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Tim Wilkey  
Superintendent  
Iowa City, Iowa

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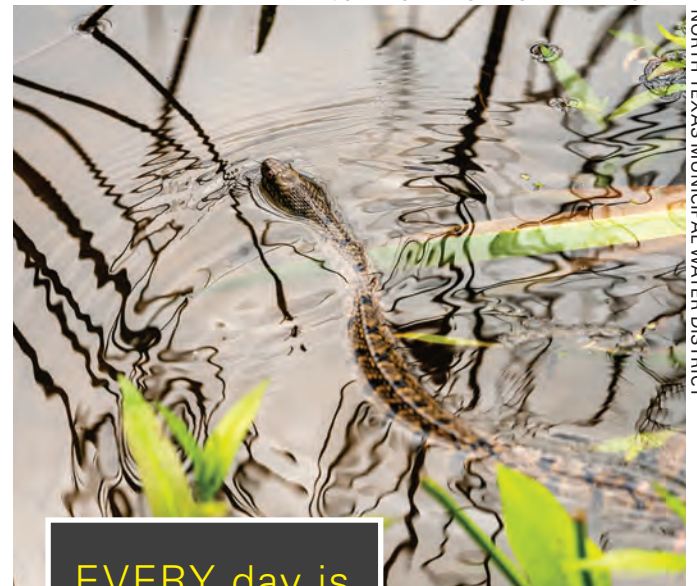
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let's be clear

## Phone? Email? Letter? Facebook?

GETTING THROUGH TO YOUR STATE OR FEDERAL LEGISLATOR IS TOUGHER AND MORE CONFUSING THAN IT USED TO BE. THAT DOESN'T MEAN YOU SHOULDN'T TRY.

By Ted J. Rulseh, Editor



In a college dorm conversation, I once lamented to my friend Dave that one person couldn't possibly make a difference in government.

Dave, born 40 years old, his owlish face framed by dark-rimmed glasses, sat back in his chair, took a puff from his pipe and begged to differ. Making a difference, he said, was deceptively simple. If we all took time to write our Congress members, they would have to listen, and things would change.

Back then I considered that wise advice. Now it seems hopelessly naïve. But Dave was right about one thing: It's a mistake to opt out of taking part in government because of apathy or cynicism.

Water and wastewater are often targets of significant legislation, for good or ill. People in the treatment profession are uniquely suited to give input on such matters. But in this age of online communication, 24-hour cable channels and a cacophony of news and opinion, how can anyone get the ear of a state legislator or a member of the U.S. Congress?

### MULTIPLE CHANNELS

Back when Dave and I were in college, it was all about writing letters. I don't even know if toll-free legislative hotlines existed back then. Today it's different. A given legislator will likely have Twitter and Facebook accounts, a website and an email address, plus traditional methods of connection.

So, if you want to deliver a message to a legislator, what's the best channel to use? Different people give different recommendations. For my part, I've mostly used email, because it's easy. That doesn't mean it's best. In my opinion, the old-fashioned letter has much more impact.

Someone who took time to write a message, print it, address an envelope and take it to the post office looks inherently more serious than someone who just tapped out words on a keyboard. (Or does that someone just look more old-fashioned?)

Anyway, I looked around on the internet for advice from people in the know. While legislators have different preferences in ways to connect with constituents, I found surprising support for another old-fashioned means of contact: the telephone.

Why not social media? Sources I found say Facebook and Twitter are not very effective. Those channels are often favorites for trolls from the opposite party and are repositories for lots of inflammatory and not very



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substantive rhetoric. And legislators likely don't have time to sift through dozens of tweets as they race around the capitol building.

Emails? Most likely, your legislator gets a blizzard of them because, that's right, it's easy. So your message stands a good chance of getting buried or ignored. A phone ringing off the hook is a lot harder to ignore than a full email inbox.

## HOW IT WORKS

When you make that phone call, you're not likely to talk to the legislator — you will reach a staff member. That doesn't mean your call is ineffective. The staffer will relay your message, one way or another.

A large volume of calls can overwhelm an office, guaranteeing that the boss hears about it. Even as few as a dozen calls targeting one issue can get noticed, especially if it's a hot issue where the legislator has not yet decided which way to vote.

Even as few as a dozen calls targeting one issue can get noticed, especially if it's a hot issue where the legislator has not yet decided which way to vote.

Staff members who receive calls make notes about them, compile the notes periodically and create reports for the legislator or top aides. If the lawmaker has already taken a position on the issue you're calling about, the staffer might read you a prepared statement. On the other hand, a flood of calls on an issue could actually lead the legislator to generate a statement. That's called having an impact.

## A FEW RULES TO FOLLOW

When you call, it's better to simply speak from the heart instead of reading a prepared set of talking points. Legislative aides suggest making the call as personal as possible. Explain exactly why and how the issue matters to you.

"What representatives and staffers want to hear is the individual impact of your individual story," one staff member tells *The New York Times*. "I couldn't listen to people's stories for six to eight hours a day and not be profoundly impacted by them."

When contacting legislators, expertise matters. For example, if you're a plant operator calling about an issue related to wastewater or drinking water, you will be taken seriously. Calling on behalf of an organization representing hundreds of professionals, such as a state or regional operator association, will be more potent still.

A final note: Be courteous. Legislators and staff members are people. Shouting or (heaven forbid) cursing at them won't make you more right. It will make you look like a crank and will be counterproductive.

In summary, making a difference in the political process isn't easy. But one way you can be sure not to make a difference is to avoid engaging in the process. **tpo**



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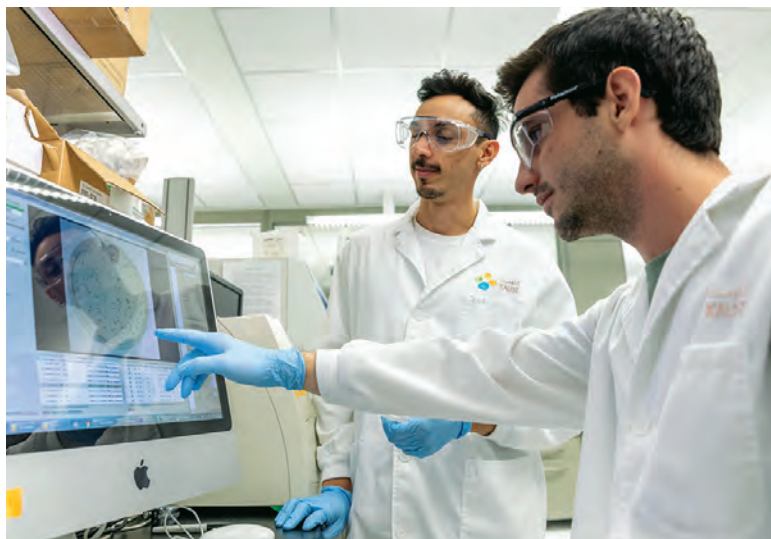
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Conventional wastewater disinfection using chlorine could facilitate the spread of antimicrobial resistance in bacteria, and treating some types of wastewater with UV light instead could be part of the solution, according to a recent study. Read details about researchers' findings in this online exclusive article.  
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"Shared responsibility is central to reducing the health risks from lead across every media, but is particularly important with developing policies to manage lead in drinking water."

*AWWA Testifies Before U.S. House On Improvements to Lead and Copper Rule*  
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## CAREER TIPS

### Staying On Track

At times, careers can be as unpredictable as the sewage coming down the line at a wastewater treatment plant. Most of it's straightforward, but you can also count on seeing some unexpected things. Either way, there are strategies you can use to keep your career on track, says Thomas Harris, an employee training and development consultant.

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## FLOATING WETLANDS

### Testing Winter Survivability

A graduate student with the University of Nebraska-Lincoln's School of Natural Resources is testing the winter survivability of floating treatment wetlands along with their ability to reduce excess nutrients from water. Collecting and testing samples from koi ponds in Nebraska's Sunken Gardens, Alexa Davis hopes to provide data about the cost efficiency of floating treatment wetlands.

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# Unquestionable Quality

CONTINUOUS SELF-ASSESSMENT AND IMPROVEMENT STEER A MICHIGAN AUTHORITY'S NEWEST WATER PLANT TO A DIRECTORS AWARD FROM THE PARTNERSHIP FOR SAFE WATER

STORY: **Ted J. Rulseh** | PHOTOGRAPHY: **Amy Voigt**

The newest of the Great Lakes Water Authority's five water treatment plants operates in the oldest building. It is also the latest of four to earn a Directors Award from the Partnership for Safe Water.

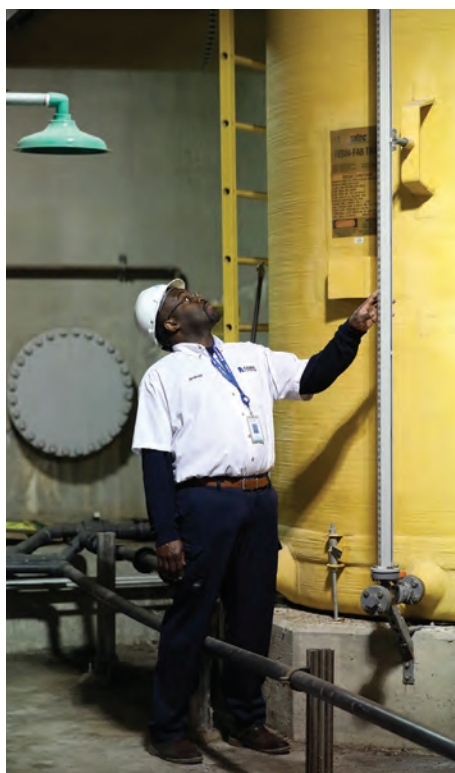
The 240 mgd (design) Water Works Park II plant opened in 2003. Technology innovation enabled the authority to combine its entire conventional treatment process (with ozone disinfection) in a single building, as opposed to several buildings previously.

The authority provides water and wastewater services to some 4 million people in 112 member partner communities in eight southeast Michigan counties. With five water treatment facilities that draw water from Lake Huron and the Detroit River, the authority has capacity to extend service to other communities in its region.

The authority invests in protection of its water and in collaboration between many universities and foundations. Through partnerships with universities, students work with the authority to conduct research focused on drinking water monitoring and treatment. This is one of many ways in which the authority makes sure finished water quality surpasses federal and state standards.

## STRATEGIC DEPLOYMENT

The water plants are geographically located and the system is designed so that if any one plant is having issues, one or two others are available to meet demand, according to Cheryl Porter, chief operating officer for Water and Field Services. The Lake Huron, Northeast and



Plant manager Andrae Savage checks the tank levels at the Great Lakes Water Authority, which serves 112 member communities.

Southwest water facilities have also earned Partnership Directors Award status, which entails a rigorous, four-phase self-assessment and peer review process developed by water utility optimization experts.

"One thing we like about the Partnership for Safe Water is that it allows us to continuously improve," Porter observes. "To make sure we deliver water of unquestionable quality, we always want mechanisms in place that drive us toward better and more stringent internal standards, beyond just meeting regulatory requirements. The Partnership for Safe Water is an excellent mechanism that allows us to do self-assessment and continually monitor ourselves in comparison with our peers."

Water Works Park has been a source of pride for southeast Michigan since 1879. It served as the first branch of the Detroit Public Library and was an architectural marvel with its minaretlike stone tower rising 185 feet in the air. The park was the site of Detroit's original pumping station. Additions were made in 1886 and 1903 as Detroit expanded; the high-lift pump station was built on the grounds in 1914.

Chlorine disinfection began in 1913, and fluoridation was added in 1962. Today, Water Works Park is the authority's most modern producer of drinking water, operating around the clock every day of the year.

## MAKING THE OLD NEW

The key challenge in recreating Water Works Park was installing a new process on an existing treatment site. That also presented great opportunity.

“The Partnership for Safe Water is an excellent mechanism that allows us to do self-assessment and continually monitor ourselves in comparison with our peers.”

CHERYL PORTER



Cheryl Porter, center, chief operating officer at Great Lakes Water Authority, is surrounded by team members, from left: Abidon Kayode, water technician; Etaune Johnson, electrical instrumentation control technician; Michael Dunne, engineer; Jessica Melrose, chemist; and Brad Gradowski, technician.



## Great Lakes Water Authority, Water Works Park, Detroit

[www.glwater.org](http://www.glwater.org)

COMMISSIONED:  
**2003**

POPULATION SERVED:  
**222,000**

SOURCE WATER:  
**Detroit River**

CAPACITY:  
**240 mgd**

TREATMENT PROCESS:  
**Conventional filtration,  
ozone disinfection**

SYSTEM STORAGE:  
**28 million gallons**

KEY CHALLENGE:  
**Right-sizing the system  
to align with demand**

One of the Great Lakes Water Authority's ordinal buildings (left photo) is next to the current facility in Detroit.



The facility uses conventional treatment but with the addition of midstream ozonation. “A unique feature of Water Works Park is it has expandable capacity,” Porter says. “It is designed for 240 mgd, but we have infrastructure in place to upgrade easily to 320 mgd.” Average flow is about 90 mgd.

While the old treatment facility included half a dozen buildings, each housing a particular process phase, the plant today houses the entire pro-

cess in one building. Three changes in technology made that possible:

- Changing from chlorine to ozonation (WEDECO) for primary disinfection.
- Changing the floc-sedimentation basins and converting to plate settling to speed up clarification.
- Replacing conventional gravel-sand-anthracite filters with deep-bed mono-media anthracite filters (Leopold - a Xylem Brand).

“Midstream ozonation gives us better response to taste and odor while providing the strongest disinfectant against microbial contaminants such as *Giardia* and *Cryptosporidium*,” Porter says. “It also avoids the creation of disinfection byproducts.”

The floc-sedimentation process now includes six parallel basins, any of which can be taken out of service for maintenance without reducing treatment capacity. Seventy-eight conventional filters were replaced by a dozen monomedia filters (Leopold - a Xylem Brand), “which are actually more effective and give us lower NTU than we had been getting,” Porter says. The filters include instrumentation that triggers backwashing at a pressure differential or NTU setpoint and can be programmed based on the season.

## MAKING WATER

The Water Works Park facility draws water from the Detroit River. Two raw water tunnels come in: one dedicated to the facility and the

second feeding two other water plants. The raw water passes through US Filter traveling screens (Evoqua Water Technologies) at the Screenhouse and Low-Lift Pumping Station.

Four low-lift pumps (Cascade Pump) raise water to the facility’s operational level. Aluminum sulfate coagulant is added; polymer can also be introduced in case of unusual raw water turbidity. After flash mixing, the water is sent to the three-phase flocculators. The floc then comes in contact with the plate settlers; clearwater is drawn off the top.

Finished water from the floc-sedimentation basins goes to the ozonation contactors and then to filtration. Fluoride is introduced, phosphoric acid is added for corrosion control, and chlorine is dosed to maintain a suitable residual in the transmission and distribution systems. High-lift pumps (De Laval) send the water in the distribution system from the reservoirs.

Detroit River water is relatively consistent except that turbidity can spike during turnover seasons in spring and fall, according to Andrae Savage, plant manager. Raw water turbidity in the past 20 years has ranged from as low as 6 NTU to as high as 125 NTU (during turnovers). Finished water turbidity consistently registers below 0.10 NTU.

## KEEPING IT RUNNING

The plant staff includes 30 people including operators, maintenance people and chemists. Afternoon and

(continued)



Andrae Savage (left) and Etaune Johnson work together at the turbine meter in the low-lift pumping station.



Jessica Melrose takes an hourly chlorine test.



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midnight shifts include a supervisor, two water technicians and a chemist.

The team includes:

Operations team leaders Victor Vecsernyes, Shannon Williams, Jeffrey Jones and Dwayne Smoth

- Water technicians Douglas Boatwright, Brian Carter, Jonathan Harper, Abidon Kayode, Melissa Willis, Rodney Patten, Vance Carter and Clarence Hayes
- Chemists Yao Kouassi (team leader), Abul Ahmed, Kevin Haywood, Jessica Melrose, Jessica Hayes and Wajid Khan
- Maintenance team leaders Brandon Ross and Reginald Bryant; and technicians Xavier Bolton, Mark Elswick, Brad Gradowski, Reginald Woodson and Reginald Hammond
- Electrical instrumentation control technicians Leonard Fleming, Jackie Hunt, Etaune Johnson and Yolanda Presley
- Engineer Michael Dunne
- Donna Jackson, office support specialist

Training is a top priority. “Along with making sure we have a safe work environment, we want our people to be well aware of the educational materials

we have available through our American Water Works Association membership,” Porter says. “A person who is particularly enthusiastic about a given subject can dig deeper into it. We have basic training for chemists and operators to help them acquire state certifications.”

Instrumentation helps drive the process. In addition to the filter control automation, it includes turbidimeters (Hach), streaming current detectors (Chemtrac) and chlorine analyzers (Hach). “We also do bench-top testing for any chemical we’re dosing,” Savage says. “In the lab there is parallel monitoring by our chemists on a 24/7 basis. We don’t just rely on our in-line instrumen-

tation. We confirm that with actual analysis in the laboratory. We analyze parameters from every hour to every four hours depending on the test. This is done around the clock.”

In his role, Savage works constantly to bolster and sustain morale. “I let them see me, and I engage them in conversation, whether it’s about the job or how their day is going,” he says. “I show concern. If they need parts or supplies, I make sure they get them. As long as you show interest in what they’re doing and demonstrate that you care, morale stays up.”

“If they need parts or supplies, I make sure they get them. As long as you show interest in what they’re doing and demonstrate that you care, morale stays up.”

ANDRAE SAVAGE



Cheryl Porter, chief operating officer, and her team take pride in delivering water of exceptional quality and in earning the Directors Award from the Partnership for Safe Water.

## STAYING SAFE

An active safety committee works to identify and remove hazards. It includes maintenance and operations team members, chemists and representatives from the Water Quality and Safety Teams. “We encourage the team members to participate,” Savage says. “They meet every fourth Wednesday

## DOWN THE PIPELINE

Besides operating five water treatment facilities, the Great Lakes Water Authority is responsible for transmission of finished water up to member partner communities’ wholesale metered connections.

As a practical matter, the authority reaches even further. “We strive not only to produce water of unquestionable quality, but to be the service provider of choice for our partners,” says Cheryl Porter, chief operating officer for Water and Field Services. “In those efforts, we provide additional assistance to them.

“We have been a part of the lead and copper issue. As a wholesaler, we don’t have lead service lines, but we offer our assistance in that area. We see it as something that’s very important to reestablishing public trust for the water service sector — to all be

on the same page and to have a common message. We’ve worked on communication tools our partners can use.

“Because we’re all dealing with the same product, we’re willing to get in the trenches and deal with a variety of subjects that are not necessarily ours to own. We’ve opened ourselves up to provide technology and resources for the benefit of our partners’ distribution systems.

“If they’re having trouble opening and closing a valve, for example, we send our field service maintenance teams out to assist them. They may not be used to dealing with a 36-inch valve, but that’s our world. Wherever we can, we try to lend a helping hand.”

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day. The committee also performs monthly walk-throughs to check for any safety violations or potential unsafe conditions.

“Also, we have a Working Safe program. When we see a team member working safely, we take a picture and give it to our Public Affairs Group. They place the picture on a community board. Whenever we get anything positive from our safety committee, we let the team know at the monthly plant meetings.”

Maintaining a quality workforce is an ongoing challenge. As part of its response, the authority has three apprenticeship programs:

- A three-year, 10-month program for maintenance technicians that began in January 2019.
- A three-year program for electrical instrument control technicians that launched in June 2017.
- A program for electricians launching in 2020.

An apprenticeship program for water plant operators is on the drawing board. The authority has committed to standing up one new apprenticeship per year until all of its critical staffing needs are met.

#### LOOKING TO THE FUTURE

Those programs alone are not enough. “We have to get better at training people faster,” Porter notes. “We’re looking at various training tools and techniques that will allow us to document the information from those who have been here the longest, and make sure that knowledge is captured and can be reviewed, so that the new people coming in can leverage it.”

“One thing that is unique to the water sector is that the people are very committed to public health and safety. We’ve had a number of team members delay their retirements in order to pass on their knowledge. It speaks highly of an organization when people are so committed that they stick

“I’m very proud that we have the kind of operators who are willing to make that extra commitment.”

**CHERYL PORTER**

around and say, ‘I’m going to make this easier for the next generation.’”

In addition, standard operating procedures are being captured in video form to make them easily accessible. “That way, people can view it at their leisure and experience the complexity and greater detail that can be captured on video,” Porter says. “We’re trying to figure out how to roll it out so that each facility has that resource available.”

Another key challenge is dealing with water demand far below the treatment plants’ collective 1.7 bgd capacity. “Right now we’re seeing average demands about 600 mgd,”

Porter says. “That is forcing us to think about how to right-size our system.”

As for the Directors Award from the Partnership for Safe Water, that required a self-assessment of the treatment process; instrumentation; safety, operational and maintenance protocols; and more. Porter observes, “To have four of our five plants move beyond day-to-day requirements to optimize operations so they can be recognized with such a program, that speaks well for our team members. I’m very proud that we have the kind of operators who are willing to make that extra commitment.” **tpo**

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# Three Spins on Earth Day

THREE UTILITIES CELEBRATE EARTH DAY IN UNIQUE WAYS  
BY PARTNERING WITH A CITY, NONPROFIT AND UNIVERSITY

By Sandra Buettner



Greenville (North Carolina) Utilities Commission wastewater treatment plant team members engaged kids with interactive exhibits.

Earth Day is an ideal time for drinking water and clean-water agencies to call attention to the work they do every day to protect public health and the environment. Here's how three utilities are marking the April 22 observance, originated in 1970 by the late Gaylord Nelson, a U.S. senator from Wisconsin.

## ACTIVITIES FOR 4,000

California's Inland Empire Utilities Agency partners with the city of Chino for its annual Earth Day celebration. Now in its 11th year, the two-day event brings in some 4,000 people.

On day one, Student Day, buses drop off roughly 2,000 children, chaperones, teachers and volunteers. The kids learn about water quality, recycled water, water conservation and watersheds through various games and activities. They also learn about composting, pollution, water-saving landscaping and the utility's Kick the Habit campaign, which teaches ways to use water wisely and end wasteful practices.

The day also includes animal encounters and a hike through the Chino Creek Wetlands and Educational Park behind the agency headquarters. Andrea Carruthers, manager of external affairs, observes, "One of the highlights for the students is an environmental show that engages them in singing and dancing to environmental-themed songs. This type of learning seems to resonate, and they leave with a handful of ways to be good environmental stewards."

Day two is Community Day, an evening event for the general public. Many of the Student Day activities are included; participants include community members, volunteers and vendors.

## FAMILY FESTIVAL

Baldwin County Sewer Service in Summerdale, Alabama, approached the Earth Day Mobile Bay organization eight years ago to take part in its well-established Earth Day event. The organization, an environmental nonprofit, established the event nearly 20 years ago.

Attended by more than 1,000 guests each year, it is lower Alabama's largest Earth Day festival. Its goal is to grow the environmental movement on the Gulf Coast and to promote environmental citizenship and awareness.

“The Earth Day Mobile Bay event is a great way for us to connect with our customers and educate them on what we do here.”

JENNY WILLIAMS





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The Mobile Bay area includes a portion of the utility's customer base. The leadership wanted to reach out in a fun and family-friendly way to teach residents what they can do to help prevent sewer issues, such as back-ups and overflows, and save water.

Several team members work a booth at the event, providing educational materials on how to take care of our water, the wastewater reclamation process, items to keep out of drains and how to maintain septic systems.

Events for the kids include a toilet toss in which children get prizes depending on where a beanbag lands. The most popular handout item is eco-friendly toilet paper rolls. Crystal Clean, the utility's water-drop mascot, walks around the ground greeting kids and adults. The utility gives out reusable fabric tote bags with Crystal Clean's image; kids color in the figure and take the bags home.

"The Earth Day Mobile Bay event is a great way for us to connect with our customers and educate them on what we do here," says Jenny Williams, communications director. "The event has been a great vehicle." This year the utility will feature a new Water on Wheels unit, giving out filtered water. That will reduce the use of plastic water bottles at the event.

### HANDS-ON LEARNING

When construction on its grounds prevented hosting its own annual Earth Day celebration, the Greenville (North Carolina) Utilities Commission joined East Carolina University's Earth Day Expo.

The eighth annual event was held on the university's main campus. Children and adults took part in hands-on activities to learn about their roles in keeping the planet clean. The expo included a passport that kids could get stamped at each display; those visiting all displays received awards.



Students at the Inland Empire Utilities Agency event in California took part in an environmental show that included singing and dancing to environmental-themed songs.

Representatives from the utility's wastewater treatment plant engaged the kids with activities that showcased the treatment process and how people can help keep rivers clean.

"Partnering with the university allowed us to get our key wastewater messages out in a fun and interactive way," says Emily Garner, public information specialist. The event also enabled utility team members to talk about water careers and the treatment plant's role in environmental safety and conservation.

"It also enabled us to share videos and photos in real time with our online social media communities," Garner says. "That helped us to reach an audience outside of those who attended the event." **tpo**





An aerial view of the Somersworth (New Hampshire) Wastewater Treatment Facility.

# An Energy-Awareness Culture

AWARD-WINNING ACHIEVEMENT AT A NEW HAMPSHIRE PLANT COMES FROM COMMONSENSE MEASURES, SOME AS SIMPLE AS TURNING OFF LIGHTS WHEN LEAVING AN AREA

By Steve Lund

**A**n equipment failure led the staff at the Somersworth (New Hampshire) Wastewater Treatment Facility to make what they thought was a temporary procedural change. It worked so well and saved so much energy that they never fixed the problem device.

That kind of work helped the facility earn a 2019 Wastewater Treatment Plant Energy Efficiency Award from the New Hampshire Department of Environmental Services and NHSaves, a utility group that promotes energy conservation.

Somersworth was the state's top-performing plant as measured by energy usage (0.62 kWh) per pound of BOD removed. The national benchmark for similar-sized activated sludge plants is 0.7 to 2.2 kWh per pound.

The Somersworth facility on the Salmon Falls River in southeast New Hampshire is in the early stages of a \$13.7 million upgrade that will involve new energy-saving equipment, but the team earned the efficiency award without any recent equipment upgrades.

The plant's last upgrade was completed in 2005 to meet new NPDES permit requirements. The aeration tanks were retrofitted to create anaerobic, anoxic and aeration zones for biological nutrient removal. The facility uses the modified University of Cape Town BNR system. The staff includes two operators, two maintenance mechanics, a chemist and a facility manager. The staff also operates and manages four lift stations and the industrial pretreatment program.

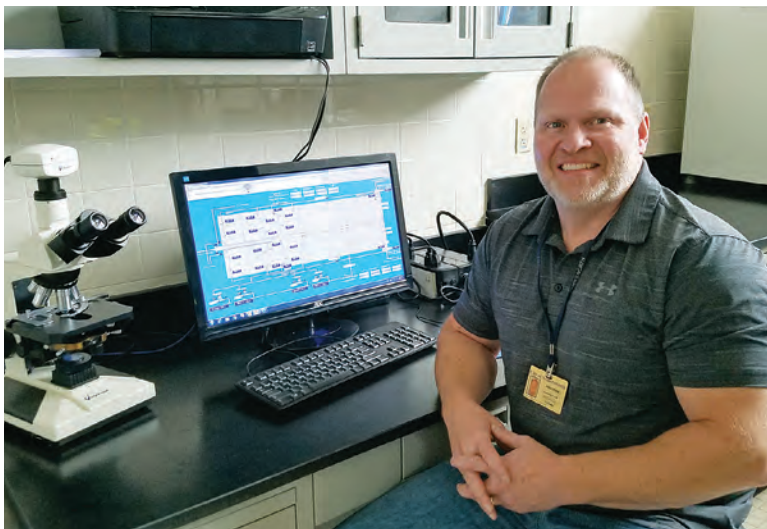
## FINDING AN ENERGY HOG

In 2016, the chlorine injection mixer at the front of the chlorine contact tank failed. Just upstream in the process is a filtration building with an overflow designed for use during unusually high flows. Instead of replacing the mixer, the staff decided to let some effluent overflow right into the disinfection chamber to agitate the water. It worked like a little waterfall.

"Doing that, we were able to get efficient mixing," says Jamie Wood, chief operator. "A minute amount of our average daily flow agitated that line and allowed us to get the mixing we needed to meet our *E. coli* bacteria limit. So at that point, we decided to keep running it that way. It has worked for the past three years, and we've never had an issue."

The change enabled the shutdown of a 3 hp motor that had run continuously.

"Winning this award was a lot of effort from the staff," Wood says. "It means as a team we're being recognized for constantly reviewing our operations and looking for areas where we can improve. It's about not just getting creative, but also recognizing when opportunity presents itself. In this case, we had a failed piece of equipment, and we just took advantage of an opportunity and ran with it."



Jamie Wood, chief operator

Another example: “During the winter when we don’t receive septage, a lot of plants shut their pumps off but then fail to shut off the variable-frequency drives in the control room,” Wood says. “Those VFDs continue to run until spring without being used. We routinely inspect all motor control center panels to ensure unused ones are powered down and not wasting energy. In many plants, the VFDs may not be located in the same building as the pumps, so it’s easy to see why they may get missed.”

## EFFICIENCY BEHAVIORS

During design for the upcoming upgrade, an energy audit conducted by Process Energy Services of Londonderry identified areas for improving efficiency. One was adding extra controls to the boiler. Another was changing the lighting, from which Wood expects substantial savings. In the meantime, exterior lights have been placed on timers, routinely adjusted to turn them off during daylight.

“There’s so much we can do just by identifying areas and reducing the energy used as the plant exists today. A lot of times operators may look around and say, ‘I’ll wait until the upgrade comes.’”

JAMIE WOOD

more energy than might seem obvious, since those lights also activate an exhaust system.

The real benefit, though, is the impact of creating an energy-awareness culture. “It sounds cliché, but empowering our employees to make decisions and think like owners benefits the organization as a whole,” Wood says.

Wood thinks people rely too much on new equipment when looking to save energy. “There’s so much we can do just by identifying areas and reducing the energy used as the plant exists today,” Wood says. “A lot of times operators may look around and say, ‘I’ll wait until the upgrade comes.’”

## ENERGY CHAMPIONS

The Somersworth Wastewater Treatment Facility was honored by the state Department of Environmental Services and NHSave, which for four years have helped treatment plants improve their energy efficiency. The agen-



Overflow from the filtration building provides enough agitation to mix chlorine in the disinfection tank.

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cies focused on wastewater treatment plants as the largest energy consumers in many municipalities. The effort started with a U.S. Department of Energy grant, and it continues with help from New Hampshire’s Clean Water State Revolving Fund.

In the award presentation, Somersworth was described as an Energy Champion because “Jamie Wood and his staff have done a phenomenal job with aging equipment (most 20-plus years old).” It noted Wood’s energy awareness, tracking of energy use, understanding of where energy goes and ability to “think outside the box and encourage his staff to do the same.”

The presentation concluded, “The Somersworth staff exemplifies the term ‘Energy Champion’ in their everyday work.” **tpo**



# Full Circle

TIM WILKEY'S HATFIELD AWARD-WINNING CAREER TOOK HIM FAR AND WIDE, BUT EVENTUALLY BACK TO HIS HOME STATE OF IOWA

STORY: **Ted J. Rulseh** | PHOTOGRAPHY: **Mark Hirsch**



**T**im Wilkey started his work life as a welder. Now toward the end of it, he's superintendent of the Wastewater Division in Iowa City, Iowa.

In between, he has been a wastewater operator, an educator and an engineering consultant doing extensive work overseas. "It's been a real rewarding experience," says Wilkey, winner of a 2019 William D. Hatfield Award from the Iowa Water Environment Association. "Forty-five years ago when I was working in a factory, I never thought I'd be doing this."

Wilkey leads a team of 26 at the Iowa City Wastewater Treatment Plant (10.5 mgd design, 9 mgd average), a biological nutrient removal extended aeration facility that operates mainly in the modified Ludzack-Ettinger mode. He has held his present position for four years, but his clean-water career goes back to 1986.

## LONG TRAIL

That's when he gave up welding and went to technical college in Cedar Rapids, earning an Associate of Science degree in general studies and an Associate of Applied Science degree in water and wastewater treatment. Later he earned a bachelor's degree (1994) and a master's degree (2005) in civil and environmental engineering from the University of Iowa.

His first position after technical college was as an operator at the Glenbard Wastewater Authority in Glen Ellyn, Illinois. After eight months there, he moved back to Iowa to manage the wastewater treatment process at a pork processing facility.

"That was a very eye-opening experience," Wilkey says. "It helped prepare me for some of the harder situations I ran into later in life. At that time, the meat industry was known for having issues with the regulatory

---

Tim Wilkey, Wastewater Division superintendent, Iowa City



Wilkey, shown with operator Jeff Tonn, did a variety of work overseas as he built his career in engineering and operations.

“If we accept food waste, make gas out of it and put it back into the system for someone to use, then we’re not just helping the city, but we’re also helping a larger area in reducing the carbon footprint.”

TIM WILKEY

## Tim Wilkey, P.E., MSCEE, Iowa City, Iowa



**POSITION:**  
**Wastewater Division  
superintendent**

**EXPERIENCE:**  
**33 years in the industry**

**EDUCATION:**  
**Bachelor’s and master’s degrees,  
civil and environmental engineer-  
ing, University of Iowa**

**CERTIFICATIONS:**  
**Grade 4 wastewater treatment,  
Grade 4 drinking water treatment,  
Grade 3 drinking water  
distribution**

**GOAL:**  
**Keep Iowa City facilities up to  
date; remain productive in  
retirement**

community. It was up to the wastewater plant operator to advise them on how to become a more responsible party.”

After 3 1/2 years there, Wilkey moved on to Kirkwood Community College in Cedar Rapids and taught water and wastewater technology for two years. He then enrolled at the University of Iowa, got his bachelor’s degree and joined a small engineering firm. Two years later, it was on to Ottumwa for 5 1/2 years as wastewater facility superintendent.

### LEARNINGS FROM ABROAD

While studying for his master’s degree, he worked for another small consultancy and then joined the Stanley Consultants global engineering service.

While there, he consulted on a variety of water and wastewater projects, working in the Middle East, Afghanistan, Egypt and Algeria. In Qatar he oversaw the startup for the SCADA system on a 175 mgd biological nutrient removal plant.

The experience overseas broadened his perspectives. “When you work outside the U.S., it opens you up to other cultures, how things are done and how other people react. As a result, I’d like to think I’m more deliberate in how I deal with certain situations.”

While in Qatar, he worked with engineers from Europe, South Africa, New Zealand, Australia and multiple countries in Asia. “We also lived amid the Arabic culture, which is different from what we have here in the states. So in dealing with all those different entities, sometimes I had to walk a delicate path in terms of getting the desired results from activities such as the commissioning of a wastewater treatment plant.”

Then in 2015, the superintendent’s position in Iowa City became available, and Wilkey grabbed it. He works within a 20-minute bicycle ride or a five-minute car ride from home.

The treatment plant has six influent pumps: three dry-pit submersibles (KSB) and three close-coupled centrifugals (Pentair - Fairbanks Nijhuis). After passing through half-inch bar screens (Vulcan Industries), the water is lifted to an influent channel with a gate that can divert wet-weather flows to a 19 million-gallon equalization basin. A PISTA grit chamber (Smith & Loveless) removes grit.



After five primary clarifiers (Walker Process Equipment, A Div. of McNish Corp.), the water enters four aeration trains, each with 10 cells (four anoxic, three aerated, three more anoxic). “We get nitrate uptake at the beginning of the trains, and then we get the carbonaceous uptake and any remaining ammonia removal in the aerated portion,” Wilkey says. “In the final portion, we aim to remove remaining carbon material and push any organisms to uptake nitrates and pull their oxygen off that.”

Influent contains on average 4.0 mg/L phosphorus; final effluent typically contains less than 1 mg/L. “We extended the anoxic areas to get to less than 1.0 mg/L DO to enable the release of the phosphorus so that it gets taken up in the aerated portion,” Wilkey says. The flow then goes to six clarifiers and to UV disinfection (SUEZ Water Technologies & Solutions) before discharge to the Iowa River.

On the solids side, primary and thickened waste activated sludges go through two thermophilic and four mesophilic digesters, followed by three 2-meter belt presses (Charter Machine) that dewater the Class A material to about 20% solids for land application by a contractor. The digester complex has multiple heat exchangers (Alfa Laval), two boilers (Burnham Industrial), several hot-water recirculation pumps (Bell & Gossett, a Xylem brand), sludge transfer and WEMCO mixing pumps (Trillium Pumps USA SLC - WEMCO) and multiple Muffin Monster grinders (JWC Environmental).

## MODERN FACILITY

The Iowa City plant was last upgraded in 2010, at which point a much older facility near the downtown was decommissioned and the site converted into a riverside park.

The plant is staffed 10 hours a day, seven days a week. At other times, a robust alarm system calls out to an on-call maintenance person. Team members are encouraged to pursue higher licenses and receive time off for training and to sit for licensing exams.

Wilkey believes strongly in promoting from within. In fact, a number of leadership positions have been filled that way recently. They include Brad

“Forty-five years ago when I was working in a factory, I never thought I’d be doing this.”

TIM WILKEY

Herrig, senior maintenance worker; Steve Flake, assistant superintendent; Al Figueroa, senior treatment plant operator; and Jesse Eister, senior maintenance worker in collections. The team also includes:

- Samara Hayek, senior clerk
- Jeff Clayton, Jeff Tonn, Dan Keating and Andy Pierson, treatment plant operators
- Maintenance operators Jim Bopp and James Holland; maintenance workers Jesse Kleopfer, Tim Robinson and Kyle Coleman; Shaun Daly, electronics technician; and Ryan Bennett, electrician
- Collections maintenance workers Brian Gaffey, John Wombacher, Tom Kacena, Gus Garcia and Josh DeWild; and Dillion Evertsen, GIS technician
- Aimee Hanson, lab chemist, and Jennifer Widmer, lab technician

The team’s experience and dedication have paid off during challenging times. Wilkey recalls an incident when team members stepped up on their own to handle an emergency. Wilkey and other plant leaders were at a WEFTEC conference in Chicago when a rake on a bar screen came loose and fell 25 feet to the bottom of the influent channel.

“The guys are pretty confident; they knew what to do,” Wilkey says. “They got the equipment locked out/tagged out, pulled the rake out and took it to the shop. By the time we came back, they had started to disassemble it. They had contacted the manufacturer and figured out what they needed to do. We had to wait on parts, but the rake was back in service within a month.”

## UPGRADES AWAITING

More challenges lie ahead for the Iowa City facility, most notably dealing with struvite. “Since we’ve gone to biological nutrient removal, struvite has become more of an issue,” Wilkey says. “When we clean the digesters, we find that it remains as a sandlike material in the bottom. But when we get a temperature drop in the storage tank, that’s where we see deposition on the pipes and the tank walls.

“We’ve started to put a ceramic-like coating on the insides of our plug valves to cut back on the struvite formation. We’ve gone to sacrificial piping on the jet mixers in the storage tank. We’re just starting to get struvite formation in the drip pans of the sludge presses.” As a long-term solution, the team is studying struvite nutrient recovery technologies to determine which is the most cost-effective.

A food-waste-to-energy project is also under study. “Recently, the city launched a greenhouse gas and climate change initiative, looking to reduce the city’s carbon footprint,” Wilkey says. “The wastewater treatment plant is the biggest user of electricity and natural gas. If we accept food waste, make gas out of it and put it back into the system for someone to use, then we’re not just helping the city, but we’re also helping a larger area in reducing the carbon footprint.”

If the food-waste-to-energy project goes forward, the increase in biogas production would enable the heating of buildings beyond the

(continued)



The team at the Iowa City Wastewater Treatment Plant includes, from left, James Holland, Brad Herrig, Tom Kacena, Kyle Coleman, Ryan Bennett, John Wombacher, Josh DeWild, Jesse Eister, Shaun Daly, Brian Gaffey and Tim Wilkey.





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## WELCOME TO THE CAREER

Tim Wilkey got his baptism into the clean-water profession after a just few months in his first job at the Glenbard Wastewater Authority in Glen Ellyn, Illinois.

"I was working third shift and transferring primary solids to the digester," Wilkey recalls. "Apparently I didn't have one valve open or another, because as soon as I kicked on the positive displacement pump, it blew the top off of a ball check valve, covering the inside of the room, and me, with primary solids."

"I got the pump stopped and got everything corrected and pumping down to the digester. So there I am, a new employee, frantically hosing off every inch of the inside of the room. I thought, 'I'll worry about myself later.' I just wanted to get the mess cleaned up."

two already served by the biogas-fueled boilers. Combined heat and power is not in the picture because such a system could not compete on cost with the area's low-priced utility electricity.

### STAYING ACTIVE

Besides his Hatfield award, Wilkey has received a 2018 Harris F. Seidel Award from the Iowa Water Environment Association for education and training. As a member of the Iowa Water Pollution Control Association Biosolids Committee, he received a 1998 U.S. EPA award for Outstanding Efforts Toward Public Acceptance for the Beneficial Use of Municipal Wastewater Biosolids.

“Since we’ve gone to biological nutrient removal, struvite has become more of an issue.”

**TIM WILKEY**

Outside of work, Wilkey enjoys bicycling, restoring a 1967 Ford Fairlane and tinkering with a 1977 BMW motorcycle. He’s also restoring a couple of old, discarded bicycles for grandkids.

He has no immediate plans to leave Iowa City: “As long as I can still do a good job, I’ll be here to help keep the city moving forward, keep the plant up to date and replace equipment as needed. I’ll probably stay four to five years, and after that I’ll see if I’m ready to retire. If not, I still maintain my Professional Engineer license, so I could always go back into consulting.

“I’ve been reflecting on my history, talking to old friends in the business and remembering back when — the interesting people we’ve met along the way, the interesting things we’ve done. It has been a great career. You work with a lot of really great people, and it’s rewarding work because you’re providing a service for people and a service for the environment.” **tpo**

“So as I was frantically cleaning up the room, the door of the building swung open and there was my foreman, who was an old motorcycle rider. He looked at me, looked around the room, and then looked back at me and said, ‘You’re busy. I’ll check back with you later.’”

“I think everybody who’s ever been in this industry has a story like that, where when things go bad, they go bad in a big way. Everybody gets some on them. It’s part of the nature of the job.”



Although nearing retirement age, Wilkey has his eye on a variety of improvements to the Iowa City facility.

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The FOG blanket was about 14 inches thick before trial started (left photo). Three weeks after the trial started, influent water could be seen.

# Innovation in Odor Control

A HYDROXYL RADICAL MISTING SYSTEM TO BREAK DOWN GREASE BUILDUP IS ANOTHER IN A LONG LINE OF LEADING-EDGE TECHNOLOGIES AT A CALIFORNIA FACILITY

By Jim Force

Grease and related odors from a trickling filter wet well were so bad at the Silicon Valley Clean Water treatment plant that the staff couldn't eat lunch at the picnic tables on the deck outside the office.

But 3 1/2 years ago, the plant — located in Redwood City, California — installed a MILLI hydroxyl radical misting system (Vapex) to dissolve and eliminate the grease layer. The odors have disappeared, and so has corrosion of plant infrastructure in that area from hydrogen sulfide.

"I was familiar with the technology," says Monte Hamamoto, chief operations officer. "It had always been appealing to me, so I felt it was worth a try." The Vapex team came on site and pilot-tested the technology for six months. Then, based on favorable results, plant staff purchased the unit.

## RESOURCE RECOVERY

Silicon Valley Clean Water is a joint powers authority providing wastewater treatment for some 220,000 customers in Redwood City, San Carlos and Belmont, plus the West Bay Sanitary District based in Menlo Park. Wastewater from all four communities is conveyed through pump stations and 9.8 miles of sewer force main to the treatment plant.

Normal flow through the plant is about 14 mgd, although the volume can increase to 80 mgd from inflow and infiltration throughout the communities' collections systems. The activated sludge plant includes tertiary filtration and chlorination with sodium hypochlorite. Discharge is mostly to San Francisco Bay, although a portion is pumped to Redwood City for reuse.

"We send about 1.5 mgd for recycling in the summer," Hamamoto says. "We could produce as much as 12 mgd for recycling."

Biosolids are anaerobically digested and dewatered to a 20% solids cake. In summer, the cake is dewatered further on drying beds and then land-applied. Biogas fuels a cogeneration unit with two engines that produce 1.2

“I was familiar with the technology. It had always been appealing to me, so I felt it was worth a try.”

MONTE HAMAMOTO

MW of electricity to fulfill 70% of the plant power needs. Hot water from the process heats the digesters and buildings.

## ATTACKING GREASE

Vapex has installed more than 350 odor control systems since it introduced the hydroxyl radical misting technology 15 years ago. The hydroxyl radical mist, made from ozone, water and air, breaks up grease while eliminating hydrogen sulfide.

A six-nozzle MILLI unit was piloted-tested on the trickling filter wet well for about six months. When the technology worked, the authority purchased the unit. A grease layer of as much as 18 inches used to build up in the influent channel. The concrete walls and aluminum hatch covers were showing signs of corrosion.

"We cleaned the channel out to give the Vapex unit a fresh start," Hamamoto says. Since the unit became operational, the grease layer has never exceeded 1 inch. It is simply washed away with the wastewater and does not congeal in downstream processes.

A second smaller unit was later purchased to eliminate grease and odors at a receiving station where grease is trucked in from restaurants. Hamamoto says the Vapex organization has been easy to deal with, providing sound training in operations and maintenance. Nozzle cleaning is the only regular maintenance required.

The units use no chemicals and operate on electricity and water supplied by the treatment plant. The units use plant effluent that has passed through



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A Vapex V3500 unit with six nozzles was used for the pilot study (precursor to the Vapex MILLI hydroxyl radical misting system).

a simple spin-down cyclone filter to remove particles that might plug the misting nozzles. The absence of chemicals is a boon to operators: “We used to use permanganate to try to scrub these odors. It was ineffective, and the operators hated it. It was not fun to deal with.”

#### ALWAYS INNOVATING

On its website, the authority champions innovation, citing breakthrough developments in energy, water, solids and new technology. “We’re in Stanford



The covered influent channel with nozzles placed above.

University’s backyard,” Hamamoto says. “We partner with them, and we’re constantly trying new things.”

In that vein, the plant is constructing new storage and flow equalization structures. The team also plans to add new drying technology to its biosolids processing train this year. A new pyrolysis unit will turn the dried solids into a carbon biochar that can be used as an agricultural soil amendment.

The odor control technology is further evidence of looking to the future. “The units have done a heck of a job for us, reducing grease, odors and corrosion,” Hamamoto says. “Plus, we can use the picnic deck again.” **tpo**

#### Share Your Ideas

*TPO* welcomes news about interesting methods or uses of technology at your facility for future articles in the How We Do It column.

**Send your ideas to [editor@tpomag.com](mailto:editor@tpomag.com) or call 877-953-3301**





The staff of the Clare Wastewater Treatment Facility includes, from left, Sven Drumheller, operator; Dale Clark, director of water treatment; and Mitch Canel and Josh Miller, operators. Not pictured is Tom Quick, deputy director of water treatment.

# A Few Hundred Bucks Work Efficiency Magic

SIMPLE IMPROVEMENTS IN LAGOON AERATION ARE KEYS TO EARNING A SUSTAINABLE ENERGY AWARD FOR SMALL TREATMENT FACILITY IN MICHIGAN

STORY: **Ted J. Rulseh** | PHOTOGRAPHY: **Ryan Watkins**





## Clare (Michigan) Wastewater Treatment Facility

**BUILT:**  
**1965; upgrade 1984 and 2011**

**POPULATION SERVED:**  
**3,100**

**FLOWS:**  
**1.35 mgd design, 0.6 mgd average**

**RECEIVING WATER:**  
**South Branch of the Tobacco River**

**TREATMENT LEVEL:**  
**Secondary**

**TREATMENT PROCESS:**  
**Continuous discharge lagoon system**

**BIOSOLIDS:**  
**Stored in holding lagoon; land-applied**

**ANNUAL BUDGET:**  
**\$1 million**

**WEBSITE:**  
**[www.cityofclare.org](http://www.cityofclare.org)**

**S**aving energy in clean-water plants often starts with the efficient use of air.

Dale Clark and his team at the lagoon-based clean-water facility in Clare, Michigan, have achieved about \$22,000 in annual electricity savings on average — roughly 19% — by making changes to the aeration system that cost only a few hundred dollars.

They did it by reconfiguring air piping, taking one of two blowers offline, shutting down the aerators in one of three lagoons for the winter and taking other measures to fine-tune air delivered to the process. The modest investment paid for itself in the first month.

The team earned a Sustainable Energy in a Small Facility Award from the Michigan Water Environment Association, based on a nomination by the Consumers Energy electric utility.

### DIVERSE OPERATIONS

Clare (population 3,100) is a mostly residential community in the heart of Michigan's Lower Peninsula. The five-member Clare Water team splits time operating the water plant (1.5 mgd capacity), two water towers, a water booster station and four wells; handling the NPDES permit for the water plant's filter backwash discharge; and operating seven wastewater lift stations.

The clean-water plant (1.35 mgd design, 0.6 mgd average) was built in 1952 as a primary treatment facility. In 1965, aerated lagoons were constricted at the present plant site, and a major 1984 upgrade added headworks screens, clarifiers with chemical phosphorus removal, UV disinfection and the current plant building.

"Then in 2011, we had to do an upgrade for ammonia reduction," says Clark, who has been with the facility for 25 years, the past six as director of water treatment. "That's when we added Webitat modules (Entex Technologies) and a SCADA system and did some sludge removal in the lagoons."

The three lagoons operate in sequence. Influent passes through a 0.030-inch microscreen (Aqseptence Group Inc. - Johnson Screens). The first lagoon (Cell 1) contains seven mechanical surface aerators (Aeration Industries International) and six Webitat modules that provide a substrate for growth of a biofilm. "The primary purpose of Cell 1 is to knock the BOD down," Clark says.

Cell 2, which contains eight surface aerators, continues biological treatment and removes most of the ammonia. The flow then proceeds to Cell 3, which has 10 Webitat modules and provides final ammonia removal. (Fine-bubble diffusers in that cell are no longer used.)

From the lagoons, the flow travels to two 60-foot-diameter clarifiers, which provide both settling and phosphorus removal. Ferric chloride is added in a mixing tank; polymer is added in the first clarifier. After the second clarifier, the water passes through the UV disinfection unit (Katadyn). The effluent easily meets the dissolved oxygen permit limit of 3.0 mg/L for discharge to the South Branch of the Tobacco River, a trout stream. "We are hardly ever below 10," Clark says.

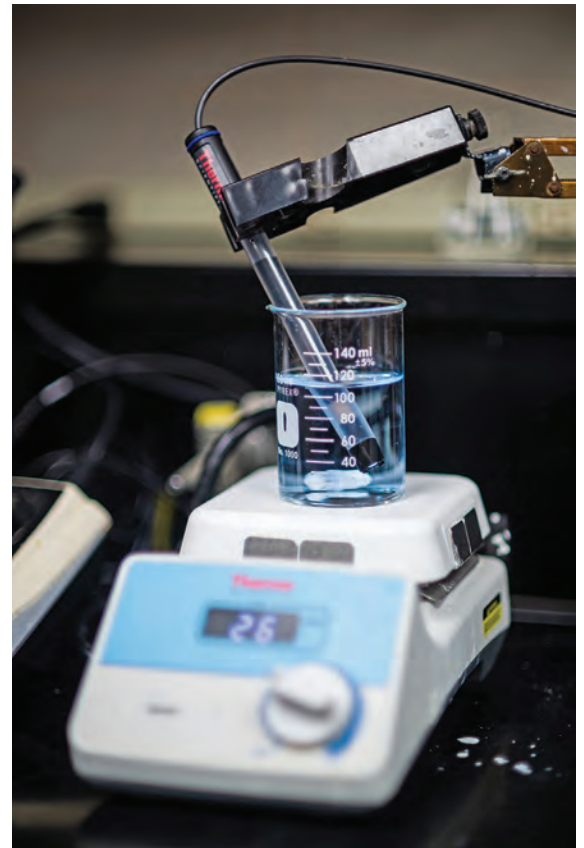


“It turned out we were able to shut the aerators off in Cell 2 and let them freeze in. It doesn’t affect our permit compliance at all.”

DALE CLARK



Sven Drumheller runs a fecal coliform test in the lab.



## WEBS OF WONDER

The lagoons at the clean-water facility in Clare, Michigan, use Webitat biological fixed-media units (Entex Technologies) as part of secondary treatment.

The units are engineered with weblike media to which treatment microorganisms can attach. Besides the media, the modules have integral air diffusers that oxygenate the bacteria and scour the web to make sure the biofilm stays at the optimum thickness. Shrouding of the units creates an airlift pump effect to optimize mixing and eliminate predatory organisms.

In lagoon settings such as Clare, the modules address three primary treatment limitations by providing mixing, aeration and biomass concentration. They are also well suited for oxidation ditches, where they enhance BOD removal and enhance nitrification and denitrification. They can be deployed along the ditch walls to enhance treatment without impeding flow velocity or causing solids to settle. The units can also be used in sequencing batch reactors.

## EYE ON ENERGY

The push to boost energy efficiency began after the addition of the Webitat units during the 2011 upgrade. “We added a 60 hp blower for the Webitat modules, and it raised our energy costs a little more than we liked. We had the large blower for the Webitats, and we had a blower for our chemical mixing and the fine-bubble diffusers.

“We decided to do some piping reconfiguration, run all the air off of one blower and shut the other blower off completely. The 60 hp blower (Aerzen) is on a variable-frequency drive, so we figured if we needed to, we could just



turn up the frequency and eliminate that other 15 hp blower. That was a decent way to save some money.”

Next, attention turned to the mechanical aerators in the lagoons. “Previously, we just ran all the aerators all winter, because if they would freeze in the ponds, we couldn’t get them running again. With the addition of the new blower, I thought it might be worth rolling the dice and shutting some of them off for the winter. The blower would enable us to adjust the oxygen level to make up for it.

“It turned out we were able to shut the aerators off in Cell 2 and let them freeze in. It doesn’t affect our permit compliance at all. There are eight 7.5 hp aerators in that pond, and we were able to eliminate the use of those all winter. We were also able to eliminate the fine-bubble diffusers in Cell 3, so we no longer run that blower.”

Some of the mechanical aerators in Cell 1 still operate through the winter to provide mixing.

“The Webitat modules are more or less for the cold-weather months, so in Cell 1 we try to keep some constant movement around those,” Clark says.

“In summertime we run all seven aerators. As the weather cools off, we start dropping those aerators off, too. We might run only four aerators in the winter, and we alternate them. The influent to that lagoon stays relatively warm, so it’s got to get super cold for that pond to freeze. That’s why we can shut three aerators off and rotate which ones we use.”

The blower also supplies air for mixing in ferric chloride before clarification, eliminating mechanical mixing. Blower air also mixes the polymer





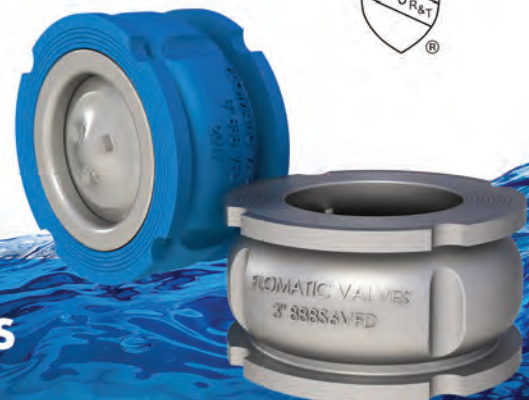
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### Clare Wastewater Treatment Plant PERMIT AND PERFORMANCE

	INFLUENT	EFFLUENT	PERMIT (Monthly Average)
<b>CBOD</b>	202 mg/L	4 mg/L	25 mg/L
<b>TSS</b>	249 mg/L	8 mg/L	30 mg/L
<b>Ammonia</b>	14.6 mg/L	3.8 mg/L	11 mg/L (May-October)
<b>Phosphorus</b>	3.14 mg/L	0.75 mg/L	1.0 mg/L

in the clarifier and has the extra benefit of adding oxygen in the water. The chemical feed pumps are now flow-proportional and driven by SCADA, saving labor and providing some chemical savings.

### FURTHER FINE-TUNING

Meanwhile, the Clare Water team took other steps to enhance energy efficiency. That included shutting off the UV disinfection lamps in summer. "Our fecal counts vary based on the temperature of the water," Clark says. "In September, we might see counts of 20 to 30, but a month or so later, they start climbing.

"When they climb up to 100 to 200, we turn our UV units on and leave them on until April. Then we shut them off. UV light from the sun gives us a lot of pathogen kill because our water is pretty clear. So we stopped running the lamps for a good portion of the year."

The quest for savings extended to the lift stations in the collections system. Two contained pumps run on single-phase power. "In Lift Station No. 7, we put in VFDs, converted its single-phase power to three-phase and installed three-phase pumps (Flygt - a Xylem Brand). That lowered our energy usage in that station by 15% to 20%.

"We're also doing some indoor LED light conversions. This year we plan



The Clare plant was built in 1952 as a primary treatment facility. After successive upgrades, it is now equipped for chemical phosphorus removal and ammonia reduction.

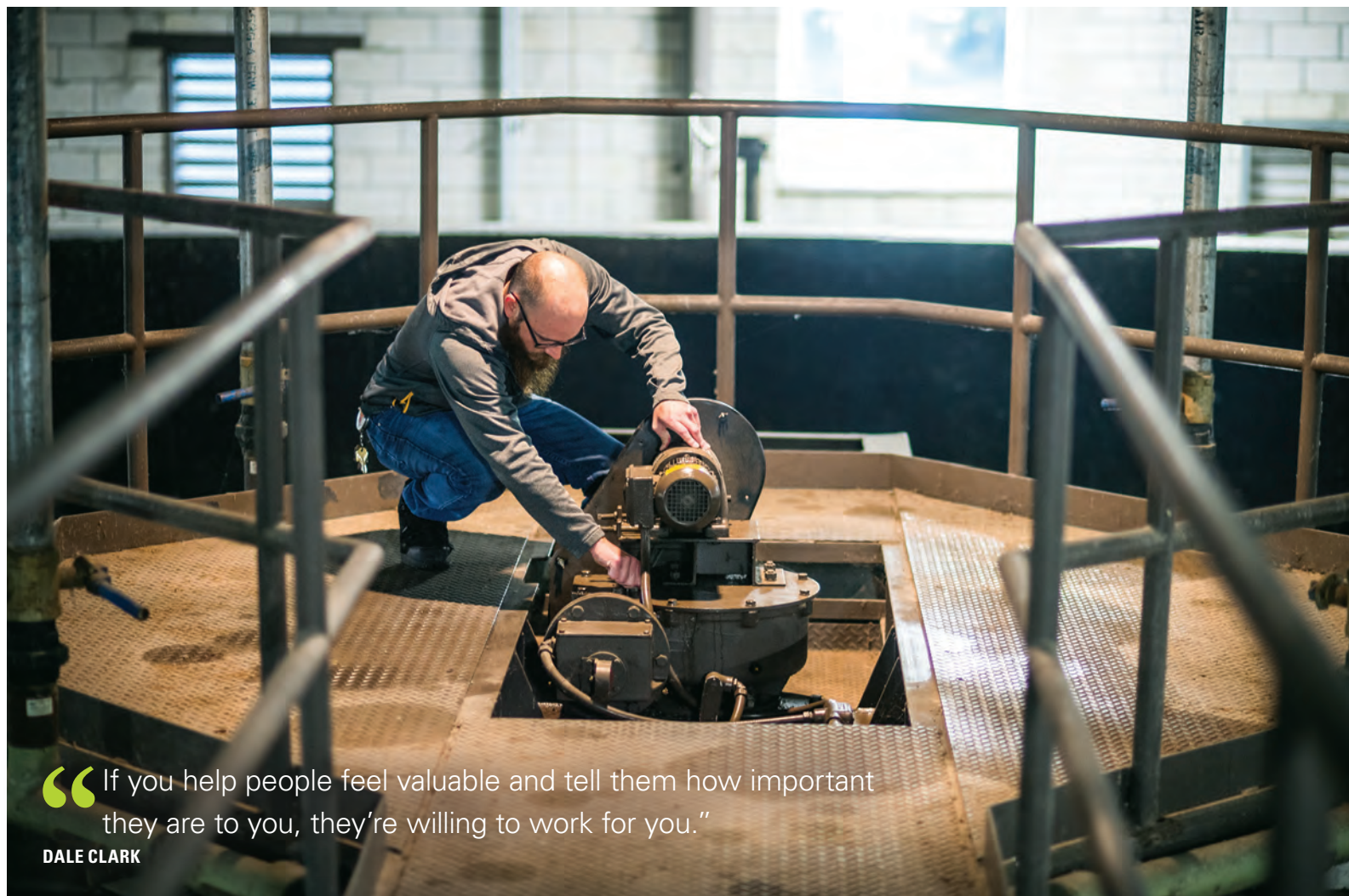
on changing our outdoor lights over to LED. We're working on that with Consumers Energy."

The energy savings are evident in total annual electric bills. Electricity costs from 2012-15 averaged \$118,025. Costs from 2015-19 averaged \$95,954. Those figures do not include savings on the lift station pump upgrade.

### AMPLE EXPERIENCE

Beyond energy savings, the Clare Water team keeps the plant rigorously maintained. It's a seasoned team with long tenure in the water department





“If you help people feel valuable and tell them how important they are to you, they’re willing to work for you.”

DALE CLARK

and with the city. Tom Quick, deputy director, is a 32-year department veteran and, like Clark, was a welder by trade before coming to Clare. Both hold associate degrees in water treatment.

Josh Miller, an operator for 11 years, transferred to the water department from the city garage team. So did Mitch Canel, the team’s heavy-equipment operator and a 15-year city employee. Sven Drumhellar, part-time helper, has been on board for two years.

“We’re tightknit; we work together,” Clark says. “We mind our own business, do our jobs and go home.” Those jobs include operating a water and wastewater lab that performs basic compliance and process-control testing. The team also pulls and analyzes samples from monitoring wells around a city-owned abandoned landfill.

“I always tell the guys, ‘There’s nothing you will do that I haven’t already done,’” Clark says. “I’m right there with them. I put myself in their shoes. I put them first as much as I can just to let them know they are valued. If you help people feel valuable and tell them how important they are to you, they’re willing to work for you.”

## METICULOUS CARE

“These guys are really good at taking care of the plant,” Clark observes. “Our equipment always lasts longer than the manufacturers say.”

A computerized maintenance management system helps keep planned maintenance on track.

A thermal imaging service visits once a year to image equipment such as starters, bearings, wiring and disconnects to predict impending trouble. “For example, if testing on an aerator shows the amps are high, that is a sign something is wrapped around a propeller, and we need to go out and look at that aerator,” Clark says.

Josh Miller performs preventive maintenance on a final clarifier.

At present, the Clare Water team is going through a water treatment plant upgrade that includes a changeout of three pressure filters, an electrical upgrade, general painting and SCADA modifications.

At the clean-water plant, the main influent lift is aging and so is the UV disinfection system. Recently, exhaust fans have been installed in the blower and electrical room to send heated air into the clarifier room to save energy and provide insurance against freezing. Another lift station is on the table for an upgrade to three-phase power.

Renewable energy isn’t in the immediate future but can’t be ruled out. “It’s a process,” Clark says. “We’re always doing things to try to lower our energy rate. We pick it apart as we go.” It’s one way to amass substantial energy savings. **tpo**

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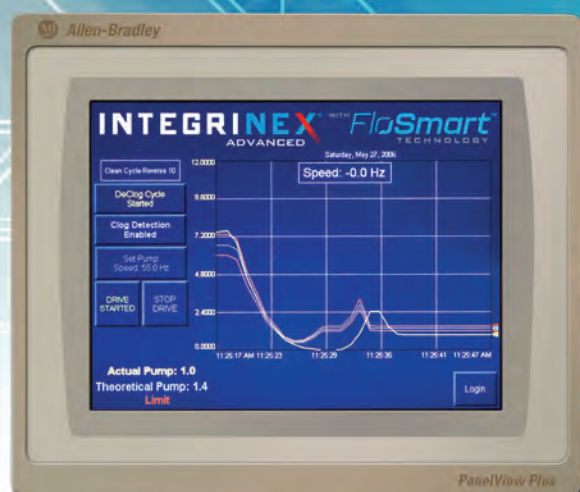
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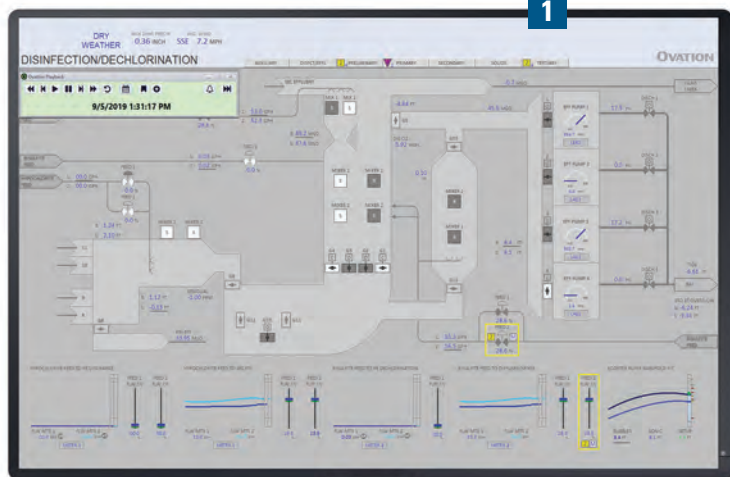
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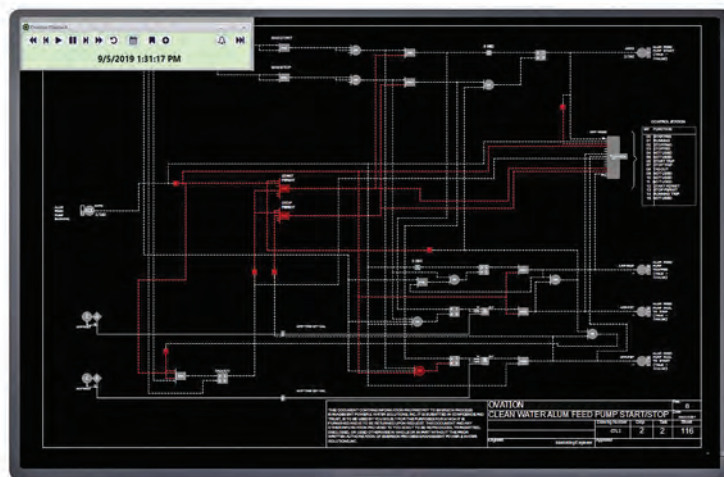
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1. Operators can use holistic and repeatable views of plant events to speed troubleshooting, enhance training and support sound decision-making.
2. Using the Ovation playback recorder, users can visually step through logic sequences as they play out on process graphics or signal diagrams.

# Getting to the Root

A PLAYBACK RECORDER TOOL FOR EMERSON'S DISTRIBUTED CONTROL SYSTEM HELPS PLANT OPERATORS TROUBLESHOOT EVENTS, TRAIN TEAM MEMBERS AND CAPTURE INSTITUTIONAL KNOWLEDGE

By Ted J. Rulseh

Imagine if you could go to your treatment plant control system display and roll back and observe the events that took place in a given interval of time.

You can do just that with the Ovation playback recorder from Emerson, a software add-on to the company's Ovation distributed control infrastructure. The system continuously records plant operating data at the same resolution as the live control system.

Functioning much like a household digital video recorder (DVR), it has standard functions such as play, pause, fast forward and rewind. Users can visually step through logic sequences with help from process graphics and signal diagrams. In this way, they can view historical data through the lens of what the operator would have seen under actual plant conditions.

Operators can use this holistic and repeatable view of plant events to speed troubleshooting, enhance training and support sound decision-making. They can review actions taken during an abnormal occurrence to identify what went wrong and determine what should have been done in response. They can then update procedures to better manage similar events in the future.

The recorder lets users quickly diagnose problems, limit equipment damage and reduce maintenance. Peter Gabor, business development manager for Emerson's water automation solutions, and Shane O'Toole, Ovation product manager, talked about the offering in an interview with *Treatment Plant Operator*.

**tpo:** What led you to bring this offering to the market?

**Gabor:** The big thing that causes people to dig into data is a substantial event at a plant. On the water and wastewater side, that could be an

“Where this really becomes valuable is when there's a cascading effect with multiple issues causing the failure. Those are the hard ones to diagnose.”

PETER GABOR

unusual discharge or a permit violation. In those cases, it's helpful to go back and see what the event looked like in real time through the lens of what the operators might have seen. Playback recorder provides the ability to do just that.

“The playback recorder goes beyond the functionality of a household DVR in that operators can see things on playback that they may not have seen while looking at the screen at the time of the event.”

SHANE O'TOOLE

**tpo:** Without this capability, how would an operations team analyze an event?

**O'Toole:** Typically they would review trend data in charts, graphs and numerical tables.

Sorting through all that data to do a root-cause analysis takes a very long time. Larger customers sometimes subcontract to a consultant to do that analysis. It costs a lot. But if they can visually step through and watch exactly what happened, on graphics they're familiar with, they can find the sources of problems a lot quicker. It's easier when they can see it visually instead of stepping through values on a spreadsheet.

**tpo:** What do treatment plants need to have in place in order to use this tool?

**O'Toole:** They would need to have the standard Ovation control system infrastructure. If that is in place, all they need to add is a computer to connect to the network, a cable to make the connection.

**tpo:** If I were an operator, how would I interact with the playback recorder?

**O'Toole:** You would sit at the operator's console and start the playback recorder application. You could hit play and watch on-screen signal diagrams, which are live running versions of control logic that show exactly what happened in the plant. That would give you the context to understand that process A was affected by process B or that thing A happened before thing B.

**tpo:** Can you provide a scenario of when an operator at a water or wastewater treatment plant would put this capability to work?

**Gabor:** Suppose they have a permit violation. All of a sudden there's a discharge and they hear news on the radio that there are problems. Where this really becomes valuable is when there's a cascading effect with multiple issues causing the failure. Those are the hard ones to diagnose. When it's over, the plant manager will ask, "Why did this happen? And how can we prevent it from happening in the future?"

**tpo:** What can operators actually observe on playback?

**O'Toole:** The playback recorder goes beyond the functionality of a household DVR in that operators can see things on playback that they may not have seen while looking at the screen at the time of the event. For instance, the operator might have been looking at screen A while doing day-to-day work, but the story of the event was actually unfolding on screen B or screen C. Playback lets them look at data that would have been on any of those screens at the time, because everything that happened was captured in the distributed control system.

**tpo:** Would they see the data all at once? Or would they view it one device at a time?

**O'Toole:** They can zero in on device A or device B. They can look at time period X, run through that scenario on screen A, then cue up screen B and run through that for same time period, then cue up screen C, and so on. They can go back and forward as much as needed to get the total picture of what went on during the event. It's like a movie where you watch a scene from one character's perspective, and then later you see the same scene through the eyes of a different character.

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**tpo:** What do users actually see on the screen during playback?

**O'Toole:** They see exactly what they would have seen in real time, except there is a little icon in the toolbar at the top of the screen that tells them they're reviewing historical data, along with buttons for play, fast forward, pause and rewind. The operator would see images of equipment, such as pumps, valves and tanks, and their levels.

**tpo:** Does this technology have uses beyond analyzing the root causes of events?

**O'Toole:** Root-cause analysis is not the only use case our customers have asked us about. In the water industry, we see turnover in organizations ramping up with retirements. Playback gives users the ability to capture, for example, a successful startup or a successful runtime with a piece of equipment that can be used for training purposes.

**Gabor:** In wastewater, for instance, it could be a scenario like switching over to a wet-weather event. That's challenging, and there may be only one operator on staff who is really comfortable with it. There are a lot of moving parts and a lot of things to get ready, and they're under duress. We can capture data on such an event so that up-and-coming operators and technicians can see and learn how someone did it successfully.

**tpo:** Is there a limit on the size of the slice of time that is captured by the recorder?

**O'Toole:** There is no hard-and-fast limit, but there is a restriction based on hard-drive space. The standard product includes an additional two terabytes of storage space. That provides on average about 28 days of data. That will scale up or down based on the amount of information the customer is pulling into the Ovation distributed control system. To retain events for long-term duration, such as for training, users can simply move those files to a different hard drive. **tpo**



# Just Two Letters. But What a Statement.

THE PROFESSIONAL OPERATOR (PO) CREDENTIAL IS A MARK OF COMPETENCE, INTEGRITY AND ACCOMPLISHMENT FOR PEOPLE IN THE DRINKING WATER AND CLEAN-WATER SECTORS

By Ted J. Rulseh

**W**hat comes to mind when you see the letters M.D. after someone's name? Or P.E.? Or CPA?

Those initials mean a lot, right? They signify someone who has studied extensively, passed rigorous examinations and earned the right to be part of an esteemed profession. So, what about the people who operate our clean-water and drinking water systems? Sure, they have earned licenses at various levels, but shouldn't they have a way to announce their status — some meaningful initials to place after their name?

That's the motivation behind the Professional Operator (PO) credential. It's offered by the Certification Commission for Environmental Professionals (C2EP), a part of the Association of Boards of Certification (ABC), which among much else develops standardized licensing exams for water professionals. PO is the industry's first professional designation for operators.

The commission hopes to establish the PO credential nationwide as a uniformly recognized symbol of professional competence and integrity. To earn the PO designation, operators must pass a certification exam and meet specific education and job experience requirements. The credential is offered for water treatment, water distribution, wastewater treatment and wastewater collection operators. Each category includes Class I to Class IV (highest) levels.

The PO designation, created in 2012, is intended to create new opportunities for career advancement and help its holders increase their earning potential. Alan Cranford, PO (Class IV water treatment), manager of the Stones River Water Treatment Plant in Murfreesboro, Tennessee, talked about the credential in an interview with *Treatment Plant Operator*.

**tpo: What is your connection to ABC and the PO credential?**

**Cranford:** I've been in the water industry for 37 years in the military and on the civilian side, and I've been active in the American Water Works Association for many years. I've also served on the Tennessee Water and Wastewater Certification Board for nine years. Our department has been an ABC member since 2011. Through that and personal connections, I was elected to the ABC board of directors. This is my third year, and I am now chairman-elect. I earned my PO credential in 2015.

**tpo: Why did ABC decide to create this credential?**

**Cranford:** The main reason is to have a universal credential reflecting operators' experience and capability. All the states have different rating schemes for operator certification. The PO was designed to provide standardization, so if I am a Class IV PO in Tennessee or Canada or Mexico or anywhere, everybody knows we're talking about the same classification, education and background.

**tpo: Is the PO credential in addition to state-level licensing and certification?**

**Cranford:** Yes. It was never meant to replace state licenses. However, my philosophy, along with many others, is that we need to standardize certification among the states. That doesn't mean taking away a state's authority to regulate, and it doesn't mean someone telling them what to do. But there should be reciprocity between, for example, Tennessee and Oregon or Michigan and Texas. The only way to achieve that is through some kind of standardization.



Alan Cranford, PO

**tpo: Why is reciprocity so important to operators?**

**Cranford:** A lot of operators want to be more mobile than they can be today. Ten or 15 years ago, it was common for someone to stay for 30 or 40 years in the same facility, but now people want to move around, whether it's for their families or for better opportunities. It's extremely difficult under the current state certification process for operators to do that.

“If you just want to clock in, clock out and go home, the PO is probably not for you. It's for people who want to be the very best they can be.”

ALAN CRANFORD

**tpo: How many operators to date have attained PO credentials?**

**Cranford:** There were 174 as of December 2019. Sixty-one new POs were issued in that year.

**tpo: Why would you say the credential has not been taking hold more rapidly?**

**Cranford:** When I talk to people at different conferences, many ask, 'How is it going to benefit me?' I tell them it's for people who really want to go above and beyond what the requirements are. If you just want to clock in, clock out and go home, the PO is probably not for you. It's for people who want to be the very best they can be and who have dedicated their lives to providing safe drinking water or producing excellent effluent from a water resource recovery facility.

**tpo: How would you compare the difficulty of the PO exams to state licensing exams?**

**Cranford:** It depends on the state. In some cases, the PO exams are

harder than the state exams, and sometimes they are equivalent. I wouldn't say the PO exams are ever less hard. And there are more continuing education requirements for the PO than for state licenses. The continuing education requirement for PO is 24 hours every two years.

**tpo:** What resources do operators use to study for the exams?

**Cranford:** The primary sources are the AWWA and Water Environment Federation manuals and the California State University, Sacramento manuals for the water and wastewater sides.

**tpo:** Do you encourage members of your team to seek the PO credential?

**Cranford:** Yes. Joe Russell, our assistant water plant manager, is a Class IV PO. Shift supervisor Mike Jones is a Class II PO, and shift supervisor Monte Casto is a Class I PO, as is Kayla Durham, our master plant operator. John Strickland, plant manager at the Murfreesboro Water Resource Recovery Facility, is a Class IV PO.

**tpo:** Have you benefitted personally from the PO credential?

**Cranford:** For me the benefit is mostly a matter of making a statement that I've gone above and beyond. Other people are also seeing benefits. So far I haven't heard of anyone getting additional pay, but it helps if you're applying for a new position somewhere. It's a credential you can show that other people don't have and that is recognized by people who are hiring.

**tpo:** Are you aware of specific instances where a PO credential has given someone an advantage in the hiring process?

**Cranford:** Yes. A former Murfreesboro team member, Alison McGee, now works for Huntsville Utilities in Alabama, where she is water supply superintendent over four water plants. She earned her Class IV PO before she left here, and it helped her attain her current position.

**tpo:** Have you seen any states accepting the PO credential in terms of reciprocity?

**Cranford:** Ohio uses the PO exams for its state certification, so operators can basically get the PO and their state certification at the same time. That's the only such case I'm aware of.

**tpo:** What is ABC doing to promote this credential?

**Cranford:** ABC holds POWER events at the WEFTEC and ACE conferences where they recognize new POs. They hold the events in the exhibit halls. The presidents of WEF and AWWA or their representatives come and give talks.

**tpo:** What is the significance of the PO code of conduct?

**Cranford:** It standardizes what is acceptable and ethical in this profession. Failure to follow the code of conduct would lead to losing your credential. There are 10 statements you must agree to. The code of conduct makes sure you understand that you're responsible for acting honestly, competently and with integrity at all times to ensure the protection of public health and the environment.

**tpo:** Do people who earn the credential regularly use the PO initials after their name in their professional communications?

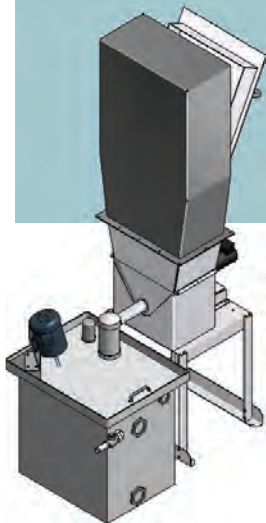
**Cranford:** Almost everyone does. There's also a pin you receive based on the level of PO you have. It's a water drop with blue jewels to signify the class level you have attained.

**tpo:** What would you say to an operator who asked whether it would be worthwhile to earn the PO credential?

**Cranford:** I would ask: 'Are you willing to go above and beyond? Are you willing to devote the extra time that's required not only to study for the credential, but to maintain it?' The people who have the PO are going to be the stars of the industry. If I had a choice between someone with a PO or not, I'm going to select the PO because I know that person is dedicated to being the best. **tpo**

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# Making Great Music

A CAMPGROUND ON A NORTH CAROLINA CLEAN-WATER PLANT SITE HOSTS VISITORS TO A MUSIC FESTIVAL AND DOUBLES AS A DISC GOLF COURSE

PHOTO COURTESY OF KAYLA MOUNCE, WILKES SOIL AND WATER CONSERVATION DISTRICT

By Jeff Smith

During the last week of April every year since 1998, hundreds of travel trailers, mobile homes, pop-up tents on wheels and backpacking tents converge on the wastewater treatment plant in the Town of Wilkesboro, North Carolina.

Their owners set up camp on a campground at the plant site that was created to support some of the tens of thousands who attend a renowned four-day music event, MerleFest. Providing more than 700 campsites on 69 acres of the 80-acre plant site is just part of being a good neighbor and helping out, says Sam Call, utilities director.

“Some of the campers have been coming since the beginning” Call says. “We have become friends with many of them over the years.” The Wilkesboro Wastewater Campground includes 200 modern campsites with RV hookups for electricity and freshwater, two heated and air-conditioned warm-water showers and a holding-tank dump. There are more than 500 tent sites.

## CAMPERS JAMMING

Late-night impromptu music jam sessions are a tradition among the campers. Several years ago, returning campers nicknamed the experience SewerFest. Call wasn’t enthused about the name because of its negative connotation. “But I’ve gotten over that and sort of embrace it now. We sell T-shirts, coffee cups and other merchandise with the SewerFest logo to raise funds for different causes.”

PHOTO ABOVE: The vacant SewerFest campground and shower room building are shown in the foreground of this aerial image of the Wilkesboro Wastewater Treatment Plant site.

More money is raised by the sale of firewood, ice and various foods and drinks. The proceeds from this year’s festival will go toward construction of an all-inclusive playground being built at the site. “We try to spread it out for community causes all over town,” Call says. “Last year, part of the proceeds went to the high school band.”

MerleFest, named after the son of American music legend Doc Watson, is held 4 miles away on the campus of Wilkes Community College near downtown Wilkesboro. A free shuttle between the campground and the festival is available for the campers.

## HOSTING HEADLINERS

Billed as one of America’s premier musical festivals, MerleFest draws many well-known musicians to 13 performance stages scattered throughout the campus. Past performers include Dolly Parton and the Doobie Brothers. Headliners for the 2020 event are Willie Nelson and Allison Krauss.

More than 30,000 people attend the festival, which serves as a fundraiser for the college. “We get people from all over the world and all walks of life,” Call says.



Preparing for MerleFest and managing the campground takes a real commitment by his staff, of whom he is proud. Plant operators team up with other town staff members to host the event.

A smaller annual two-day music and food event, Carolina in the Fall, occupies the campground each September. When the festivals are over, the campground property reopens as the 18-hole Rolling Pines professional disc golf course. Carved out of hills covered with loblolly pine trees, the course is open to the public.

“Some of the campers have been coming since the beginning. We have become friends with many of them over the years.”

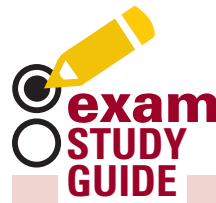
**SAM CALL**

## ROOM TO GROW

Land for the golf course and campground was acquired in the early 1990s when the plant needed more room to expand the plant to its current 4.9 mgd capacity. The owner wouldn't sell only a portion of the property, so the town bought the entire 69 acres.

“That's when MerleFest began attracting more people than the other campgrounds around town could handle,” Call says. “The idea of a campground caught on, and SewerFest has grown to what it is today.”

Although an 8-foot-tall fence isolates the plant's treatment operations from the public, an attractive wooden carved sign mounted on a decorative stone support welcomes visitors to the disc golf course and campground. “I've got a great staff who helps to make this all work,” Call says. “It's not always easy, but sometimes it just takes hard work to accomplish good things.” **tpo**



Licensing exams can be challenging. Our **Exam Study Guide** helps you prepare by presenting questions similar to those on an actual exam. You can find many more sample questions on the **TPO** website at [www.tpomag.com/study](http://www.tpomag.com/study).

## WASTEWATER

**By Rick Lallish**

**While operating an automatic composite sampling device, you notice elevated TSS or BOD in the effluent sample. What could be causing this problem?**

- A. Not enough samples in the 24-hour period
- B. Refrigerator temperature set too low
- C. Dirty labware/operator error
- D. Sample tubing residue

**ANSWER:** D. Automatic samplers are outstanding and generally reliable devices if maintained properly. Dirty tubing can lead to elevated TSS or BOD readings in the effluent samples. The residue is biological growth and, if left unchecked, it will cause many problems. Periodic cleaning or changing of the rubber or plastic tubing is necessary. Other problems to look for include low battery causing the sample to warm and begin bacterial growth, clogged strainers and dirty sample bottles. More information can be found in the California State University, Sacramento textbook, *Operation of Wastewater Treatment Plants*, volume one, eighth edition, Chapter 9.

## DRINKING WATER

**By Drew Hoelscher**

**An operator has a 100-gallon chemical day tank containing 60 gallons of water. How many pounds of chemical should the operator add to the tank to prepare a 10% solution by weight?**

- A. 6
- B. 10
- C. 35.5
- D. 55.6

**ANSWER:** D. When asked to make a solution with a percent-by-weight concentration, the weight of the water plus the weight of the chemical are taken into account. For instance, 60 gallons of water weighs 500.4 pounds and should only contribute to 90% of the total weight if the desired concentration is 10% chemical.

## 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***



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Helga Bundy, lead operator, prepares to test the backflow assembly device.



# Improving the Landscape

RESOLVING PRESSURE PROBLEMS, EDUCATING CUSTOMERS AND LEVELING OUT IRRIGATION DEMAND PUT A SUBDIVISION WATER PLANT ON COURSE FOR A SIGNIFICANT AWARD

STORY: **David Steinkraus**

PHOTOGRAPHY: **Heidi Kurpiela**

When the City of Leesburg in Florida took over a water plant serving a large subdivision, it inherited a facility that did not meet customers' demands. A homeowner association had owned the plant, and customers were plagued by low water pressure, made worse by limited system storage and heavy demand for irrigation. But the Leesburg team overcame the problem. It took a few years, many changes and some public education that is still going on, but demand is now spread out and the pressure problems are under control.

## CYCLING PUMPS

The Plantation Water Treatment Plant draws from three of the 17 wells the city has in the aquifer. Raw water comes in through a 12-inch pipe and flows into a 800,000-gallon aboveground storage tank and through a 3,500 gpm aerator (Precon). Sodium hypochlorite is mixed at the same time. A baffle wall in the tank ensures sufficient chlorine contact time.

“We started bringing in contractors to have little town meetings about conservation and the different things we could do — rock landscaping and things like that.”

AL PURVIS

The Plantation plant is challenged by having to serve both higher and lower elevations.



High-service pumps (Pentair - Fairbanks Nijhuis) pull water out and send it to customers. In 2015-16, the utility added an 800,000-gallon tank, pump room and chemical storage. A new raw waterline was laid to the site of the new tank, about a mile from the existing plant and a new building for pumps and chemical storage. This became the new water plant.

The homeowner association gave the city land for the project; in return, the city gave the association the land where a wastewater treatment plant for the subdivision used to be. That plant was replaced with a lift station to move wastewater to the city's central plant.

The Plantation plant is not interconnected with the other five water plants operated by Leesburg, says Al Purvis, chief operator. Because the Plantation plant operates under a separate state permit, it cannot be interconnected at the moment, but stub-outs are in place so that in an emergency a crew could make a connection in about an hour. When the current permit expires, the city can consider combining all its plants on the same permit.

## REDUCING PRESSURE

Pressure problems began from the day the city took over the water plant. The original plant for the subdivision drew from wells and pumped water directly into the distribution pipes. A series of upgrades followed as the subdivision grew. The association had a private firm running the facility, but the plant wasn't well designed from the start, Purvis says.

The original storage was a 54,000-gallon tank. Four pumps with capacities of 1,000 to 4,000 gpm pushed water into the distribution pipes. “But, really, you could run only three of them because cavitation was so bad that the pipe would heat up on the fourth one and make the pump nonfunctional,” Purvis says.

## Plantation Water Treatment Plant

Leesburg, Florida

[www.leesburgflorida.gov](http://www.leesburgflorida.gov)

BUILT:

**1985, upgraded 2000, 2016**

POPULATION SERVED:

**5,139**

SERVICE AREA:

**Approximately 3 square miles**

EMPLOYEES:

**8**

FLOWS:

**3.5 mgd design, 1.5 mgd average**

SOURCE WATER:

**3 aquifer wells**

SYSTEM STORAGE:

**800,000 gallons**

DISTRIBUTION:

**10 miles of water mains**

ANNUAL BUDGET:

**\$1.8 million (operations)**

KEY CHALLENGE:

**Hire and retain licensed operators**

Producing 2.5 mgd with so little storage was almost impossible. Most of the demand occurred between 2 and 9 a.m., about 90% of it for irrigation. Purvis knows that because of the difference between what the water plant produced and the wastewater plant treated.

“I would produce 2.5 million gallons, and they would only get back 300,000 to 400,000 gallons, so you know where the rest of it went,” Purvis says. “We have a lot of sandy soils, so it just soaks up the water, and it's gone.”

## BOOSTING EFFICIENCY

During those early-morning peak hours, an operator on site ran the plant manually to keep the storage tank as full as possible and maintain system pressure. After taking over the plant in 2006, one of the city's first actions was to upgrade the pumps with variable-frequency drives (Danfoss VLT Drives) in 2008.

Previous operators had tried to run the system with pressure switches. The pumps came on every 30 seconds to charge the system. “It was on off, on off all day long,”





Adam Hamblin takes a sample from the facility's finished water sample tap.

Building the new plant near the middle of the distribution system helped reduce the need for higher pressures. There are now two 12-inch taps into the distribution pipes, one directly in front of the plant and the other about three-quarters of a mile away and downhill. Those also helped balance pressure across the system. Pressure is now adequate to satisfy demand but not high enough to break older pipes.

### GREEN AS GRASS

Because most of the subdivision's demand was for lawns, addressing irrigation was key. Using rules from the area water management district and a list of connections in the subdivision, the team divided the development into sections and set a schedule specifying which sections could irrigate on which days of the week. That spread out demand and helped ease pressure problems.

By far, the largest challenge was educating homeowners about water use, Purvis says. Homeowners favor St. Augustine grass, a native tropical grass, but maintaining a dense, green, weed-free piece of turf in inland areas requires supplemental water. Leesburg is inland, about 45 miles northwest of Orlando.

"We started bringing in contractors to have little town meetings about conservation and the different things we could do — rock landscaping and things like that," Purvis says. Educators included Purvis, the city's utility director, University of Florida experts and some private contractors who specialized in water conservation.

"That was a battle, too, because the homeowner association had its rules, which weren't conservation friendly," Purvis says. "It slowly came around as well." Homeowners still must obtain association approval for alternative landscaping, but the



The team at the Plantation Water Treatment Plant includes, from left, Christopher Surgener, plant technician; Helga Bundy, lead operator; Al Purvis, chief plant operator; Bradley Leachman, apprentice operator; and Daniel Myklejord and Adam Hamblin, operators.

Purvis says. Power bills were high because of the electricity needed to start pumps so often. The VFDs reduced the on-off cycles.

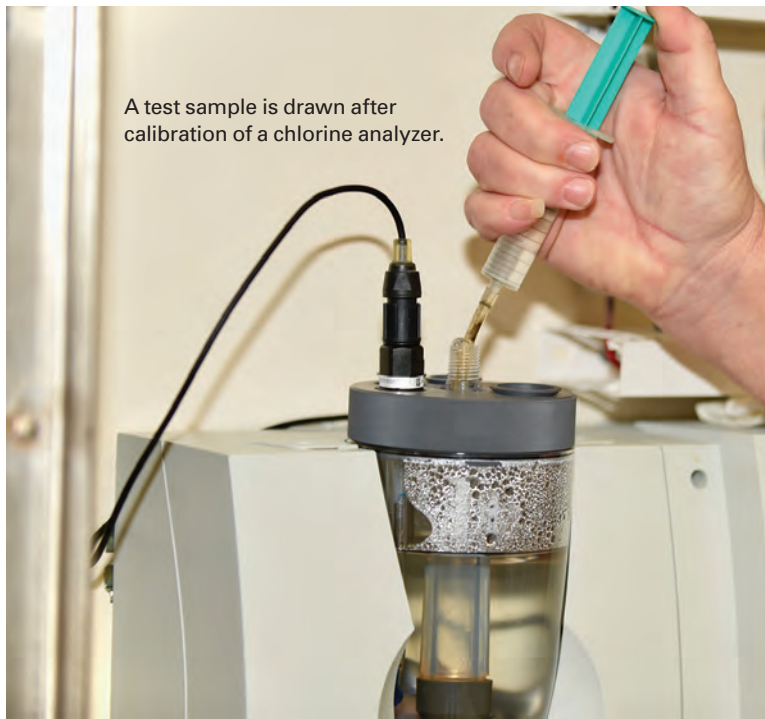
The terrain is hilly: On high ground is a newer section of the subdivision built in the 2000s, and on lower ground is a section built in the 1950s. "So if we increased the pressure to get water uphill, we were blowing pipes on the older section," Purvis says. "When we took over, we increased the pressure to help with demand, and some of the pipes just couldn't handle it."

group has loosened its regulations to allow other options.

No single incident or meeting changed minds. The slow, continuous process of providing information made a difference. "I think over time people realized that other landscaping would still look nice and conserve water at the same time," Purvis says.

"Also, some residents jumped on board and helped us. One gentleman did his entire front yard in rock. He tracked his water use, and he saved





A test sample is drawn after calibration of a chlorine analyzer.

“What I tell my team is, if the public doesn’t know we exist, then we’re doing our jobs the best we can, because that means every time they turn their faucet on, they have water.”

**AL PURVIS**

enough to basically repay himself. We now have a full-time conservation officer on staff. We still go out to all the communities and have meetings and discussions.”

### ROTATING EXPERIENCE

Operators at the Plantation plant don’t work there all the time. They rotate among the city’s six plants. The team includes Helga Bundy, lead operator; Matthew Turner and Daniel Myklejord, Class C operators; Christopher Surgener, plant mechanic; and Adam Hamblin, Jonvier Christian, Bradley Leachman and David Brown, apprentices.

This group’s performance earned the facility a 2018 Most Improved Water Treatment Plant award in Class C from the Florida Section of the American Water Works Association. Its accomplishments included managing pressure problems, adding new pumps, adding an emergency generator (Caterpillar Inc., Electric Power Division), promoting water conservation, building the new plant and replacing chlorine gas with sodium hypochlorite for disinfection.

“When we started out, we were pumping 2.8 mgd, and now we average about 1.5 mgd,” Purvis says.

No longer does an operator have to run the plant manually in the early morning during peak irrigation demand. There is just one day shift at the plant — one hour per day, six days a week, plus a visit on Sundays to look at the equipment and take daily readings. At all others times, the plant is monitored through the utility’s SCADA system.

When the new storage tank and plant were finished in 2016, the plant team held an open house. Many people were surprised at what is needed to provide their water. “What I tell my team is, if the public doesn’t know we exist, then we’re doing our jobs the best we can, because that means every time they turn their faucet on, they have water. It’s good quality, at the lowest price possible, and everything is fine.” **tpo**



Al Purvis,  
chief operator

## LICENSED OPERATORS WANTED

Al Purvis, chief operator, has a good team working at the Plantation Water Treatment Plant in Florida. There’s one thing he wishes he had more of.

“The biggest problem I’m having is getting licensed operators,” he says. “We get people as apprentices. We spend the dollars to get them trained and get them certified, and they move to a neighboring city making more.” They sometimes move to smaller cities, sometimes larger cities, sometimes to upper or lower Florida. And he says they can’t be blamed, because they have families to care for.

A person hired without training is given two years to become licensed. Once the state license is granted, team members typically stay for another year before moving on. “That’s not every case,” Purvis says. “We’re fully staffed right now, and I hope I keep it that way.”

Occasional job fairs and regular open houses keep the plant team in touch with the public and provide forums to explain water careers to potential operators. His team now is very young. “That’s good for us if we can get them to stay, because their knowledge of our system would be fantastic as they grow,” he says. “Right now we’ve got a great bunch of operators and apprentices.”

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# Monitoring and Instrumentation

By Craig Mandli

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Alyza analyzers from YSI, a Xylem brand

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CP20/40/50 Series control panels from Delta Treatment Systems

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## Data Loggers

### KELLER AMERICA LEO RECORD

The LEO Record from Keller America combines a high-accuracy digital pressure gauge with an integral, programmable data logger to provide the optimal solution for water system pressure monitoring. This battery-operated instrument is available in pressure ranges from 0-10mBar to 0-30,000 psi, offers 0.1% FS TEB accuracy and stores 57,000 data points. Intrinsically safe versions are also available for measurement applications in hazardous areas. It interfaces with Keller's PC-based software via USB for setup and data download. Downloaded data can be viewed graphically or in tabular form and can be easily exported to popular spreadsheet software for report generation. **877-253-5537; www.kelleramerica.com**

## LOGIC BEACH ADQUIERALOGGER

The AdquieraLogger from Logic Beach is an industrial-grade stand-alone data acquisition, alarming and reporting instrument that samples analog and digital inputs and reports readings to the cloud. Via their favorite web browser, users can simply access current values, historical data plots and reports from the cloud portal. Fully programmable via HyperWare-II drag-and-drop graphic programming software, it not only samples and processes inputs, but also performs local alarming. Communication options include Wi-Fi, cellular and Ethernet. Via the cloud portal, users can configure custom webpage display objects for data visualization, as well as set up automated reporting, FTP, email and SMS alarm and status messaging. It is suited to remote site field deployments, as well as in-plant and production floor installations. **619-698-3300; www.logicbeach.com**



**AdquieraLogger from Logic Beach**

## PHOENIX CONTACT PDR-1000

The PDR-1000 data recorder from Phoenix Contact makes it easy to visualize, alarm, store and convert data from analog devices such as thermocouples, resistive temperature detectors, digital inputs and remote Modbus devices.



**PDR-1000 data recorder from Phoenix Contact**

Local data can be collected and communicated in real time to the device, which can be used with an existing system that requires field signals to be monitored locally, or with a telemetry system using a wireless radio. It offers intuitive webpage configuration, so no programming is required. Alarms are stamped with the time of activation and time of acknowledgment. Data can be downloaded as a CSV file or transferred to remote storage via FTP. **800-322-3225; www.phoenixcontact.com**



**Operator10 from AllMax Software**

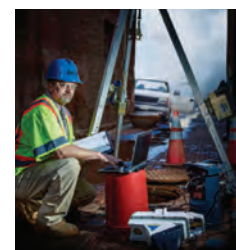
## Flow Control and Software

### ALLMAX SOFTWARE OPERATOR10

Operator10 from AllMax Software provides a central database for all of a plant's operational and process control data. Users have the ability to manually enter data, pull data directly from SCADA and/or import data from LIMS programs. Built-in tools allow for regulatory reporting/electronic submittal, custom report creation, graphing, process control calculations, built-in formulas (mean cell residence time, sludge volume index, food-to-microorganism ratio, etc.), easy customizable data entry sheets, customizable user dashboards, a full audit trail and a biosolids module. Users benefit from easy access to historical/current plant data, decreased time on monthly reporting, better overall data management and improved plant efficiency. **800-670-1867; www.allmaxsoftware.com**

## HACH DATA DELIVERY SYSTEM (DDS)

The Data Delivery System (DDS) from Hach is an efficient flow monitoring service tailored to deliver relevant data when needed. For a fixed monthly fee, it provides all of the equipment, data transmission and technical support needed to acquire flow data — delivered in real time for immediate analysis. It allows operators to know their flow status anytime, anywhere, for either long- or short-term applications. **800-368-2723; www.hach.com**



**Data Delivery System (DDS) from Hach**



**Force Main Sync from Smith & Loveless**

## SMITH & LOVELESS FORCE MAIN SYNC

Force Main Sync from Smith & Loveless can assist industrial and municipal end users and water companies when faced with problems installing multiple wastewater pump stations on a common force main. Force main pressures vary, and without accounting for the variable



conditions and reduced service life, a multitude of issues arise. These phenomena result in impeller and volute erosion, reduced bearing and seal life, excessive pump noise and vibration. The program monitors hydraulics in the common force main to keep pumping at the required flow rate. Utilizing a PLC touch-screen human-machine-interface controller, a VFD and a force main sensor, the PLC constantly senses force main pressure and automatically adjusts the VFD to maintain a constant flow rate no matter how many stations are online. **800-898-9122; www.smithandloveless.com**

## Gas/Odor/Leak Detection Equipment

### MILWAUKEE RUBBER PRODUCTS GASALERTMICROCLIP XT

The slim and compact GasAlertMicroClip XT from Milwaukee Rubber Products provides affordable protection from atmospheric hazards. This multigas detector offers continuous visual confirmation of detector operation and compliance with the IntelliFlash feature and simple one-button operation offers ease of use and significantly reduces time spent training the user. It is fully compatible with the MicroDock II automatic test and calibration system. **800-325-3730; www.milwaukeeerubber.com**



GasAlertMicroClip XT from Milwaukee Rubber Products

### MSA NORTH AMERICA ULTIMA X5000



ULTIMA X5000 gas monitor from MSA North America

The ULTIMA X5000 gas monitor from MSA North America offers a touch control display, dual sensor inputs and XCell sensors with TruCal technology. It operates from two touch buttons or wirelessly via a Bluetooth-enabled device from up to 75 feet away. At a glance, users can see colorful text and icons that show a gas reading gauge, progress bar, operational status, maintenance alerts and alarms. It can also connect two sensor inputs into one transmitter via dual 4-20mA outputs. This economical design reduces the cost of wiring, conduit and technician installation time.

It detects any two combinations of combustible gas, hydrogen sulfide or carbon monoxide, as well as 0% to 25% carbon dioxide. TruCal technology can extend calibration cycles up to 18 months by detecting sensor failures without applying calibration gas and compensates for sensor drift due to environmental changes. **724-776-8600; www.msasafety.com**

### RKI INSTRUMENTS GX-3R PRO

The GX-3R Pro five-gas monitor from RKI Instruments weighs only 4.58 ounces and fits in the palm of your hand. In addition to monitoring standard confined-space gases, it has a fifth channel to add infrared or toxic gas sensors. Two of the four sensor slots have interchangeable sensors providing flexible configurations, which can easily be changed in the field. It comes equipped with Bluetooth wireless communication, man-down alarm and the choice of alkaline or rechargeable power supply. The lithium-ion battery pack will operate for 25 hours and will fully charge in three hours. It utilizes Bluetooth communication to display direct gas readings from the instrument to a phone app, which is available free on either



GX-3R Pro five-gas monitor from RKI Instruments

iOS or Android phones. Automatic notifications can be programmed to send text or email messages if there is an alarm event. **800-754-5165; www.rkiinstruments.com**

## Meters

### BADGER METER DYNASONICS TFX-5000 FLOWMETER

The Dynasonics TFX-5000 ultrasonic clamp-on flowmeter from Badger Meter accurately measures the volumetric flow of clean liquids and those with small amounts of suspended solids or aeration, such as surface water or raw sewage. It is suitable for water and wastewater applications such as lift stations, booster pump stations and water mains. This meter provides accuracy up to 0.5% and flow rates ranging from 0.07 to 33,000 gpm on pipes as large as 48 inches. Designed to clamp onto the outside of pipes, the meter does not contact the internal liquid, allowing for installation without shutting down operations in new and retrofit applications. It is equipped with an internal clock and built-in 8 GB data logging capabilities to log flow down to one second. It also pairs with dual clamp-on resistance temperature detectors for Btu energy measurement. **877-243-1010; www.badgermeter.com**



Dynasonics TFX-5000 flowmeter from Badger Meter

### BLUE-WHITE INDUSTRIES DIGI-METER F-2000 SERIES FLOWMETER



Digi-Meter F-2000 Series flowmeters from Blue-White Industries

The Digi-Meter F-2000 Series electronic, digital paddle wheel flowmeters from Blue-White Industries monitor flow in a wide variety of applications. The units measure water ranges from 0.4 to 8,000 gpm and feature an easily visible, eight-digit LCD readout with up to four decimal positions. The meter is field programmable via the

front panel touchpad, and the panel is equipped with a security lockout. It is designed to accommodate pipe or wall mount installations. The insertion-style F-2000 displays flow rate, total flow and includes an NPN open-collector output for communication with data loggers, SCADA systems and other external devices. Additional features include 4-20mA/0-10 volts DC, batch processing, a high/low flow-rate alarm output and front panel security lockout. It comes factory programmed with a calibration certificate. **714-893-8529; www.blue-white.com**

### FLOW TECHNOLOGY QCT SERIES IN-LINE ULTRASONIC FLOWMETER

The QCT Series in-line ultrasonic flowmeter from Flow Technology is a versatile solution for measuring low-viscosity liquids. It has no moving parts, nonwetted sensors and nothing in the flow stream to cause an increase in pressure drop. It is available in 1/8- to 1-inch sizes, accurate to plus or minus 0.5% of reading plus zero stability and repeatability is plus or minus 0.2% over a 10-1 calibration range. It has a temperature range of 14 to 176 degrees F and has analog, scaled frequency and Modbus RTU outputs. This small-footprint, lightweight instrument is suitable for low-viscosity applications such as water, water-based products and oils, and the all-plastic construction makes it suitable for many corrosive fluids. **480-240-3400; www.ftimeters.com**



QCT Series flowmeter from Flow Technology

## LOVIBOND TINTOMETER PTV SERIES PROCESS TURBIDIMETER

Lovibond Tintometer PTV Series process turbidimeters are optimized for drinking water applications with low range accuracy below 1 NTU. The instruments include a long-lasting LED light source and a bubble exclusion system that deliver accurate and ultrastable measurements. Combined with the heated optical assembly, the chance for condensation and fogging is eliminated. The flow body is easy to clean and can be easily drained for cleanings and calibration with quick-connect fixtures. Collecting a grab sample for verification is easier than ever with no need to disconnect tubing to access the sample. The low volume flow body provides faster response to turbidity spikes and uses less water and calibration standards. They meet EPA and ISO regulatory requirements. **941-756-6410; [www.lovibond.us](http://www.lovibond.us)**



**Lovibond Tintometer PTV  
Series turbidimeters**



**MAS 801 pump monitoring system  
from Flygt - a Xylem Brand**

## Process Control Equipment

### FLYGT - A XYLEM BRAND MAS 801

As part of a complete Flygt - a Xylem Brand pumping system, the MAS 801 pump monitoring system helps reduce costs over a pump's lifetime. Thanks

to its 24/7 on-site overview of pump data that simplifies methods for diagnostics, this technology enables continuous station health checks on pump operation. In addition, with three-axis vibration, current measurement, and temperature and leakage measurements, you can take timely, preventive measures for increased lifetime of the pumping equipment. **704-409-9700; [www.xylem.com](http://www.xylem.com)**

## FORCE FLOW SOLO G2

The SOLO G2 digital weight indicator from Force Flow, when combined with a scale or ultrasonic sensor, offers a way to see how much chemical is being used and how much remains in a tank. It allows readability to 0.1 pound per kilogram and is available as a single- or dual-channel unit. Housed in a NEMA 4X enclosure, it offers protection against harsh environments.

All functions are menu-driven, and configuration changes are done through the keypad. It comes standard with 4-20mA outputs for remote monitoring through a PLC or SCADA system. Level alarm relays are also available. **800-893-6723; [www.forceflow.com](http://www.forceflow.com)**



**SOLO G2 digital weight  
indicator from Force Flow**

## GREYLINE INSTRUMENTS PSL 5.0

The PSL 5.0 pump station level controller from Greyline Instruments has redundant level sensing. It includes a noncontacting ultrasonic sensor and can be connected to a loop-powered pressure sensor for redundant sensing in applications with foam or grease. It will continuously recalibrate the pressure sensor and automatically switch

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**to protect the receiving waters we discharge to. I care about the waters.**

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**Mark Fogle**  
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Lakehaven Utility District, Federal Way, Wash.

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back and forth from ultrasonic to the pressure sensor as required. It is designed for lift stations, wet wells and storage tanks. Calibration and relay setpoints are easy to enter through the user-friendly keypad and menu system. An automatic pump runtime logging and reporting system helps operators to plan pump maintenance and identify lazy pumps before they fail. It includes an isolated 4-20mA output and six programmable control relays for pump control, pump alternation and level alarms. An intrinsically safe sensor and a built-in data logger are optional. **315-788-9500; [www.greyline.com](http://www.greyline.com)**

**PSL 5.0 level controller from Greyline Instruments**

## VEOLIA WATER TECHNOLOGIES (DBA KRUGER) AQUAVISTA PLANT



**AQUAVISTA Plant from Veolia Water Technologies (dba Kruger)**

The AQUAVISTA Plant from Veolia Water Technologies (dba Kruger) provides a holistic digital solution for optimization of the consumption of energy and chemicals, biological and hydraulic capacity enhancement, stable operation and increased compliance of wastewater treatment plants and sewer networks. With advanced analysis of online sensor measurements in real time, it continuously determines optimum set-

points and updates those settings in the plant control system automatically through a dedicated portal. Significant gains in performance, capacity and efficiency have been verified in wastewater systems using its advanced controls. The system is suitable for small and large municipal and industrial wastewater systems and is applicable to a wide variety of systems including complete collections systems, CAS/biological nutrient removal systems, biofilters, moving bed biofilm reactor/integrated fixed-film activated sludge, oxidation ditches, upflow anaerobic sludge blanket (UASB) systems and deammonification. **919-677-8310; [www.veoliawatertech.com](http://www.veoliawatertech.com)**

## Sensors

### BINMASTER LEVEL CONTROLS NCR-84

Measuring distances up to 98 feet, BinMaster Level Controls' NCR-84 80 GHz radar level sensor is designed for reliable measurement in demanding liquid conditions. The signal is focused in a very narrow beam, allowing precise aiming to avoid obstructions in the tank. It is also appropriate for use in tanks with turbulent product surfaces, viscous media and slurries. This sensor is offered in threaded, flange and hygienic versions for a wide variety of applications, plus a plastic antenna option for use in low pressure or temperature ranges. The threaded 1.5-inch version mounts conveniently in existing small process fittings. An optional 3/4-inch NPT process fitting makes it easy to mount in small tanks and space-constrained areas while its compact design makes reliable measurement possible in small tanks. It is simple to configure and commission and is compatible with software and digital panel meters for easy access to sensor data wherever it's needed. **402-434-9102; [www.binmaster.com](http://www.binmaster.com)**



**NCR-84 80 radar level sensor from BinMaster Level Controls**

## MARKLAND SPECIALTY ENGINEERING SLUDGE GUN

The Sludge Gun hand-held sludge blanket level detector from Markland Specialty Engineering measures liquid-solids interface levels in clarifiers, settlement tanks and lagoons. It helps eliminate unnecessary pump-



**Sludge Gun detector from Markland Specialty Engineering**

ing/dredging and aids in monitoring sludge bed depth for regulatory compliance and prevention of carryover. It uses high-intensity infrared light to locate both sludge blanket and overlying cloudy layer. A thumb-adjustable sensitivity control allows users to detect silt/sludge/biosolids in densities ranging from light flocs to thick blankets. As its sensor is lowered into the tank/pond, the instrument emits an audible tone that varies in volume and pitch depending upon the concentration of suspended solids. Operators observe interface levels on the numbered depth markers of the cable. Compact and weatherproof, it is suitable for use on boats and narrow catwalks. No calibration is necessary. **855-873-7791; [www.sludgecontrols.com](http://www.sludgecontrols.com)**



**3014AB Filter Alarm (Smart Alarm) from Polylok**

### POLYLOK 3014AB FILTER ALARM (SMART ALARM)

The 3014AB Filter Alarm (Smart Alarm) from Polylok is a wired indoor/outdoor filter alarm that provides audio/visual warning notifying operators that a tank filter needs cleaning. The Smart Alarm Switch activates when the filter cartridge is near capacity (approx-

imately 90% full) with solids. The Smart Alarm Switch installed in the filter sends a signal to the panel, activating the audible and

visual alarm. It offers a manual alarm test switch and horn silence, an alarm horn rated to 82 dB at 10 feet, and 15 feet of cable, with longer lengths available. **888-765-9565; [www.polylok.com](http://www.polylok.com)**

## VEGA AMERICAS VEGAPULS

VEGAPULS radar level sensors from VEGA Americas are 80 GHz sensors that use precision focusing to deliver reliable measurements regardless of internal obstructions or ambient conditions such as temperature changes or condensation. The stand-alone loop-powered sensors are available in a compact version with cable connection housing or a standard version with fixed cable connection (IP68). The instrument series is complemented with optional VEGAMET controllers. All instruments and controllers can be adjusted via Bluetooth with a smartphone or tablet. This makes setup, display and diagnostics considerably easier, especially in harsh environments or hazardous areas. **800-367-5383, [www.vega.com](http://www.vega.com) tpo**



**VEGAPULS radar level sensors from VEGA Americas**

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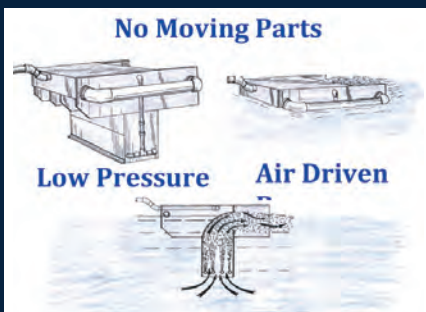
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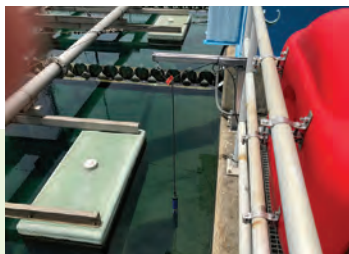
## Treatment plant finds sonde key to cost-effective optimization

### Problem

Heath Plowman, chief operator at the Ed E. Love Water Treatment Plant in Tuscaloosa, Alabama, needed a cost-effective water-quality monitoring solution to help control costs and comply with U.S. EPA regulations.

### Solution

Plowman selected the **Aqua TROLL 600 multiparameter sonde** from **In-Situ** for its capability to monitor turbidity, pH and temperature with one instrument. Another plus was ease of integration with the plant SCADA system. “The Aqua TROLL transfers data to my operators in real time, so we have a quicker response time to upsets,” Plowman says. “Before, we were monitoring on a weekly basis, increasing the risk of missing our optimization window. Now we can see and address issues right away.” Operators take calibrations every month, and drift has been nearly nonexistent. It’s also easy to unscrew the probes from communication and move them to different locations while an internal SD card captures the data.



#### RESULT:

“The Aqua TROLL 600 has been a cost-effective way to deliver the results I was looking for,” Plowman says. “Regulatory windows keep getting smaller, and the real-time data and reliable accuracy help keep us where we need to be.” 800-446-7488; [www.in-situ.com](http://www.in-situ.com)

## Continuous testing reduces repair and replacement

### Problem

At the Casitas Municipal Water District in California, 2,300-volt motors are essential to supplying water to 60,000 to 70,000 people. To avoid problems caused by dusty motor windings or dampness, frequent megohm meter testing was important. A motor failure can cost \$50,000 for repair.

### Solution

The district uses a **MegAlert continuous testing and monitoring device** in a number of pump plants. The device is installed in the high-voltage compartment of the motor control center or switchgear and directly connects to the motor or generator windings. The unit senses when a motor or generator is offline and performs a continuous dielectric insulation resistance test on the insulation until the equipment is restarted.



#### RESULT:

“If there is a problem with the motor windings, like too much moisture, the MegAlert equipment will alarm, lock the unit and prevent the motor from failing on startup so we can investigate the problem,” says Tracy Medeiros, electrical mechanical technician. “If the meg reading is low on a long-term basis, we can proactively get preventive maintenance done.” 800-778-5689; [www.megalert.com](http://www.megalert.com)

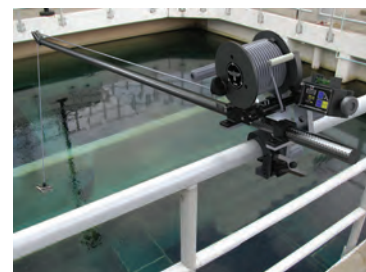
## Measuring media expansion throughout the filter during backwash

### Problem

A drinking water filter plant in St. Louis was measuring expansion of the filter media during backwash only at the sidewall with a device built on site. Seeking more accurate data, the plant wanted to reach into the filter chamber to measure at multiple points 3 feet off the sidewall.

### Solution

**Raven Environmental Products** created the **Filter Media Manager S-60100** to allow plants to easily measure the rate of media expansion in gravity filters. The portable instrument has a digital counter and is repeatable from operator to operator. Users simply lower the stainless steel sensor to rest on the compacted media. As the media begins to expand, a red LED illuminates. The operator reels in the sensor until the media has reached its maximum elevation. The U.S. EPA and American Water Works Association recommend 25% expansion for most gravity filters.



#### RESULT:

The water-quality manager has renewed confidence that the filters are operating at peak performance and the filter media is being cleaned as intended. 800-545-6953; [www.ravenep.com](http://www.ravenep.com)

## Plant improves efficiency with accurate wastewater monitoring

### Problem

A West Coast wastewater management facility needed an accurate and reliable way to measure and control the flow of wastewater into a splitter box to two separate clarifier basins. Operators would eyeball the flow in an attempt to equalize the flow to each basin. The previous instrumentation used a pressure sensor in the splitter box that would often clog and rarely operated.

### Solution

The **HydroRanger 200** from **Siemens Process Instrumentation** uses continuous ultrasonic echo ranging technology to monitor water and wastewater of any consistency up to 50 feet deep. It is immune to problems caused by suspended solids, harsh corrosives, grease or silt in the effluent. It offers single- or dual-point monitoring with six standard relays, as well as digital communications with built-in Modbus RTU via RS-232 and RS-485.



#### RESULT:

The controller provided an economical, low-maintenance solution, delivering control efficiency and productivity. Instrumenting the splitter box weirs saved the plant time and labor in ensuring the correct flow to each clarifier basin. 800-365-8766; [www.usa.siemens.com/pi\\_tpo](http://www.usa.siemens.com/pi_tpo)

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## product spotlight water

### Software delivers faster problem-solving

By Craig Mandli

SCADA software is regularly used by water and wastewater treatment facilities around the world for plantwide connectivity, visibility and control. New **iFIX 6.0 HMI/SCADA technology** from **GE Digital** is designed to improve operational productivity by providing treatment plant operators the most informed view of the problem or task and secure visualization from anywhere at any time.

“Building on our heritage as an industrial company, we are intimately familiar with the challenges our customers face every day,” says Matt Wells, vice president of Product Management for GE Digital. “Facilities are looking for better ways to quickly build new SCADA applications, improve user performance and respond to changing needs while maintaining the security of the application.”

The iFIX 6.0 system provides integrated support for ISA 18.2 standards for consistent alarm shelving and interface presentation, helping operators easily prioritize critical alarms and enabling water and wastewater plants to increase productivity by up to 70%. The update also includes secure-by-design client connections with an OPC Unified Architecture server, a machine-to-machine communications protocol that incorporates the latest industrial interoperability standards. This means iFIX 6.0 runs across a variety of hardware platforms and operating systems.

“By leveraging standards such as OPC Unified Architecture, integrated support for ISA alarm shelving and enabling new web development tools, iFIX



iFIX 6.0 HMI/SCADA  
from GE Digital

6.0 allows organizations to rapidly build new applications while ensuring the stability and security of their operations and empowering operators to respond better to changing conditions in real time,” Wells says.

Also provided are rapid application development features for HMI/SCADA, such as long tag names and descriptions, helping users capture any hierarchy from their programmable logic controllers. This speeds up configuration and deployment of HMI/SCADA, reducing costs and saving time.

As a companion product, Historian 7.2 boosts performance and improves security and ease of use. It enhances the OPC Unified Architecture collector to support user authentication. Historian also features integration with complex Active Directory to meet the needs of users with complex nested domain arrangements. Boosting read performance, it enhances the existing-archive files defragmentation tool. Users can defragment existing archive files using a command-line-based tool. This reorganizes the data nodes of a tag, bringing the data nodes together so bigger reads can be performed, improving read performance. **800-433-2682; www.ge.com/digital**



### FEBCO ArmorTek advanced coating system

ArmorTek advanced coating system from FEBCO, a Watts Water Technologies brand, adds a layer of protection to its ductile iron backflow preventer valves. Three layers of protection create an effective barrier, increasing resistance to corrosion. First, an anti-corrosion primer slows the spread of corrosion should the metal substrate become exposed from wear or impact. Secondly, ArmorTek's formulation inhibits the growth of bacteria that causes microbial-induced corrosion, limiting the growth of tubercles that can clog or foul downstream equipment. And lastly, the robust topcoat is designed to bond to the primer below, providing a high-strength barrier between the iron substrate and water.

**800-767-1234;**

**www.febcoonline.com**



### Zurn Industries 20XL pressure reducing valve

The 20XL pressure reducing valve from Zurn Industries is designed to reduce high-inlet pres-

sure on potable waterlines. Its short lay length and compact design ensure ease of installation in residential or commercial applications from new construction to replacement. The balanced stem design enables the valve to react in a smooth and responsive manner when changes to system flow occur. The composite cartridge and bellhousing deliver superior strength and corrosion resistance. The stainless steel strainer screen catches debris, while the cartridge ensures easy repairs. The 20XL is available in 3/4- and 1-inch sizes with versatile connection options. **814-875-1252; www.zurn.com**



### ADS Environmental Services ECHO ultrasonic monitors

The ECHO from ADS Environmental Services has a 20-foot dynamic measurement range in an 8-inch pipe. It provides for total manhole visibility and introduces stabilized, near-top-side mounting. It is located

just under the manhole cover, making installation easy with no manned entry. For reliable connectivity, the ECHO now features communication via the LTE-M network, which is designed and optimized for the Industrial Internet of Things. Its cloud-based software and advanced analytics platform provide fast, easy access and insights into the collections system's behavior.

**800-633-7246; www.adsenv.com**

## product spotlight

### wastewater



Varcor system from Sedron Technologies

## Evaporation technology produces Class A biosolids

By Craig Mandli

Especially in recent years, municipal wastewater treatment plants have made significant investments on equipment for treating biosolids outputs. Even with this equipment, the output material is still often quite heavy and wet. In addition, the material typically only reaches a Class B biosolids quality designation, which limits the legal locations of disposal. This results in high transportation costs since disposal sites are often located in distant areas.

**Sedron Technologies** recently introduced the **Varcor system for managing those wastewater solids** in a significantly more efficient manner. The company describes the process as a complete and holistic system that achieves 100% pathogen removal that enables nutrient recovery. Developed for dairy and agriculture applications, the technology is now being extended to wastewater treatment.

The technology is based on a process known as vapor recompression distillation. The solid and liquid fractions are separated through thermal evaporation, and the resulting vapor is sent to a compressor, where it undergoes mechanical recompression. The compressed vapor is then used as the heat source for the evaporation process; in transferring its heat, the vapor condenses and forms a water output.

The remaining vapor is concentrated and condensed into an ammonia solution. Due to the thermal process involved, the water, solids and concentrated constituents are guaranteed pathogen-free, according to the manufacturer. The technology offers reduced operating costs and yields byproducts that have inherent value and offer convenient use, according to the company. The process is not susceptible to biological or chemical upsets, making it versatile for integration into wastewater treatment plants with varied processes and equipment. It allows plants to easily add biosolids processing or take existing processing offline to ease loading on primary treatment steps. The process yields Class A biosolids.

Sedron also markets the system as a solution for septage haulers looking to avoid high processing fees for discharging material at municipal wastewater treatment plants. Stand-alone Varcor regional facilities can be established in nearly any location and are similar in size and process to gas stations. Waste haulers can access these sites 24/7. Upon entry, haulers can then empty their septic trucks for processing and would be charged a processing fee on a per gallon basis. Sedron can install and operate Varcor technology on a contract basis or users can purchase it outright as a turnkey system. 360-399-6193; [www.sedron.com](http://www.sedron.com) *tpo*

## MUNICIPAL SEWER & WATER

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## people/awards

**Lynn Miller** was hired as superintendent of the Sugar Creek Wastewater Treatment Plant in Alexander City, Alabama.

**Clint Baze** was hired as general manager of the Rincon del Diablo Municipal Water District in Escondido, California.

**Greg Thomas** was hired as general manager of the Elsinore Valley Municipal Water District in California.

The **City of Lewisburg**, Kentucky, received a \$750,000 Community Development Block Grant to help pay for upgrades to its wastewater treatment facility.

**Ron Garlington**, wastewater treatment plant supervisor, received a Most Outstanding Employee honor from the City of Port Allen, Louisiana.

**Brian Bowman**, treatment operations supervisor and assistant director of waste management services in Waterloo, received the Wastewater Treatment Operator of the Year award from the Iowa Water Environment Association.

**Scott Kingeekuk**, plant operator for the Village of Savoonga, received the Operator of the Year award from the Alaska Rural Water Association.

**Jeson Nikrasch**, senior inspector, was awarded Valley Center (California) Municipal Water District Employee of the Year. He received the award mainly for overseeing the North Village Wastewater Collection System Project.

The **Fremont Wastewater Treatment Plant** received the Scott Wilber Outstanding Facility Award from the Nebraska Environment Association.

The **wastewater team in Scottsbluff**, Nebraska, received the Scott Wilber Award for Outstanding Operations and Maintenance from the Nebraska Water Environment Association. Lynn Garton, water reclamation supervisor, was named a founding member of the Golden Manhole Society.

The **Bee Creek Wastewater Treatment Plant** in Murray, Kentucky, received the American Public Works Association Kentucky Chapter Project of the Year honor and the American Council of Engineering Companies of Kentucky's Engineering Excellence Grand Award.

## events

### March 29-April 1

Missouri Water Environment Association and Missouri Section American Water Works Association Joint Annual Conference, Margaritaville Lake Resort, Osage Beach, Missouri. Visit [www.mwea.org](http://www.mwea.org).

### March 31-April 1

Texas Water 2020, presented by the Water Environment Association of Texas and Texas Section AWWA, Fort Worth Convention Center, Fort Worth, Texas. Visit [www.txwater.org](http://www.txwater.org).

### March 31-April 3

Water Environment Federation Residuals and Biosolids Conference, Minneapolis Convention Center, Minneapolis. Visit [www.wef.org](http://www.wef.org).

### March 31-April 3

California Water Environment Association and Nevada Water Environment Association Joint Annual Conference, Reno-Sparks Convention Center, Reno, Nevada. Visit [www.cwea.org](http://www.cwea.org) or [www.nvwea.org](http://www.nvwea.org).

### April 5-7

North Carolina Section of the AWWA Spring Symposium, Renaissance Asheville Hotel, Asheville, North Carolina. Visit [www.ncsafewater.org](http://www.ncsafewater.org).

### April 5-8

AL/MS Joint Annual Conference, presented by the Alabama Water Environment Association, Mississippi Water Environment Association and AL/MS Section of AWWA, Mobile Convention Center, Mobile, Alabama. Visit [www.awea-al.com](http://www.awea-al.com).

### April 5-9

Kentucky Water & Wastewater Operators Association Annual Conference, Galt House Hotel, Louisville, Kentucky. Visit [www.kwwoa.org](http://www.kwwoa.org).

### April 6-9

California-Nevada AWWA Spring Conference, Disneyland Hotel, Anaheim, California. Visit [www.cwea.org](http://www.cwea.org).

### April 7-8

AWWA Chesapeake Section Mid-Atlantic Utility Conference, Turf Valley Resort, Ellicott City, Maryland. Visit [www.csawwa.org](http://www.csawwa.org).

### April 14-15

AWWA International Symposium on Inorganics, Embassy Suites Denver Downtown, Denver. Visit [www.awwa.org](http://www.awwa.org).

### April 14-16

AZ Water Association Annual Conference, Phoenix Convention Center, Phoenix. Visit [www.azwater.org](http://www.azwater.org).

### April 15-16

WaterNow Alliance Summit, The Inn at Penn, a Hilton Hotel, Philadelphia. Visit [www.waternowsummit.org](http://www.waternowsummit.org).

### April 15-16

Nebraska Water Environment Association Great Plains Waste Management Conference, Embassy Suites, La Vista, Nebraska. Visit [www.nebwea.org](http://www.nebwea.org).

### April 20-22

Illinois Water Environment Association Annual Conference, Crowne Plaza, Springfield, Illinois. Visit [www.iweasite.org](http://www.iweasite.org).

### April 20-22

Design-Build for Water/Wastewater Conference, presented by the Water Environment Federation, AWWA and the Water Design-Build Council, Hilton Anatole, Dallas. Visit [www.wef.org](http://www.wef.org).

### April 26

Water Environment Association of Ontario Technical Symposium, Sheraton Centre Toronto, Toronto. Visit [www.weao.org](http://www.weao.org).

### April 26-28

British Columbia Water & Waste Association Annual Conference and Trade Show, Penticton Lakeside Resort and Conference Centre, Penticton, British Columbia. Visit [www.bcwwa.org](http://www.bcwwa.org).

### April 26-29

Arkansas Water Works and Water Environment Association Annual Conference, Embassy Suites Hotel, Hot Springs, Arkansas. Visit [www.awwwea.org](http://www.awwwea.org).

### April 26-29

Florida Water Resources Conference, presented by the Florida Water Environment Association and the Florida Section of the AWWA, Palm Beach County Convention Center, Florida. Visit [www.fwea.org](http://www.fwea.org).

The **Geneva (Illinois) Wastewater Treatment Plant** facility update was named a Project of the Year by the American Public Works Association Fox Valley Branch.

The **Elsinore Valley Municipal Water District** in Lake Elsinore, California, received Public Relations Society of America Inland Empire Chapter's Polaris Awards for its Community Relations Campaign for Variable Sewer Outreach; Marketing Campaign for Being Water-wise, Easy as 1,2,3; and Social Media Tactics for Instagram Outreach. It also received the Capella Award for Excellence in the Special Events category for its Waterwise Workshops Series.

**Prior Lake** and the **Shakopee Mdewakanton Sioux Community** in Minnesota earned a Local Government Innovation Award for a \$20 million water treatment facility.

After nearly 40 years of service, **Ron Thompson** stepped down as general manager of the Washington County Water Conservancy District in St. George, Utah.

**Robert Simmons**, chief water treatment operator for El Dorado, Kansas, retired in December 2019 after 46 years with the city.

*TPO welcomes your contributions to Worth Noting. To recognize members of your team, please send notices of new hires, promotions, certifications, service milestones or achievements as well as events notices to [editor@tpomag.com](mailto:editor@tpomag.com). tpo*

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## industry news

### DuPont Water Solutions finalizes acquisition of inge GmbH

DuPont announced that after signing agreements to acquire BASF's Ultrafiltration Membrane business from inge GmbH, including ultrafiltration and membrane technologies, the acquisition has been finalized. The inge GmbH product lines will join DuPont's FilmTec reverse osmosis and nanofiltration membranes, IntegraFlux/IntegraPac ultrafiltration portfolio and Amber series of ion exchange resins to provide more options for customers.

### Badger Meter highlights water utility trends for 2020

Badger Meter announced key trends predicted to shape the water utility industry in 2020. Of the four trends included in this year's list, the value of the Internet of Things and 5G networks in creating smarter water metering solutions and resiliency in the face of growing water security concerns rose to the top. The key trends predicted to shape 2020 include smart water metering for smart cities; increasing value on resiliency and system security; the future of low-power wide-area network (LPWAN) technologies, including cellular Narrowband IoT and LTE-M, that ensure system longevity; and infrastructure renewal and financing capital improvements. *tpo*

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September 29-30, 2020

Jacksonville, FL –  
January 12-13, 2021

Tempe, AZ –  
April 13-14, 2021

York, PA –  
June 15-16, 2021

NEXT EVENT:

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- Maintain underflow sludge density

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