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**A PLANT TOUR WITH GIRL SCOUTS
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FOR A WATER CAREER**

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Cheri Cousens
Executive Director
North Andover, Mass.


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By Steve Lund

ON THE COVER: Cheri Cousens found out early that wastewater treatment was interesting. Her Girl Scout troop visited a Massachusetts treatment plant when she was 8 years old: "I thought it was fascinating." Now she is executive director of the Greater Lawrence Sanitary District and winner of the New England Water Environment Association's 2021 William D. Hatfield Award. (Photography by Scott Eisen)

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let's be clear

Not Invented Here? So What?

THE WATER SECTOR IS FULL OF OPPORTUNITIES FOR UTILITIES TO BORROW AND ADAPT IDEAS AND BEST PRACTICES FROM OTHERS, WITHOUT FEAR OF CONSEQUENCES

By Ted J. Rulseh, Editor



In the 1990s, consultant Tom Peters enjoyed a reputation as a business guru, a breaker of outdated norms and traditions, a promoter of new and exciting ideas and approaches.

One thing he railed against was the tendency of companies to reject concepts or innovations they didn't come up with on their own. He called it the "not invented here" syndrome: Company A would refuse to adopt something, even if likely to be beneficial simply because it was developed by Company B.

He encouraged companies to replace that mindset with a new mantra: "Not invented here but swiped with pride." Of course this didn't extend to stealing trade secrets or infringing patents. It did involve being willing to copy certain great ideas from other companies, including competitors, with appropriate customizations and enhancements.

Peters advised, "Put NIH behind you — and learn to copy/adapt/adopt from the best. Become a learning organization. Shuck your arrogance — 'If it isn't our idea, it can't be that good' — and become a determined copycat/adapter/enhancer."

LEANING ON OTHERS

"Not invented here" and "creative swiping" are different in character in the utility sector, although they still apply. The great thing about the utility sector is that excellent ideas can translate easily from one utility to another because the organizations are not competitive.

That is, Utility A and Utility B share a commitment to a set of public benefits, and neither does harm by borrowing ideas from the other — or even using something the other created with no changes at all (though perhaps with the courtesy of asking permission).

This is important, because it means small utilities with extremely limited resources can benefit greatly by borrowing from larger utilities with bigger staffs and budgets. One area where this especially applies is in public outreach and education.

Clean-water and drinking water utilities serve customers who do not fully understand or appreciate the services they receive. Some utilities do a great job of filling that information void with plant tours, literature, public service announcements, videos and similar tools.

Other utilities have the option to replicate and adapt these tools for their own purposes, instead of having to reinvent the wheel. In fact, there are cases where a utility could pick up and use, completely as is, something another utility or public organization created.

A CASE IN POINT

A good example of this is a video created by the New England Water Environment Association as part of its Water for Life outreach campaign. Titled *A Day in the Life of a Water Professional*, this video shows people in



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The great thing about the utility sector is that excellent ideas can translate easily from one utility to another, because the organizations are not competitive.

various roles at Upper Blackstone Clean Water explaining what they do, why they care, and why it matters.

In just under four minutes, the video makes a strong and emotionally compelling case for the value of the services delivered not just by Upper Blackstone but by any clean-water agency. It's available on YouTube, so any utility can encourage customers to watch it, such as by linking to it on their website or mentioning it in a bill insert or newsletter.

You can find this video at www.youtube.com/watch?v=4dM372yahyM or by searching YouTube under "NEWEA Water for Life."

WHAT CAN YOU SWIPE?

The public water is full of materials that any utility can use or easily adapt. For example, the Water Environment Federation and the American Water Works Association offer a wide range of ready-made resources that any utility can simply pick up and use.

It doesn't take a large staff or an expansive budget to create a serviceable public outreach program. Any utility can get started by taking and using materials that already exist, free of charge, there for the asking. In other words, by engaging in a little creative swiping. **tpo**

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NEW RESEARCH FINDINGS

Recycled Water Is Cleanest

Recycled wastewater is not only as safe to drink as conventional potable water, it may even be less toxic than many sources of water we already drink daily, Stanford University engineers have discovered. As drinking water sources become more scarce, the discovery is promising news.

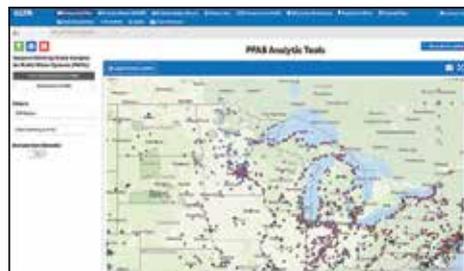
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PFAS ANALYTIC TOOLS

EPA's New Interactive Webpage

The U.S. Environmental Protection Agency has released a new interactive webpage called "PFAS Analytic Tools," which provides information about per- and polyfluoroalkyl substances (PFAS) across the country. This information will help the public, researchers and other stakeholders better understand potential PFAS sources in their communities.

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OVERHEARD ONLINE

"We believe the EPA should direct states that receive federal funds to help under-resourced communities apply for and use the money."

How to Steer Money for Sewer and Water Upgrades to the Communities That Need It Most

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RESOURCE RECOVERY

Pennsylvania Town Pursues Upgrades



The Derry Township (Pennsylvania) Municipal Authority has taken a significant step on its journey toward energy and nutrient recovery from organic waste at its Clearwater Road Wastewater Treatment Facility. Ongoing upgrades at the 5 mgd plant will expand capacity and increase energy efficiency, boosting the plant's sustainability.

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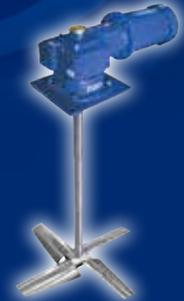
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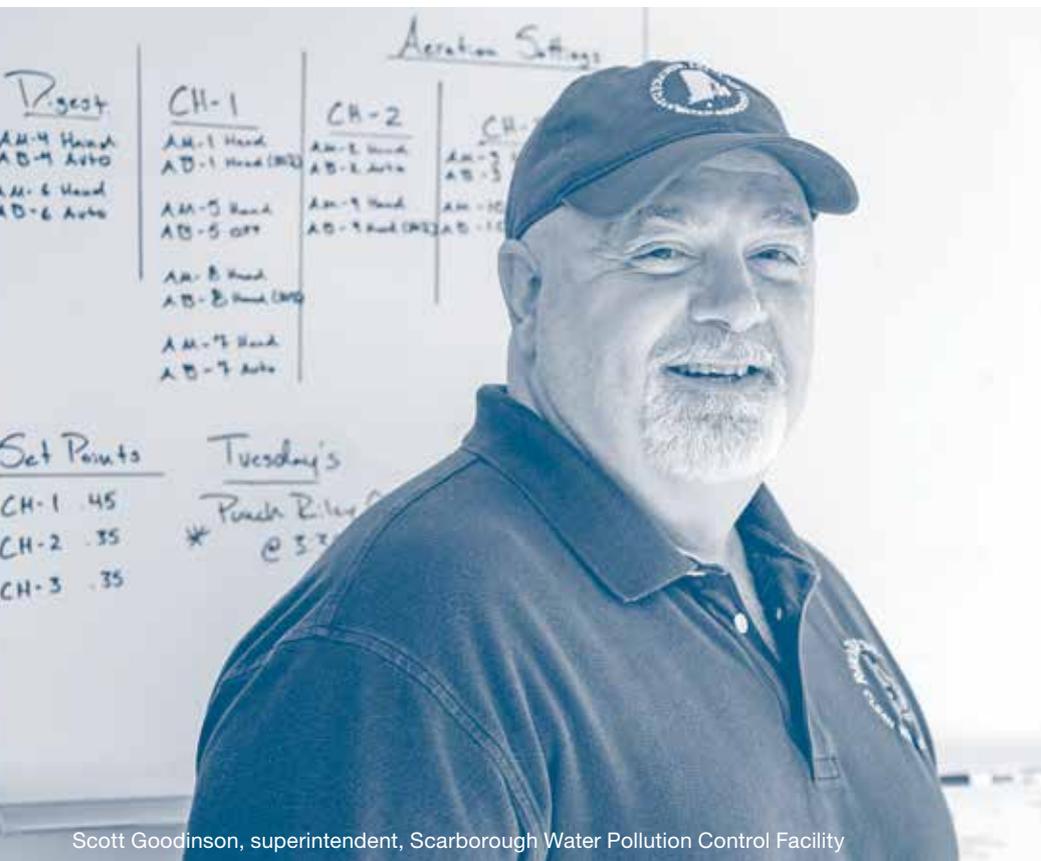


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Cooking Up a Career

SCOTT GOODINSON STARTED WORK LIFE AS A NAVY COOK ON A NUCLEAR SUBMARINE. HE FOUND HIS TRUE CALLING IN A 32-YEAR CAREER IN THE CLEAN-WATER PROFESSION.

STORY: **Ted J. Rulseh** | PHOTOGRAPHY: **Daniel Forster**



Scott Goodinson, superintendent, Scarborough Water Pollution Control Facility

“We have team members who are not only on a first name basis but almost finish each other’s sentences. We really mesh, like a NASCAR pit crew.”

SCOTT GOODINSON

After leaving active submarine duty in the U.S. Navy, Scott Goodinson worked on various jobs that included a couple of years pumping out portable restrooms.

One day while cleaning a restroom at a baseball field he turned off the vacuum truck and overheard a father say to his son, “That’s the kind of job you get if you don’t go to college.”

Hearing that snippet of conversation brought Goodinson to a pivot point. “My wife was pregnant with our second child,” he says. “Sucking out port-a-johns is considered one of those dirty jobs. It paid the bills, and I enjoyed doing it, but it was time to move on. I said to myself, ‘I’ve got to do something more with my life.’”

That something more turned out to be a long career in the clean-water profession. Goodinson, winner of a 2021 Operator Award from the New England Water Environment Association, is now superintendent of the Scarborough Water Pollution Control Facility in the Town of Narragansett, Rhode Island.

After 32 years in the industry working at four clean-water plants in his native Rhode Island, he feels he has found himself a home — a plant where he will be glad to stay until he retires.

COOKING FOR THE CREW

While attending high school in Warwick, Rhode Island, Goodinson worked part time at restaurants and bakeries and dreamed of owning a restaurant someday. To pursue his love of cooking, he dropped out of high school in April of his junior year, at age 17, to join the Navy.

After boot camp he went through Mess Specialist school in San Diego, followed by submarine training in Groton, Connecticut. He was assigned to the USS Tinosa, a nuclear fast-attack submarine, as the chef.

While in the Navy he earned his GED. He left active duty after four years at the rank of petty officer second



Scott Goodinson says good mentors share the credit for his success in the clean-water profession. (Sludge transfer valve by Victaulic, thickened sludge transfer pump from Moyno.)

class, transitioned to the reserves, and returned to Rhode Island. Unsure of a career direction, he took an assortment of jobs.

While working for the portable restroom company, he learned of an opening at the Cranston Water Pollution Control Facility and was hired in 1990 as an operator in training. During 20 years at that facility (20.2 mgd design), operated by the environmental services company that is now Veolia, he advanced to operator, chief operator and, ultimately, operations manager.

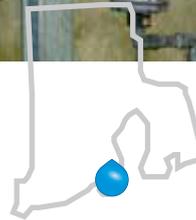
His next stop was at the West Warwick Regional Water Pollution Control Facility (7.9 mgd), first as assistant superintendent and then superintendent. In 2012 he joined the team at the Warwick Sewer Authority treatment plant (7.7 mgd), staying seven years, the last five as superintendent. He assumed his current position in November 2019.

A PERFECT FIT

“I took a small cut in pay to come here,” Goodinson says. “It was well worth it, when you’re pushing 60 years old you want to change things up a bit. Sometimes the stress isn’t worth the money. It’s a smaller plant with a less chal-

Scott Goodinson

Town of Narragansett, Rhode Island



POSITION:
Superintendent, Scarborough Water Pollution Control Facility

EXPERIENCE:
32 years in the industry

CERTIFICATIONS:
Grade 4 Wastewater Operator, Grade 2 Collections Systems Operator

AFFILIATIONS:
Associate member Pawtuxet River Authority, past president Rhode Island Clean Water

Association, vice president New England WEA

GOALS:
Continue working with team to keep Rhode Island rivers, ponds and beaches pristine

BUDGET:
\$1 million (public services, including water and sewer)

GOALS:
Continue to provide reliable water services to customers as district manager

2018, paddle wheel aerators were replaced with 10 floating aerator mixers (Newterra). The flow then passes to two secondary clarifiers, followed by chlorine disinfection, dechlorination with sodium bisulfite, and discharge through a diffuser 2,200 feet offshore in Rhode Island Sound.

Biosolids are thickened to about 3.5% solids and hauled to a Synagro facility in Woonsocket for dewatering and incineration.

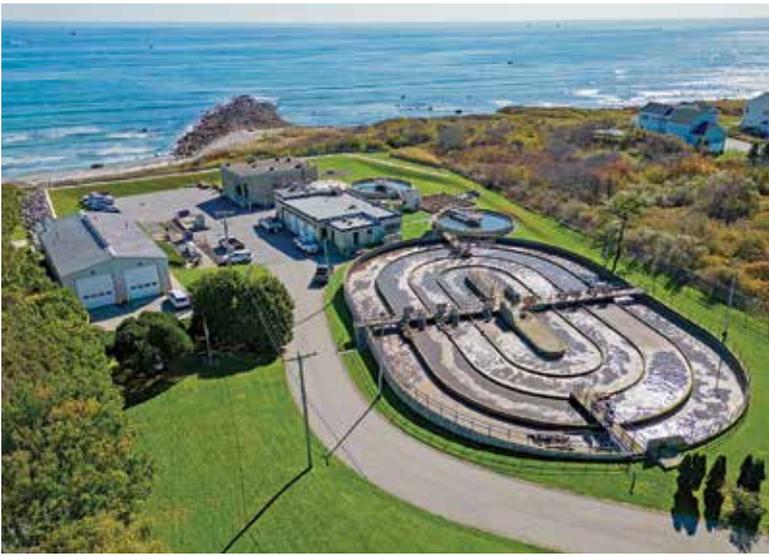
COHESIVE TEAM

The plant’s straightforward permit requires 30 mg/L BOD and TSS. Keeping compliant is the job of Ken McKay, process control and pretreatment

lenging permit. It’s not an easy plant to run, but it’s manageable. It has beautiful views. I’m really happy here.”

The coastal Town of Narragansett attracts tourists for its beaches. The population of 16,000 doubles in summer, and so does the flow of the treatment plant (1.4 mgd design, 0.6 to 0.7 mgd average). Influent first passes through a Raptor fine screen (Lakeside Equipment) and a lift screw grit-removal system (Keene Corporation).

Three centrifugal lift pumps (Grundfos) deliver the flow to an oxidation ditch with three trains. In



Tourists double the coastal town of Narragansett's population in summer and substantially increase flows at the Scarborough Water Pollution Control Facility (1.4 mgd design, 0.6 to 0.7 mgd average).

coordinator; Phil Rattenni, maintenance supervisor; Dan Johnson, foreman; and operators Steven Card, Jake Mambro, Riley Greene and Chad Cota. "We are all cross-trained and switch duties as needed," Goodinson observes.

Johnson and Mambro maintain the system's 19 pump stations and flush the lines on a rotating basis, about one-fourth of the system per year. Greene, beyond his role as a plant operator, operates the CCTV sewer inspection system and is a member of the Rhode Island team in the Water Environment Federation Operations Challenge. Cota is responsible for solids handling and Card takes care of sampling, lab testing and process reporting.

"All team members have assigned planned maintenance tasks, do landscaping and handle any other work needed to keep the facility in tip-top shape and in compliance," says Goodinson.

"Behind every successful superintendent is a good team," Goodinson says. "We have a smaller facility with a smaller staff, and it's intimate. We have team members who are not only on a first name basis but almost finish each other's sentences. We really mesh, like a NASCAR pit crew."

A regular challenge is dealing with the variability of flows from winter to summer. "Air is one of the key things, keeping the bugs happy," Goodinson says. "Also keeping a close eye on the microscopic evaluations in the lab. We also monitor the secondary clarifier blankets and watch the filamentous organisms to determine whether we need to chlorinate the return activated sludge."

“ It's a good town. It's well run. We have one of the lowest sewer rates in Rhode Island. The ratepayers are happy.”

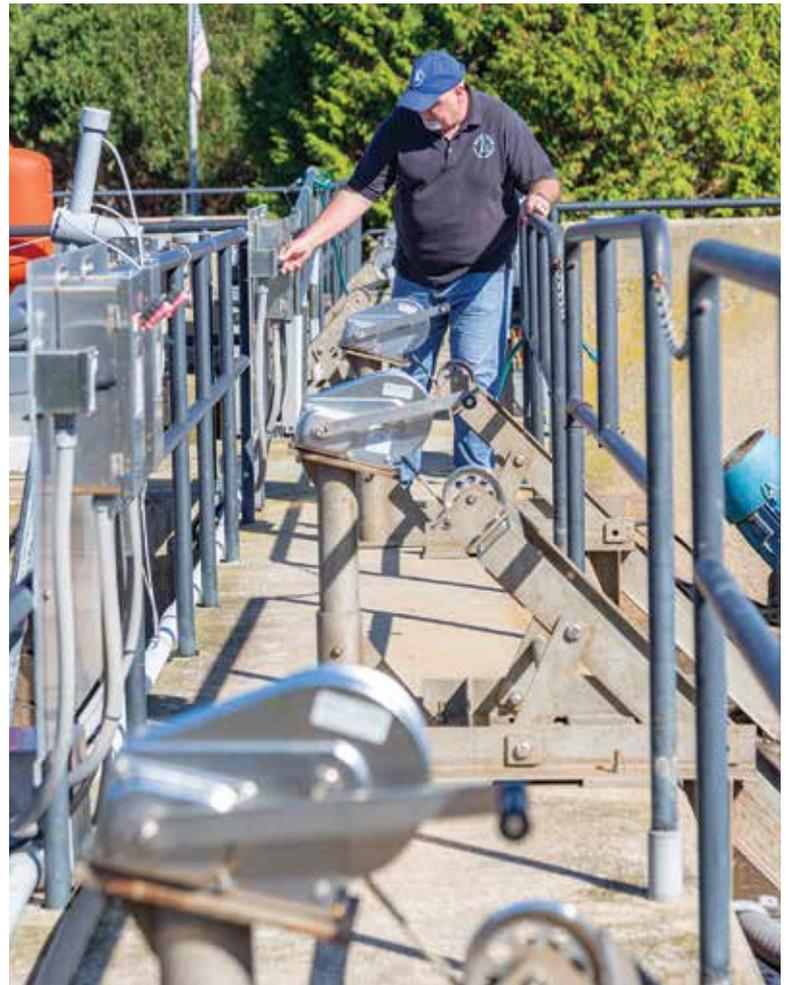
SCOTT GOODINSON

KEYS TO LEADERSHIP

In leading his team, Goodinson draws on experience gained in previous jobs. He mentions one mentor in particular, Ernie Persechino with whom he worked for three years at Cranston. "I was the second shift chief operator. I would see him when I was coming to work at 3:30, and we would go over the previous night's assignments.

"Maybe I had an issue, like I couldn't find a certain valve. He had an old ruler, like a teacher who has a yardstick. He would take me by the hand and say, 'Here's the pump. Here's where it starts. Now, follow that system. Put the end of the ruler on the pipe, follow it down, and trace out the system as best you can.'

"I learned so much from that guy. I would turn around and follow the processes, where they began and where they ended. In time I knew every



Scott Goodinson operates the oxidation ditch blower via hand-off-auto (HOA) switch. Blowers and mixers are from Aeration Industries (Newterra); Square D control boxes (Schneider Electric) govern the HOA and safety disconnect switches.

single valve, every little loophole in that plant. That's how you learn. You have to take ownership of the facility. When you buy in and take ownership, that's how you go from being a good operator to an excellent operator.

"I've seen a lot of good bosses. I try to emulate them and pick up on the skills they use. I tell younger colleagues who are getting into leadership roles to lead by example, to be a person of integrity. I don't like the word 'subordinates.' Your people are your team. They're your co-workers. I try to show them that by the way I talk to them, by looking them in the eye and letting them know I appreciate them. People want to be spoken to like they matter."

On the other hand, he doesn't shy away from difficult conversations: "I've had some operators and mechanics who just needed some one-on-one training, someone willing to talk to them about their shortcomings and the improvements they needed to make. That can help you as a manager by heading off problems early, by counseling them, making it a teaching moment instead of a disciplinary moment." While fostering close relationships, he does draw some boundaries. For example, he doesn't have lunch with his team members; he eats in his office: "If you're eating with the guys and going out for drinks with the guys, they treat you like you're one of the guys. And sometimes the respect level is lost."

ACTIVE IN THE INDUSTRY

While helping his team members advance, Goodinson has grown by giving back to the industry in various ways. He is a graduate of the Rhode Island Interlocal Trust Supervisor's Management Institution, which puts on boot

(continued)

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“I’ve seen a lot of good bosses. I try to emulate them and pick up on the skills they use.”

SCOTT GOODINSON

The team at the Scarborough Water Pollution Control Facility includes, from left, Chad Cota and Riley Greene, operators; Scott Goodinson, superintendent; Jake Mambro, operator; Dan Johnson, foreman; Phil Rattenni, maintenance supervisor; and Ken McKay, pretreatment coordinator/process controller. Not pictured is Steve Card, operator.

camp to teach leadership skills. He’s also a graduate of the Veolia Water Project Manager’s Boot Camp.

He has earned a variety of train-the-trainer certifications, has completed the 40-hour OSHA Hazardous Waste Operations and Emergency Response course, and is trained in first aid and CPR. He has served as a board member and for a time vice chair of the Pawtuxet River Authority and Watershed Council, a consortium of five communities dedicated to protecting Rhode Island’s largest river.

He is perhaps most proud of his contributions to the Rhode Island Clean Water Association, where he has served as vice president, president, state director and now past president. The association is a training and resource center for the state’s operators.

“We offer operator training in microbiology, lockout/tagout, seal training, pump training and more,” he says. “It’s not just the training. It’s the networking and the camaraderie. We have an annual trade show where operators can meet the vendors. We offer scholarships from \$500 to \$3,000 for high school graduates.

“We have an annual holiday party. We do a food drive for the local food bank. We do an annual chowder cookoff here in our plant, and I’m glad to say I have three first-place awards on my wall. I make a mean chowder.” Goodinson strongly supports the Operations Challenge, and after some years as a Rhode Island team contestant he chaired the New England Water Environment Association Operations Challenge Committee in 2020-21.

For 2022, Goodinson was nominated as NEWEA vice president; he will be president in 2024.

CHALLENGES TO COME

Looking ahead, Goodinson is planning upgrades to the biosolids thickening process and the polymer and potassium permanganate feed systems, replacement backup generators and automatic transfer switches at the plant and several lift stations, and various building repairs.

“It’s a good station,” he says. “It’s well run. We have one of the lowest sewer rates in Rhode Island. The ratepayers are happy. This is a good place to finish out my career. Eight more years will bring me to 67. That’s my retirement age. If I’m still having fun, I’ll keep working.”

Meanwhile, Goodinson is proud of the role his profession plays in keeping the waters clean for fishing, swimming and boating. He notes specifically the improvement in the Pawtuxet River, his home stream. He also notes

SAILING THE SEAS

Scott Goodinson looks back fondly on his years as a cook in the U.S. Navy, first in active duty on a nuclear attack submarine, then in the reserves on a fast frigate.

He remembers how he met up with the USS Tinosa submarine after he finished his preparatory schooling. “After sub school they sent me off to meet my boat,” he says. “The Tinosa was in the Mediterranean at the island of Sardinia; that’s where I met her.

“There were 113 officers and crew on board, and I was there for three years. I was in the Navy during the Cold War. We spied on the Russians and the Russians spied on us. That’s totally a different life. You go down for a couple of months. You pop up and you’re in another country, another ocean. You go through the Panama Canal.

“It was amazing. I highly recommend it for someone who doesn’t have a track on life when they’re 17 or 18 years old.”

the work he and Rhode Island colleagues have done to help keep open the beaches that were often closed when he was young.

All in all, it has been an amazing journey for someone who describes himself as “just a humble ex-Navy cook.” **tpo**

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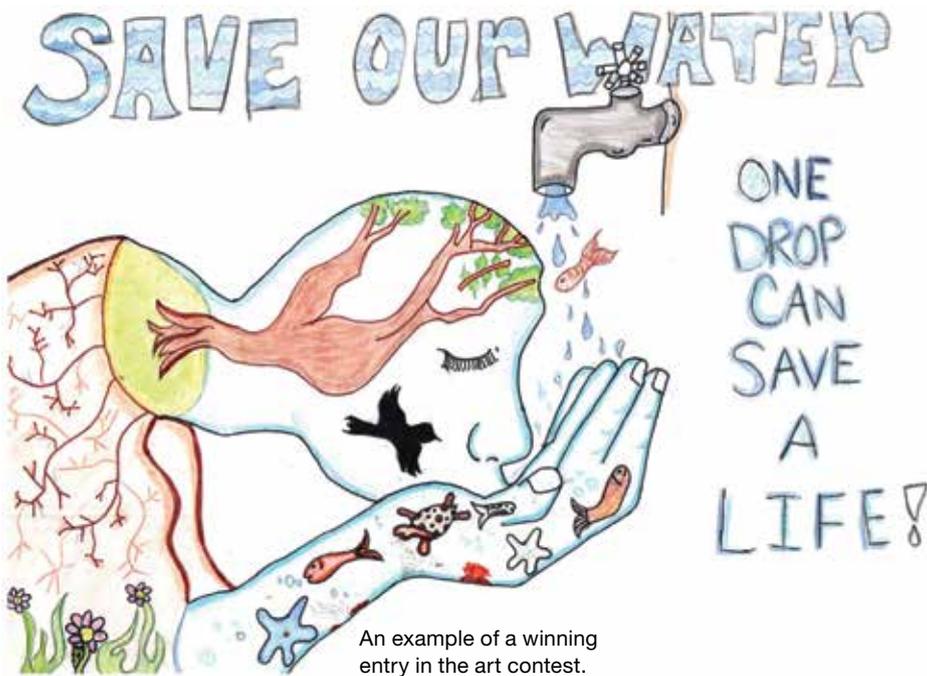
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An example of a winning entry in the art contest.

“ Learning about our natural resources made me more aware of my family’s farm and what was going on in the creek behind the house. That stayed with me through the years.”
JOHNNA MCHUGH

Words and Art for Water

A CONSERVATION WRITING CONTEST WAS HATCHED IN 1944 TO GET KENTUCKY STUDENTS INTERESTED IN NATURAL RESOURCES AND STILL CONTINUES TO THIS DAY

By Sandra Buettner

Every year a contest for Kentucky students focuses on one of four alternating topics: wildlife, water, soil and forestry. In 1974 Jim Clayhill, the first assistant director of the Division of Conservation and an educator, added an art contest to the competition. From that point on, the art contest has been for grades K-5 students and the writing contest for grades 6-12.

Although the Division of Conservation is the main source of information on the contest, there have been several co-sponsors along the way, at present the Kentucky Farm Bureau Federation.

RULES AND REGS

The contest is open to all students in the Commonwealth: public, private, parochial and home-schooled. Last year the theme dealt with water. The competition begins on Sept. 1 when the theme and materials are provided on the Division of Conservation and Farm Bureau websites.

Entries from the schools are due to the local conservation district by Dec. 1. There are 121 conservation districts in the state; about 100 take part in the poster contest and about 90 in the essay contest.

The schools pick their top three winners and send those entries to the districts. Area and state level judging is done during January, and the winners are announced in February. Submissions generally number around 65,000. Each conservation district promotes the competition locally. It is also promoted through word of mouth, social media, and sponsors’ and organizers’ websites.

“Each year a beautiful 36-page tabloid magazine is created by our staff, contributing writers and the Farm Bureau,” says Johnna McHugh, assistant director of the Division of Conservation. Its title for 2021 was, *We All Need Water*. The magazine is used to promote the contest.



The Division of Conservation contest has been around for 80 years. Parents and grandparents of students remember taking part while in school.

CELEBRATING WINNERS

The schools or the conservation districts have their own celebrations in which they honor the winners and give them certificates. In most cases, the school invites a speaker on the year’s topic; parents are invited.



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Each county conservation district reviews all the winning school entries and chooses a county winner. Those winners are submitted to the Division of Conservation.

FFA and 4H state officers choose the nine area winners. First-, second-, and third-place winners for the state competition are chosen from area winners. The winners are invited to the state capitol for a tour and get to meet their state legislators. The ceremony includes a guest speaker. Winners receive cash prizes:

- First prize - \$250
- Second prize - \$150
- Third prize - \$50
- Regional winners - \$50
- County-level winners - \$25

Teachers of the winners also get a cash prize they can use to buy supplies for their classrooms.

ALL IN THE FAMILY

The contest is multigenerational, according to McHugh. Through its 80-year history, students' parents and their grandparents remember competing when they were in school.

"It's always so interesting to see each year what the students come up with to demonstrate their knowledge of natural resources," McHugh says. "I remember competing when I was in school, and I learned all sorts of interesting things about Kentucky's water, trees, animals and soil."

That, in a way, influenced her decision to pursue a career in conservation: "Learning about our natural resources made me more aware of my family's farm and what was going on in the creek behind the house. That stayed with me through the years."

From the essay submissions she reads, McHugh observes that the students say the same things about how they are now more aware of the environment: "We are happy that we have some role in shaping that awareness." **tpo**

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“ I just absolutely fell in love with wastewater. Even today, I can’t imagine doing anything else.”

KIM FURRY

Kim Furry, manager of the Lima Wastewater Treatment Plant, was named a Water Environment Federation Fellow in 2022.

Ever Dedicated

NEWLY MINTED WEF FELLOW KIM FURRY STRIVES FOR EXCELLENCE, WHETHER LEADING HER CLEAN-WATER PLANT TEAM OR GIVING VOLUNTEER SERVICE TO THE INDUSTRY

STORY: **James Careless** | PHOTOGRAPHY: **J.D. Pooley**

The Lima Wastewater Treatment Plant was built in 1931 and in 1976 was expanded to a dry-weather design capacity of 18.5 mgd.

As manager of the Lima Wastewater Treatment Plant, Kim Furry certainly has her hands full.

She is in charge of an Ohio facility that handles a dry-weather design flow of 18 mgd (12 mgd average, 70 mgd peak capacity). She's also responsible for 32 lift stations, a 13 million-gallon combined sewer overflow basin and 19 permitted CSO discharges to the Ottawa River.

Along with all that, Furry fulfills numerous volunteer positions with the Water Environment Federation and the Ohio Water Environment Association, in that latter case as president. She's also a member of the American Water Works Association.

Add 10 published wastewater-related articles in various scholarly journals, and an assortment of industry accolades, and it's no wonder she was honored last year as a WEF Fellow, recognizing professional achievement, stature and contributions to the global water environment.

"I was surprised and honored to be named a WEF Fellow because the winners are nominated by their peers in the water industry," Furry says. "I joke with my husband that I won for all my volunteer work, which is just another way of saying that I can't say no!"

Actually, Kim Furry won this honor for the same reason she has won five awards: She is dedicated to excellence in wastewater treatment and environmental protection, and she lives that dedication daily in everything she does.

A LOVE FOR BIOLOGY

Furry's affinity for wastewater management may well come from her family history. She was born in Toledo in 1973. "My dad was a biology teacher, and my mom was a registered nurse in the intensive care unit," she says. "Biology and environmental science were subjects I grew up with." She became passionate about them while in high school and then in college.

Furry graduated from Jefferson High School in Delphos in 1992. She then earned a bachelor's degree in biology from the University of Toledo in 1996. When she graduated from college, a family friend told her about a laboratory technician job at the Van Wert (Ohio) Wastewater Treatment Facility.



Kim Furry

Lima (Ohio) Wastewater Treatment Plant

POSITION:

Plant Manager

EXPERIENCE:

In water treatment since 1997

EDUCATION:

Bachelor's degree, biology, University of Toledo; master's degree, organizational management, Bluffton University

CERTIFICATION:

Class IV Wastewater Operator, Class II Wastewater Laboratory

GOALS:

Continue building a strong team, be a positive mentor, work with OWEA and WEF to develop outstanding operator training materials

She got the job and "just absolutely fell in love with wastewater. Even today, I can't imagine doing anything else."

Furry's career has taken her through many aspects of the profession and to a few locations across Ohio. Along the way she earned her Class IV Wastewater Operator and Class II Wastewater Laboratory licenses. While serving as plant superintendent in Delphos from 2002-10, she oversaw the design, construction and startup of a new state-of-the-art \$32 million membrane bioreactor treatment plant with auto-thermophilic aerobic digestion.

TAKING CHARGE

In June 2021, Furry took her current position in Lima, where she oversees day-to-day operations, along with the laboratory, the industrial pretreat-

ment program and in-plant stormwater monitoring. She also manages all of the facility's design and construction projects, the operating and capital improvement budgets, and 24/7 operations and staffing.

"Because we have a combined sewer system we do see a huge fluctuation in flow," she says. "Our average daily flow, when it's not raining, is about 12 mgd, where we are designed for 18 mgd. But half an inch of rain will take us up to 70 mgd in about a half an hour."

For that reason, and to comply with a 2014 U.S. EPA consent decree related to untreated discharges to the Ottawa River and Pike Run during rain events. Lima has been investing to improve its wastewater handling processes.

"We have a lot of projects we'll be doing between now and the time, quite frankly, that I will retire," says Furry. "Every two to three years we'll have a major construction project out in the system to improve our ability to cope with excessive rainwater events."

EVOLVING OPERATION

The activated sludge treatment plant was built in 1931 with a design capacity of 7 mgd. That was increased to 12 mgd in 1952 with the addition of a new digester and a chlorination building. In 1976 the capacity was expanded to 18.5 mgd with a 33 mgd maximum flow.

To make that happen, nitrification towers and related equipment were installed. A year later, new solids dewatering facilities were brought online through the installation of EIMCO vacuum filters (Ovivo), for dewatering, new sludge holding tanks, a new biosolids cake storage facility and a liquid biosolids loading dock.

Improvements to the anaerobic digestion system occurred in 1989 with the addition of new EIMCO mixers (Ovivo) and Kewanee boilers, new screening facilities and chlorination/dechlorination facilities were added in 1993, and belt filter presses and a sludge processing unit were installed in the sludge filter building in 2000.

Biosolids are dewatered on three belt filter presses (Alfa Laval). The resulting cake is then processed by addition of lime and ash in the NViro process



Kim Furry has collaborated with her team to build "an amazing work culture" and develop an asset management and maintenance capital improvement program.

“I joke with my husband and say that I won for all my volunteer work, which is just another way of saying that I can't say no!”

KIM FURRY

to meet Class A requirements. Biosolids at about 60% solids are then land applied by farmers.

The most recent upgrade in 2016, entailed rebuilding the plant to increase the peak flow capacity to 70 mgd with four new bar screens (Headworks) rated at 23.3 mgd each; four aerated grit tanks using two WEMCO Hydrogritter systems (Trillium Flow Technologies); and four new primary settling tanks, bringing the total to seven.

The project also included a new primary sludge pump station, a scum screen (HUBER Technology) and a polymer building equipped with a chemical feed system able deliver polymer before and after primary settling.

The facility now has five sectioned aeration tanks, each with diffused-air piping and fine-bubble diffusers (EDI - A Nexom Brand). The process air system includes blowers from Spencer and Continental.

Solids from the final settling tanks flow to two common wet wells in the secondary sludge pump station. There, 5,000 gpm centrifugal pumps (Hayward Gordon) move the return activated sludge from the wet wells to the reaeration channel and then on to the aeration tanks. Settled activated sludge is continuously extracted using one of two Hayward Gordon 3,000 gpm waste activated sludge pumps.

During flows less than 30 mgd, the entire flow receives full secondary treatment and is pumped to trickling filter towers via four centrifugal effluent pumps, each rated for 12,000 gpm. When flows exceed 30 mgd, the wastewater is split between secondary treatment and the towers.

The secondary flows are pumped to disinfection by one of three secondary effluent pumps (American-Marsh axial-flow vertical turbine pumps, each rated for 13,900 gpm). Flows are then recombined at the disinfection building where Watson-Marlow peristaltic pumps feed sodium hypochlorite for disinfection and sodium bisulfite for dechlorination.

Despite all the improvements made to the plant, aging equipment remains a challenge. "For instance, we haven't done any major upgrades to our biosolids

GIVING BACK

When taking time off, Kim Furry generally doesn't stray too far from the wastewater field. Besides her many volunteer duties with industry associations, Furry sits on the Ohio EPA Advisory Council, helping review applications for Class IV wastewater certification.

"Ohio's Class IV certification process is similar to a master's degree dissertation," she says. "Most of them average 200 to 300 pages of written content explaining what the applicant has achieved during their wastewater career. I review two or three of these a month. I have also served as lead writer for our new wastewater fundamentals handling manual."

When not focused on wastewater, Furry enjoys motorcycling with her husband Eric or boating with him and her two children: Alex, 23, and Emmalee, 20.



Kim Furry

“I plan to be in Lima until my retirement, which isn't for another 16 years.”

KIM FURRY

process since the 1980s or 1990s,” says Furry. “So a lot of the equipment is 30 years old or older, while our digester tanks are a hundred years old.”

CAPABLE CREW

To keep the facility operating at peak performance while upgrading it to comply with the consent decree, Furry relies on capable operations and maintenance teams. The operations staff includes:

- Shawn Dershem, assistant supervisor
- Amy Staley, industrial monitoring and laboratory chief
- Ange Layton, chemist
- Rob Flinn, industrial monitoring technician
- Plant operators Robert Anderson, Alex Anderson, Shane Biss, Casey Davisson, Sean Griesdorn, Ben Lovejoy, Jessica Preston, Joe Welker, Jordan Greeley and Tilden Sturgill.
- Maintenance mechanics Mike Hile, Scott Rapp, Ron Fullom and Clint Clauson.

Furry calls Dershem her go-to person: “He has been at the plant for over 16 years, and he has been integral to my learning how things were done historically and what changes we need to make for the future. Amy Staley, our lab chief, has been a major help in addressing our industrial pretreatment program, as has Mike Hile. He has been here for over 40 years and knows all about our lift stations and how they fit into the overall system.

“We've got an amazing work culture here. Our people care about what they do and are well-trained and prepared to take us into the future. Another thing Shawn and I are proud of is developing an asset management and maintenance capital improvement program, which had been lacking in the past.”

BELIEF IN TRAINING

At the same time, Furry's volunteerism is driven by her commitment to people in the industry. “Operator training is something that I'm very passionate about,” she says. “I was very fortunate throughout my career to have several mentors who really encouraged me. That's how I try to give back to the industry. Technology and regulations have changed so much — and are still changing — that continuous training is a must for our people.”

As for her own future, Furry likes having reached the Class IV operator level and enjoys working at a facility where many improvements are being made.

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“Besides, I like the fact my work is close to my parents and my brother and his family,” she says. “So I plan to be in Lima until my retirement, which isn't for another 16 years.” She adds with a laugh, “So I'll be around for a while!” tpo

Are All Mixers the Same?

NOT IN WINFIELD, KANSAS, WHERE A REPLACEMENT MIXER WITH A FOUR-POLE MOTOR HAS YIELDED SUBSTANTIAL ENERGY SAVINGS AND A PROMISE OF LONGEVITY

By Chris French

In the Kansas city of Winfield they know a thing or two about energy. Since 1904, Winfield has been a public power community. Its residents are stockholders, and the profits go to support vital services such as police, fire, streets and parks. At the local wastewater treatment facility, Clint Gregor also knows a thing or two. He has worked there since it was commissioned in 1996.

“We’re a top-three power user here,” says Gregor. “Energy takes up 30% of our budget, and in today’s world, we have to look at power consumption more than ever.”

LOOKING LONG TERM

While energy costs are firmly in the industry spotlight, Gregor’s driving factor for continuous improvement is total cost of ownership. Return on investment has been in focus of late due to the prohibitive cost of maintaining some of the plant’s mixers.

The 1.5 mgd plant serves a population of 12,000. A 7.5 hp direct-drive mixer in the anoxic zone of a 26-foot-deep aeration tank continued to have issues, causing unplanned downtime. Repair bills were running high. “Being quoted around \$8,000 to repair a mixer that costs \$10,000 gets your attention,” says Gregor.

“We did everything we could to keep it going, but eventually it was all chewed up beyond repair. The cost of having the copper rewound on a direct-drive mixer or replacing an impeller seemed sky-high. Everything seemed geared to making the mixer almost a throwaway piece of equipment.

“This can’t be right. The work couldn’t be undertaken by a local repair shop. That added to our costs, and then we were given lead times of anything between 18 and 20 weeks, which was totally unacceptable.”

A DIFFERENT DESIGN

Effective mixing in the anoxic zone was important to nutrient removal. Keen to find an alternative mixer that would give the best total cost of ownership, while also being energy efficient, Gregor found help from local supplier, Fluid Equipment. Representative Jeff Ubben recommended a Landia mixer that he said would give 20-plus years of reliable service.

“It was a very different but far better construction compared to what we had,” Gregor observes. “The mixer that failed had a 16-pole motor. The new one was just a four-pole, which would be much better for controlling speeds. These were just the first signs that despite what some people say in the industry, not all mixers are the same.”

Although it has a much lower speed and considerably less horsepower than the previous mixer, Gregor reports that the new unit provides equally good mixing, if not better. Additionally, installation was easy and cost-effective because it was possible to use the existing guide rail.



“Total cost of ownership is best. This mixer will soon pay for itself.”

CLINT GREGOR

ABOVE: The new mixer (Landia) at the Winfield Wastewater Treatment Facility has delivered substantial energy savings while promising reliability and long life. RIGHT: Clint Gregor, plant superintendent



HISTORIC STANDARDS

Gregor notes that the new mixer’s propellers are sturdy and therefore heavier, but overall it is relatively light and easy to service, with a motor about half the size of the failed unit.

The City of Winfield was established in 1870 by the American military commander and political candidate Winfield Scott (1786-1866). Known as Old Fuss and Feathers for his insistence on proper military etiquette, he was also called the Grand Old Man of the Army for his many years of service.

That adherence to high standards and commitment to the job prevail today in Winfield. Gregor and his team work to meet ever-stricter permit requirements prescribed by the U.S. EPA and the Kansas Department of Health and Environment to protect the Walnut River, which was declared an Outstanding National Resource Water in the late 1990s.

Persistence in best practice is paying off for Winfield, as after one year the new mixer was using half the energy of its predecessor.

“Total cost of ownership is best,” says Gregor. “This mixer will soon pay for itself. We also know that because of the way it is designed and the way the company behind it operates, we won’t be held to ransom for heavy repair bills and very expensive replacement parts.

“The amp draw is less than half of the old drive mixer, so we were confident in making significant energy savings as well as longevity. In our adjacent tank we have another mixer that is coming to the end of its days, and when it needs to go, we’ll be replacing it with a Landia mixer.” **tpo**



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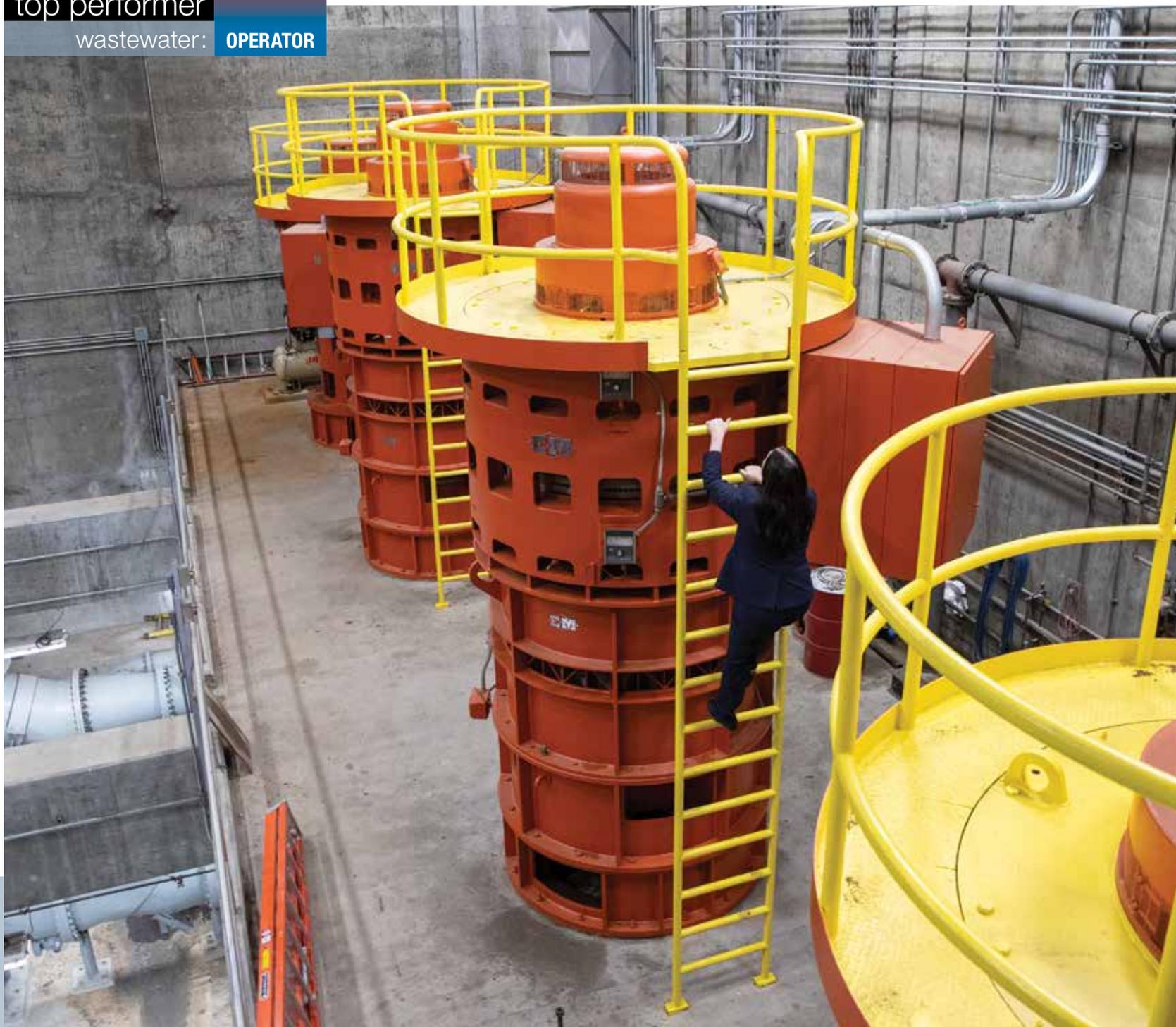
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Drawn to Water

CHERI COUSENS DREW INSPIRATION FROM A GIRL SCOUT TOUR OF A CLEAN-WATER PLANT. THAT SET HER ON COURSE FOR AN AWARD-WINNING CAREER.

STORY: **Steve Lund**
PHOTOGRAPHY: **Scott Eisen**



“There are so many nuances to a treatment plant that make it different from a sister plant.”

CHERI COUSENS

Cheri Cousens, executive director of the Greater Lawrence Sanitary District, climbs a 1,200 hp pump that moves wastewater to the Greater Lawrence Sanitary District’s main facility in North Andover, Massachusetts.

Cheri Cousens found out early that wastewater treatment was interesting. Her Girl Scout troop visited the South Essex Sewerage District in Salem, Massachusetts, when she was 8. “To get the Water Badge, we had to tour a water or wastewater facility or something like that, and that’s where we went,” Cousens says. “I thought it was fascinating.”

Now she is the executive director of the Greater Lawrence Sanitary District in North Andover, Massachusetts, and winner of the New England Water Environment Association’s 2021 William D. Hatfield Award.

STEADY PROGRESS

The line from that Girl Scout trip to her present position isn’t perfectly straight, but she never ventured too far off course. In college at Wentworth Institute of Technology, she started as a biology major but switched to environmental engineering.

“My studies and thought processes veered here and there over the years, but I ended up wanting to do something in the water or wastewater field,” she says. “I’ve always loved math and science.



Cheri Cousens, P.E.,
Greater Lawrence
Sanitary District
North Andover, Massachusetts

POSITION:
Executive director

EDUCATION:
Bachelor’s degree, environmental engineering, Wentworth Institute of Technology; master’s degree, civil engineering, Worcester Polytechnic Institute

CERTIFICATIONS:
Grade 7-C Wastewater Treatment Operator, Professional Engineer

AFFILIATIONS:
New England WEA, Massachusetts Coalition of Water Resources Stewardship, Treasurer; New England Biosolids and Residuals Association, Director

AWARD:
William D. Hatfield Award, New England WEA

I was going the route of biology or possibly the medical field, and I enjoyed it but it didn't feel right.

"Then when I switched to environmental engineering and really got into water, wastewater, air pollution control and site remediation and those types of topics, especially the water-based topics. I really enjoyed it."

One of her college summer internships was at the Charles River Pollution Control District in Medway, Massachusetts. After graduation, she landed a job there after a short stint working for the consulting firm CDM Smith. She worked for 11 years with the Charles River district as an engineer and industrial pretreatment coordinator, and in 2010 she became the executive director.

Charles River had a staff of 10, and she was responsible for all aspects of wastewater treatment for four towns. In 2014 she assumed her current role, responsible for a much larger facility with a staff of 40. The district serves the communities of Lawrence, Methuen, Dracut, Andover and North Andover in Massachusetts as well as Salem, New Hampshire.

UP TO THE CHALLENGE

Although she has all the degrees and certifications appropriate to her position, Cousens is a firm believer in gaining hands-on experience. Treatment plants, even those designed similarly, have their own personalities.

"If you transplanted me to another plant, it would take me a good year or two to really get a good feel for it," she says. "There are so many nuances to a treatment plant that make it different from a sister plant."

Clean-water plants that are well maintained and professionally operated can still have unexpected difficulties. "Whenever you're operating a mechanical system of any sort, things don't always work right," she says.

"We're trying to meet the expectations of the community and make sure the equipment is properly maintained and replaced ahead of a failure. But with all of that work, it's still not 100%. Outside things can happen that could cause a breakdown. It's a team effort to get things back online properly in a fairly quick manner."

The plant she oversees is automated to a large extent, but it still requires the hands-on experience of operators: "We have a SCADA system (GE Intellution Software, Allen-Bradley PLCs by Rockwell Automation) that provides data from all the different processes, but certainly this facility still requires the human element. That means walking the plant, listening, making sure everything is running properly.

"Each piece of machinery has a normal sound, and you can tell something might be wrong by the sound. You need to walk through the plant and listen and look. The SCADA system is phenomenal, but I think anyone in this industry would agree you cannot rely on it totally."

SOLVING PROBLEMS

Soon after starting at Greater Lawrence, she encountered one of those difficult situations: Sometimes one or more of the digesters would overflow without warning. The overflows had to be collected with vacuum trucks and returned to the front of the treatment process.

"It was messy, and it was labor-intensive, and I felt like it was an urgent situation that needed to be corrected," Cousens says. She worked with a team including Richard Weare, Steve Harwood and Glen Wilson to adjust variables, one at a time.



Cheri Cousens (right), shown with Kristin Politano, administrative assistant, sees multiple opportunities are very good for women in the clean-water industry, especially for those moving into administrative roles.

They changed the temperature in the digesters and changed the way they were fed and how they were mixed. For added insurance, they tested different defoaming agents. "We completely turned the whole situation around, and we haven't had an overflow event since mid-2014," Cousens says.

The combination that worked was a slight rise in temperature, continuous mixing 24 hours a day, and measurement of the inputs, not just by volume but also by loading — pounds of volatile solids going into the digesters. The team also worked with a chemist to custom-mix a defoaming agent that worked if something still went wrong.

"We decided on a defoamant that we could manually add if the height was coming up a little bit," Cousens says. "Over time we would do a little bench testing and fine-tuning. We had excellent success with it. I'm really proud that the team was able to find a solution, and do it in-house. It wasn't with consultants; we actually figured it out."

“We have continuously improved our design flow. We've added tankage and made process adjustments so we can take more flow in, and we've improved our pumping capacity.”

CHERI COUSENS



The Greater Lawrence Sanitary District's main facility has a design flow of 52 mgd and an average flow of 30 mgd.

“The industry as a whole is doing a better job of educating the public about what we do. ... We don't want the public to hear about us only when something negative happens..”

CHERI COUSENS

CONTINUOUS IMPROVEMENTS

In November 2019, the district brought a combined heat and power system online for the first time, powered by two Caterpillar 3520C generators (total capacity 3.2 MW) fueled with biogas. Cousens remembers that as a very good day: “We were making our own power and heading on the path toward self-sufficiency.”

Now the district is more than self-sufficient with electrical power. A fourth digester was added, along with the capacity for adding high-strength food waste. The resulting increase in biogas production enables the treatment plant to produce more electricity than it uses.

The surplus is net-metered to the grid and credited to the district's pump station, or to the plant to pay for utility power when a generator is down for maintenance. “It's nice to have a cushion, so if we have to do maintenance on one or both engines, and they are offline for any period of time, we can use the credits to take care of the bill.”

The CHP system shuts down automatically if the electrical grid goes down, but it can be restarted with natural gas and operated off-grid to keep the plant running even during an electrical outage.

The treatment plant has a design flow of 52 mgd; average 30 mgd. After an aerated grit removal tank, the influent goes through screening, two 3 million-gallon primary clarifiers, biological treatment with fine-bubble membrane aerators (Sanitaire - a Xlyem brand), four 2.6 million-gallon final clarifiers, disinfection with chlorine, and dechlorination with sodium bisulfite. The effluent is discharged to the Merrimack River.

Digested solids remaining are dewatered in a centrifuge (Westfalia) and a rotary drum dryer (Baker-Rullman). The resulting Class A EQ biosolids can be used as fertilizer.

Over time, every facet of the facility has seen improvements, many accomplished before her tenure. Improvements to the plant on her watch include a major renovation of the pumping station along a 9-foot interceptor pipe to more efficiently bring the influent to the plant.

“We have continuously improved our design flow, meaning the maximum flow we can take into the facility,” she says. “It was less than 100 mgd, and now we're at 165 mgd. We've added tankage and made process adjustments so we can take more flow in, and we've improved our pumping capacity.”

OPPORTUNITIES FOR ALL

When Cousens started her environmental engineering studies, she was one of only a few women in her class. “It was still a newer thought for women to be in the field, but I saw a lot of opportunity,” she says. “I worked hard. I pursued my master's degree,

my operator's license, and my professional engineering license. I knew there were things I needed to obtain to be successful in this industry, and I just kept reaching out and working on those.”

She started working on her master's immediately after graduating from college, taking classes at night while working for CDM Smith and then Charles River. “It was a lot of schooling and a lot of exams,” she says. “I got all that out of the way before I started my family,” which now includes two sons, 11 and 14.

“The opportunities are very good for women in this industry,” she says. “It's an excellent field, especially as you move into more of an administrative role. It requires many facets, including communication, technical ability and collaboration with cities, towns and regulatory agencies. For someone interested in water or wastewater, it's an excellent field, male or female.”

(continued)

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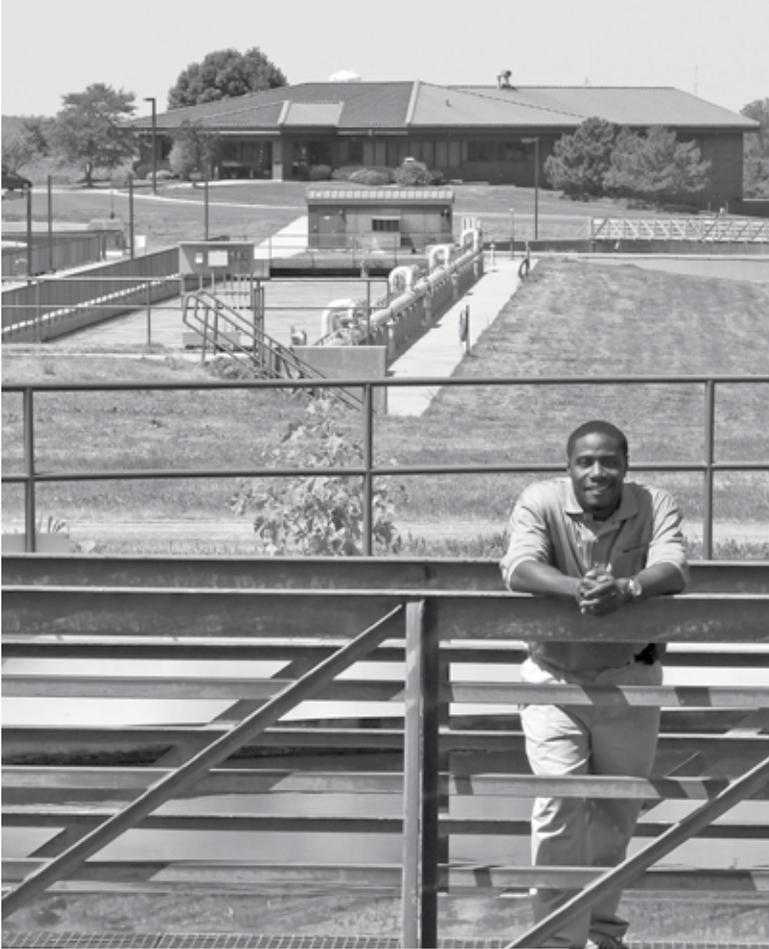
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NOW "THEY KNOW WHO WE ARE"

In her 20-plus years in the clean-water industry, Cheri Cousens has seen changes in the way the public perceives wastewater treatment.

"I think the public is more aware of our service to the community," she observes. "They also have higher expectations of these facilities and a better understanding of their importance.

"The industry as a whole is doing a better job of educating the public about what we do. It's still a work in progress, and we need to continue with that effort indefinitely. We don't want the public to hear about us only when something negative happens. We want them to know about all the positive things."

The Greater Lawrence Sanitary District recently revamped its website to make information about the utility's services more accessible: "We have a portal for them to reach out to us. We have a lot of information about what we do here, our process and how it all works.

"In the past I think the normal mode of operations was to hide. Now it has become more of a priority to tell people about what we're doing and the improvements we're making, so they know who we are."

From her conversations with people who have lived in the area for a long time, Cousens is confident that the district's work matters. "It's a challenging job, but it's also interesting, and I know this work makes a difference for the environment and for the people of the communities we serve. I take pride in that.

"I work with a phenomenal board of commissioners who are very supportive and truly care about this facility and the people of the communities we represent. Before our plant was online, the Merrimack River was an open sewer. There has been a major change over the last several decades. We have made tremendous strides."

RECRUITING CHALLENGES

Nevertheless, bringing new people into the field isn't easy. "I would say one of the biggest challenges is making sure we have enough staff and trained staff. That's been a problem across many industries, but it has hit the wastewater industry as well."

To bolster recruiting, the district recently reached out to a vocational school about setting up a co-op program for maintenance, operations and laboratory jobs. "We definitely need to make more of an effort to expose high schoolers to this career path," says Cousens.

The district also gives tours to groups of elementary, high school and college students. As her own career demonstrates, sometimes those tours can make a significant impact.

Cousens was deeply humbled by the Hatfield Award: "I felt really honored that my peers nominated me. It validates that hard work and commitment to the industry, and to this work, is recognized." **tpo**

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Drying Biosolids With Biogas

A CENTRAL WISCONSIN UTILITY ABANDONED ITS COMBINED HEAT AND POWER SYSTEM IN FAVOR OF A MORE COST-EFFECTIVE USE FOR METHANE FROM ITS ANAEROBIC DIGESTERS

By Steve Lund

The Stevens Point Water Department decommissioned the combined heat and power system at its wastewater treatment plant and redirected the biogas to drying biosolids.

The result was a significant operating cost reduction. The utility, in Central Wisconsin, received the 2021 Renewable Energy, Energy Efficiency, and Resource Recovery Award from the Central States Water Environment Association.

High maintenance and operating costs convinced utility leaders to abandon the combined heat and power system in 2021. The engine had to be rebuilt three times in the 10 years the system operated. Ultimately, it costs more to run the CHP system than to buy electricity.

“It took eight to nine months to get the money back from a rebuild, and that’s assuming nothing else went wrong,” says Chris Lefebvre, wastewater superintendent.

BIOGAS FOR HEAT

The conventional activated sludge treatment plant (4.55 mgd design, 2.1 mgd average) still produces enough biogas to heat five buildings, heat 2.2 million gallons of mixed material in the anaerobic digesters and heat thermal oil to dry the biosolids.

Digester gas production is boosted by mixing in high-strength food waste trucked in from dairy and potato processing plants and received in a 40,000-gallon tank. A pipeline brings in waste from the Stevens Point Brewery, about two-thirds of a mile away.

“Every decision is based on sustainability and reuse, if we can do it.”

CHRIS LEFEBVRE

The three boilers — one Hurst and two Envirex (Evoqua Water Technologies) — can burn the biogas without significant processing. “We have a skid for moisture removal and then slight pressurization, and then it goes straight to the boilers,” Lefebvre says.

SAVINGS ON SOLIDS

The biosolids are first dewatered on a belt press (BDP Industries), which operates with low horsepower, needs small amounts of polymer, and can be maintained by plant staff. “It makes a huge difference when we don’t have to wait on other people to come in and do maintenance,” Lefebvre says.

The belt press yields material at about 19.5% solids. “We could get a little bit more out of it, but it would cost us more polymer, which is expensive,” Lefebvre says. “We make our biogas on site, so we’re able to evaporate the liquid out rather than press it out.”

The dryer (Andritz) uses a thermal oil heater (Vapor Power) to indirectly heat the biosolids with oil at 320 degrees F to evaporate the water. More than 90% of the fuel for the heater comes from biogas, which can be supplemented with natural gas if needed.



The Vapor Power thermal oil heater for drying biosolids is fueled by biogas, supplemented by natural gas when needed.



A heat exchanger is part of a solar-powered geothermal heat pump system that provides heating and cooling for the Stevens Point wastewater treatment plant.

The dryer operates at a low speed by choice: “Our dryer is slightly oversized because of how small we are. And we’re not maxed out on anaerobic digestion capacity. So we’re able to run at a slower rate, at maximum turndown, and use as much biogas as we can to dry.”

“We’re trying to run as slow as we can. By feeding it slower, we avoid needing a centrifuge or something similar to get thicker solids.”

The result is a Class A product at more than 90% solids. Previously, the plant yielded about 500 truckloads per year of liquid biosolids for land application. Hauling costs were high. Now the dry biosolids are picked up by a farmer at no charge. “Now we’re well under 100 trucks a year, actually probably under 50, at no cost to us. It’s hundreds of thousands of dollars in operational savings,” Lefebvre says.

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The dryer typically runs for about 20 days and then is idle for 10 days, during which maintenance is performed.

SUSTAINABILITY CULTURE

The biogas project is just one of several innovations in sustainability. Since the 1990s the water department has operated a geothermal heating and cooling system using treatment plant effluent. In summer, the effluent is usually at 68-72 degrees F; in winter typically 48-52 degrees F.

In 2018, the utility put a 131 kW solar array on the roof of the garage to power one of the geothermal system heat pumps. On sunny days the panels produce more power than the heat pump can use; the excess is sold to the utility grid," says Joel Lemke, public utilities director.

The utility is investigating other ways to use the electricity on site instead of putting it back onto the grid at wholesale rates.

The water department has considered energy use and sustainability with every new project at the treatment plant since a 2002 energy audit by Wisconsin Focus on Energy. Projects have included changing to LED lighting and turning off yard lights when no one is on the property.

"We've changed numerous setpoints throughout the wastewater plant to use less energy and in particular less on-peak energy," Lefebvre says. "We're trying to do things overnight rather than during the day. Every decision is based on sustainability and reuse, if we can do it." **tpo**

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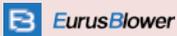


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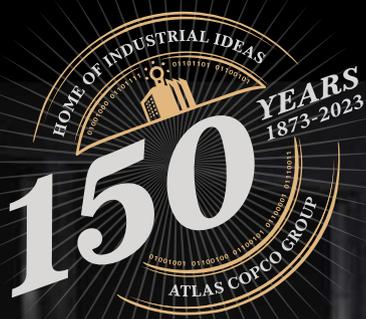
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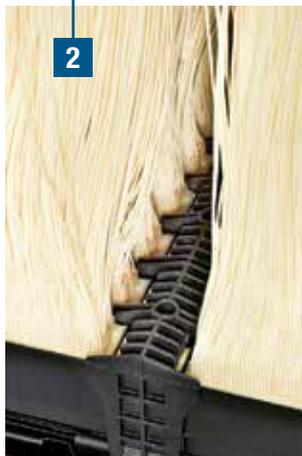
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By Ted J. Rulseh

Membrane bioreactors can be an attractive wastewater treatment option, delivering high-quality effluent in a relatively compact footprint. MBRs combine conventional activated sludge treatment with membrane filtration, delivering advanced removal of organic and suspended solids and, if so designed, significant nutrient removal as well.

At WEFTEC last October, Veolia Water Technologies & Solutions introduced a new version of its ZeeWeed 500 MBR for larger municipal applications. It is designed to enable expansion of capacity at low capital expense, reduce energy costs and provide long membrane life with simplified maintenance.

The ZeeWeed 500 series has a record of longevity and reliability and has some 2,500 users worldwide. The ZeeWeed 500EV reduces the membrane tank footprint by up to 50% and is designed to minimize plant construction or expansion costs.

The manufacturer says it also reduces energy costs by 20%, cuts usage of cleaning chemicals, has fewer parts to maintain, and has a robust membrane that meets the requirements of water reuse regulators. Jennifer Lim, product line director for the Veolia MBR product line, talked about the unit in an interview with *Treatment Plant Operator*.

tpo: What was the market rationale for creating this new version?

Lim: Our existing product, the 500D, was 20 years old last year, and we recognized that the market had shifted. When we talked to our customers, we heard five drivers. Capital cost of new builds and upgrades to existing conventional systems continued to go up, so they needed cost savings. Space is restricted in many places around the world, and so they needed a unit with a small footprint. Their budgets were not increasing while energy, technical and labor costs were going up, so they needed to minimize operating costs. They also wanted a system that would be easy to maintain with a long mem-

brane life. And finally, as regulatory requirements become stricter, they wanted a product that could still comply if permit limits changed.

tpo: What are the key market niches for this system?

Lim: At present this product is focused on municipal applications, but as we expand factory capacity, we will expand it to our entire MBR portfolio. So this system would fit any MBR application with 10 mgd capacity or larger, whether industrial or municipal. There are systems that exceed 50 mgd in capacity that we are actively pursuing.

tpo: What are the capacity limits of individual ZeeWeed 500 EV units?

Lim: Depending on the temperature of the water, the capacity is anywhere from 0.5 mgd to 1 mgd per unit.

tpo: In brief, how does this system treat water?

Lim: A conventional wastewater treatment plant typically has primary clarifiers, a biological process feeding into secondary clarifiers, and potentially some type of tertiary filtration. In the MBR the primary clarification typically remains, but the biological process and secondary clarifiers are replaced with the MBR. The biological treatment process is smaller, and the secondary clarification step is replaced by the membrane filtration tanks. Unlike clarifiers, which can have upsets, the membrane is a 100% barrier that prevents anything from going downstream. That eliminates the need for tertiary filtration, except where a user might want a reverse osmosis process downstream in an industrial application.

tpo: What level of membrane filtration does this system use?

Lim: All of our units use ultrafiltration membranes.

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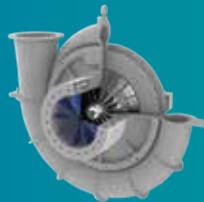
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tpo: What has enabled the significant capacity increase within the same footprint?

Lim: We started with the same footprint as the ZeeWeed 500D because we wanted the new product to be completely retrofittable for our existing customers. We achieved the 50% increase in capacity by optimizing the membrane packing density — the amount of membrane that is actually in the unit.

tpo: How was the energy requirement curtailed?

Lim: We didn't change the amount of air we put in on a membrane basis, but the significant increase in membrane within the same footprint results in the 20% energy savings.

tpo: What was done to reduce the requirement for cleaning chemicals?

Lim: Our standard cleaning mode is what we call relax. We turn off the permeation and allow air to clean the membranes. We don't actually back-wash. For chemical cleaning, the way we achieve chemical reduction is two-fold. First, while the membrane fibers have not changed between the two generations of ZeeWeed, we knew from more than 25 years of experience that we could reduce the chemical inputs. We surveyed our customers to understand how frequently they felt they needed to clean the membranes, and then we did a chemical optimization. Second, for the biennial soak-cleans, we reduce chemical usage because the tanks are smaller.

tpo: What is the market reaction to this new version so far?

Lim: The reaction from customers and the consulting community is very positive. The drivers we selected resonate with them, and the demand is high. We have units operating at a number of plants, including two sites in North America, in Beaver Creek, Tennessee, and just outside London, Ontario. An additional three units will be started up in the near future. **tpo**

case studies

PUMPS

By Craig Mandli

Direct in-line pump system chosen to solve frequent maintenance and confined space problems

Problem

A wastewater treatment plant in the village of Sherman, New York, needed to replace a pair of centrifugal pumps, which tended to clog from rags and FOG, resulting in downtime. Bar screens required weekly cleaning, and a vacuum truck cleaned the wet well every two to three months. Confined-space entry of the wet well was a safety concern.

Solution

The town selected an **OverWatch Direct In-Line Pump system** from **Industrial Flow Solutions**, designed with a DIPCUT impeller that enables self-cleaning operation. When solid objects impede the impeller, variable-frequency drives sense a higher torque and reverse the pump's direction. The hinged vanes fold flat, exposing cutting knives that shred mop rags and other fibrous material.



RESULT:

The system was delivered ready to install, and in 11.5 hours. The wet well was transformed into a dry pit, creating conditions for maintenance. Clog-free operation eliminated the need for vacuum trucks and weekly bar screen cleaning. Maintenance has been reduced from 26 hours per year to 20 minutes in four years. **860-631-3618; www.flowsolutions.com tpo**

WEF President Seeks More Engagement With Operators

IFETAYO VENNER SEES OPERATORS AS IMPORTANT PARTICIPANTS IN THE FEDERATION AND LOOKS FOR WAYS TO BREAK DOWN BARRIERS TO THEIR INVOLVEMENT

By Ted J. Rulseh

Ifetayo Venner has come a long way from her childhood in the Caribbean. The time she spent on island beaches kindled a love for water that grew into a prosperous career.

Today, Venner is senior vice president in the water business of the Arcadis environmental consulting firm and president of the Water Environment Federation for 2022-23. As president Venner leads the WEF board of trustees in providing governance, oversight and direction on implementing the federation's new strategic plan.

That plan includes cultivating a purpose-driven community to solve water challenges sustainably, leading the transformation to the circular water economy, and attracting and developing a diverse and passionate workforce to the water professions. To Venner, that diversity includes more engagement with plant operators as a source of valuable insights and perspectives.

Venner's water career spans two decades, and for most of that time she has been active in WEF and other industry associations. She has served on the WEF board for five years, including one-year terms as vice president and president-elect.

She holds degrees in environmental engineering from McGill University in Montreal (bachelor's) and Stanford University (master's) and an MBA from the University of South Florida. Venner is a member of the Florida Water Environment Association and the Water Environment Association of Texas, both WEF Member Associations.

From the Tampa office of Arcadis, she is responsible for planning, design and startup of municipal wastewater treatment and reuse facilities throughout the U.S. She has been the wastewater service leader since 2016. Venner talked about her career journey and her priorities as WEF president in an interview with *Treatment Plant Operator*.

tpo: How did you form your attachment to water?

Venner: I'm a product of the Caribbean. I was born in Jamaica and also lived in St. Vincent and Barbados. I did most of my schooling in Barbados but finished in Jamaica. I have family on the different islands and spent a lot of my summers on them as well. My mother is a doctor, and she had a clinic near the beach so I would go to the beach fairly often. That's how my love affair with water began.

tpo: At that early age, did any mentors steer you toward a career in water?

Venner: Over time I would see the beach eroding, and I would ask questions about it. My mother had a cousin who was a coastal engineer, and she told me to ask him questions. He explained to me why that was happening. One Easter break he took me to where he worked, and I got to meet all the engineers. That's where I really got interested in water. My mother thought

I was maybe going to join Greenpeace. She steered me to the engineering side, noting how much I liked science and solving problems.

tpo: What attracted you to becoming active in WEF?

Venner: A senior colleague at Arcadis said I needed to join AWWA and WEF and should get involved as a way to network and have professional training. I joined the young professionals groups in the Connecticut AWWA section and the New England Water Environment Association. After about five years I moved to Florida, and the same colleague suggested we write a paper together for WEFTEC. It was accepted. I showed up to WEFTEC, looked around and said, "This is amazing. I have to figure out how to get back here every year."

tpo: How did you move through the ranks at WEF?

Venner: I looked at what committees I could get involved with, and I started with the Municipal Resource Recovery Design Committee. It snowballed from there. I also became engaged in the Program Committee, Sustainability Committee Chair and then the Sustainability Community of Practice director. Along the way, WEF members and staff would engage me in initiatives. When I was almost done with something, someone would say, "You should try this next." As I was finishing as Community of Practice director, a couple of past presidents encouraged me to apply for the board of trustees.

“In my experience at WEF, people in the water sector are very collaborative. Where water is the mission they are driven to make the water sector better.”

IFETAYO VENNER



Ifetayo Venner

tpo: What would you say to clean-water operators or engineering colleagues about the benefits of being active in an organization like WEF?

Venner: No. I has been the community. I work for an organization where I have access to technical experts, but wastewater treatment is different from place to place. It can be very dynamic, which makes it fun. But a lot of times you have questions. Did this happen elsewhere? Did someone try this piece of equipment or this online analyzer? And through WEF I have a network where I can reach out and ask those questions. It's a great tool to facilitate knowledge and the advancement of innovation.

tpo: Did your WEF activities help enhance any particular career skills?

Venner: The WEF committees are essentially where I learned my leadership skills in a lower-risk setting before I had to apply them in my real job. I don't think I would have advanced as far without that experience. It has

also been valuable just being able to interact with my peers and my clients in a relaxed environment. In my experience at WEF, people in the water sector are very collaborative. Where water is the mission they are driven to make the water sector better.

tpo: How do you envision an expanded role for operators in WEF?

Venner: A lot of our committees now are heavily consultant- and engineer-based. We're striving to make sure that operators are better represented, because we value their voices. We need to break down the barriers to their ability to participate, or even wanting to participate. We want more operator representation on our committees and in the WEFTEC program beyond the Operations Challenge. Stephen Sanders, who is director of the environmental training center at the State University of New York Morrisville, is a member of our board, and I hope he helps break down some of those barriers.

tpo: Do those barriers include the ability to get time off and reimbursement for travel?

Venner: Yes. When it comes time to decide who goes to this or that conference, it's usually the senior folks. When we engage with operators, that connection to the sector outside of their daily jobs really advances their careers and improves their job performance. But it can be hard for them to communicate that justification to their supervisors. We're very interested in knowing what things would help facilitate their participation.

tpo: What other professional roles do you see as important to carry out WEF's mission?

Venner: We've been looking at how to get manufacturers more engaged with our programs and committees. Communications folks are also critical as we talk about telling our stories.

tpo: What went into the creation of the WEF strategic plan?

Venner: Over a period of four months we conducted surveys and focus groups with our members and various stakeholders. We talked to leaders in the water sector and in some cases people outside the sector but connected to water. We asked why they were WEF members, why they engaged with us, what they needed from us, and where they thought the water sector was going.

tpo: What would you say is the key component of the strategic plan?

Venner: To be successful in any of the things we're doing, we need to be more visible and vocal, both within and outside our water community. In our three-year outcome statement we talk about amplifying the stories of water and growing, strengthening and diversifying the water community. The idea behind that is telling our stories. As an industry where a lot of our infrastructure is hidden, we have also been a bit hidden, and that has hampered us in terms of being able to attract the investment and the workforce we need.

tpo: How would you rate the importance of drawing people into the water sector?

Venner: Our first goal is around attracting and developing a diverse and passionate water workforce. Part of that is raising public awareness through storytelling so that people can see water as a viable and great career. It also includes reducing barriers to the entry and retention of folks within water, and making sure once they are here that WEF is providing opportunities for them to connect with each other. Professional education is a huge component — making sure they are growing in their careers and have the tools necessary to do the important work they do for their communities.

tpo: What specifically is meant by reducing barriers to entry into the water workforce?

Venner: Many people aren't even aware that the water sector exists as an option, and that's especially so among some of our under-represented groups. Our InFLOW program, for example, is designed to actively reach

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out and bring those people to WEFTEC so they can become aware of all the various career options and make connections.

tpo: Do diversity, equity and inclusion remain as priorities?

Venner: Yes. We formed a workforce DE&I task force in 2018 and then a board DE&I committee in 2020. We've been investing in DE&I over the last four years and continue to view that as key. We want our WEF communities and committees to reflect the diversity of the water workforce. Coming into this industry as a minority, I showed up to my first conference, looked around and thought, "This does not reflect me or the people I grew up with. If I'm not seeing folks like me in the higher positions, do I have a shot at getting to that level?" We want to make WEF more inclusive and accessible to folks from different backgrounds.

tpo: Is the recovery and reuse of resources still a major focus?

Venner: Yes. We have a goal around making the transformation to a circular water economy. That means conserving the resources we have, but also recognizing that in wastewater we have valuable resources to recover and reuse. We want to lead that transformation by helping to put innovation into practice, and by forging partnerships with industries that rely on the products in wastewater, such as agricultural, food and beverage, oil and gas.

tpo: What does the plan say about changes within WEF itself?

Venner: We are focused on how we can do better as an organization in cultivating community. When we talked to our members, we heard time and again that what they love about WEF is the community we foster, and that they get to connect with people outside of their jobs. We want to improve our member experience, delivering content and programming in innovative and exciting ways. **tpo**

Pumps and Blowers

By Craig Mandli

Centrifugal Pumps

GORMAN-RUPP SUPER T SERIES

Super T Series self-priming centrifugal trash pumps from Gorman-Rupp are available with Eradicator Plus solids-reduction technology for 3-, 4- and 6-inch sizes. The product was designed for extreme-duty applications in municipal, industrial and agricultural markets. For liquids containing trash bags, wipes, mop heads, hair, industrial byproducts and agricultural wastes, it cuts and tears organic solids entering the pump. Pumps include an easily removable lightweight inspection cover, a back cover plate incorporating an obstruction-free flow path, a heavy-duty hard iron continuous vane impeller with thick back shroud to prevent debris buildup, an extra-thick hard iron wear plate with notches, grooves and oversized lacerating teeth to cut and shred organic solids, and an upgraded stainless steel, load-bearing shaft. Complete units are available in cast iron construction. Upgrade kits are available for pumps currently in use. **419-755-1011; www.grpumps.com**



Super T Series pumps from Gorman-Rupp

PIONEER PUMP DIESEL-DRIVEN PUMP PACKAGES



Diesel-driven pump packages from Pioneer Pump, a brand of Franklin Electric

Pioneer Pump, a brand of Franklin Electric, offers a comprehensive range of diesel-driven pump packages including options for fixed and portable installations. These packages are built for tough environments and are available with vacuum-assisted priming, self-priming and standard centrifugal pump ends. Available in sizes up to 18 inches, the centrifugal pumps are designed to provide better flow, higher head and greater efficiency to meet unique challenges. Sound-attenuated enclosures are available for select models. Enclosures are manufactured from heavy-duty sound-deadening material to meet industry standards for noise reduction. All enclosures offer lockable door panels that can be removed in minutes without tools for easy and direct access to the pump. **503-266-4115; www.pioneerpump.com**

Chopper Pump

VAUGHAN COMPANY ROTAMIX SYSTEM

The Vaughan Company Rotamix system is a cost-effective means of mechanical hydraulic mixing for sludge tanks, digesters and other high-volume applications. Combining high-velocity mixing nozzles and the Vaughan Chopper Pump, the Rotamix creates a multizone mixing pattern while simultaneously chopping all accumulated solids, resulting in an easy-to-pump, homogeneous mix. **888-249-2467; www.chopperpumps.com**



Rotamix system from Vaughan Company

Effluent Pumps

ASHLAND PUMP EFFLUENT PUMPS

Heavy-duty effluent pumps from Ashland Pump are available in multiple horsepower sizes for various performance requirements and have efficient permanent split-capacitor motors. The oil-filled pumps have an upper and lower ball-bearing design and handle solids up to 3/4 inch. They are made of cast iron with cast iron impellers and equipped with a piggyback switch (20-foot standard cord) or in manual configurations. They are offered in 3/10, 4/10, 1/2, 3/4, 1 and 1 1/2 hp models. **855-281-6830; www.ashlandpump.com**



Heavy-duty effluent pumps from Ashland Pump

CRANE PUMPS & SYSTEMS BARNES RAZOR

The 2 hp Barnes RAZOR grinder pump from Crane Pumps & Systems is suitable for light commercial and residential solids-handling applications. It is designed with axial cutting technology to reduce solids like flushable wipes, diapers and other nonbiodegradable items. Maintenance is convenient with only a single tool needed for disassembly. The plug-and-play cord also provides easy servicing without requiring removal of epoxy in the conduit. Its 1.25-inch discharge is suitable for preconfigured packaged systems and turnkey solutions. It is available in the Barnes EcoTRAN Pressure Sewer System for grinding in tough terrain. It provides a practical and environmentally safe alternative to traditional gravity systems. Numerous configuration options are available. **937-778-8947; www.cranepumps.com**



Barnes RAZOR grinder pump from Crane Pumps & Systems

HYDRA-TECH PUMPS S4SHR AND S4SHR-LP



S4SHR and S4SHR-LP pumps from Hydra-Tech Pumps

S4SHR and S4SHR-LP 4-inch hydraulic submersible shredder pumps from Hydra-Tech Pumps are designed to continuously rip and shear solids with a 360-degree shredding action. The pump's carbide-tipped impeller and hardened macerator suction plate work together to produce a violent shredding action that keeps the discharge open. This 4-inch pump is suitable for municipal, industrial, agricultural and institutional waste applications.

The S4SHR-LP is narrower in size at 21.5 inches, which allows it to fit through most manholes. Depending on the application, there is a version for portable or fixed installations. A guide rail assembly is available for stationary applications. Combined with HT16 to HT25 power units, the S4SHR is capable of flows up to 810 gpm. The safe and variable-speed hydraulic drive can be used where electric power is hazardous or impractical. **570-645-3779; www.hydra-tech.com**

ZOELLER PUMP 10 & 15 HP GRINDER PUMPS

Zoeller Pump's 10 & 15 hp is an expansion to its existing grinder product offering now ranging from 1 to 15 hp. The units include a dual carbon ceramic shaft seal, moisture and thermal sensor and buna-N gasket protect the 3,450 rpm motor, and class F windings. They are available in 208, 230, 460 or 575 volt, three phase. The 3- or 4-inch ANSI flanged horizontal discharge allows for easy adaption to competitor grinder or sol-



Grinder pumps from Zoeller Pump

ids handling rail systems. The pumping performance ranges from 250 feet at shut off and a max flow at 150 gpm at 50 feet TDH. Removable legs clear the bottom of the pump to allow debris to flow easier into the cutter assembly when used with a guide rail assembly. This assembly uses 440 stainless steel with a Rockwell C hardness of 55-60 cutter and cutter plate in a scissor-like cutting motion that reduces solids down to 1/8 inch in size. **800-928-7867; www.zoellerengineered.com**

Metering Pumps

BLUE-WHITE FLEXFLO M5 PERISTALTIC METERING PUMP

The FLEXFLO M5 Peristaltic Metering Pump from Blue-White accurately doses chemical .0124 to 540 gph at motor speeds of just 75 rpm. This greatly increases tube life, reduces overall maintenance and is energy-efficient. It is all-inclusive with no external components required. The chemical resistant enclosure houses the pump head, energy efficient BLDC motor, premium control boards, and all connections (manual, remote analog/digital, EtherNet IP, Modbus TCP/IP, PROFIBUS). The large 5-inch touchscreen color display is as simple to operate as a cellphone. It includes password security to prevent tampering. Pulsation is reduced by up to 80% with its offset roller design and dual-channel tube assembly. The heavy-duty roller eliminates flexing and increases accuracy. There are no metal springs or hinges to corrode. It is equipped with built-in tube failure detection to help prevent hazardous chemical spills. **714-893-8529; www.blue-white.com**



FLEXFLO M5 Peristaltic Metering Pump from Blue-White



FRAM pumps from JAECO Fluid Systems

JAECO FLUID SYSTEMS FRAM PUMPS

FRAM pumps from JAECO Fluid Systems are hydraulically actuated and designed for accurate, completely leakproof metering of difficult-to-handle liquids. The durable cast iron pumps are available in simplex or duplex with capacities ranging from 0.86 to 56 gph at operating pressures up to 1,200 psi. Liquid end options include 316 stainless steel, PVC or Alloy 20 and include single or double ball or poppet spring-loaded check valves. The pumps customized to each customer's specific needs and are designed for continuous use with minimal downtime. **877-778-3456; www.jaecofs.com**

PULSAFEEDER PULSATRON MP SERIES

Pulsafeeder's Pulsatron MP Series has an optional 4-20mA output signal that provides a remote indication of pump speed, so the user can remotely confirm the pump's speed is adjusting to process parameters, to more accurately estimate chemical usage over time. The pump transmits a 4-20mA signal proportional to the actual speed of the unit and is factory calibrated for easy installation in the field. It is a true micro-processor-controlled instrument, delivering precise and accurate metering control. It includes automatic control via 4-20mA or 20-4mA inputs, an external pace function with a stop feature, and a graphical LCD display with support for English, French, German and Spanish languages. Models are capable of flows ranging between 3 and 504 gpd and pressure ranges from 20 to 300 psig, and a turndown ratio of 1,000 to 1. **800-333-6677; www.pulsafeeder.com**



Pulsatron MP Series pump from Pulsafeeder

VALMET FLOW CONTROL FLOWROX FXM

Flowrox FXM metering pumps from Valmet Flow Control are suitable for but not limited to chemical dosing applications that require accurate metering. FXM2 and FXM3 series pumps have only one wear-resistant part (tube assembly) in contact with corrosive or abrasive mediums. The pumps have a low consumption of spare parts, which allows reduced maintenance and downtime to improve process performance and provides accurate dosing. They ensure accurate dosing by the positive displacement of the tube bore with zero slip that produces the same volume on every cycle. There is no variation due to the discharge pressure condition. The compression points of the tube act as a self-cleaning check valve without clogging. This helps eliminate the risk of vapor lock. They have expanded logic programming, functionality and have a higher pumping capacity. Other features include contactless external leak sensors for tube failure detection. They have upgraded motors and control circuits to ensure accuracy even at the lowest speed. **678-772-9584; www.valmet.com**



Flowrox FXM metering pumps from Valmet Flow Control



BLUEline rotary lobe pumps from Boerger

Rotary Lobe Pump

BOERGER BLUELINE ROTARY LOBE PUMPS

Boerger BLUEline rotary lobe pumps are a self-priming, valveless, positive displacement pump used for conveying viscous and abrasive materials. They are resistant to wear and provide pulsation-free operation. Operation is fully reversible, with dry run capability and flow rates up to 7,000 gpm. They are constructed with maintenance in place design, allowing for all wetted parts to be easily replaced through the front cover without the removal of pipe or drive systems. The pump conveys biosolids (primary, WAS, RAS, digested, thickened, etc.), grease, sewage, scum, lime slurry, alum sludge, permeate and polymers. **612-435-7300; www.boerger.com**

Slip Pump

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Triplex pumps from Cat Pumps

(continued)

Solids/Sludge Pump

MYERS SETH PUMP DV-6

The DV-6 from Myers Seth Pump is a vacuum-assisted 6-inch double diaphragm pump with incorporated vacuum assisted technology through an oilless 80 cfm vacuum pump and float chamber assembly.

With the addition of the vacuum pump it creates a total of 120 to 130 cfm. This will allow customers who prefer using double diaphragms to use this pump for much larger and deeper wellpoint and sock drain systems, in addition to other applications such as sump pumping, rim ditching and open pond applications. It only burns 9 to 10 gallons of fuel per day and is capable of running over seven days continuously.

904-389-6114; www.myerssethpumps.com



DV-6 pump from Myers Seth Pump

Submersible Pump



POLYLOK PL-CPE4A

The Polylok PL-CPE4A is a submersible, 4/10 hp, 115-volt, single-phase effluent pump with a 2-inch NPT vertical discharge. It has a maximum head of 38 feet and a maximum flow of 56 gpm. The pump is designed with a 3,450 rpm oil-filled permanent split-capacitor motor and has an amp rating of 6.6 for 115 volts, a rugged cast iron housing and volute equipped with a cast iron vortex impeller capable of passing 3/4-inch-diameter solids. The stainless steel shaft is supported by two single-row, oil-lubricated ball bearings. The shaft seal is an inboard design with a secondary Exclusion V seal. It has a 20-foot UL/CSA-listed power cable suitable for submersible service and fitted with a three-prong plug. The unit is supplied with an integrated clip for the included piggyback mechanical float switch and used for automatic operation.

PL-CPE4A pump from Polylok

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Blowers

EURUS BLOWER ZZ SERIES

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ZZ Series blowers from Eurus Blower

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Rotary screw blowers from KAESER

Pump Controls



TOPAX MC controller from Lutz-JESCO America

LUTZ-JESCO AMERICA TOPAX MC

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Force Main Sync system from Smith & Loveless

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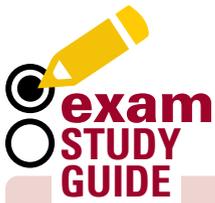
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Rapid Set mounting system from PRIMEX



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WASTEWATER

By Rick Lallish

Duckweed can be a nuisance and cause problems in facultative lagoons. What is the recommended method of controlling duckweed outbreaks?

- A. Apply large amounts of HY-var to the influent flow
- B. Add live *Daphnia* to the lagoon
- C. Physical removal
- D. Allow the duckweed to flourish, as it will assist the algae with dissolved oxygen

ANSWER: C. Some treatment facilities actually use duckweed to control excessive algae growth. However, duckweed is an extremely aggressive plant and can overtake a facultative lagoon cell in a very short time. The most recommended method of controlling duckweed is to physically remove it. This can be done by using a boat with a rake or board in the front, pushing the duckweed to the bank and removing it. Herbicide may be used in some cases but only with regulatory authority and proper application certification (in some states). Chemical treatment of lagoons should be a last option. More information may be found in the WEF textbook: *Wastewater Treatment Fundamentals I: Liquid Treatment*, Chapter 6.

DRINKING WATER

By Drew Hoelscher

Which assembly will protect a water main from a fire-suppression system and identify illegal water usage from the fire-suppression waterline?

- A. DCV
- B. RPZ
- C. AVB
- D. RPDA

ANSWER: D. A cross-connection-control program is one method public water supplies use to help protect the distribution system from contamination. Public water supplies are responsible for the quality of the water delivered to the end user, so it is important to identify high-risk connections and protect the distribution system with backflow preventers. Operators typically use the survey method, and site visits when necessary, to gather initial service connection information. The reduced pressure detector assembly is equipped with a meter on the bypass line to detect leaks or unauthorized water usage.

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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people/awards

Chuck Gorman, assistant director of the State Revolving Fund for the South Carolina Department of Health and Environmental Control Bureau of Water, received the Friend of Rural Water Award from the South Carolina Rural Water Association.

The **Norfolk Water Pollution Control Plant** received the Scott Wilber Award for outstanding operations and maintenance from the Nebraska Water Environment Association. The facility also received the Gold Safety Award for excellence in accident prevention and the WEF George W. Burke Jr. Safety Award.

Megan Watt of Sidney (Ohio) Wastewater Treatment Department received the Rookie of the Year award at the city's annual Service Awards Program.

The **Guam Waterworks Authority Northern District Wastewater Treatment Plant Expansion** received the Grand Award in the Water and Stormwater category in the 2022 American Council of Engineering Companies Tennessee Engineering Excellence Awards program.

The **Albert Lea (Minnesota) Wastewater Treatment Plant** received an Honored Institution Award from the National Weather Service in the Twin Cities for 50 years of service for its observing program.

Donald Clark, assistant district manager at the South Coastal Regional Wastewater Facility in Delaware, was named Sussex County employee of the year.

Sherry Bradley, director of the Bureau of Environmental Services with the Alabama Department of Public Health and MPA director of the Black Belt Unincorporated Wastewater Project, received an Award of Excellence from the state of Alabama.

The staff at the **Kannapolis Water Treatment Plant** earned the North Carolina Area Wide Optimization Program Award for the sixth consecutive year.

Wen Zhang, an associate professor of civil and environmental engineering at New Jersey Institute of Technology won a Thomas A. Edison Patent Award from the R&D Council of New Jersey for a technology that uses microwave irradiation to catalyze reactions on membrane surfaces, producing hot spots and reactive radicals that rapidly degrade pollutants, kill microbes and mitigate membrane clogging.

Chen Vang of the Albemarle Highway 52 Water Treatment Plant was named North Carolina Certified Waterworks Operator of the Year in the surface water operator category.

The **Ricky L. Miller Water Treatment Plant** in the town of Boone received the Gold Star honor for the North Carolina Area Wide Optimization Award.

Tom Muth, district manager of the Fox Metro Water Reclamation District based on Oswego Township, Illinois, retired after 36 years of service.

Peter Fernandez, director of public works in Salem, Oregon, retired after 28 years with the city.

Karen Henry was named acting director of the Anne Arundel County (Maryland) Department of Public Works, replacing Chris Phipps, who retired.

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 event notices to editor@tpomag.com. tpo

events

March 1-3

WI Land+ Water 70th Annual Conference, Chula Vista, Wisconsin Dells. Visit www.wisconsinlandwater.org.

March 5-8

2023 WateReuse Symposium, Marriott Marquis Atlanta. Visit www.watereuse.org.

March 8

AWWA Benefits from the Application of Hydraulic Modeling for Small Water Systems, webinar. Visit www.awwa.org.

March 12-15

2023 South Carolina Environmental Conference, The Sheraton Myrtle Beach Convention Center Hotel. Visit www.scwaters.org.

March 13-15

Nebraska Rural Water Association Annual Conference, Younes Center, Kearney. Visit www.nerwa.org.

March 14-16

Contaminants of Concern AWWA Virtual Symposium. Visit www.awwa.org.

March 15-17

Michigan Rural Water Association Annual Conference, Grand Traverse Resort, Traverse City. Visit www.mrwa.net.

March 20-22

WEF Forum 2023 – Intensification of Resource Recovery, Embassy Suites by Hilton Raleigh Durham Research Triangle, Cary, North Carolina. Visit www.wef.org.

March 21-22

Nevada Water Environment Association Annual Conference, Grand Sierra Resort, Reno. Visit www.nvwea.org.

March 22-24

Montana Rural Water Association Technical Conference and Exhibition, Heritage Inn, Great Falls. Visit www.mrws.org.

March 26-28

AWWA/WEF Young Professionals Summit, SAFE Credit Union Convention Center, Sacramento, California. Visit www.awwa.org.

March 26-29

Missouri Water Environment Association 2023 Joint Annual Meeting, Tan-Tar-A Resort, Osage Beach. Visit www.mwea.org.

March 28-31

WEF/AWWA Utility Management Conference 2023, SAFE Credit Union Convention Center, Sacramento, California. Visit www.awwa.org.

March 29-30

Michigan Water Environment Association Biosolids Conference, Firekeepers Casino Hotel, Battle Creek. Visit www.mi-wea.org.

March 29-31

Texas Rural Water Association RuralWaterCon, Austin. Visit www.trwa.org.

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OZ Lifting Aluma-Lite davit cranes

OZ Lifting Products announces the new Aluma-Lite davit crane for wastewater and water operators. The Winona, Minnesota-based manufacturer has released the ultra-portable davit crane in 500- and 1,000-pound capacities, each available with three bases: pedestal, socket (flush-mount) or wall-mount. The Aluma-Lite 500 weighs in at 24 pounds with a maximum capacity of 500 pounds and the Aluma-Lite 1,000 weighs in at 47 pounds with a maximum capacity of 1,000 pounds. Both fold flat for easy storage or transportation, and are made of aerospace/military grade aluminum. The cranes are available with a manual winch (including drill drive adapter), AC or DC electric winches. The Aluma-Lites have a durable, powder-coated finish, no tools are needed for assembly/disassembly, and they are made in the USA.

800-749-1064;
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product spotlight

water

Level transmitter employs Guided Wave Radar technology

By Craig Mandli

Accurate level measurement is essential in water and wastewater management for the effective monitoring and control of process steps in the water cycle. Taking that accuracy requirement further, **Hawk Measurement Systems** has designed and developed what they are calling the industry's first Guided Wave Radar level transmitter featuring Power over Ethernet communications — the **CGR PoE Level Transmitter**.

The CGR PoE Level Transmitter is ideal for the measurement of liquids, sludge, powders and granules for level and interface. The measurement technology is more accurate than other transmitters because, according to Jack Evans, global president of Hawk Measurement, the unit itself is not affected by pressure, temperature, viscosity, vacuum, foam, dust, changes in dielectric constant or coating of the probe.

"HAWK continues to focus on developing technologies to help our customers," says Evans. "We are very excited about the interest and feedback for the Guided Radar Power over Ethernet product, as this was developed based on our customers' needs and input."

The guided-wave technology sends the radar pulse down a probe to measure either liquids, solids or a low dielectric to high dielectric interface level. The pulse hits the surface and/or interface and is reflected back up the probe to the sensor, where the transit time is translated into a distance using time of flight and time expansion. The amplitude of the reflection depends on the dielectric constant of the product.

The advantages to Power over Ethernet connec-

tion are secure in-plant and remote monitoring, as well as remote sensor setup, diagnostics and troubleshooting abilities. If any troubleshooting is required, the CGR PoE will communicate to remote service technicians for off-site diagnostics, sensor health and re-configuration, without the need to climb a tank or enter the facility.

piece of equipment, minimizing upfront investment. Additionally, the crane is designed with adequate reach to accommodate lifting large loads within tight spaces, and a boom that can be adjusted to nearly 45 degrees to allow for clearance over obstructions such as handrails. It also comes standard with a hot-dipped galvanized finish, stainless steel hardware and steel sheaves, making it ideal for wet work environments. Available in 1/2- and 1-ton capacities, Patterson Davit Cranes are made in the USA, and deliver on the company's promise of keeping employees safe and positively impacting your business's bottom line.

800-322-2018;
www.pattersonmfg.com/davit-cranes



CGR PoE Level Transmitter from Hawk Measurement Systems

tivity are secure in-plant and remote monitoring, as well as remote sensor setup, diagnostics and troubleshooting abilities. If any troubleshooting is required, the CGR PoE will communicate to remote service technicians for off-site diagnostics, sensor health and re-configuration, without the need to climb a tank or enter the facility.

The CGR PoE level transmitter can connect to an online portal — HawkEye365 — which can monitor multiple tanks worldwide in real time. This portal provides accessibility to critical data such as the ability to view volume, space, material height, historical trending, alarms and alerts, sensor setup and diagnostics. Plant-level operator screens are customized to the company's specifications to include control room level and operations level interface screens. The graphical user interface will be common throughout and permissions can be set for different tiers such as plant-level, finance or executive-level.

888-429-5538; www.hawkmeasurement.com



INDCO air-powered handheld mixers

INDCO's lineup of air-powered hand-held mixer packages are equipped with rugged and reliable 3/4 or 1 1/2 hp motors, and a 40-inch long shaft with 5-inch integral paddles (model SP400). Robust

air motors provide maximum agitation when supplied with 100 psi and 30 cfm for 3/4 hp (70 cfm for 1 1/2 hp version). An airflow valve allows speed control from 300 to 3,000 rpm. Air motors provide a lighter weight option than electric motors, and non-electric operation reduces the possibility of explosion in a combustible environment. Single-handle or dual-handlebar options are available. With a wide variety of impeller designs available, INDCO handheld mixers ideal for mixing resins, chemicals, adhesives, block fillers and more.

800-851-1049;
www.indco.com



Emerson Crosby J-Series PRV product line

Emerson announced the release of two new technologies for the Crosby J-Series pressure relief valve product line. The first is a Balanced Diaphragm, which eliminates the need for bellows in PRVs, while providing balanced operation against backpressure to lower cost of ownership and enhance performance. The second technology is Bellows Leak Detection, enabling remote detection of bellows ruptures in PRVs, with the capability to reduce and accurately calculate volumetric

emissions in real time. The most common causes of bellows failures are excessive backpressure and rapid cycling. Upgrade kits for existing Crosby J-Series PRVs are available for both new technologies, and new PRVs can be purchased with these features pre-installed.

800-972-2726; www.emerson.com



Blackline Safety G7c gas wearable gas detector

The G7c personal wearable connected gas detector and lone worker safety monitor by Blackline Safety is certified to the newly upgraded BS 8484:2022, the standard that underpins the UK's lone worker safety leadership. Lone workers face the

risks of slips, trips, falls, health events, extreme weather, vehicular accidents and a number of other potentially harmful events. Blackline's G7c is an all-in-one cloud-connected solution, integrating 4G connectivity and capabilities to enable efficient and reliable lone worker monitoring. It offers reliable communication with two-way text messaging, two-way voice calling and push-to-talk options. G7c's emergency SOS latch generates an instant visible and audible alarm, alerting monitoring personnel should a worker be faced with a threatening or dangerous situation.

877-869-7212;

www.blacklinesafety.com

Aquasight ACE Rain Heatmaps and Storm Catalog

Aquasight's ACE Rain Heatmaps and Storm Catalog solution provide critical insights to storm events in

time for utilities to minimize flooding impacts or potential sewer overflows. It provides actionable, data-driven insights into current, past and forecasted storm events, enabling all aspects of wastewater utility operations, from operator to utility executive, to make better, more informed decisions. The GIS-based solution provides rapid, automated, and on-the-fly live and historical storm event records correlated to each utility's unique design storm distributions. It provides powerful analytics to make accurate visualization of storm event characteristics for rapid, proactive response to the effects of extreme rainfall events. It also merges sewer flows and levels across sewer shed.

248-590-2190;

www.aquasight.io tpm

product spotlight wastewater

Digital control allows system to operate at peak efficiency

By Craig Mandli

Anue Water Technologies' FORSe Oxygen/Ozone systems serve as an eco-friendly approach to mitigate hydrogen sulfide-related odors and corrosion in wastewater collection systems like force mains and lift stations, while replacing costly chemicals such as calcium nitrate. The systems are regulated by **Flo Spec Control Software** — a fully SCADA-compliant program that allows for bidirectional monitoring and control of each system with access to Wi-Fi.

According to Greg Bock, vice president and general manager at Anue Water Technologies, the efficiency of immediate data access and system control has allowed municipalities and industrial wastewater treatment plants to reduce costs. Its design allows standalone remote system monitoring, as well as SCADA interface as a standard product offering.

"Basically FloSpec is the on-board digital control system which enables the FORSe Oxygen/Ozone system to work efficiently," he says. "It is an Allen-Bradley-based PLC with unique control algorithms for safe and efficient utilization of pure oxygen infusion."

Programming options include specific alarm alerts that can be sent to any computer or smartphone to identify and correct problems quickly. In many cases the Anue standalone capabilities have provided customers with critical information regarding remote locations before their operations staff would normally find the problem. According to Bock, FloSpec Digital Communication systems not only send alerts but also allow the end user to respond to these alerts and act accordingly remotely. This technology is applicable to other industries like power generation and landfills where odor and corrosion mitigation is required.



"Anue has designed these systems with a tremendous amount of flexibility and capabilities," he says. "These systems can be configured to meet the customer needs such as additional FOG control, external grinder pump control, external data acquisition and integrating into their SCADA network."

All products are manufactured in the USA for domestic and international markets — with engineering considerations for site specific installation requirements. Bock says that feedback on the telemetry upgrade to the FORSe system has been overwhelmingly positive.

"The flexibility of these systems is the game changer," he says. "Our clients are very pleased by the savings both in economics and manpower from replacing their chemical purchases with our oxygen/ozone technology and user-friendly approach. With the rising cost of chemicals (up 150% this year) and demands for more eco-friendly solutions, FORSe Oxygen/Ozone systems are the perfect fit for the industry."

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industry news

Aqua-Aerobic's Decker elected as WWEMA chairman

The Board of Directors of the Water and Wastewater Equipment Manufacturers Association elected Bill Decker to assume the position of chairman for its 2023-2024 term. Decker has been involved with WWEMA for 20 years. During this time, he has represented WWEMA at various industry meetings including discussions with the EPA and the Made in America office, as well as participated in various WWEMA committees including chairing the marketing and member services committee. His role as chairman includes serving on the Strategic Planning and Executive committees and providing leadership to the organization.



Bill Decker

120Water names new director of water quality compliance

120Water welcomed Jonathan Cuppert as director of water quality compliance. He will be instrumental in monitoring federal and state compliance requirements and providing relevant regulatory insight to the 120Water team. For the last 13 years, Cuppert worked at The Water Research Foundation developing relationships with utilities, NGOs and other stakeholders while managing more than \$25 million of projects across the water industry.



Jonathan Cuppert

Emerson software automates Purdue University's Nanogrid House

Purdue University is using Emerson's digital technologies to automate its Nanogrid House, a living lab for energy-efficient home research. Compared to today's homes and businesses that are powered predominantly by AC power, the Nanogrid House can shift between AC and DC power, which increases the ability to use renewable energy and lower homeowners' energy costs. The Nanogrid House enables researchers to develop technologies to address these challenges in anticipation of a future nationwide shift to DC power.

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Pennsylvania's DTMA selects Ecoremedy for biosolids improvement program

Ecoremedy's Fluid Lift Gasification system has been selected by Derry Township Municipal Authority as the major component in a biosolids improvement program at its Clearwater Road Wastewater Treatment facility. The 5 million gpd plant serves the residents, visitors and businesses of Hershey, Pennsylvania, which includes the popular Hersheypark theme park and hotels, Hershey Chocolate World, Hershey Chocolate production plants and Tröegs Independent Brewing. The installation of the biosolids drying and gasification platform is expected to boost the wastewater treatment facility's sustainability by expanding capacity and increasing energy efficiency, according to DTMA Executive Director William Rehkop.

Endress+Hauser names new service partner

Endress+Hauser announced its representative partner of seven years, Eastern Controls, is the new, exclusive authorized sales and service provider for the municipal markets in east Pennsylvania, New Jersey and Delaware. Eastern Controls specializes in calibration and maintaining high-quality service capabilities. **tpo**

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