE

Taniguchi-Dennis is proud of each of her team members. Key people include Nate Cullen, chief operating officer; Kathy Leader, chief financial officer; Mark Jockers, chief of staff; Jerry Linder, general counsel; Joe Gill, chief utility relations officer; and Jack Liang, chief strategy officer.

Early in the pandemic, Taniguchi-Dennis texted Dr. Ken Williamson, director of the research and innovation program, wondering if CWS could test for potential COVID in the community by sampling wastewater.

“Within a day he had figured out what we could do. He started working with Oregon State University and made it happen. Now we have a geneticist on staff. We have a genetics lab. We’re using sewage as an indicator of public health within our service area.”

Taniguchi-Dennis deeply appreciates her staff and recognizes that many will retire in the near future; there is a need for new blood. “It’s a significant



“My focus will be on developing a strong sense of purpose, a yes-we-can attitude not only in managing our assets but in creating transformative partnerships.”

**DIANE TANIGUCHI-DENNIS**

challenge,” she says. “The baton needs to be passed to the next generation. It’s a changing of the water guardians.”

CWS has been able to attract young people: “We need them. They need to be grounded and know what they want to contribute to the public and the environment. They need to have gumption, not be afraid to share ideas and be part of the organization.”

Her swan song will be to create roadmaps based on all the scenarios her agency might encounter in the future: “My focus will be on developing a strong sense of purpose, a yes-we-can attitude not only in managing our assets but in creating transformative partnerships.”

That will fulfill her hopes for the future of water and the environment. **tpo**



Taniguchi-Dennis takes pride in her team members, such as Noah Harvey, left, plant manager; and Edher Estrada, operator. (Dissolved oxygen probes from YSI, a Xylem brand.)

## A NAME THAT SAYS IT ALL

When Clean Water Services changed its name 20 years ago from the Unified Sewerage Agency, it was more than just an image makeover.

The utility’s mission evolved dramatically. Today Clean Water Services operates four water resource recovery facilities, serves as the stormwater utility, and inspires its community in areas such as watershed management, water recycling, wetlands creation, public involvement and resource conservation.

It’s a holistic approach by which CWS puts the “One Water” vision into practice as well as any water agency in the United States. And it’s one that CEO Diane Taniguchi-Dennis fully embraces.

“As a utility, our pumps and pipes and plants are critical, and we need to keep them strong and operating well,” she says. “But we need to maintain our focus to protect public health and the environment throughout the Tualatin River Watershed. We all need to work together by leveraging science and technology with the power of Mother Nature, to find elegant water solutions.”

CWS is responsible for wastewater, stormwater and watershed restoration in Washington County, just outside Portland, Oregon. It is responsible for wastewater conveyance throughout its unincorporated areas and smaller cities. The larger cities maintain their own sewer lines and connect to the CWS system.

Facilities at Durham, Rock Creek, Forest Grove and Hillsboro treat a total of 66 mgd. The Durham and Rock Creek plants are advanced facilities, recovering the resources of energy, fertilizer and clean water. At both, phosphorus is removed in the PEARL process (Ostara Nutrient Recovery Technologies) and converted to a slow-release fertilizer sold as Clean Water Grow.

Other components in the wastewater are also treated as resources. Fats, oils and grease at the Durham facility are digested with biosolids to boost methane production. The two advanced facilities also use solar arrays to produce renewable energy.

Most of the clean water produced at the facilities is returned to the river, where it sustains ecological health and recreational value. Through its expanding reuse program, CWS also provided more than 64 million gallons of water for irrigation in 2020.

As new treatment capacity is needed, the CWS team expands incrementally. “We call it just-in-time capacity delivery,” says Taniguchi-Dennis. “It helps us manage costs. We don’t tie up financial capacity for long periods when it may not be needed.”

Of all the innovative projects CWS has spearheaded, the Fernhill natural treatment system is its showcase. Located at the Forest Grove Water Resource Recovery Facility in space that used to be sewage lagoons and parking lots, the area is now a birding area with wetlands, walking trails and viewing stands, demonstrating how water can be cleaned and returned beneficially to the environment.

The water garden was designed by renowned Japanese landscape architect Hoichi Kurisu, and Taniguchi-Dennis calls it an “ecological bridge to the river. We can show people why the decisions they make putting things down the drain really matter. It reflects our hopes for water and the environment in the future.”

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# In the Absence of Oxygen

AN ANAEROBIC WASTEWATER TREATMENT DEMONSTRATION PLANT MEETS CLEAN-WATER TARGETS AND PRODUCES MORE ENERGY THAN IT USES

By Steve Lund

A demonstration project by Silicon Valley Clean Water with Stanford University researchers shows that anaerobic secondary treatment of wastewater can be effective and more efficient than traditional aerobic processes.

Anaerobic treatment has several sustainability advantages, including lower power consumption, reduced biosolids volume and a smaller footprint. The process also produces biogas similar to anaerobic digesters at traditional plants.

The project was funded by a grant from the California Energy Commission and contributions from utility, industry and academic partners. The project is led by Silicon Valley Clean Water, which operates a large wastewater treatment plant in Redwood City. Next to the main plant, a team including Stanford's Codiga Resource Recovery Center built a 24,000 gpd anaerobic plant, which receives primary-treated wastewater.

## TWO STAGES

The demonstration plant is called a staged anaerobic fluidized-bed membrane bioreactor (SAF-MBR). The first stage is a 6-foot-square, 20-foot-tall fluidized bed reactor filled with granular activated carbon. The wastewater is pumped up through the carbon bed, which becomes a habitat for biofilm containing anaerobic bacteria.

The second stage is a membrane tank that uses Suez membranes with a porosity of 0.04 microns. In a traditional system, the membranes would be kept clean with charges of air. In this system, biogas collected from the first stage is used to prevent the membranes from fouling.

After several months of operation, the team was satisfied with the reductions in COD, says Sebastien Tilmans, Ph.D., PE, executive director of the Codiga Center. "The water going in is averaging close to 600 mg/L COD, but the effluent averages 30 mg/L," Tilmans says. "That's a 95% reduction in COD that is compliant with U.S. secondary effluent standards."

The effluent BOD was averaging 15 mg/L, TSS was about 1 mg/L. Biogas is collected from the fluidized bed and membrane tank. In the demonstration project, the gas was measured and then flared, but it could be used to fuel a combined heat and power process.

"Our numbers are showing that this system is actually net energy positive," Tilmans says. "The electricity you could generate from the biogas is greater than the power it takes to run the plant."

## REDUCED SOLIDS

The anaerobic treatment produces far lower biosolids volume than aerobic treatment because the anaerobic bacteria grow slowly and have to consume more organic material in order to reproduce. Tilmans estimates that the secondary biosolids volume is reduced by 90%.

The SAF-MBR demonstration plant provides secondary treatment to about 24,000 gpd of primary-treated wastewater. The fluidized bed is on the left; the membrane tank is on the right with the controls in the center.



"You still have your primary solids," he says, "but if you are close to eliminating the secondary solids, you are cutting down the total solids by 30-50%. It's a pretty large reduction in the number of trucks that would be leaving your facility. That's a big cost savings."

The bacteria that live on the biofilm in the fluidized bed are naturally occurring in wastewater but are slow-growing. To jump-start the process, the Stanford team seeded the fluidized bed with bacteria from a wastewater treatment plant at a winery and from the digesters at the Silicon Valley Clean Water plant.

Tilmans says the bacteria from the winery had especially good adhesion to the activated carbon.

"The advantage of the bacteria from the winery is they are already in a biofilm form to attach to the carbon," he says. "The advantage of the ones from the wastewater treatment plant is they are acclimated to the wastewater already flowing in that community. They are locals."

## ADDITIONAL ISSUES

Although the demonstration has been successful, some issues need to be addressed. For example, some biogas remains dissolved in the effluent leaving the membrane tanks. "We are testing efficient ways to extract the gas so we can use it," he says.

Another issue is nutrient removal. The SAF-MBR process doesn't remove phosphorus or nitrogen, so additional steps would be necessary, just as with a traditional plant. "We're starting to think about what the full treatment process would look like for plants that have nutrient limits in their permit," Tilmans says.

A third issue is water reuse, especially important in California. "We're thinking about what downstream treatment processes, including reverse osmosis and advanced oxidation, that could take the water from our system to irrigation or drinking water quality."

One bonus with anaerobic treatment is that the bacteria appear more capable than aerobic bacteria to consume some chemicals of emerging con-



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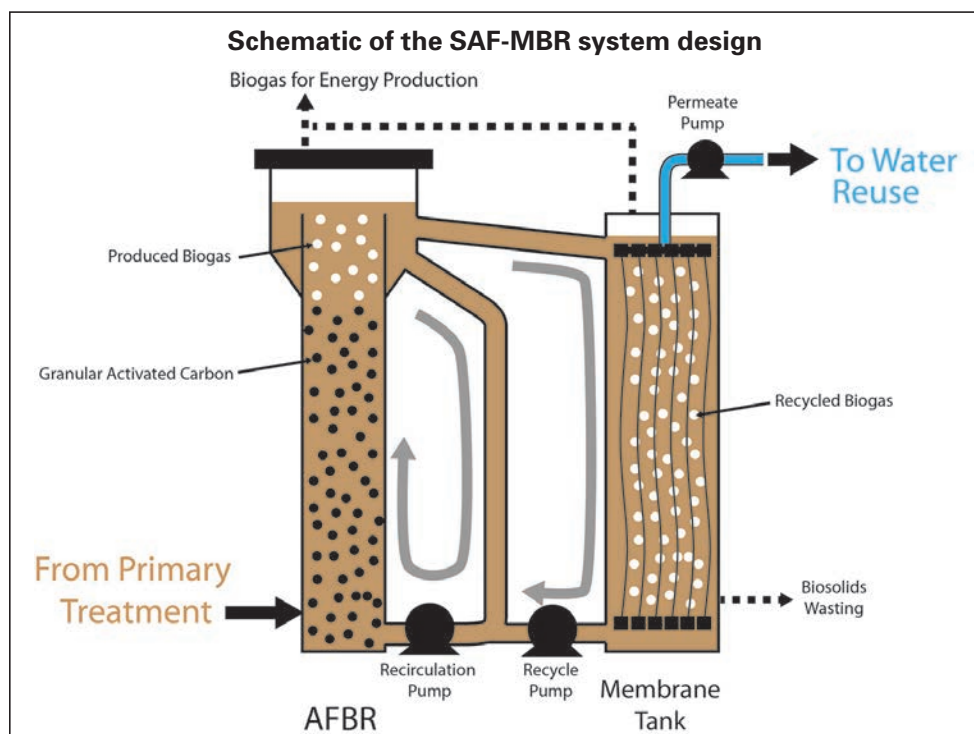


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cern, such as certain pharmaceuticals. Odor at the demonstration plant has not been a problem because the entire process is sealed.

### MAKING IT BIGGER

There are several ways to scale up the technology. “One way to envision scale-up is simply to multiply the reactor,” says Tilmans. “The current system

processes 24,000 gpd; a 240,000 gpd system would use 10 of these reactors in parallel, or one reactor 60 by 6 feet and 20 feet tall.

“Ideally, we would build the reactors taller, which would reduce the footprint.”

Tilmans says that for many years, effective anaerobic treatment was considered impossible.

“Because anaerobic organisms grow more slowly, and because they don’t settle well, it was traditionally considered impossible to achieve the high solids retention times necessary to grow the organisms and achieve low effluent organic concentrations.

The advent of membranes, along with the innovation of using the granular activated carbon as biofilm media, enabled us to overcome that challenge, achieving long solids retention times without provoking excessive fouling of the membranes.”

The total hydraulic retention time for the SAF-MBR systems, including the membrane tank, is less than six hours. “This would mean the treatment process would happen in a footprint competitive with typical aerobic activated sludge systems,” Tilmans says.

“However, the lower biosolids production means the biosolids handling footprint could be reduced by 30 to 50%, and dual-media filtration facilities could be eliminated because of the membrane filtration achieved within the system.”

The bottom line is that anaerobic secondary treatment is a potential option for wastewater treatment plants. “We thought we knew that it was impossible,” says Tilmans. “But it turns out that it’s very possible.” *tpo*





“We knew it was important that we set a good example by making these modifications for the festival.”

JESSICA STAHELI

Activities at the Central Iron water festival included water balloon fights and a water slide converted to a foam slide.

# Leading by Example

CONSERVING WATER WAS PRIORITY AT A POPULAR UTAH WATER FESTIVAL AS THE AREA CONTENDED WITH SEVERE AND PERSISTENT DROUGHT CONDITIONS

By Sandra Buettner

**A** Utah utility resumed its popular water festival in June 2021 after skipping a year due to the COVID-19 pandemic — with a special twist on water conservation. The festival returned at a time when the service area was seeing the worst drought in almost 125 years.

The festival events themselves were adjusted to reduce water usage. The fire department’s water slide became a foam slide; water balloon fights were replaced by other games and activities. “We knew it was important that we set a good example by making these modifications for the festival,” notes Jessica Staheli, public outreach and conservation manager.”

The Central Iron County Water Conservancy District sponsors the event, now in its sixth year, with Southwest Plumbing Supply.

The drought has also led the district to ramp up education to involve residents in conserving water in their homes, as the community is growing while the regional water diminishes. The district, in Utah’s Southwest corner near the Great Basin Desert, provides water to about 1,300 homes in a 1,500-square-mile service area in Cedar Valley of Iron County. It is charged with conserving, developing and stabilizing the Cedar Valley aquifer, its water source.

## GETTING CREATIVE

The return of the water festival gave the district a chance to introduce attendees to its new regional drought information campaign, “Get to Know

Your H<sub>2</sub>O,” and to engage the community in conserving water. The campaign asks residents to help in three ways:

- Watering landscapes only after dark
- Fixing leaks in the homes
- Shortening showers

A booth at the festival introduced the campaign, which was also promoted in newsletters, flyers, social media and news releases. The campaign includes short videos narrated by a professor about the urgency of the situation and how the community can help.

To further educate attendees, separate booths gave information on water conservation, water reuse and recharge, and the importing of water. Besides asking residents to conserve, the district set an example by modifying some festival activities.

## FAMILY FUN

Truly a family affair, the festival draws good crowds every year, typically about 2,000 attendees of all ages. To help make it work, about 10 college students and youth from the community volunteer to support 10 district staff members. The event is held at the Main Street Park in Cedar City, from 10 a.m. to 2 p.m.

In addition to the district’s tents, booths from festival sponsors and vendors included information and demonstrations on water-efficient products,



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A bouncy house was a popular attraction at the Central Iron festival.

irrigation and landscape equipment, consulting and professional services, and software and technology.

There were also food booths, including free hot dogs and water. There were plenty of games and activities for children, including a bouncy house, beach volleyball, treats and on-site music and giveaways from the local radio station.

Last year when the event was canceled, the district held a contest for kids, promoted through social media and the website. The children received a goody bag with toys including a squirt gun and other items as a reward for entering.

In 2021 the festival included a contest for attendees. People had to attend to qualify, and the prizes included a cooler and lawn games for families. "Feedback is always positive," Staheli says. "Residents comment how much they enjoy the festival. A lot of people return every year and spread the word about how much fun it is for their children, and what they learn." **tpo**



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# Guiding the Process

AMANDA TOBIN AND HER LABORATORY TEAM PLAYED A KEY ROLE IN THE UPGRADE AND EXPANSION OF THE CHAMBERS CREEK REGIONAL WASTEWATER TREATMENT PLANT

STORY: **Steve Lund** | PHOTOGRAPHY: **Stephen Brashear**

“Once you get into wastewater, you don’t leave.”

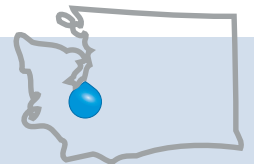
That’s Amanda Tobin’s observation after nearly 18 years in laboratories, 16 of them devoted to wastewater. “It’s a live biomass, so it’s never the same from day to day,” Tobin says. “You’re constantly learning, and things are always adapting and evolving. It’s always keeping you on your toes. There are always things to learn.”

Tobin, a laboratory analyst for the Chambers Creek Regional Wastewater Treatment Plant in Pierce County, Washington, received the 2020 Laboratory Analyst Excellence Award from the Pacific Northwest Clean Water Association.

Tobin always expected to work in a lab. She enjoyed all the science and math classes she took in high school and majored in chemistry at the University of Washington. After graduation, she took a job with a private laboratory in Kitsap County, where she grew up.

“We tested drinking water, environmental water and did some soils and solids testing,” she says. “We did some

Amanda Tobin  
Pierce County, Washington



POSITION:  
**Laboratory Analyst, Chambers Creek Regional Wastewater Treatment Plant**

EDUCATION:  
**Bachelor’s degree, chemistry, University of Washington**

EXPERIENCE:  
**18 years in laboratories**

DUTIES:  
**Oversees testing, monitor trends, direct quality assurance/control, prepares discharge monitoring reports**

MEMBERSHIPS:  
**Pacific Northwest Clean Water Association**

Amanda Tobin, laboratory analyst, Chambers Creek Regional Wastewater Treatment Plant



“With wastewater you tend to make your career of it. You tend to see people stick with wastewater a long time.”

AMANDA TOBIN

nutrient analysis for some smaller treatment plants, and that introduced me to the wastewater side of things.”

After a couple years with the private lab, Tobin took a lab job at the wastewater treatment plant in Kitsap County, and she has been in wastewater ever since. “With wastewater you tend to make your career of it,” she says. “You tend to see people stick with wastewater a long time.”

So far, that’s fine with her. She signed on as a lab technician at Chambers Creek in Tacoma in 2015 and was promoted to analyst about a year later. “I’ve been fortunate to work with excellent folks who have been willing to teach me throughout my career,” she says. “My supervisor, the operations staff, the maintenance staff and engineers have all helped me in one way or another to learn the treatment processes here.”

## PLANT UPGRADE

When Tobin arrived at the Chambers Creek plant, it was undergoing a significant upgrade and expansion. The plant serves a population of about 290,000; design flow is 44.3 mgd. The lab was intimately involved in the upgrade, testing and retesting of new processes so the operators could optimize performance.

“There were quite a few new processes brought online, and the lab did a lot of the in-house analysis for the startups,” Tobin says. “When each process would come online, we would take samples and analyze them just to see how the process was working, analyzing what goes in and what comes out, and seeing how the process was optimized.”

One change was from gravity belt thickeners to rotary drum thickeners to feed solids to the anaerobic digesters; it was one of the first of the changes to go online. “We would analyze the solids going into the RDTs and the solids coming out to ensure that the polymer was being optimized to get the desired thickness for the digesters,” she says.

“We continue to do those tests. Those results go to operations, and operations makes adjustments as they deem fit. The lab doesn’t do the tweaking. We just report the results.”

## UNDERSTANDING THE NUMBERS

Tobin’s team includes supervisor River Wan and technicians Marissa Waltz, Earnest Lockett and Sonia Hernandez. They keep up with changes



Tobin, shown counting filaments, received the 2020 Laboratory Analyst Excellence Award from the Pacific Northwest Clean Water Association.



The Chambers Creek Regional Wastewater Treatment Plant (44.3 mgd design) serves a population of about 290,000.





Amanda Tobin appreciates the training provided by professional organizations, such as the Pacific Northwest Clean Water Association.

“We encourage everyone to learn the process, so they understand what their numbers mean.”

AMANDA TOBIN

“There are a lot of new, up-and-coming ways of doing things,” she says. “There are always things to read about, to learn about and see what’s out there. It’s fascinating what people come up with and what companies come up with.”

Some treatment processes and techniques at Chambers Creek weren’t typical when Tobin started working in wastewater. The plant has side-stream treatment now, for example, to treat separately the high-strength wastewater that comes off the dewatering process.

“Water that comes off the centrifuge is high in ammonia,” she

says. “You can try to reduce that first before you introduce that into the main stream. It’s like a mini-treatment plant within the treatment plant. We test that for ammonia and alkalinity.”

But the tests themselves haven’t changed that much: “There have not been a whole lot of changes in laboratories as to how you analyze things,” she says. “We still do BOD and TSS tests the same way we always did.”

Tobin appreciates the training provided by professional organizations such as the Pacific Northwest Clean Water Association. She took part in more of them than usual in the past year because the virtual workshops were easy to attend. She misses the plant tours that were part of training workshops before the pandemic.

Her role has her working at a computer much of the time. The plant uses Hach WIMS (Water Information Management Solution) software, and Tobin is charged with analyzing the data, making sure the results are within quality assurance and quality control parameters, and creating dashboards for

something completely different: sewing. She started by making masks, which at the start of the pandemic were in short supply.

## TEAM EFFORT

“I made them for staff who needed or wanted them,” she says. She progressed to making quilts in a short time: “I had an old sewing machine from my grandmother. That’s how it started. I originally learned how to sew in order to make masks, and it just snowballed into quilting.”

Tobin’s sewing and quilting instructor was one of her early mentors, Nancy Parrott, who was the supervisor at the first laboratory where Tobin worked after college. Parrott is retired, but the two stay in touch, and they did sewing lessons virtually during the pandemic.

“We would FaceTime from each other’s houses,” Tobin says. “I still have a lot to learn.”

Although she enjoys sewing and has made quilts worthy of gift-giving, she was glad to get back to the archery range and to Seahawks games.

Although she enjoys sewing and has made quilts worthy of gift-giving, she was glad to get back to the archery range and to Seahawks games.

Although she enjoys sewing and has made quilts worthy of gift-giving, she was glad to get back to the archery range and to Seahawks games.

## A NEW HOBBY

During the COVID-19 pandemic, Amanda Tobin and colleagues in the lab at the Chambers Creek Regional Wastewater Treatment Plant were considered essential workers.

Work went on as usual, although Tobin, her supervisor and four technicians worked remotely half the time. They split into two teams, each working one week on site and one week remotely. Those working on site wore masks. All the work shifted back on site last April.

But it was a different story for many recreational activities. One of Tobin’s hobbies, recurve archery, almost completely stopped. Tobin took up archery after seeing it in the Olympics several years ago. She practices at a range and has entered several tournaments, including a large one in Las Vegas, but indoor archery was mostly on hold for more than a year.

Tobin is also a Seattle Seahawks season ticket holder; the games were played without fans during 2020. So Tobin took up



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The Chambers Creek Regional Wastewater Treatment Plant laboratory staff includes, from left, Melissa Didier, pretreatment technician; River Wan, laboratory supervisor; Amanda Tobin, laboratory analyst; and Marissa Waltz, pretreatment technician.

the system. She creates forms and reports for process control and regulatory compliance as well as monthly, quarterly and annual reports.

A good day in the lab, she says, is when the samples and tests come in with good quality control and in a timely fashion, and the results go out to the operators so they can optimize the process and ensure permit compliance.

“A good day is when everything runs smooth and you feel like you’ve made a good contribution to the team effort, which is what we have here at Pierce County.” **tpo**

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# PFAS – An Innovative Treatment

AQUEOUS ELECTROSTATIC CONCENTRATOR IS DESIGNED TO REMOVE “FOREVER CHEMICALS” FROM STREAMS INCLUDING WASTEWATER, GROUNDWATER AND SURFACE WATER

By Ted J. Rulseh

**P**FAAS, sometimes called forever chemicals because of their persistence, have gained attention as pollutants of significant concern.

Drinking water and wastewater agencies have been searching for cost-effective treatments for PFAS. Solutions that have been explored include reverse osmosis, adsorption with granular activated carbon, and ion exchange.

Now BioLargo, a company that specializes in innovative technologies for solving challenging environmental problems, has introduced an Aqueous Electrostatic Concentrator (AEC) for PFAS removal.

The company says the device can remove more than 99% of PFAS from wastewater, groundwater or surface water in a single pass with short contact time. It selectively targets and removes PFAS compounds with minimal disruption to the base water chemistry.

The modular, compact unit takes advantage of the polar behavior of PFAS molecules to optimize removal while minimizing waste.

The system collects and retains the PFAS compounds; after an extended operating life, modules are exchanged through a service that handles disposal of PFAS-laden waste. Dennis Calvert, CEO of BioLargo, Tonya Chandler, director of strategic marketing, talked about the technology in an interview with *Treatment Plant Operator*.

**tpo:** What qualifications does your company have for addressing PFAS in water and wastewater systems?

**Calvert:** Our technical group that has a track record of 30 or 40 years attacking problems around the world. Members of our engineering team in previous positions led one of the world's largest dioxin remediation projects, organized the pumping out of New Orleans post-Katrina, and provided technical support to the U.S. Postal Service for addressing anthrax threats at the post office. We also spent years developing an advanced oxidation process for the water industry. So it was a natural extension to say we know what to do with PFAS.

**tpo:** How did your team go about developing the technology?

**Calvert:** About two years ago our engineers came up with an idea for isolating and concentrating PFAS. At the core, it's the selectivity that makes the process unique. We're able to highly concentrate and extract PFAS compounds from a stream of water, and also from soil, such as at military bases. We got a U.S. EPA grant that allowed us to dedicate budget to the project. After that we decided to finance the balance with our own funds.

**tpo:** Where does this technology stand in terms of commercial availability?

**Calvert:** We're now doing commercial trials with some of the largest customers in the industry, including the federal government. We're also doing work with the Orange County Water District in California, commonly

thought of as one of the world's leading innovators. We have a number of clients working through our early-stage testing program, and we're preparing to introduce our first units into the field.

**tpo:** In simple terms, how does the AEC process work?

**Calvert:** The technology uses an electrochemical field. Water passes through the field, and with that configuration we're able to migrate the charged PFAS molecules to their opposite charge. As we migrate them in a flow of water, we take them across a membrane. As they touch the membrane they attach, in sort of the way flypaper would capture a fly. While concept is very simple, the implementation is extraordinarily complex because there are many variables: power, flow rate, materials, washing, extracting, replacing.

**tpo:** Is the AEC technology useful for other applications as well?

**Chandler:** It can be used for chlorine removal and some metals removal, but the innovation was designed for PFAS; we found along the way that it can be used for other purposes.

**tpo:** How do you separate PFAS from the many charged particles in a water stream?

**Tonya:** That is the proprietary aspect of the process. However, as we put the water through an electrical charge, we do end up with an anion stream and a cation stream. Because the PFAS has been removed from the anion stream, we can blend that back to whatever chemistry the customer needs. For example, if they need to remove chlorides, we can blend the water back in at a rate that will get them below their chloride limit.

“By selective extraction, we can concentrate PFAS across a very small footprint of membrane that is easily replaced in a cartridge system.” DENNIS CALVERT

**tpo:** Does the process require customizing or calibration for the specific source water?

**Calvert:** There is always the variable of the water itself. We developed a testing program so that before we got too deep into the cycle we run some preliminary screens.

**tpo:** How would you summarize the advantages of the AEC technology?

**Calvert:** Fundamentally, we see it as a lower-cost alternative, especially on the maintenance side. Replacement and disposal are big cost centers for the current menu of solutions. Second, our process is available for use across a broad range of waters.



“Fundamentally, we see [AEC] as a lower-cost alternative, especially on the maintenance side.” **DENNIS CALVERT**

**Chandler:** It can be used on wastewater, and there are not a lot of solutions available that can remove PFAS from wastewater cost-effectively. For example, activated carbon has been the go-to option, but putting activated carbon on a secondary wastewater stream uses up the carbon very rapidly.

**tpo:** What is the specific advantage on the waste disposal side?

**Calvert:** By selective extraction, we can concentrate PFAS across a very small footprint of membrane that is easily replaced in a cartridge system. We handle the waste product for the client, and it is a very small amount as compared to what could be truckloads of spent activated carbon. The regulatory environment is narrowing in on PFAS and will continue to for some time. The disposal of truckloads of carbon laden with PFAS is highly problematic.

**tpo:** Are any technologies available for destruction of PFAS?

**Calvert:** We are working on some breakdown technologies that are not yet ready for prime time. We understand from our experience with dioxin in the 1970s what it takes to break those strong carbon bonds. That's an area of keen interest for us. But because the regulatory noose is tightening, what's most critical is to get the PFAS out of the water first rather than wait around for a destructive technology.

**tpo:** How does your testing program operate?

**Chandler:** First, for a small fee the customer can send a sample of about five gallons that we will test to determine what the best treatment path is. If that for some reason our process is not effective, we'll move on to other technologies or combinations of technologies to find the best solution for them. At the end the customer receives a report.

**tpo:** What happens if the customer wants to explore further?

**Chandler:** The next step is on-site testing, during which we credit back the cost of the first test. We set up parameters with them, such as how long we will be there and who will operate the pilot system. We then perform test and give them another report. If they choose to go to a full-scale system, we'll credit the cost of the on-site pilot test.

**tpo:** What specifically can you offer if the AEC process itself does not prove to be an optimum solution?

**Chandler:** We may look at adding in, for example, a nanofiltration process or some sort of carbon treatment. We are willing to pair our technology with others if that is what it takes.

**Calvert:** In some situations a client may want only 50% or 70% PFAS reduction. That does two things. It reduces power consumption, and it increases flow rate. So that calibration can be optimized to meet the customer's specific requirement.

**tpo:** How do you handle the maintenance side of the customer relationship?

**Chandler:** Once they received a full-scale process, we offer a maintenance contract that includes a service exchange on the membrane modules. We monitor the system, and when we see that a module is close to end of life, we exchange it and dispose of the PFAS-laden material. **tpo**

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# Getting the Lead Out

AS THE THREAT POSED BY LEAD IN DRINKING WATER DRAWS MORE ATTENTION IN MICHIGAN, AN AWWA EXPERT DISCUSSES PROGRESS TOWARD REMOVING THE DANGER

By Ted J. Rulseh

**T**he problem of lead in drinking water came into the spotlight with the crisis in Flint, Michigan, in 2016. It resurfaced late last year in Benton Harbor, Michigan, as residents complained loudly about persistently high lead levels in water from some home taps.

But concern about lead in drinking water goes back much farther. The hazards of lead have been known for decades. It is highly toxic, especially for young children, and is linked to problems such as central and peripheral nervous system damage, learning disabilities, shorter stature, impaired hearing, and impaired formation and function of blood cells.

This is why, long ago, lead was removed from paint, gasoline and plumbing materials in contact with water. Still, legacy plumbing materials, including lead service lines in some communities, continue to release lead into drinking water.

Community water systems, the U.S. EPA, the American Water Works Association, and other entities have been working on the lead problem for a number of years, starting long before the crisis in Flint hit the news wires. They have made significant progress, but more work needs to be done, and the problem is not as simple as it may appear.

The Infrastructure Investment and Jobs Act signed by President Biden last November provides substantial funding to improve drinking water systems, and it includes \$15 billion for replacement of lead service lines. Steve Via, director of federal relations for AWWA, talked about progress on lead abatement in an interview with *Treatment Plant Operator*.

**tpo: For how long has lead in drinking water been a concern?**

**Via:** We have been managing lead in water for many years. In 1986 there was a ban on new installations of lead piping. The first EPA Lead and Copper Rule was finalized in 1991; corrosion-control measures taken after that significantly reduced lead at customers' taps. In the early 2000s, the focus shifted to maintaining reliable corrosion control while improving treatment for other contaminants of concern, such as disinfection byproducts. In 2012 an EPA report set the stage for an emphasis on replacement of all lead pipe between the water main and interior plumbing. In 2014 the Reduction of Lead in Drinking Water Act took effect, further reducing the potential for alloys like brass to release lead into drinking water. In 2015 a National Drinking Water Advisory Council Work Group Report recommended changes to the existing Lead and Copper Rule.

**tpo: Who has been involved in working to reduce lead in drinking water?**

**Via:** Water utilities have been working on it, as have AWWA, the Lead Service Line Replacement Collaborative, the EPA, state agencies, the National Rural Water Association, the Rural Community Assistance Partnership, and

others. All are distributing information to help water systems move forward. But many states are not providing clear direction. An important area where clarity is needed is the definition of lead service lines.

**tpo: In what ways has that definition changed?**

**Via:** When we started the conversation around lead service lines, we focused on the portions of lines that were within utility ownership. Then we moved on to characterizing the entire service line, including the portion on the customer side. Because there are cases where galvanized pipe can absorb lead and subsequently release it, the definition was expanded to galvanized pipe where there is or may have been lead pipe upstream. Some also recommend that lead connectors be included in lead service line inventories and figure in line replacement requirements.

**tpo: What are the practical implications of these changes?**

**Via:** A number of utilities that had a good handle on their lead service lines will find that universe expanded with the inclusion of galvanized pipe requiring replacement, and potentially lead connectors, depending on how the EPA finalizes the current revisions to the Lead and Copper Rule, and how the states proceed. The number of pipes that are characterized as



Steve Via

“Water systems that have not already done so should prepare their lead service line inventories regardless what the Lead and Copper Rule Revisions entail.”

STEVE VIA

being of uncertain lead material is going to be larger. That has implications for public communication and the interactions that are required under the Lead and Copper Rule Revisions.

**tpo: When do you expect the latest Lead and Copper Rule revisions to take effect?**

**Via:** The revised rule provisions were to become effective on Dec. 16, 2021, and initial compliance dates begin on Oct. 16, 2024.

**tpo: How does AWWA recommend that water systems proceed now to address lead in drinking water and to comply with the revised rule?**

“How can we do more with lead service line replacement? Because we’ve done so much already, those next steps are expensive, and they’re harder.”

STEVE VIA

**Via:** Water systems that have not already done so should prepare their lead service line inventories regardless what the Lead and Copper Rule Revisions entail. Now would also be a good time, if they haven’t already done so, to make sure they understand their corrosion control practice fully and, if need be, further evaluate their practices and establish protocols to track performance.

**tpo: What is involved in corrosion control?**

**Via:** Corrosion control is specific to each water system’s combination of source water quality, treatment, distribution system conditions, and installed plumbing materials. Many water systems rely on multiple water sources. Corrosion control often consists of modifying pH or alkalinity; water systems can employ orthophosphate as a corrosion inhibitor. It’s also necessary to maintain water quality in the distribution system, so systems need to consider water age and blending. Controlling corrosivity must take place while also managing disinfection and formation of disinfection byproducts. Systems also need to consider pipe materials in distribution systems in addition to lead and copper. The new rule requirements will mean that many more smaller systems in addition to larger systems will need to focus on corrosion control.

**tpo: How will compliance procedures change under the revised Lead and Copper Rule?**

**Via:** Observed lead levels will be changed by under new sample locations and sampling protocol. The revisions include a revised set of sample site tiers that includes galvanized service lines preceded by lead pipe or a lead connector. These and other changes will increase the probability that system with lead service lines or galvanized lines preceded by lead will exceed either the lead action level or a new trigger level.

**tpo: How would you describe the trigger and action levels?**

**Via:** The Lead and Copper Rule historically had an action level where if the lead level in the 90th percentile of samples exceeded 15 micrograms per liter, a utility had to begin public education, begin service line replacement, re-evaluate corrosion control practices, and based on that study, possibly revise what they’re doing for corrosion control. The revised rule adds a trigger level of 10 micrograms per liter that, for larger systems in particular, forces re-evaluation of treatment and corrosion control. A lead action level notice will require a Tier 1 public notice to the affected community with 24 hours. The revised rule limits successful lead service line replacement to full-replacements, increases the speed with which lead service line replacement must be initiated, and extends the minimum duration over which lead service line replacement must be conducted.

**tpo: Does the revised rule extend beyond residential drinking water?**

**Via:** The revised rule includes a requirement for community water systems to conduct sampling for lead in child care facilities and elementary schools. Schools are large institutional structures with a lot of outlets and potential for water quality changes inside the building. The sampling is to help schools understand their plumbing and take steps to care for water quality in the building. The rule would require water systems to take a sample from each elementary school, and from licensed child-care facilities.

**tpo: What is AWWA doing to further abatement of lead in drinking water?**

**Via:** We have been active in promoting the federal infrastructure funding package. A broad coalition has been working on that, and we have been one of the players. We’ve been encouraging research to support corrosion control and lead service line identification. Also, partners including the Water Research Foundation have done a great job of producing materials to help water systems prepare for the Lead and Copper Rule revisions. One area where we’ve been working is to develop more robust corrosion control training offerings. Corrosion control, lead service line inventory, lead risk communication, and outreach to schools and child care facilities have all been a focus of our webinars, conferences and training modules.

**tpo: What is the Lead Service Line Replacement Collaborative?**

**Via:** It’s a broad coalition of stakeholders that includes associations representing water systems, state agencies, the public health community, community action organizations, and others. All are contributing to a website on how to move lead service line replacement forward on a community level. The collaborative hopes helps communities that want to proactively identify where lead service lines, build lead service line inventories, and replace those lines.

**tpo: Are actions being taken at the state and local levels as well?**

**Via:** AWWA has state sections that have been offering materials related to corrosion control and lead service line replacement. All have been providing content on the core elements of the Lead and Copper Rule Revisions that are relevant to the states they serve, and are fostering conversations with water systems about next steps. They are also helping water systems stay on top of state-specific requirements and deadlines.

**tpo: What makes abatement of lead in drinking water so challenging?**

**Via:** If you look at a population-weighted level of lead in drinking at the tap, those numbers are quite low; we’re talking less than 2.74 µg/L. Now we’re asking ourselves: What is the next step? How can we do more with lead service line replacement? Because we’ve done so much already, those next steps are expensive, and they’re harder. Everyone agrees that we want to remove sources of lead from contact with water, like lead service lines but removing each one of them costs thousands of dollars.

**tpo: Can the new infrastructure funding help in this area?**

**Via:** Lead service line replacement is an expense for homeowners, either individually or as rate payers. It’s something water systems can most readily address when engaged in water main replacement or rehabilitation as part of an ongoing program. Unfortunately, many water systems are either prohibited from or find it very difficult under local and state policy to fund spend public money to improve private property. Replacing all lead service lines completely is the goal, but requires coordination and support of property owners. That’s where the infrastructure funding is going to come in handy. We hope the federal funds will help make it easier for communities to replace lead service lines completely and to do so more rapidly. **tpo**



## Franklin Electric names new business unit directors

Franklin Electric announced personnel moves and additions within its water systems sales team. Travis Bradley has been promoted to business unit director of industrial and engineered systems. Filling Bradley's previous position, Andrew Schwarze has joined the organization as business unit director of groundwater distributors. Both will be responsible for directing Franklin Electric's product development, sales and support efforts throughout the United States and Canada.



Travis  
Bradley



Andrew  
Schwarze

## Watson-Marlow begins building new U.S. manufacturing facility

Watson-Marlow started construction on a new manufacturing facility in the United States, with first production due in late 2022. The new facility will be dedicated to its range of products, including peristaltic pumps, tubing, fluid path solutions and BioPure components.

## Kaeser offers new rental blower program

Kaeser announced a new rental blower program. Designed for such instances as when a unit needs to be taken offline for service without compromising operations, meeting a temporary surge, or wanting to try out new blower technology without spending capital, a portable rotary screw blower can be rented from Kaeser. Available in three sizes with oil-free flows ranging from 200 to 2,309 cfm, the variable-speed rotary screw blowers are efficient and provide flexibility for a variety of low-pressure applications.

## Duperon wins MFG award

Duperon, based in Saginaw, Michigan, received recognition as a recipient of the 2021 MFG Innovation Excellence award, hosted by the Michigan Manufacturers Association. The awards are held annually to celebrate the exceptional contributions that Michigan manufacturers make to their workforce, their communities, the economy and the industry.

## Waldo named USALCO CCO

USALCO has appointed Terry Waldo as chief commercial officer. In this newly created CCO position, Waldo will direct the sales and marketing teams across USALCO, which recently merged with G2O Technologies.



Terry Waldo

## Grundfos joins 50L Home Coalition

Grundfos joined the 50L Home Coalition with the ambition to promote circular water in homes and cities. The 50L Home Coalition is a global action-oriented platform that unites leaders from the private, nonprofit and public sectors to address two global challenges: water security and climate change. Grundfos and the coalition will focus on making the reuse and recycling of water the norm in homes, which calls for smarter approaches that allow for water "fit-for-purpose" use.

## ResinTech starts U.S. production of nonsolvent resins

Camden, New Jersey-based ResinTech announced that it has begun commercial production of its flagship line of nonsolvent cation resin. Historically, the bulk of ion exchange resins were manufactured outside the U.S. using solvents like ethylene dichloride, a suspected carcinogen. The absence of the chemical from ResinTech's process helps reduce the public's exposure to the chemical. The resin factory is capable of manufacturing up to half a million cubic feet of the black cation every year in a variety of mesh sizes and crosslink ranges.

## Solential Energy bringing floatovoltaics to Midwest

Carmel, Indiana-based Solential Energy announced a strategic initiative to work with Ciel et Terre to bring floatovoltaics to the Midwest. Ciel et Terre's floatovoltaic racking systems — solar arrays designed and engineered to float on the surface of reservoirs and treatment lagoons — are already in use in California and Florida.

## Envirosuite executes MoU for partnership with Aeroqual

Envirosuite announced it has executed a Memorandum of Understanding for a strategic partnership with Aeroqual, a manufacturer of air quality monitoring technology. The MoU outlines a framework for the joint pursuit of global strategic opportunities between the companies' mining, waste, wastewater and industrial sectors. Headquartered in New Zealand, Aeroqual has offices in the U.S. and China and is represented by a global network of partners.

## Liberty Pumps holds groundbreaking at new center

Liberty Pumps hosted a groundbreaking celebration at the site of its materials center in Bergen, New York. State and local partners as well as Liberty employees attended the event. The 107,000-square-foot expansion will provide additional warehousing and added manufacturing space. It is anticipated to support 30 additional jobs at the family- and employee-owned manufacturer. This will be the third expansion for the company since 2000. Upon completion, Liberty will have approximately 350,000 square feet of facilities at its corporate campus in New York.



From left, Peter Cunningham, chief operating officer; David Williams, director of engineering; Randall Waldron, vice president of sales and marketing; Robyn Brookhart, president and CEO; Dennis Burke, chief financial officer; Don Cunningham, manufacturing manager; and Charlie Cook, chairman of the board.

## Endress+Hauser and ISA to offer extended training services

Endress+Hauser and the International Society of Automation, a nonprofit professional association for leaders in industrial automation, announced a collaboration for training and certification. ISA will provide select certified training courses in conjunction with Endress+Hauser's instrumentation training courses, with these courses offered onsite at Endress+Hauser's 11 process training units located across the U.S.

## Industrial Scientific welcomes new VP of product management

Industrial Scientific announced that Pronitha Shankarananda has joined the company as vice president of product management. She will be responsible for leading the Industrial Scientific product management and applications engineering teams while developing and executing the business and product strategy at a global scale. Shankarananda holds a Bachelor of Engineering from the National Institute of Technology in Karnataka, India, a Master of Business Administration from the University of Delhi, and a Master of Science in Management Studies from the Sloan School of Management at the Massachusetts Institute of Technology. **tpo**



Pronitha  
Shankarananda

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# Water Found Him

NATURAL COMMUNICATION SKILLS, HUNGER FOR KNOWLEDGE AND LOVE OF FIELDWORK CREATED THE FOUNDATION FOR GREGG RANDAHL'S REWARDING CAREER IN UTILITY MANAGEMENT

STORY: **Suzan Chin-Taylor** | PHOTOGRAPHY: **Brad Stauffer**



Gregg Randahl (left), shown with David Nusser, utility operator, was nominated by his peers for the 2020 Minnesota Section AWWA Meritorious Operator Award, which he received.

**G**regg Randahl's career of more than 30 years in the utility industry was purely accidental.

Randahl, assistant utility superintendent for the Bloomington (Minnesota) Water Utilities Division, wasn't looking to enter the water field. Instead, the career found him. It has been a great fit and an ideal way for a natural organizer and communicator to progress, improve and leave a strong legacy. Last October, Randahl retired to enjoy the fruits of his long career in service to the region, after mentoring his potential successors.

Randahl graduated from the University of Minnesota with a bachelor's degree in environmental studies and public health, so his migration into water made sense. After college, he began his career as a land surveyor and survey technician.

Then Bloomington, a Minneapolis-St. Paul suburb, offered him a position in records management and utility locating. Over the years that entry-level position blossomed into more technical duties and management of special projects.

Even in Minnesota's sometimes harsh climate, Randahl enjoyed working outdoors, so when the opportunity came for training to become a certified water and wastewater operator, he jumped at it.

### EXPERT COMMUNICATOR

Soon after earning his initial certifications, Randahl was responsible for customer service work, construction inspection, and coordinating with state and county agencies on various projects in Bloomington jurisdiction and the Twin Cities area.

“I encouraged members of my team to accompany me to meetings and neighboring community site visits to learn about various projects.”

**GREGG RANDAHL**

The utility recognized him as a naturally gifted communicator who would excel as a liaison to facilitate projects needing cooperation and logistics management across multiple agencies and jurisdictions. Randahl and teams he led have been responsible for projects including roadway drainage, water storage, water treatment and wastewater lift stations.

One high-profile project involved the expansion of Bloomington's water treatment plant, built in 1972. In 2001 the plant underwent an expansion to double its capacity; it now

processes 14 mgd using lime softening. The challenge was the plant's multimedia filtration system; four of the eight filters were original and had never been rehabilitated, and yet they had retained the same media.

The project involved removing all the media, constructing new underdrain systems with new media, and matching and installing new filters compatible with the older ones.

The utility serves some 87,000 residents with about 50 employees. Randahl manages 38 team members who include Randy Poore and Pat Conrad, water/wastewater utilities supervisors; Steve Roepke, water treatment utilities supervisor; and Deb Weltzin, water quality supervisor.



**Gregg Randahl**  
Bloomington, Minnesota

**POSITION:**  
Assistant utilities supervisor

**EXPERIENCE:**  
30+ years in the industry

**EDUCATION:**  
Bachelor's degree, environmental studies/public health, University of Minnesota

**CERTIFICATION:**  
Class A Water Supply System Operator, Class B Wastewater Collection

**MEMBERSHIP:**  
Minnesota Section AWWA

**GOAL:**  
Leave a strong legacy and build a sustainable system for the future



### CONNECTED HISTORY

Bloomington has a dual-source water system. An agreement to purchase water from Minneapolis began in 1960; that was the community's sole source until 1972, when its own treatment plant came online.

Minneapolis draws surface water from the Mississippi River and treats it with lime softening. Water at a designated pH and chlorine residual is delivered to Bloomington through two large-diameter pipelines. From there it is sent to several storage facilities at a pumping station.

The Bloomington treatment plant has six deep wells. Raw water enters treatment at 300 ppm hardness on average. The treatment process uses lime



Gregg Randahl (left), shown with utility operator Matt Feltes, has led teams responsible for projects including water storage, water treatment, and wastewater lift stations.

and calcium oxide softening processes with a polymer addition in upflow basins, along with re-carbonation to adjust pH. The water then goes through gravity filters, chlorination and fluoridation, and finally into 4 million-gallon clearwells to be pumped out for distribution.

By some standards the system is new, and Randahl noted that networking and tapping the knowledge of key mentors enabled him to operate the plant and manage his team.

“We regularly attended Minnesota Pollution Control Agency and Department of Health events and found those to be our best source of support and unity, learning that our problems were not that much different from other agencies,” he observes. “I encouraged members

of my team to accompany me to meetings and neighboring community sites to learn about various projects. These connections were invaluable for liaison work with other state and county agencies.”

Like many utilities, Bloomington faces the silver tsunami as engineers, senior operators and field people plan to retire in the near future. As an industry veteran, Randahl understood the importance of conveying to younger members the importance of water and wastewater services. “I found it’s really important to explain to your team members the significance of what we were asking them to do,” he says. “That includes how to be a liaison with the contractor on a water tank rehab.

“They need to learn that relationships with consulting engineers and vendors need not be adversarial, and the importance of making observations



“I found it’s really important to explain to your team members the significance of what we’re asking them to do.”

GREGG RANDAHL

and recording details, either handwritten or electronically. Any knowledge gained is for their benefit, as it will make them more valuable to the organization and knowledgeable resource for the entire group they work with.”

## STRONG MODEL

Over the years, Randahl developed a strong and sustainable model for project management, rehabilitation and preventive maintenance for the plant and distribution system. Because the system is relatively new, Bloomington has no issues with lead service lines. Most distribution lines are cast or ductile iron, and all service lines and connections are copper.

Randahl was strategically involved in the setup of Bloomington’s computerized maintenance management system (CMMS). The utility recently migrated to Asset Essentials (Dude Solutions), which handles database management, generates work orders, and communicates with workstation computers, tablets and other mobile field devices.

Hydrant inspections are performed in each spring and fall, and the utility has a comprehensive valve operation/exercise program (Wachs exercisers). All valves 12 inches and smaller are operated every other year; 16-inch and larger valves are operated every year. Water storage facilities have been placed on the regular AWWA recommended rotations of inspection, cleanout and rehabilitation.

Excellent record management and upkeep since the system’s inception helps staff members know the locations of all valves, enabling fast emergency response. All asset information is also integrated into ESRI ArcView GIS tools.

The Bloomington water treatment team includes, from left, David Nusser, utility operator; Steve Roepke, water plant supervisor; Bree Landherr, laboratory analyst; Carol Fearing, office support specialist; Clint Wilson, instrumentation technician; Gregg Randahl, assistant utilities supervisor; Matt Feltes, utility operator; Deb Weltzin, water quality supervisor; and Anthony Hallberg and Aaron Tschida, senior utility operators.





“We can all learn from each other, and learning is something we should never be satisfied with as being done.”

GREGG RANDAHL

### PERSONAL FAVORITES

All this data was of great benefit when Randahl was tasked to lead his team in developing a government-mandated vulnerability assessment and preparedness plan. In 2018 the American Water Infrastructure Act began requiring water utilities to perform a risk and resiliency assessment and to certify that they had a plan in place.

Bloomington was required to assess any credible natural threats along with intentional or unintentional human intervention that could create problems. From this grew a response action plan. The bulk of the information was kept confidential for security purposes. As part of the process Randahl had to dovetail his plan with the city's overall emergency response plans. The documentation began in 2004 and now comprises more than 300 pages.

Although he was involved in many special projects over his career, Randahl most enjoyed water storage tank rehabilitation projects. “I don’t know why they attracted me,” he says. “I guess I just enjoy taking something that had been well maintained and had provided a good service to the community, and rehabilitating it so that it could continue serving us.

“Water tanks are high-value assets, and replacement costs are astronomical, so taking action to keep them in service as long as possible is very gratifying.” Not surprisingly, Randahl noted that there wasn’t much about his work that he didn’t like: every task he and his team undertook helped support the health of the community.

### SWAN SONG

One change Randahl and his team made involved fire hydrant maintenance and a painting program. Bloomington has more than 4,500 hydrants, and the utility aims to paint 900 of them every year. “It is these little things that create community pride, and in a small way keep us in the public eye,” says Randahl.

“It’s important that people understand the work we do, and the value of water conservation, and what they’re putting down the drain, and to not use the toilet as a trash basket. Speaking to elementary students has been important, as that is a very good time in their lives for them to be made aware of how little things can make a big difference.”

### SILVER LINING

Operating its own testing lab, the Bloomington Water Utility derives healthy revenue providing lab services for businesses, such as well drillers and contractors.

Besides doing its own testing, the utility provides testing for other communities and submits required reports to the state Department of Health. When the COVID-19 pandemic mandated no contact, the staff quickly developed a work-around to continue providing service while keeping lab personnel and visitors safe.

They created a self-service drop-off for samples. At first, they were concerned that the service would not be readily accepted, but the opposite proved true: clients could drop off items for testing at all hours, not just standard operating hours.

An added benefit was that with fewer people entering the main facility, it was easier to clean and maintain. In addition, lab personnel no longer needed to stop work to take samples in. In light of that, the drop-off remained after the shutdown mandates were lifted.

Randahl looks out on a prairie restoration project established on acreage in front of the treatment plant he helps oversee. Behind him is an old windmill dating to the homestead that originally graced the site.



Randahl’s colleagues wanted to make sure all his years of dedication were recognized and so in 2020 his peers nominated him for the Minnesota Section AWWA Meritorious Operator Award, which he won.

As he planned to leave well-loved workplace and career to enjoy time with his family and play more golf, he worked diligently to set up essential future projects to be executed by his successors. One of these is rehabilitation of a large lift station in the middle of a residential community; it will involve delicate work and communication with the residents about what is being to improve the system that serves them.

“Those who will carry on the work will need to continue championing funding for infrastructure renewal and, more important, training of the future workforce,” Randahl says. “It will be vital to plant the seeds of interest for this industry in middle or secondary school systems and to share the great opportunities available for young operators.

“Equally important is establishing and maintaining rapport and communications with colleagues and with peers from other communities as well as contractors and consultants. We can all learn from each other, and learning is something we should never be satisfied with as being done. We need never be afraid to keep learning.” tpo

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The Wareham Water Pollution Control Facility is fed by 61 miles of gravity sewer pipe and 45 pump stations. It treats 1.56 mgd with biological nutrient removal.

# A Monster of a Solution

REGULATIONS, PUBLIC EDUCATION AND A GREASEZILLA SYSTEM HELP A MASSACHUSETTS TOWN GET A HANDLE ON FOG AND GENERATE REVENUE

By Brian Levine

As the Gateway to Cape Cod, the Massachusetts town of Wareham boasts 54 miles of coastline. Its family-friendly beaches combined restaurants and hotels attract a steady stream of tourists each year.

To preserve the local ecology and the health of the Agawam River, the Wareham Water Pollution Control Facility treats wastewater that arrives through 61 miles of gravity pipe and 45 pump stations.

Guy Campinha, director of the treatment facility, has spent the last decade working to keep the sewers clean and to improve the plant's operating efficiency. Since his arrival 2010, he has incorporated proactive measures and greener processes into the water and sewer infrastructure.

A primary focus of his attention has been to educate the public, business owners and town officials on the problems of fats, oils and grease (FOG) in the sewer system. As part of the remedy, Campinha has added a Greasezilla hydronic thermal FOG separation system which collects FOG waste and recycles it into reusable resources.

The system has helped reduce FOG-related blockages in the sewer system while creating a new source of revenue for the town.

## TROUBLE WITH FOG

Situated on 66 acres, the town's 1.56 mgd biological nutrient removal facility discharges effluent to the Agawam River. The facility operators face continual challenges of increased demand, seasonal flooding and aging pipes, along with occasional sewer blockages, some caused by FOG, that lead to backups and spills.

Nursing homes and medical centers, along with more than 125 restaurants in the Wareham area, generate substantial amounts of grease that can filter into the sewer system. FOG accumulating in the pipes severely reduced flow and caused recurring problems.

After a 2014 grease-induced sanitary sewer overflow that resulted in temporary beach closings, Campinha escalated his efforts to address FOG issues. He took a three-pronged approach: implement and enforce regulations, educate the public, and procure specialized equipment to improve FOG collection and disposal.

"If everyone did their part to keep FOG out of our sewer pipes, we could prolong the life and improve the efficiency of our infrastructure and treatment facility," Campinha says.

“Instead of just generating waste, we now decant and send the grease right to the Greasezilla as biofuel, saving us hundreds of thousands of dollars.”

GUY CAMPINHA

## APPLYING TECHNOLOGY

Campinha spearheaded efforts to educate the town and public about grease in the sewer system. He proposed new regulations requiring businesses that generate grease to clean their grease traps regularly and contract with professionals for maintenance and waste disposal.

He also led an informational meeting about grease in sewer pipes, showing video from a robotic camera that allowed attendees to see congealed FOG in the pipes for themselves.

Still, inevitably some FOG still gets through. So, in 2015, Campinha won approval from town officials to purchase the Greasezilla system; it was installed in fall of that year. Developed by Ron and Mary Crosier, the unit is a turnkey, standalone system that separates and processes FOG waste.

The system removes FOG from the grease trap waste stream, reducing

disposal costs and creating a new revenue source. It operates without dewatering, leaves nothing to be landfilled and has a total operating cost of 1-2 cents per gallon.

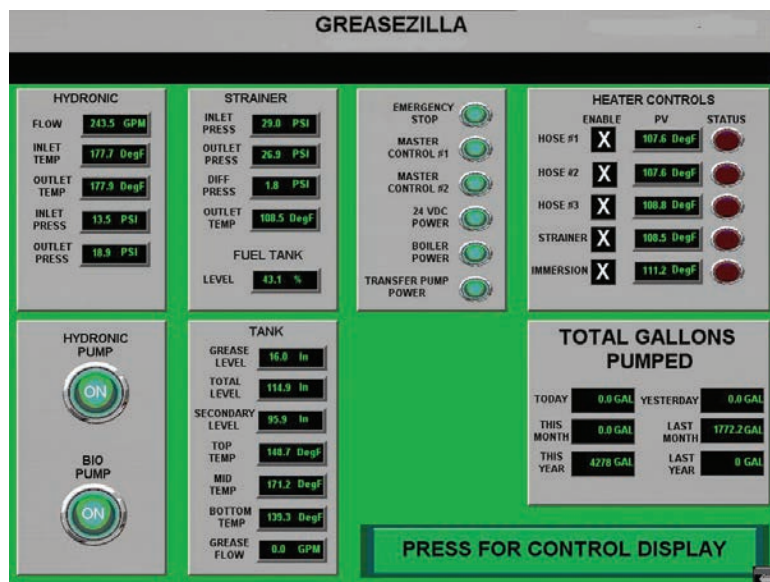
## PROFITABLE PRODUCTS

The system allows the Wareham facility to accept grease trap waste from haulers; it also treats grease skimmed from the treatment plant scum tanks and clarifiers. The FOG entering the system is heated and separated into three distinct layers:

- **Brown Grease**, about 10% of the finished process, is converted into an advanced biofuel, about 5% of which returns to fuel Greasezilla. The remaining 95% can be sold as fuel substitute on the commodities exchange. Its low moisture content (less than 1%) makes it an excellent feedstock for biodiesel conversion technologies.
- **Batter**, making up 5% percent of volume, can serve as a feedstock for anaerobic digesters. It can also be treated with traditional processes, composted or processed with the effluent water.
- **Residual pasteurized effluent water**, comprising 85% of the material and nearly free of suspended solids, can be safely returned to the headworks for standard treatment.



The Greasezilla unit removes FOG from the grease trap waste stream, reducing disposal costs and creating a new revenue source.



The Greasezilla system includes an intuitive and easy-to-use display screen.

Along with better enforcement and greater public awareness, the Greasezilla unit helped Wareham reduce grease-related blockages in the sewers and pump stations, enabling plant operators to focus on other critical issues.

## GENERATING REVENUE

"We regularly check all our systems, and our team members do a great job of minimizing breakdowns and maximizing the uptime and efficiency of all our equipment," says Campinha. "Greasezilla has taken a huge burden

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BEFORE



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and transformed it into an asset. Not only are we saving time and money by streamlining FOG disposal, but we're preventing blockages and backups. Greasezilla has become the backbone of our FOG mitigation program."

During its first year, the unit brought in some \$300,000 in grease disposal fees and now doubles that annually. Because the system can process millions of gallons each year, the town plant accepts grease trap waste from large event complexes across southern New England.

The growing worldwide demand for biofuel and biodiesel makes the town's advanced biofuel a valuable commodity. "For me, the biggest value is what we save on grease that used to be sent to the incinerator," Campinha observes.

"Instead of just generating waste, we now decant and send the grease right to the Greasezilla as biofuel, saving us hundreds of thousands of dollars. It's a more sustainable way of handling FOG, and it makes a huge impact on our bottom line."

Other facilities are following Campinha's lead. Notably, the Hampton Roads Sanitation District and Southwest Water are installing systems as part of facility upgrades.

"Everyone has a FOG problem, whether they know it or not," Campinha says. "It's part of everyday living. For those of us trying to provide safe and effective wastewater treatment, FOG can be a constant headache. We found a huge part of the solution in Greasezilla. The system has helped us make life better for the people of Wareham and our local ecosystem."

## ABOUT THE AUTHOR

Brian Levine is executive vice president of Downey Ridge Environmental. [tpo](http://tpo)

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# Biosolids Management and Headworks

By Craig Mandli



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## Biosolids Handling/Hauling/Disposal/Application

### BDP INDUSTRIES ROTARY DRUM THICKENER

The rotary drum thickener from BDP Industries is a suitable solution to thicken at water and wastewater treatment facilities. Internally baffled thickening zones lead to higher solids capture and higher throughput capability, all with reduced polymer usage. A full stainless steel construction with all bearings located outside of the enclosure makes operations and maintenance activities simple and easy. **518-796-1440; [www.bdpindustries.com](http://www.bdpindustries.com)**



Rotary drum thickener from BDP Industries



I-BOx Biological Odor Control System from Integrity Municipal Systems

### INTEGRITY MUNICIPAL SYSTEMS I-BOX BIOLOGICAL ODOR CONTROL SYSTEM

The I-BOx Biological Odor Control System from Integrity Municipal Systems is a standardized, pre-engineered, factory-assembled odor control system for treating odors at sewage pump stations and wastewater treatment plants. Pre-engineered systems are simple to install, reducing the overall installed cost and delivery time. It uses a two-stage process with a biological stage to remove 99% of the hydrogen sulfide, followed by an activated carbon polishing stage to remove residual hydrogen sulfide and organic odors. Standard models are available to treat up to 5,000 cfm of odorous air. **858-486-1620; [www.integrityms.net](http://www.integrityms.net)**

### JDV EQUIPMENT LEVEL LODOR

The Level Lodor from JDV Equipment provides water quality professionals a means to dispose of processed waste, control odors and limit waste exposure to operators. It uses auto-leveling technology to level the waste material. This increases the fill percentage of a dumpster without operator intervention, slide gates or extensive control strategies, while limiting exposure to potentially hazardous material and working conditions. Made for indoor or outdoor use, it can save valuable indoor square footage or eliminate the need for additional building space by installing the system outdoors. The covers are custom made to cover standard 20-, 30- and 40-yard dumpsters, with an overall footprint barely larger than a standard dumpster. The shaftless option uses replaceable ultra-high molecular weight liners that will reduce screw wear. The shafted option can be used for increased efficiency and has easily accessible grease points. **973-366-6556; [www.jdvequipment.com](http://www.jdvequipment.com)**



Level Lodor from JDV Equipment



Truck load-out stations from Jim Myers & Sons

### JIM MYERS & SONS BOTTOM-DISCHARGE TRUCK LOAD-OUT STATIONS

Bottom-discharge truck load-out stations from Jim Myers & Sons are typically loaded by conveyor, pump, or directly from dewatering equipment. These systems provide storage until biosolids can be discharged into transportation vehicles. Stations generally include a hopper and potentially additional conveyors

or pumps. The discharge rate of biosolids into trucks is controlled by a combination of one type of discharge method coupled with slide or knife gates. Systems are optimized to prevent plugging, bridging, and rat-holing; and in most cases, to evenly distribute material within the hopper to fully utilize available capacity. Engineers can provide assistance in sizing custom equipment for the application, taking into account angle of repose, material characteristics, and loading/discharge points of a given project. **704-554-8397; [www.jmsequipment.com](http://www.jmsequipment.com)**

## PAXXO LONGOPAC FILL

The Longopac Fill continuous bag system from Paxxo can connect to the discharge point of machines used to move, dewater or compact screenings, grit and biosolids. Material is then deposited in a 90-meter-long continuous bag for odor containment and spillage control. The cassette bag can be sealed with ease, and the material and odors are trapped inside, cutting down development of bacteria and fungus spores. **770-502-0055; [www.paxxo.com](http://www.paxxo.com)**



Longopac Fill continuous bag system from Paxxo

## Biosolids Heaters/Dryers/Thickeners



Electro-Osmosis Dehydrator from ELODE USA

### ELODE USA ELECTRO-OSMOSIS DEHYDRATOR

An Electro-Osmosis Dehydrator from ELODE USA can reduce can cut sludge disposal cost by 60% and landfill acceptable by having much drier sludge cake. This compact machine can easily retrofit in line with many existing presses. It doesn't use thermal heat

energy to pull water away from the sludge cake, instead using electrical potential difference to separate water to work on 95% of municipal biosolids cake. It is so efficient the sludge cake never gets too hot to the touch, all without any chemical, polymer, heat nor mechanical press. **201-568-7778; [www.elodeusa.com](http://www.elodeusa.com)**

## HURST BOILER EURO SERIES

The Euro Series from Hurst Boiler has a full wet-back radiant heat transfer area that promotes internal water circulation and rapid heat absorption. Separate rear tube sheets allow each pass of tubes to expand and contract at their own rate without tube-to-sheet stress. Tubes are mechanically rolled, flared and beaded, making any tube service a simple matter. The only refractory in this design is a rear plug, which allows easy access to the furnace for inspection. It is available in eight models from 100 to 2,000 bhp. It is designed for optimum fuel efficiency and has proven in certified tests to meet, and often exceed, the efficiencies of four-pass boilers. There are no refractory baffles to replace or maintain. **229-346-3545; [www.hurstboiler.com](http://www.hurstboiler.com)**



Euro Series boilers from Hurst Boiler

## HYDRO-THERMAL NOH

The NOH, or Non-Obstructing Heater from Hydro-Thermal, has a straight-tube design that allows for unrestricted flow, prevents pressure drop, and heats slurries without plugging or fouling. Its rugged design

and construction materials enable it to handle viscous slurries, particulate-filled products, abrasive/corrosive substances, stringy products and inline water heating abilities. It utilizes a smaller footprint, with direct installation into the existing system piping, and does not require special tools for maintenance. Utilizing a steam connection larger than the process connection, the max diffuser is sized to accommodate the full flow available from the steam piping. It ranges from 2 to 12 inches in size, with volume capabilities to 6,900 gpm. **800-952-0121; [www.hydro-thermal.com](http://www.hydro-thermal.com)**



NOH, or Non-Obstructing Heater from Hydro-Thermal

## Centrifuges/Separators

### FLOTTWEG SEPARATION TECHNOLOGY XELLETOR

Xellektor series separators from Flottweg Separation Technology include a rotor and scroll designed to reduce the consumption of polymer while also reducing energy consumption. Depending on biosolids quality, the centrifuge can save about 20% on energy while providing significantly better performance. It can increase throughput by up to 15%, reduce the volume of biosolids by as much as 10% and save up to 20% in energy and polymer consumption. **859-448-2331; [www.flottweg.com](http://www.flottweg.com)**



Xellektor series separators from Flottweg Separation Technology

## Chemical/Polymer Feeding Equipment



FLEXFLO dosing pumps from Blue-White Industries

### BLUE-WHITE INDUSTRIES FLEXFLO

FLEXFLO municipal peristaltic dosing pumps from Blue-White Industries are offered in three model sizes to accommodate a broad range of chemical feed requirements. They are engineered to be rugged and efficient with two CNC-machined rollers and two alignment rollers for optimum squeeze and tube life. The single-piece heavy-duty rotor means no flexing and increased accuracy, with no metal springs or hinges to corrode. The pump head cover is clear acrylic annealed for added strength and chemical resistance. No special tools are required for pump head cover removal during routine maintenance. They may be equipped with heavy-duty pump head tubing — Flex-A-Prene — available in multiple sizes and materials to meet a broad range of chemical compatibility requirements. **714-893-8529; [www.blue-white.com](http://www.blue-white.com)**

efficient with two CNC-machined rollers and two alignment rollers for optimum squeeze and tube life. The single-piece heavy-duty rotor means no flexing and increased accuracy, with no metal springs or hinges to corrode. The pump head cover is clear acrylic annealed for added strength and chemical resistance. No special tools are required for pump head cover removal during routine maintenance. They may be equipped with heavy-duty pump head tubing — Flex-A-Prene — available in multiple sizes and materials to meet a broad range of chemical compatibility requirements. **714-893-8529; [www.blue-white.com](http://www.blue-white.com)**

### FORCE FLOW TOTE BIN SCALE

The Tote Bin Scale from Force Flow allows plant operators to accurately monitor the amount of polymer being fed from IBC-type totes for dewatering. Simply place the tote on the platform and monitoring begins, as there is nothing to install inside the tote. Monitoring systems prevent costly overfeed conditions and enable



Tote Bin Scale from Force Flow



the documentation of the actual amount fed, which keeps the plant in compliance with federal and state reporting requirements. Users can remotely monitor from SCADA or PLC. The unit is available with the SOLO G2 digital display or with the advanced Wizard 4000 chemical inventory management system. **800-893-6723; [www.forceflow.com](http://www.forceflow.com)**

## OPERATORS UNLIMITED CUSTOM CHEMICAL FEED SYSTEMS

From wasted chemicals to permit violations, operational efficiency can be controlled and maximized through proper chemical dosing. Operators Unlimited designs custom chemical feed systems for all areas of the facility. Cooling towers, boiler water, process and solids all benefit from proper dosing. If a chemical feed system is improperly designed, the facility could face several issues including permit violations, increased operational costs, increased maintenance costs and additional labor costs. The plant could potentially overuse chemicals, thus contributing to safety issues, waste and create a system performance issue. An issue in performance can lead to more repairs and the need for replacement parts. As a result, the plant could suffer downtime with consequences for the entire manufacturing facility. Therefore, the design and implementation of a quality chemical feed system that releases the correct amount of chemicals for your exact wastewater treatment needs can be an essential component of a treatment facility. **864-228-1131; [www.operatorsunlimited.net](http://www.operatorsunlimited.net)**



**Chemical feed systems from Operators Unlimited**

## Composting Equipment



**1220-20 compost mixer from Roto-Mix**

### ROTO-MIX 1220-20

The Roto-Mix 1220-20 horizontal rotary compost mixer has a mixing capacity of 1220 cubic feet and can hold a maximum load of up to 36,000 pounds. It is designed

to thoroughly mix materials to ensure rapid decomposition to produce quality compost.

This rotary compost mixer, equipped with a GeneRation II Staggered Rotor Mixer, will uniformly blend materials in a tumbling action that does not pack material and helps introduce air into the mix. The rotor lifts the material past the wedging point of the lower side auger, resulting in an aerated mixture while lowering power requirements. Total movement of material in the mixing chamber eliminates dead spots that are common in conventional auger mixers. Optional conveyors allow for the discharge and distribution of mixed nutrients with microorganisms into static compost piles or windrows. It is available in truck or stationary units. This size of mixer works well with large volume composting operations. **620-225-1142; [www.rotomix.com](http://www.rotomix.com)**

## Dewatering Equipment

### AQUA-ZYME DISPOSAL SYSTEMS ADS

The ADS 30-yard open-top roll-off dewatering unit from AQUA-Zyme Disposal Systems can be filled with 22,000 to 25,000 gallons of biosolids at 1% to 2% solids in about two hours. After draining for 24 hours, the unit can be picked up using a standard-capacity roll-off truck

and transported for solids disposal. Sludge volume can be reduced by 80% with reductions to 98% in BOD, COD, FOG and TSS. Effluent is clear, the unit has few moving parts, and the size of filter media can be selected according to job requirements. Standard equipment includes a roll-over tarp system; side, floor and center screens; 1/4-inch floor plate; 7-gauge side plates; four door-binder ratchets; eight drain ports; two inlet ports; and a long-handle scraper. Units are also available in a 15-yard size. **979-245-5656; [www.aqua-zyme.com](http://www.aqua-zyme.com)**



**ADS dewatering unit from AQUA-Zyme Disposal Systems**

### LUTZ-JESCO AMERICA LJ-POLYBLEND POLYMER SYSTEM

The LJ-PolyBlend Polymer System from Lutz-JESCO America is a dependable, motorized mixing machine with a corrosion-resistant housing, large turbine and multizone mixing chamber that provides uniform dispersion energy at the moment of initial polymer wetting. The prime mixing zone fully activates the polymer, while the second mixing zone promotes gentle polymer activation via a small turbine, lessening molecule fracturing. Its stainless steel injection valve prevents agglomerations and reduces the need for extended mixing time. The system includes a clear mixing chamber that provides visual monitoring of mixing polymer feed. Its compact design — only 1 to 1.5 square feet — means it's light and allows for easy installation and transportation. It has automatic pump speed adjustment via 4-20mA input, water flow sensor and priming port. **800-554-2762; [www.lutzjescoamerica.com](http://www.lutzjescoamerica.com)**



**LJ-PolyBlend Polymer System from Lutz-JESCO America**

### PARK PROCESS SLUDGE KING II



**Sludge King II dewatering container from Park Process**

The Sludge King II roll-off dewatering container from Park Process incorporates an engineered design that eliminates any trapped water in the bottom of the filter cake. The second center wall filter increases filter area by 33% producing drier cakes in less time. The plastic floor panels that cover the floor space between wall filters and center wall filters serve three purposes; they hold down the

bottom of the filter elements, help to eliminate standing water and facilitate the dumping of filter cake. The inlet manifold is split into three separate inlets, each with a ball valve, allowing the incoming flow to be distributed evenly into the three compartments formed by the two center wall filters. **855-511-7275; [www.parkprocess.com](http://www.parkprocess.com)**

## Grinders/Shredders

### HYDRA-TECH PUMPS S3SHR

The S3SHR 3-inch hydraulic-drive submersible shredder pump from Hydra-Tech Pumps continuously rips and shears solids with 360-degree shredding action. It uses an open-vane shredder impeller with tungsten carbide cutting tip. Compact size allows it to fit in tight spaces.

A guide rail assembly is available for stationary applications. Combined with HT11 to HT20 power units, it handles flows up to 450 gpm. The safe and variable-speed hydraulic drive can be used where electric power is hazardous or impractical. **570-645-3779; [www.hydra-tech.com](http://www.hydra-tech.com)**



**S3SHR shredder pump from Hydra-Tech Pumps**



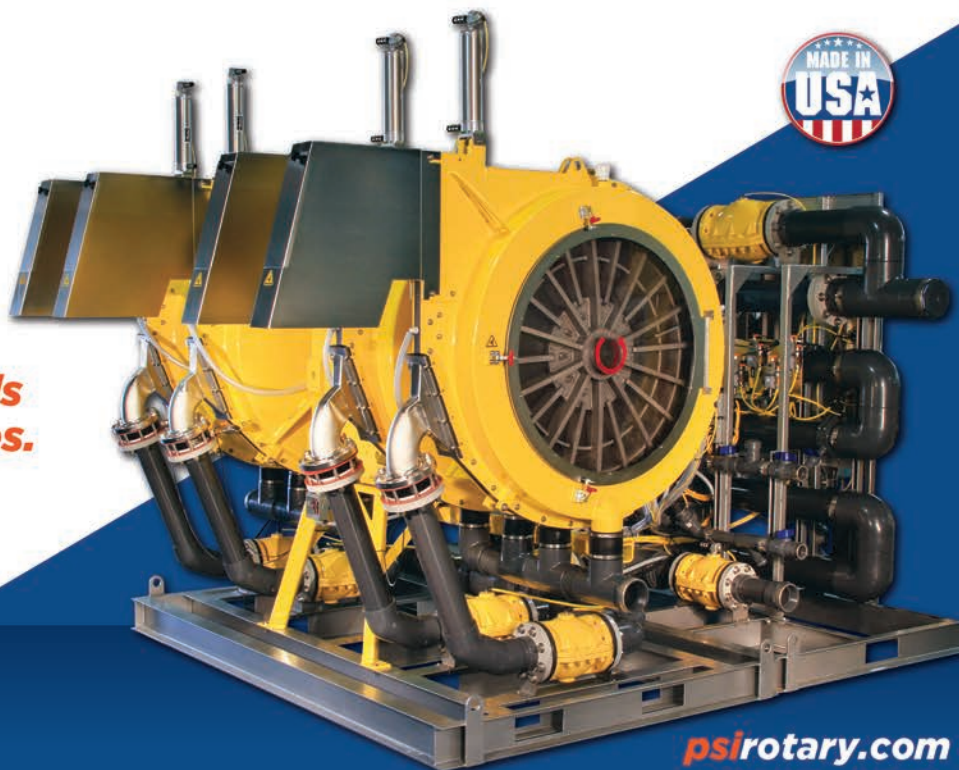
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### VAUGHAN SELF-PRIMING CHOPPER PUMP

Self-priming Chopper Pumps from Vaughan are designed to be easily accessed outside of the wet well while pumping waste solids at heavy consistencies, without plugging or dewatering of the solids. They eliminate the loss in production and mess, along

**Chopper Pumps from Vaughan**

with making it easy to service the pump to get it back in operation. 888-249-2467; [www.chopperpumps.com](http://www.chopperpumps.com)

## Grit Handling/Removal/Hauling

### SMITH & LOVELESS PISTA STAINLESS STEEL GRIT CHAMBER

The PISTA Stainless Steel Grit Chamber from Smith & Loveless is designed to offer reliable and long-lasting grit removal performance that is easy to install and can be inserted into existing tankage without the need for new concrete work, including for retrofitting aerated grit chambers. It is constructed of high-quality 316 stainless steel that is corrosion-resistant and designed to provide 50 years of paint, rust and maintenance-free



**PISTA Stainless Steel Grit Chamber from Smith & Loveless**



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service. The prefabricated system is significantly easier and more cost-effective to install for most sites than typical concrete chambers. Contracting costs are reduced or eliminated altogether, while system downtime and bypass pumping or dewatering needs are reduced. Because it is built exactly to specification, each system is guaranteed to perform exactly as designed and contractor issues are eliminated. Internals are similarly constructed of 316 S.S., including the flow control baffle that provides 95% grit removal down to 100 microns. **800-898-9122; [www.smithandloveless.com](http://www.smithandloveless.com)**

## Septage Receiving Stations

### LAKESIDE EQUIPMENT RAPTOR SEPTAGE ACCEPTANCE PLANT

Remove debris and inorganic solids from septage tanks, grease traps, sludge, leachate and industrial waste with the fully automated Raptor Septage Acceptance Plant from Lakeside Equipment. The heart of the unit is the Raptor Fine Screen, which compacts and dewateres the captured screenings to a solids content of 40%. The screen's rotating rake teeth fully penetrates the cylindrical screen bars, which prevents plugging and blinding from grease and small debris. This allows for faster unloading times to generate more revenue for your facility. The Raptor Acceptance Control System is a security access station that can be integrated with the SAP to allow authorized haulers to unload their waste at a facility. Adding the data management and accounting system with the RACS station provides administration capabilities to track and invoice customers. **630-837-5640; [www.lakeside-equipment.com](http://www.lakeside-equipment.com)**



**Raptor Septage Acceptance Plant from Lakeside Equipment**

### SCREENCO SYSTEMS TRASH MASTER 400 AUTO SCREEN



**Trash Master 400 Auto Screen from Screenco Systems**

The Trash Master 400 Auto Screen from Screenco Systems uses gravity to separate the trash from the flow stream through a 4-inch inlet with a fan spreader to power-offload vacuum trucks. It has an aluminum hopper with a 6-inch outlet cam and 3/8-inch gapped 1/4-inch bar screen that meets U.S. EPA 503 regulations. A stainless steel U-channel with plastic-lined

titanium UHMW provides for years of wear, with a high-strength alloy steel 8 1/2-inch shaftless screw that moves trash to a waste container. The stainless steel U-channel has slotted drain holes and a center channel bar screen for cleaner and dryer trash. A custom-built stainless steel bar rake is included for easy maintenance. A front spray bar with a 1 gpm nozzle keeps the unit clean and free of buildup. A 2 hp NORD gear reduction drive with Lenze variable-frequency drive control accomplishes a variable-speed screw from 6 to 30 rpms. **208-790-8770; [www.screencosystems.com](http://www.screencosystems.com)**

## Screening Systems

### DUPERON FLEXRAKE IQ



**FlexRake IQ from Duperon**

The Duperon FlexRake IQ platform provides real-time smart screening for maximum resilience at the headworks. It tackles high peaking factors due to extreme weather and difficult debris like flushable wipes, first flushes and settled solids. This is accomplished by system improvements and a sequence of operations that automatically responds in real time to optimize the screen field. The reimagined design focuses on smart enhancements to the raking device to manage heavy solids loading events with four times increased

debris removal capacity, improved grit and rock handling and greater solids capture. During peak flow conditions, it adjusts the bar

screen opening itself to provide additional hydraulic capacity and safety factor, matching the best capture rate to the flow volume in real time.

**800-383-8479; [www.duperon.com](http://www.duperon.com)**

### FEDERAL SCREEN MBBR SYSTEM SCREENS

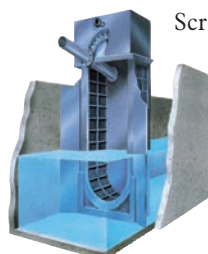
MBBR System Screens from Federal Screen are used as a secondary treatment for a variety of municipal and industrial applications. They are designed to maximize flow rates as well as to prevent biofilm carriers from escaping in wastewater treatment applications. Manufactured with high-quality stainless wedge wire, using wastewater screens



**MBBR System Screens from Federal Screen**

reduces environmental pollution levels and lowers operational costs over the years. They are fabricated with strong and durable resistance welding and are available in a wide range of profile wire to suit most systems. They are robust for vertical wall applications and are self-cleaning when designed to the flow rate. Screens are available in a flat, curved or cylindrical form, and are manufactured to meet specifications. **905-677-4171; [www.federalscreen.com](http://www.federalscreen.com)**

### JOHNSON SCREENS NOGGERATH CENTRE-FLO BAND SCREEN



**Noggerath Centre-Flo Band Screen from Johnson Screens**

The Noggerath Centre-Flo Band Screen from Johnson Screens is a fully customizable screen suitable for coarse and fine screening of freshwater, seawater and municipal and industrial wastewater. They utilize a honeycomb screen element, combined with hydraulic efficiency, integral bypass, and a stainless steel enclosure to meet demanding project requirements. They are typically controlled via upstream water level or differential level, allowing the band screen to remain

stationary to build up a mat of screened solids, improving the overall capture rate. With proven screening capture rates

of over 87%, when using 5 mm openings or less, they are suitable for pre-screening in front of delicate MBR systems. Also, the honeycomb panel provides the ideal hydraulic performance with over 90% open surface area. **800-833-9473; [www.johnsonscreens.com](http://www.johnsonscreens.com)** tpo



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By Craig Mandli

## No more manual raking for pump station operators

### Problem

The Louisiana Pump Station in Tampa, Florida, moves up to 35 mgd. It needs high-quality equipment keep debris from getting to the river Hillsborough River and to perform in hurricanes and heavy rains than can cause storm surges and flooding. The facility's manual bar screen with 2.5-inch spacing allowed smaller debris to pass. Operators had to clean the screen manually as often as three times a day.

### Solution

The city chose an **Aqualitec Heavy Duty Screentec vertical bar screen**. With its 90-degree angle installation, it fits almost all headworks, pump stations, lift stations, wet wells and manholes. Due to constraints of the site, there was no way to build a new well, but the screen installed seamlessly in the existing 30-foot-deep wet well.



#### RESULT:

The screen only solved the clog issues and eliminated potential safety hazards for operators. **310-703-2174; [www.aqualitec.com](http://www.aqualitec.com)**

## Biosolids and odor challenges mitigated at plant

### Problem

The 1.0 mgd wastewater treatment plant in Weyburn, Saskatchewan (population of 10,000) had biosolids piles above the waterline in its main settling pond and continuous biosolids problems in its multiple storage lagoons. This created severe odor problems and chronic resident complaints. Frequent flushing of mainlines for heavy FOG and fatberg buildup was also burdensome.

### Solution

Vital Utilities set up an **EBS-Di unit** from **Enbiorganic Technologies** in one lift stations. The unit uses a customized active-state soil microbiology tailored to the city's wastewater. The formulation is autonomously delivered to the collection system in a process that generates and activates the microbiology.



#### RESULT:

The anaerobic and highly adaptable organisms immediately went to work. Within 30 days after installation city staff saw evidence of 20% biosolids removal, nearly 100% odor eradication and a significant reduction in FOG and fatbergs. Within 60 days, the frequently mainline flushing was eliminated, the biosolids piles disappeared and buildup in the corners of the main lift station was gone. Lab analysis reported other changes that translate to reduced retention time and lower cost per volume treated. **888-356-8333; [www.enbiorganic.com](http://www.enbiorganic.com)**

## Facility makes dewatering upgrade with rotary press

### Problem

The City of Pittsfield, Massachusetts, had to reduce effluent phosphorus discharges to the Housatonic River. The addition of tertiary treatment was projected to generate 20% more sludge; a dewatering upgrade was crucial.

### Solution

Fournier led a tour of several rotary press installations in New England. "The first thing we liked of the **Fournier Rotary Press** was that it's totally enclosed, clean and contains odors," noted Carl Shaw, superintendent. "Operators did not need to babysit the equipment. We appreciated that the units were built of several chambers, providing redundancy." The city installed four rotary presses, each with six modular watering chambers, in 2020.



#### RESULT:

The presses run six to seven hours, five days per week, processing an average of 59,000 gpd. Five to seven dry tons of cake leave each day at 18-23% solids. With the major process upgrades going on in our plant, we've been working with a whole lot of vendors," says Shaw. "We've been very pleased with Fournier's service and responsiveness." **418-423-4241; [www.fournierdewatering.com](http://www.fournierdewatering.com)**

## Dewatering unit solves problem caused by municipality's COVID-delayed centrifuge rebuild

### Problem

A Midwest U.S. city's wastewater treatment plant had delayed a rebuild of its only centrifuge because parts were unavailable during the COVID pandemic. The city needed to remove biosolids that were accumulating each day.

### Solution

City staff contacted a contractor with a mobile dewatering unit from **In the Round Dewatering**. The dewatering drum was unloaded from the roll-off truck and set on the concrete pad with a center drain for sending water back to the headworks. Within a few minutes, the 3-inch hose was connected to the drum, polymer had been injected, and the biosolids were rapidly floccing. Once the drum was full, the hose was unhooked and the drum rotated until the next morning at about one turn per hour. The drum uses a 1/4 hp motor, making it efficient to operate.



#### RESULT:

In the morning the liquid-free biosolids were unloaded in a roll-off box for landfilling. This process was repeated until the centrifuge was back in operation. On average, 18,000 to 25,000 gallons per run were dewatered, generating 9 to 11 tons of material hauled off each day. **317-563-2072; [www.itrdewatering.com](http://www.itrdewatering.com)**

## Treatment plant gains flexible biosolids thickening system

### Problem

The Brockville (Ontario) Wastewater Treatment Plant faced stricter effluent limits, resulting in biosolids volumes that overwhelmed digester capacity. The city had a choice to build another digester for \$2.9 million or add two rotary drum thickeners for less than \$1 million.

### Solution

**JWC Environmental** installed two **Monster Drum Thickeners** for their low maintenance, easily removable wedgewire or mesh panels, and adaptive controls to compensate for variable flow and solids content. The plant team estimated a daily additional 20 to 30 cubic meters of primary sludge (3-4% solids), along with 200 to 250 cubic meters more waste activated sludge (0.5% solids). The thickeners converted the waste activated sludge into 20 cubic meters at 5% solids, meaning less water sent to the digesters. The digesters now handle a total of 40 to 50 cubic meters more per day, within their capacity.



### RESULT:

The plant met its effluent limits without building a new digester, avoiding more than \$2 million in cost. **800-331-2277; www.jwce.com**

## Screw press a fit for pressure sensitive waste

### Problem

A tofu manufacturing facility in the northeast U.S. to dewater a 50-50 blend of waste activated sludge and primary tofu waste, a highly pressure-sensitive sludge.

### Solution

A **Model MWP-240 Multi-Wave Screw Press** from **Komline-Sanderson** was commissioned, with feed solids 3-5%. The press dewateres pressure-sensitive sludges such as waste activated and oily sludges without blinding or poor capture rates. Instead of a cylindrical screen, alternating fixed and moving rings are stacked to form a cylinder in which the screw is inserted. As the screw rotates, the rings rise and fall as they ride on the screw, creating a continuous self-cleaning action. The cylinder is set at an incline to speed liquid evacuation; and the solids are progressively stabilized as they move toward the discharge end.



### RESULT:

The equipment achieved an average 650 dry lbs/hr throughput and cake 25% solids. Previously liquid sludge was hauled out in tanker trucks; dewatered material is now hauled in dump trucks at a significant savings. **800-225-5457; www.komline.com**

(continued)

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## Decanter centrifuges remove flume solids from water used to convey beets to sugar factory

### Problem

A sugar factory in Bay City, Michigan, needed to remove flume solids from water used to convey beets to a sugar factory. Near the end of processing campaigns, when beets deteriorate and lime salts increase, the facility struggled with the purification process.

### Solution

Three **Mammoth Decaners** from **Pieralisi North America** now remove beet residual solids from the flume water at an average of 80 dry tons per day. Flume water typically contains 2.5-3.5% solids. The factory settles those solids out through a flume clarifier and a series of settling ponds that need to be cleaned out annually. Residual solids are mixed with water down to a 20% concentration, pumped into tanker trucks, transported to fields and injected into the soil. Decanter centrifuges separate much of the flume solids from the water before it reaches the settling ponds, minimizing pond cleaning.



#### RESULT:

The high centrifugal force induced by a high-speed drum enables efficient sedimentation or separation of the liquid and solids. This material has a moisture content of less than 50% and is being sold as a co-product. 513-707-2946; [www.pieralisinorthamerica.com](http://www.pieralisinorthamerica.com)

## Rotary fan press leads to simplicity in city's dewatering

### Problem

When the Cambridge, Ohio wastewater treatment plant needed to move from drying beds to a more efficient and effective dewatering process, they did their homework.

### Solution

They decided the **Prime Solution Rotary Fan Press** was the simplest and most effective solution for their dewatering needs. Chris Jamiel, Site Superintendent, says the selection of the Rotary Fan Press was made not only on price, but also on simplicity of use and simplicity of maintenance. "It is pretty simple and compact to work on if you need to, but you really do not need to, as maintenance is at a minimum," he says. "There are some things that may wear over time, especially when you run the amount of sludge we do and how abrasive our sludge is, but major repair-wise there has been nothing and we have had it for eight years."



#### RESULT:

After installation they went from 10% to over 21% solids, equating to, in their words, "a lot of savings." When they decided to upgrade their capacity this year, a second rotary fan press was an easy decision. 269-694-6666; [www.psirotary.com](http://www.psirotary.com)

## Products helps improve solids handling treatment at plant

### Problem

The team at a 60 mgd wastewater treatment plant in northern New Jersey wanted to improve cost structure in the solids treatment section due to rising chemical treatment and landfill costs.

### Solution

Adding **BAE** from **Prodex** to the digested solids at the plant's gravity belt thickeners produced higher cake solids, a cleaner return stream, and lower disposal costs.



#### RESULT:

The product achieved annual savings of \$353,000 on re-treatment costs; less polymer was required for dewatering. A reduction of 2.28 tons per day of sludge cake significantly reduced tipping fees. 856-234-4540; [www.prodexproducts.com](http://www.prodexproducts.com)

## Dryer helps reduce biosolids hauling risks

### Problem

The City and Bureau of Juneau (CBJ) produces 7,000 wet tons of dewatered biosolids each year, hauled 1,300 miles by truck, barge and train to the Columbia Ridge landfill in Arlington, Oregon. This was costly, and CBJ faced uncertainty over environmental regulations.

### Solution

**Veolia's BioCon** medium-temperature **belt dryer** met CBJ's four guiding principles for selection. The Class A EQ biosolids process provides pathogen reduction and expands the range of uses to include landfill cover material, fertilizer for community sites and parks, erosion control and topsoil replacement. These options offer potential for a significantly lower end-to-end cost.



#### RESULT:

The dryer is designed for 36 wet tons per day and will produce 5.5 tons of dried product, an 85% reduction in volume and weight. This means less truck traffic, lower emissions, less noise and lower costs. 919-677-8310; [www.veoliawatertech.com](http://www.veoliawatertech.com) tpo

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### SEEPEX Bravo H chemical metering systems

The BRAVO H chemical metering systems from SEEPEX are pre-engineered, chemical-feed skid systems that provide low pulsation and accurate metering of chemicals via progressive cavity pumps. They are used for disinfection, pH control, flocculation, corrosion inhibitors, oxygen scavengers and containment elimination. The updated design improves on the original, vertically mounted design, BRAVO V, by mounting the pumps horizontally, implementing a new pipework design and providing enhanced skid bases to simplify installation and extend longevity of the system. The plug-and-play skid-mounted system includes piping, drives, system control and calibration and optional equipment adders in one compact unit. The geometry of the rotor stator combination in the progressive cavity pump produces laminar flow and a high degree of accuracy.

937-864-7150; [www.seepepex.com](http://www.seepepex.com)



### CAS Dataloggers OdaLog G20 hydrogen sulfide data logger

CAS Dataloggers' new OdaLog G20 hydrogen sulfide data logger features a digital H<sub>2</sub>S smart sensor.

## product spotlight

### water

### Coatings optimized for range of treatment environments

By Craig Mandli

Water and wastewater treatment creates a range of corrosive environments that can quickly disintegrate concrete and steel substrates. Strong coating options are needed to ensure that important infrastructure stands the test of time. Fortunately, **PPG Protective & Marine Coatings** recently announced an expansion of its coatings offerings specifically geared toward water and wastewater treatment facilities, including collections systems, primary and secondary treatment, biosolids handling and disinfection.

"PPG is excited to offer a much broader range of coatings solutions for our infrastructure customers thanks to RAVEN Lining Systems' technologies and extensive experience in that industry," says Juanjo Ardid, PPG vice president, protective and marine coatings, U.S. and Canada.

Customers can choose from a comprehensive range of coatings that provide corrosion and chemical resistance based on the environment, the substrate being protected (concrete or steel) and specific performance requirements. Due to PPG's recent acquisition of RAVEN Lining Systems, the expanded portfolio is able to combine PPG RAVEN and PPG AQUATAFLEX coating systems for aggressive underwater concrete applications with a variety of their own coating solutions for exterior and interior steel tanks, basins and facility infrastructure.

"Plant operators, engineers and contractors can benefit from having a single coatings resource with proven products backed by the extensive technical support, applications expertise, specification tools and distribution network of PPG," says Ardid.



Protective & Marine Coatings from PPG

While all PPG coatings are designed to resist aggressive corrosion and provide long-lasting performance, each is optimized for specific end-use requirements. These include PPG RAVEN 405 high-build epoxy that provides protection and broad chemical resistance, especially to hydrogen sulfide, for concrete immersion applications like wet wells, digesters and manholes; PPG AQUATAFLEX tri-hybrid series that combines the chemical resistance of an epoxy, flexibility of a polyurethane and fast cure of a polyurea for concrete substrates that are subject to structural movement or that require quick return to service such as filter basins, clarifiers and tanks; PPG RAVEN 755 cementitious resurfacer that rehabilitates deteriorated concrete as a first coat in a system with PPG RAVEN 405 or PPG AQUATAFLEX series coatings for manholes, wet wells, filter basins and headworks; PPG SIGMASHIELD that provides high abrasion and impact resistance for steel-immersion applications due to its ultra-high film build with broad application thicknesses; PPG NOVAGUARD 890 novolac epoxy lining that offers resistance to a wide range of chemicals and solvents, including H<sub>2</sub>S, for direct-to-metal applications; and PPG AMERCOAT interior and PPG AMERLOCK exterior epoxy coatings that provide versatile, surface-tolerant coatings for atmospheric steel applications in tanks and basins. 888-977-4762; [www.ppgpmc.com](http://www.ppgpmc.com)

The G20 is IP68 rated for use in harsh wastewater applications and ATEX IECEx certified for hazardous environments. New features include a gas sensor that allows for up to 90-day deployment, SD memory card that stores up to 10 million data points, built-in sensor health indicator, Modbus communication for connection to SCADA systems, and an integrated 4G cellular modem for remote monitoring.

800-956-4437;  
[www.dataloggerinc.com](http://www.dataloggerinc.com)



### Grundfos CR 255 modular pump

The CR 255 pump from Grundfos has a new hydraulic design that improves everything from impeller and guide vanes to inlet, discharge port, sleeve and diffuser. To ensure maximum efficiency, the hydraulic design of the new CR range has been

optimized to move liquids with as little friction and turbulence as possible. The shaft seal of the CR pumps is available in various material combinations to suit different liquid, pressure and temperature requirements. Thanks to its balanced design, the CR seal can withstand a great amount of pressure and can extend a longer service life. The pumps also are designed to reduce the risk of cavitation and increase the robustness and life cycle of the pump.

800-926-6688;  
[www.grundfos.com/us](http://www.grundfos.com/us)

## product spotlight wastewater

### Pump system designed to make the wet well obsolete

By Craig Mandli

The vast majority of maintenance issues in lift stations originate in the wet well. Grease, “flushable” wipes, rubber material and an assortment of anything and everything that enters the system can clog pumps at this point in the treatment process, creating maintenance issues on a regular basis.

The **OverWatch Direct In-Line Pump System** from **Industrial Flow Solutions** tackles those challenges in wastewater pumping lift station management head-on. The system lifts influent at the point of entry, eliminating the need for a wet well. Effluent is contained, eliminating odors, and reducing maintenance. The stainless-steel body is designed to withstand the effects of corrosion from harsh materials and solutions, making OverWatch a solution for municipal and industrial headworks applications.

“Traditional wet well systems retain water and are plagued with odors and dangerous hydrogen sulfide gases. These conditions pose health hazards for people and cause concrete walls to erode over time,” explains Jim Huck, business development manager for Industrial Flow Solutions. “OverWatch converts an existing wet well into a dry and odorless machine room, providing safe environment for wastewater professionals to interact with the pumping system. Influent is contained in the pipeworks, never becoming atmospheric. Hydrogen sulfide is eliminated.”

In essence, the system performs all the functionality of a traditional lifting station without the need for additional equipment. Specifically designed to absorb the air/fluid mix flowing in from the gravity lines, it

operates by variable-speed drives, using a sensor at the inlet combined with control panel logic to adjust in line with the incoming flow, eliminating hydraulic surges while automatically adapting to constantly changing flow rates. This operating mode enables materials to move through the system without causing blockages and provides a long-term durable solution, with minimal need to replace, repair or maintain the wastewater system. An intelligent controls algorithm makes OverWatch suitable in applications where process pumping could change drastically. Utilizing a liquid level transducer to understand the incoming flow rate, the system adjusts its performance in real-time. The system has been installed in over 2,000 facilities around the world.

“The system can be used in any application where there is a need improve safety concerns and conditions, eliminate odor or reduce energy consumption,” says Huck. “With the increase in ragging, FOG, and odor concerns, the OverWatch successfully reduces the impact of these issues. Each system is factory wired and tested before delivery.” **860-631-3618; www.flowsolutions.com**



OverWatch Direct In-Line Pump System from Industrial Flow Solutions

### GF Piping Systems thermoplastic butterfly valve

GF Piping Systems' 565 butterfly valve is strong yet lightweight, made of high-performance plastic components that include PVDF disc with fiber-reinforced polyamide housing and EPDM or fluoro elastomer seals, making it suitable for pressures up to 232 psi and temperatures ranging from 14 to 176 degrees F. Available in sizes from NPS 2 through 12, the 565 valve is 60% lighter than a comparable metal valve, allowing a single technician to safely and easily handle it during installation. The new valve comes in the same installation length as metal valves so that retrofitting requires no additional work on the pipes or new designs. **800-854-4090; www.gfps.com**



### OZ Lifting Products stainless series

OZ Lifting Products' stainless steel range includes chain hoists, trolleys and beam clamps, all designed for use in corrosive environments. The centerpiece of the line is the lightweight stainless steel chain hoist, which helps lift loads with minimal effort but is durable enough for the industry's most demanding applications. The hoists feature fully enclosed gearing; fully

machined lift wheel; weatherproof holding brake; roller bearings on all gears and shafts; and forged stainless steel hooks and safety latches. Chain hoists, like the trolleys, are available in 1/2-, 1- and 2-ton capacities. The stainless push beam trolley fits most I, S and W beams and has precision ball bearing trolley wheels. The beam clamps are available in 1 and 2 ton capacities. All products in the line are made from Type 304 stainless steel and come with individual test certificate and serial number.

**800-749-1064;**  
**www.ozliftingproducts.com tpo**

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manufacturers and dealers at:  
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## people/awards

Consolidated Water subsidiary **PERC Water** has received the Outstanding Membrane Plant Award, Large Plant, from the Southwest Membrane Operator Association. The award is for its work at the Albert Robles Center for Water Recycling & Environmental Learning, an advanced water treatment facility in Pico Rivera, California.

San Antonio-based **WaterFleet** won the Environmental Stewardship Award in the South Texas Energy and Economic Roundtable's Eagle Ford Excellence Awards.

The City of **Longmont, Colorado**, won the Water Environment Federation's 2021 Project Excellence Award. The Public Works and Natural Resources Department and consultants CGRS and Carollo Engineers won for a biogas treatment and renewable natural gas fueling station that converts biogas to vehicle fuel.

The wastewater treatment staff at the **Tyson Fresh Meats** beef processing plant in Lexington received the Nebraska Water Environment Association's George W. Burke Jr. Award.

**Clackamas Water Environment Services** in Oregon City, Oregon, received the 2021 Water Heroes Award from WEF for its response to the historic February 2021 ice storm that caused widespread power outages and other damage.

**Pamela Randolph**, manager of the Edmonds (Washington) Wastewater Treatment Plant, received the William D. Hatfield Award from the Pacific Northwest Clean Water Association.

**Lindy Farmer**, general manager of the Henry County (Georgia) Water Authority completed his 40-year career leading the utility at the end of 2021. He was succeeded by Tony Carnell, previously deputy manager.

**Lloyd Veil**, water commissioner for Streeter, North Dakota, received the Operator of the Year award from the state Department of Environmental Quality.

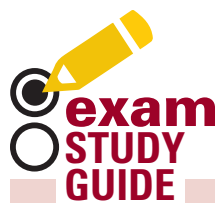
**Oak Creek** earned the title of best-tasting water in Wisconsin as determined by the AWWA.

Illinois American Water's **Peoria Water Treatment Plant** earned the Directors Award from the Partnership for Safe Water for maintaining a Phase III certification for 20 years.

**Babcock Ranch (Florida) Water Utilities** was recognized by the Water Resources Utility of the Future Today for innovative and forward-thinking practices in water reuse.

The **Oklahoma City Water Utilities Trust** received the Platinum Award for Excellence in Utilities Management from the Association of Metropolitan Water Agencies. Water Treatment Plant award from the Rocky Mountain Section AWWA.

TPO welcomes your contributions to Worth Noting. Email [editor@tpomag.com](mailto:editor@tpomag.com). tpo



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## WASTEWATER

By Rick Lallish

**Denitrification in the secondary clarifier is undesirable. Which is the best method of minimizing denitrification of secondary clarifier sludge?**

- A. Proper wasting methods
- B. Proper RAS controls
- C. Maintaining elevated SRT levels
- D. Maintaining higher HRT levels

**ANSWER:** B. Maintaining a consistent and controllable sludge blanket in the secondary clarifier by controlling the RAS rates in the activated sludge process is typically the best method. Higher HRT and elevated SRT rates are detrimental methods for this application. Denitrification of sludge in the secondary clarifier should be minimized to avoid negative effects to the final effluent. More information may be found in the WEF Manual, *Activated Sludge and Nutrient Removal*, Third Edition, Chapter 8.

## DRINKING WATER

By Drew Hoelscher

**New groundwater sources are:**

- A. Required to conduct triggered source water monitoring as required by the SWTR and/or maintain 2-log inactivation for viruses.
- B. Required to conduct triggered source water monitoring as required by the SWTR and/or maintain 4-log inactivation for viruses.
- C. Required to conduct triggered source water monitoring as required by the GWR and/or maintain 2-log inactivation for viruses.
- D. Required to conduct triggered source water monitoring as required by the GWR and/or maintain 4-log inactivation for viruses.

**ANSWER:** D. New groundwater sources placed in operation after Nov. 30, 2009 are required to implement triggered source water monitoring or provide at least 4-log inactivation/removal, or a state-approved combination of these technologies, and conduct compliance monitoring within 30 days of the source being put in service. More information pertaining to the groundwater rule (GWR) can be obtained at [nepis.epa.gov/Exe/ZyPDF.cgi?Dockkey=P100156H.txt](http://nepis.epa.gov/Exe/ZyPDF.cgi?Dockkey=P100156H.txt).

### ABOUT THE AUTHORS

*Rick Lallish is water pollution control program director and Drew Hoelscher is program director of drinking water operations at the Environmental Resources Training Center of Southern Illinois University Edwardsville. tpo*

## events

**Feb. 21-24**

WEF/AWWA Utility Management Conference 2022, Hyatt Regency Grand Cypress, Orlando, Florida. Visit [www.wef.org](http://www.wef.org).

**Feb. 21-24**

WWETT 22, Indiana Convention Center, Indianapolis. Visit [www.wwettshow.com](http://www.wwettshow.com).

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